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Research Article

"A Study to Assess the Effectiveness" of Planned Teaching Programme on Knowledge and Practice Regarding Buerger Allen Exercise Among Traffic Police with Diabetes Mellitus of Selected Urban Areas"

Neelam Rawat[1], Gayatri Gholap[2]

[1]Department of Medical Surgical Nursing, Narayan Swami College of Nursing, Dehradun, Uttarakhand, India, [2]Department of???, Medical Surgical Nursing, Bombay Hospital, Mumbai, Maharashtra, India

Abstract

Background: Occupational health workers spending most of the day on their feet, every working day are at greater risk of health problems including varicose vein, poor circulation and swelling in the feet's and legs, foot problems, and joint damage. Early detection of the condition could lead to treatment that offers the potential to reduce the incidence of fatal as well as to also improve the quality of life.

Aim: The aim of the study was to assess knowledge and practice regarding Buerger Allen exercise on the lower extremity perfusion among traffic police before and after planned teaching.

Methodology: Quantitative (descriptive evaluatory) research approach and one group pre-test- post-test research design (pre-experimental) is used.

The study was conducted in selected urban areas of Mumbai with sample consisted of 60 traffic police personnel. Structured questionnaire was prepared to assess knowledge and self-reported questionnaire was used to assess practice. Planned teaching program with demonstration on Buerger Allen exercise was the intervention of the study provided to the samples.

Results: The overall pre-test mean knowledge score and the overall pre-test mean practice score was found to be 8.42. The overall post-test mean knowledge score and practice score was found 15.05 and 6.48, respectively. The "*t*" value ($P = 0.05$) for knowledge score was 18.21 and for practice score 24.87 which indicates the effectiveness of planned teaching program regarding Buerger Allen exercise.

Keywords: Buerger Allen exercise, lower extremity perfusion, occupational health, planned teaching, structured questionnaire

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Introduction

Lower limb disorder causes over 2 million days sick leave a year. Chronic heart and circulatory disorders are linked to prolonged standing at work. Prolonged time in upright posture at work may cause hypertension comparable to 20 years of ageing.[1]

In a recent health check-up conducted by the Delhi police, it has been found that the around 30% of the traffic police personnel

Address for Correspondence:
Mrs. Gayatri Gholap, Professor, Bombay Hospital College of Nursing, Mumbai, Maharashtra, India. E-mail: catchgayatri@gmail.com

who are doing their best in providing safe environment on the roads of the city are suffering from varicose vein a disease caused due to prolonged standing hours. Around 5500 personnel of Delhi work in the field standing nearly 8–12 h and sometimes double shifts.

Occupational environment place a major role on the health of the exposed. The health hazards get more severe when the duration of exposure increases. This fact is more important in situations as the personnel engaged in traffic duty. Still little has been done to assess their health status and suggest preventive measures for the upliftment of their health. Standing all the day can be detrimental to one's health.[2]

Peripheral vascular disease and varicose vein are the two diseases which can easily attack people whose daily lifestyle puts a lot of stress on their legs. A growing number of traffic policemen are suffering from varicose veins, a painful ailment which often develops due to high pressure while standing and walking. The only way to avoid the varicose vein among traffic police is to follows the preventive measures.[3]

According to "Save India" screening program for vascular disease on "National Vascular Week," in India one in every 20 Indians over the age of 40 has peripheral arterial disease and it is estimated to affect more than 9 million people in India. Individuals with peripheral arterial disease suffer a five-fold increased relative risk of a cardiovascular ischemic event and total mortality that is two to three folds greater than those without peripheral arterial disease. The estimated number of asymptomatic individuals varies widely from 20% to 50%. The risk factors for the occurrence of peripheral arterial disease are diabetes mellitus, hypertension, heart disease, cigarette smoking, and eating food high in fat.[4]

Based on above statistics, the investigator felt that, the traffic police who are at the risk of vascular complications such as varicose veins, chronic venous insufficiency, and venous thrombosis should be adequately informed about its prevention. Nurses can play an important role in educating traffic police regarding supervised exercise like Buerger's Allen exercise that will improve the lower extremity perfusion by draining the engorged vessels, developing collateral circulation, and reducing symptoms of claudication.

Objectives of the study

1. To assess knowledge and practice regarding Buerger Allen exercise on the lower extremity perfusion among traffic police personnel before and after planned teaching
2. To compare the effectiveness of planned teaching regarding Buerger Allen exercise on the lower extremity perfusion among traffic police before and after planned teaching
3. To find out the association between knowledge score and practice score with selected demographic variables regarding Buerger Allen exercise on the lower extremity perfusion among traffic police.

Subjects and Methods

Sixty samples who fulfilled inclusion criteria were selected through non probability purposive sampling technique. One group pre-test post-test design was used. The traffic police were included who had diabetes mellitus, willing to participate in the study and were available at the time of study. The subjects who already had knowledge regarding the exercise, and developed leg ulcers were excluded from the study.

Study tools

The study tool used for data collection was semi-structured questionnaires and self-reported checklist. Consisted of three sections

Section 1: Includes demographic variables, that is, age, educational qualifications, gender, personal habits, history of diabetes mellitus, lower extremity problems, and work pattern.
Section 2: Consists of 20 structured questionnaires to assess various aspects of knowledge.
Section 3: This section consists of 10 self-reported questionnaires to assess the practice regarding Buerger Allen exercise to improve lower extremity perfusion.

Data collection procedure

Before starting the study, researcher obtained written permission from Superintendent of Police, Mumbai. The procedure was explained to the participants, consent was taken. Data collection was done using semi structured questionnaire for the assessment of knowledge and self-reported checklist to assess practice. Following pre-test data collection planned teaching was introduced with demonstration and post-test was obtained on 7th day of planned teaching. The total duration spent with sample for conducting pre-test, planned teaching program and post-test was 2 h.

The score obtained as pre-test and post-test knowledge and practice score.

Statistical analysis

Data were presented as frequency and percentages, mean and standard deviation. Paired test was used to compare means within group.

Chi-square test was used to find out association between demographic variable. $P < 0.05$ was considered significant.

Results: Demographic Data

Table 1 depicts that maximum traffic police 26 (43.33%) were from the age group of 41 to 50 years, 18 (30%) were from the age group of 51–60 years, and 16 (26.67) were from the age group of 30–40 years of age. Maximum number of traffic police 55 (91.67%) were male and only few 5 (8.33%) were female.

About 39 (65%) samples had completed their basic education up to 12th standard. Only 21 (35%) had completed graduation.

Table 2 specifies that 14 (23%) traffic police had habit of alcohol consumption, 7 (12%) had habit of smoking and

about 1 (2%) traffic police had habit of chewing tobacco. About 63% (38) had no such personal habits. The maximum number of traffic police, that is, 36 (60%) out of 60 were having diabetes mellitus since 1–3 years. About 15 (25%) were having diabetes since 4–6 years and only few that is 9 (15%) were having Diabetes mellitus since 7–9 years. Maximum number of traffic police 37 (61.67%) were standing continuously during working hours, about 14 (23.33%) were standing >8 h followed by 7 (11.66%) sitting intermittently during working hours, and only 2 (3.33%) were standing intermittently during working hours.

Table 3 shows, 39 (65%) traffic police had complaints of leg pain, about 10 (16.67%) had numbness and tingling in legs and only few, that is, 7 (11.67%) had developed superficial varicose veins.

Table 1: Distribution of Samples (traffic police) according to their demographic data *n*=60

Demographic data	Frequency (f)	Percentage
AGE		
30–40 years	16	26.67
41–50 years	26	43.33
51–60 years	18	30%
GENDER		
Male	55	91.67
Female	5	8.33
EDUCATION		
12th pass	39	65
Graduates	21	35

Table 2: Distribution of samples according to their demographic data: Personal Habits *n*=60

Demographic data	Frequency (f)	Percentage
Personal habits		
Alcohol consumption	14	23
Smoking	7	12
Chewing tobacco	1	2
None	38	63
History of diabetes mellitus		
1–3 years		
4–6 years		
7–9 years		
Total	36	60
4–6 years	15	25
7–9 years	9	15
Work pattern		
Sitting intermittently	7	11.66
Standing>8 h	14	23.33
Standing continuously	37	61.67
Standing intermittently	2	3.33

Table 3: Distribution of sample according to demographic data: Lower Extremity Problems *n*=60

Demographic data	Frequency (f)	Percentage
Lower extremity problems		
Leg pain	39	65
Numbness and tingling	10	16.67
Varicose vein	7	11.67
None	4	6.66
Total	60	100

Effect of planned teaching program on knowledge and practice regarding Buerger-Allen exercise

Table 4 depicts that only 2 (3.33%) samples had poor knowledge followed by maximum 53 (88.33%) with average knowledge, and very few 5 (8.33%) had good knowledge. The post test results shows drastic shift of sample as none of the samples were in poor range, only 3 (5%) samples were in average knowledge followed by moderate 28 (46.66%) in good knowledge, Maximum 29 (48.33%) sample were in range of excellent knowledge.

In pre-test, maximum 56 (93.33%) sample practiced Buerger-Allen exercise poorly, only few 4 (6.67%) had good practice whereas in post-test, Maximum 50 (83.33%) samples had good practice, followed by 10 (16.67%) excellent practice. None of the sample were in the range of poor practice.

Above values illustrates that after planned teaching program there is a change of number of sample from poor, average, good to excellent range, which proves effectiveness of planned teaching program in improving overall knowledge and practice score of samples.

Comparison of mean of pre- and post-test knowledge and practice score

Table 5 shows comparison of pre and post mean scores of overall knowledge and practice.

The calculated t value was found to be 18.21 for knowledge. As the calculated t value is greater than the table value 2.00 at 0.05 level of significance with the degree of freedom (df) 59, so the research hypothesis (H_a) is accepted and null hypothsis $H0_{a\ is}$ rejected.

The calculated *t* value for practice score was found to be 24.87. As the calculated *t* value is greater than table value 2.00 at 0.05 level of significance with the degree of freedom 59, so

Table 4: Distribution of pre-and post-test knowledge and practice score *n*=60

Overall knowledge level	Range	Pre test		Post test	
		F	%	F	%
Poor knowledge	0–5	2	3.33	0	0
Average knowledge	6–10	53	88.33	3	5
Good knowledge	11–15	5	8.33	28	46.66
Excellent knowledge	16–20	0	0	29	48.33
Total		60	100	60	100
Overall practice level					
Poor practice	0–3	56	93.33	0	0
Good practice	4–7	4	6.67	50	83.33
Excellent practice	8–10	0	0	10	16.67
Total		60	100	60	100

Table 5: Comparison of mean of pre-test and post-test knowledge and practice score *n*=60

Comparison of knowledge	Mean	S. D.	M.D.	't' value	*P*-value
Pre-test	8.42	1.77	6.63	18.21	<0.05
Post-test	15.05	2.204			
Comparison of practice					
Pre-test score	2	0.97	4.48	24.87	<0.05
Post-test score	6.48	0.99			

df=59, level of significance is 0.05 for the table value 2.00

Table 6: Association of demographic variable with pre-test knowledge core *n*=60

S. No.	Demographic variable of traffic police	*n*	Mean	df	*F*-value	Table *F*-value	*P*-value
1	Age			2.57	1.61	3.15	0.2087
	30–40 years	16	8.38				
	41–50 years	26	8.03				
	51–60 years	18	9				
2	Education						
	Up to 12TH pass	39	8.48	2.58	0.42	2.0017	0.678
	Graduates	21	8.28				
3	Habits			2.56	0.114	3.2317	0.952
	Alcohol consumption	14	8.21	2.56	0.114	3.2317	0.952
	Smoking	7	8.57				
	Tobacco chewing	1	9.00				
4	Work pattern						
	Standing continuously	37	8.59	3.56	0.622	2.8387	0.604
	Sitting intermittently	7	8.14				
	Standing intermittently	2	7				
	Standing >8 h	14	8.29			2.8387	

Table 7: Association of demographic variables with pre-test practice score *n*=60

S. No.	Demographic variable of Traffic police	*n*	Mean	df	*F*-value	Table *F*-value	*P*-value
1	Age			2.57	0.048	3.15	0.95
	30–40 years	16	2				
	41–50 years	26	2.038				
	51–60 years	18	1.94				
2	Education						
	12TH pass	39	1.97	58	0.27	2.0017	0.78
	Graduates	21	2.04				
3	Personal Habit						
	Alcohol consumption	14	1.57	2.56	1.472	3.2317	0.232
	Smoking	7	2.43				
	Chewing Tobacco	1	2.00				
	None	38	2.08				
4	Work pattern						
	Standing continuously	37	1.89	3.56	0.415	2.8387	0.743
	Sitting intermittently	7	2.14				
	Standing intermittently	2	2.00				
	Standing>8 h	14	2.21				

the research hypothesis (H_b) is accepted and null hypothesis $H0_b$ is rejected.

Above data show that there is significant difference in mean of both overall knowledge and practice, which proves that planned teaching program is effective in improving knowledge and practice of traffic police.

Association of demographic variables of traffic police with pre-test knowledge and practice scores

Table 6 depicts that the calculated F value of above demographic variables is less than their respective "F" table value at 0.05 levels.

Thus there is no statistical difference between groups of demographic variables age, education, personal habits and work pattern with respect to their pre-test knowledge scores. Hence, the research hypothesis ($H0_c$) is rejected and null hypothesis ($H_{c)}$ accepted.

This indicates that pre-test knowledge score is not dependent on certain demographic variables such as age, education, personal habit, and work pattern.

Table 7 depicts that the calculated F value of above demographic variables is less than their respective "F" table value at 0.05 levels.

Thus there is no statistical difference between groups of demographic variables age, education, personal habits and work pattern with respect to their pre-test practice mean scores. Hence, the research hypothesis ($H0_c$) is rejected and null hypothesis ($H_{c)}$ accepted this indicates that pre-test practice score is not dependent on certain demographic variables such as age, education, personal habit, and work pattern.

Discussion

Peripheral vascular disease is common disease in adults and its complications take a great toll in terms of quality of life. Early detection of the condition could lead to treatment that offers the potential to reduce the incidence of fatal as well as to also improve the quality of life.[5]

This study assess the effectiveness of planned teaching program regarding Buerger-Allen Exercise in terms of knowledge and practice of traffic police. The study was conducted in selected urban areas of metropolitan city.

The research hypothesis (H_a) for knowledge and (H_b) for practice was accepted in the study This shows that there is a statistical significant difference in the mean of pre-test and

post-test knowledge and practice score of the sample at 0.05 significant levels.

Association between knowledge and practice with selected demographic variables of the participants was done using AANOVA test. The study showed that pre-test knowledge and practice score are independent of age, education, personal habit, and work pattern. Hence, the research hypothesis (H_c) for knowledge and practice was rejected.

Ms Towar Shilshi Lankang, Dr Aruna S, Dr Mangla Gowri, P, August 2017 conducted a study to assess effectiveness of Buerger-Allen exercise on level of the lower extremity perfusion among patients with type 2 diabetes mellitus. The result showed that there is a significant improvement in the level of lower limb perfusion in experimental group after Buerger-Allen exercise than the control group among patients with type 2 diabetes mellitus at ($P < 0.001$). This study indicates that the Buerger-Allen Exercise is simple, non-pharmacological and effective method for the management of lower limb perfusion among the patients with type 2 diabetes mellitus.[6]

The present study revealed the effectiveness of planned teaching program on knowledge and practice regarding Buerger-Allen exercise among traffic police. And the study has consistent findings with the study conducted by Wen –Chun 2006 Chennai among 25 peripheral vascular disease patients to determine effectiveness of Buerger-Allen exercise training to improve the symptoms of PVD. The study results showed that 18% of the population increased the activity and perfusion by reducing the symptoms, 4% of the population illustrated a delayed effect of exercise and 2% showed improvement with surgery.[7]

The study concluded that exercises are effective in reducing peripheral vascular symptoms.

Conclusion

Understanding the various factors that contribute to poor health and lower limb problems among prolonged standing personnel, creating awareness, and teaching various preventive methods by healthcare workers is a key to improve knowledge and practices of such personnel.

Along with teaching periodic, evaluation of knowledge and practice can play an important role.

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Conflict of Interest

All authors declare they have no conflict of interest.

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