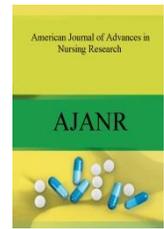




AMERICAN JOURNAL OF ADVANCES IN NURSING RESEARCH



Journal homepage: www.mcmed.us/journal/ajanr

EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING COMPARTMENT SYNDROME AND IT'S PREVENTION AMONG NURSES

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Article Info

Received 28/04/2025

Revised 15/05/2025

Accepted 20/05/2025

Key word:

CS-Compartment Syndrome, STP - Structured Teaching Programme.

ABSTRACT

This study assessed the effectiveness of a structured teaching programme on nurses' knowledge of compartment syndrome and its prevention in a selected Chennai hospital. Using a structured questionnaire, knowledge levels of 60 staff nurses, selected through non-probability convenient sampling, were evaluated before and after the intervention. Pre-test results showed that 78.33% had inadequate knowledge, 20% had moderate knowledge, and only 1.67% had adequate knowledge. Post-test results, conducted one week after the programme, revealed significant improvement, with 73.33% demonstrating adequate knowledge and 26.67% moderate knowledge. The mean knowledge score increased from 10.03±3.63 to 19.28±2.74, with a mean difference of 9.25 (37% improvement). A paired t-test ($t=18.132$, $p<0.001$) confirmed statistical significance, highlighting the structured teaching programme as an effective method for enhancing nurses' knowledge of compartment syndrome and its prevention.

INTRODUCTION

Compartment syndrome is a critical condition resulting from increased pressure within a closed fascial compartment, leading to compromised circulation and tissue perfusion. It is a surgical emergency that, if not promptly diagnosed and treated, can result in permanent tissue damage, loss of limb function, and even death. The condition primarily affects the extremities, where the rigid fascia encases the muscle compartments, preventing the expansion necessary to accommodate increased pressure.

The Lancet Healthy Longevity's article on the global, regional, and national burden of bone fractures, published from the Global Burden of Disease Study 2019,

reports that the age-standardized rates of fractures in 2019 were 2,296.2 incident cases (with a 95% uncertainty interval of 2,091.1–2,529.5) per 100,000 population. These high fracture rates, particularly in older populations, may contribute to the development of compartment syndrome, a serious condition that can arise when swelling or bleeding after a fracture increases pressure within a closed muscle compartment, compromising circulation and leading to potential tissue damage. The growing incidence of fractures highlights the increasing risk of such complications, necessitating timely diagnosis and intervention to prevent long-term morbidity.

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According to the National Center for Biotechnology Information (NCBI) (2015), the incidence of acute compartment syndrome (ACS) is estimated to be 7.3 cases per 100,000 in males and 0.7 cases per 100,000 in females, with the majority of cases occurring following traumatic events. Among the various types of fractures, tibial shaft fractures are the most common cause of ACS, with an incidence rate ranging from 1% to 10%. ACS is a serious condition that arises when increased pressure within a muscle compartment impedes blood flow, potentially leading to tissue ischemia, muscle and nerve damage, and long-term functional impairment if not treated promptly. The high association between tibial fractures and ACS highlights the importance of early detection and intervention, especially in trauma patients.

According to The Journal of Orthopedics Trauma Surgery and Related Research (2023), compartment syndrome is significantly more common in males, with an estimated incidence of 7.3 cases per 100,000 in males compared to 0.7 cases per 100,000 in females. The majority of these cases occur following trauma. Additionally, compartment syndrome is particularly prevalent in males under the age of 35, which may be attributed to larger intra compartmental muscle mass and a higher likelihood of being involved in high-energy trauma events, such as accidents or sports-related injuries. These factors contribute to the increased risk of developing acute compartment syndrome, especially in young, physically active males who are more prone to traumatic injuries.

This study seeks to address these gaps by providing a comprehensive review of the current literature on compartment syndrome, emphasizing the importance of early recognition, timely intervention, and the role of healthcare education in improving patient outcomes. By synthesizing the insights of key authors in the field, this study aims to contribute to a deeper understanding of the condition and enhance clinical practice in its prevention.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of structured teaching programed on knowledge regarding compartment syndrome and its prevention among nurses in selected hospital at Chennai.

OBJECTIVES

- To assess the knowledge regarding compartment syndrome and its prevention among nurses
- To evaluate the effectiveness of structured teaching program me on knowledge regarding compartment syndrome and its prevention among nurses
- To associate the mean differed knowledge on compartment syndrome and its prevention among nurses with their selected demographic variables.

NULL HYPOTHESES

NH1: There is no significant difference between the pre-test and post-test levels of knowledge on compartment syndrome and its prevention among nurses.

NH2: There is no significant association of post-test level of knowledge regarding compartment syndrome and its prevention among nurses with their selected demographic variables.

RESEARCH METHODOLOGY

A quantitative research approach and one group pre-test and post-test research design was used to assess the effectiveness of Structured teaching programme on knowledge of regarding compartment syndrome and its prevention among nurses. The 60 staff nurses were chosen by non-probability convenient sampling technique. The level of knowledge score was assessed by structured self-administered questionnaire. Structured self-administered questionnaire consists of 25 questions. Each correct answer carried 1 mark. Each question had only one right answer. The total score of the tool was 25

RESULTS

SECTION A: Description of the Demographic Variables of the Nurses.

The table 1 (a) shows that most of the nurses, 42 (70%) were aged between 21 – 25 years, 49 (81.7%) were female, 51 (85%) were unmarried, 46 (76.7%) had done B.Sc. in nursing, 42 (70%) were Hindus, 28(46.6%) had below 2 years of nursing services, 30(50%) were working in combined ICU, 53 (88.3%) were carrying rotation duty, 44 (73.3%) had handled any patient with compartment syndrome and 53 (88.4%) had not received any previous training course regarding compartment syndrome.

SECTIONB: Assessment of Level of Knowledge Regarding Compartment Syndrome and Its Prevention Among Nurses

The above table 2 shows that in the pretest, 47(78.33%) had inadequate knowledge regarding compartment syndrome and its prevention, 12(20%) had moderately adequate and only 1(1.67%) had adequate knowledge and after the intervention, 44(73.33%) had adequate knowledge and 16(26.67%) had moderately adequate knowledge regarding compartment syndrome and its prevention among nurses.

SECTION C: Effectiveness Of Structured Teaching Program me on Knowledge Regarding Compartment Syndrome and Its Prevention Among Nurses.

The table 3 shows that the pretest mean and standard deviation score of knowledge was 10.03±3.63 and the post-test mean and standard deviation score was 19.28



± 2.74 . The mean difference score was 9.25 and the mean difference percentage was 37%.

The calculated paired “t” test value of $t=18.13$ was statistically significant at $p<0.001$ level which clearly indicates that Structured Teaching program me on knowledge regarding Compartment syndrome and its prevention administered among the nurses was effective in improving the level of knowledge among them in the post test.

SECTION D: Association of level of knowledge

regarding compartment syndrome and its prevention among nurses. With selected demographic and variables.

The table 4 shows that the demographic variable years of experience in nursing service ($\chi^2=8.164$, $p=0.043$) had shown statistically significant association with post-test level of knowledge regarding Compartment Syndrome and its prevention among nurses at $p<0.05$ level respectively and the other demographic variables had not shown statistically significant association.

Table 1: (a) Frequency and percentage distribution of demographic variables of the nurses

Demographic Variables	Frequency (f)	Percentage (%)
Age in years		
21– 25years	42	70.0
26– 30years	13	21.7
31– 35years	5	8.3
Above36years	-	-
Gender		
Male	11	18.3
Female	49	81.7
Marital status		
Married	9	15.0
Unmarried	51	85.0
Divorce	-	-
Separated	-	-
Educational status		
ANM	3	5.0
GNM	11	18.3
B.Sc. in Nursing	46	76.7
M.Sc.in Nursing	-	-
Religion		
Hindu	42	70.0
Christian	17	28.3
Muslim	1	1.7
Others	-	-
Year of experience in nursing services		
Below2years	28	46.6
2–5years	24	40.0
6–10years	4	6.7
Above10years	4	6.7
Current working area		
Medical &Surgical Ward	26	43.3
Post-Operative Ward	-	-
Emergency Department	3	5.0
Labor & Post Natal Ward	1	1.7
Combined ICU	30	50.0
Usual Shift Rotation		
Dayshift only	5	8.3
Evening shift only	2	3.3



Nightshift only	-	-
Rotation duty	53	88.4
Are you handle any patient with compartment syndrome		
Yes	16	26.7
No	44	73.3
Receiving any previous training course regarding compartment syndrome		
Yes	7	11.7
No	53	88.3

Table 2: Frequency and percentage distribution of pretest and post-test level of knowledge regarding compartment syndrome and its prevention among nurses

Level of Knowledge	Pretest		Post Test	
	F	%	F	%
Inadequate knowledge ($\leq 50\%$)	47	78.33	-	-
Moderately adequate (51–75%)	12	20.0	16	26.67
Adequate ($>75\%$)	1	1.67	44	73.33

Table 3: Effectiveness of Structured Teaching Program me on knowledge regarding Compartment Syndrome and its prevention among nurses

Knowledge	Mean	S.D	Mean Difference & %	Paired “t” test & p-value
Pretest	10.03	3.63	9.25 (37%)	t=18.13 p=0.0001, S***
Post Test	19.28	2.74		

***p<0.001, S–Significant

Table 4: Association of post-test level of knowledge regarding Compartment Syndrome and its prevention among nurses with their selected demographic variables N=60

Demographic Variables	Moderately Adequate knowledge (51–75%)		Adequate Knowledge ($>75\%$)		Chi-Square Test & p-value
	No.	%	No.	%	
Age in years					X ² =2.008 d.f=2 p=0.366 N.S
21– 25years	12	20.0	30	50.0	
26– 30years	4	6.7	9	15.0	
31-35years	0	0	5	8.3	
Above 36years	-	-	-	-	
Gender					X ² =0.648 d.f=1 p=0.421 N.S
Male	4	6.7	7	11.7	
Female	12	20.0	37	61.7	
Marital status					X ² =1.310 d.f=1 p=0.252 N.S
Married	1	1.7	8	13.3	
Unmarried	15	25.0	36	60.0	
Divorce	-	-	-	-	
Separated	-	-	-	-	
Educational status					X ² =1.153 d.f=2 p=0.562 N.S
ANM	0	0	3	5.0	
GNM	3	5.0	8	13.3	
B.Sc. in Nursing	13	21.7	33	55.0	
M.Sc.in Nursing	-	-	-	-	
Religion					X ² =3.986



Hindu	9	15.0	33	55.0	d.f=2 p=0.136 N.S
Christian	6	10.0	11	18.3	
Muslim	1	1.7	0	0	
Others	-	-	-	-	
Year of experience in nursing services					X ² =8.164 d.f=3 p=0.043 S*
Below2years	11	18.3	13	21.7	
2–5years	4	6.7	24	40.0	
6–10years	1	1.7	3	5.0	
Above10years	0	0	4	6.7	
Current working area					X ² =0.433 d.f=3 p=0.933 N.S
Medical &Surgical Ward	7	11.7	19	31.7	
Post Operative Ward	-	-	-	-	
Emergency Department	1	1.7	2	3.3	
Demographic Variables	Moderately Adequate knowledge (51–75%)		Adequate Knowledge (>75%)		Chi-Square Test & p-value
	No.	%	No.	%	
Labour &Post Natal Ward	0	0	1	1.7	X ² =2.447 d.f=2 p=0.294 N.S
Combined ICU	8	13.3	22	36.7	
Usual Shift Rotation					X ² =0.031 d.f=1 p=0.860 N.S
Dayshift only	0	0	5	8.3	
Evening shift only	1	1.7	1	1.7	
Nightshift only	-	-	-	-	
Rotation duty	15	25.0	38	63.3	X ² =1.062 d.f=1 p=0.303 N.S
Are you handle any patient with compartment syndrome					
Yes	4	6.7	12	20.0	
No	12	20.0	32	53.3	
Receiving any previous straining course regard in compartments syndrome					
Yes	3	5.0	4	6.7	
No	13	21.7	40	66.7	

*p<0.05, S–Significant, N.S–Not Significant

Figure 1: Percentage distribution of handled any patient with compartment syndrome by the nurses



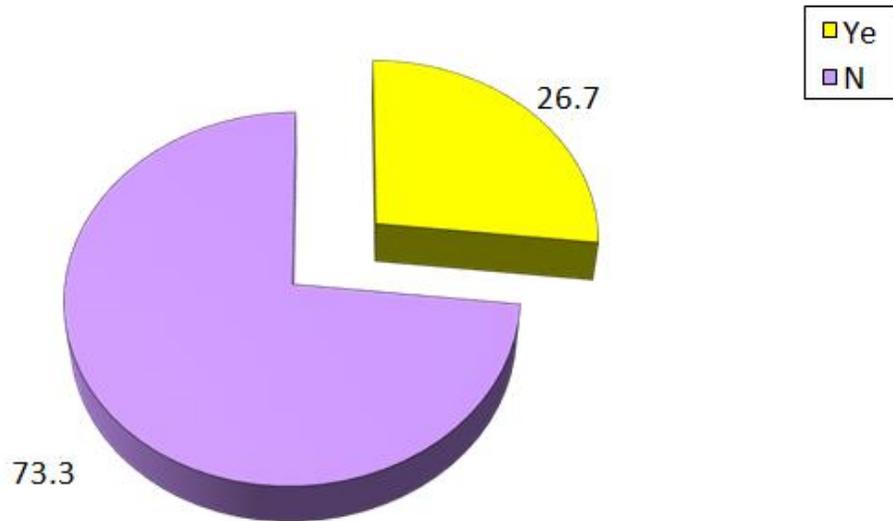
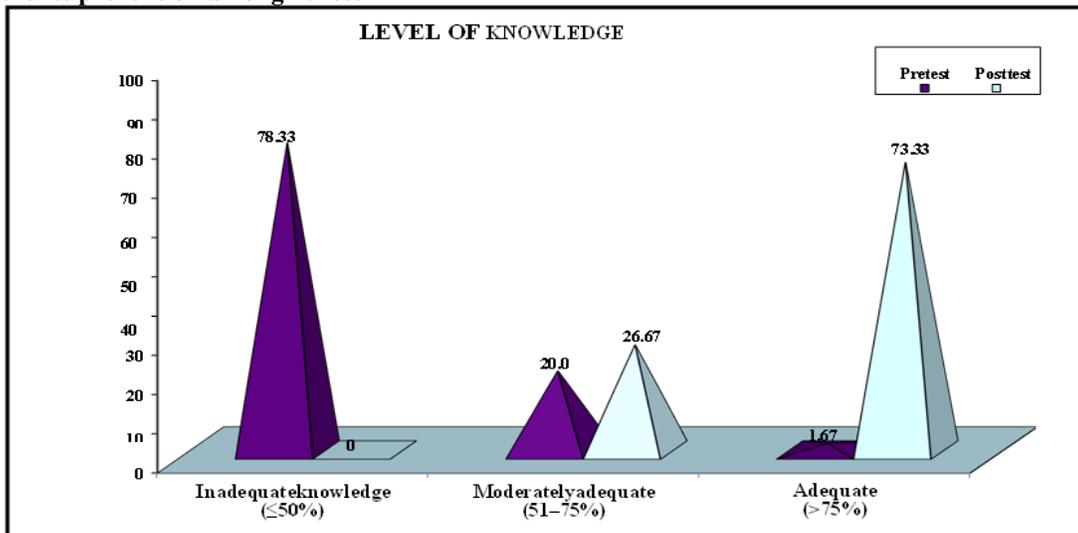


Figure 2: Percentage distribution of pretest and post-test level of knowledge of knowledge regarding compartment syndrome and its prevention among nurses



DISCUSSION

This chapter presents the data analysis assessing nurses' knowledge of compartment syndrome and its prevention. Most nurses were young (70% aged 21–25), predominantly female (81.7%), unmarried (85%), held a B.Sc. in nursing (76.7%), and had limited experience (46.6% with under 2 years), with the majority having not previously handled a compartment syndrome case or received related training. In the pre-test, 78.33% had

inadequate knowledge, which improved dramatically in the post-test where 73.33% demonstrated adequate knowledge. The mean score increased from 10.03 ± 3.63 to 19.28 ± 2.74 , a 37% improvement (paired t-test $t = 18.132$, $p < 0.001$). Additionally, only years of nursing experience was significantly associated with post-test knowledge (chi-square = 8.164, $p = 0.043$), confirming the effectiveness of the structured teaching program me.

CONCLUSION



Compartment syndrome is a painful condition that occurs when pressure within the muscle compartments increases to dangerous levels. This elevated pressure can impede blood flow, preventing essential nourishment and oxygen from reaching nerve and muscle cells, potentially leading to serious complications. Symptoms often include severe pain, swelling, and a sensation of tightness in the

affected area. If left untreated, compartment syndrome can result in muscle and nerve damage. In conclusion, the administration of the STP was an effective strategy for enhancing nurses' knowledge about compartment syndrome and its prevention, emphasizing the importance of continuous education in improving patient care and outcomes.

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