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**A COMPARATIVE STUDY ON MUSCULOSKELETAL DISORDERS  
AMONG NATIONAL CADET CORPS AND NON-NATIONAL  
CADET CORPS UNIVERSITY STUDENTS**<sup>p.p:47-55</sup>



**Singh Jaspreet<sup>1\*</sup>**

<sup>1</sup>Assistant Professor, Department of Physiotherapy, RIMT University, Mandi Gobindgarh, Punjab, India.

<sup>2</sup>BPT Student, Department of Physiotherapy, RIMT University, Mandi Gobindgarh, Punjab, India.

<sup>3</sup>Head, Department of Physical Education & Sports, RIMT University, Mandi Gobindgarh, Punjab, India.

\*Corresponding Author: Singh Jaspreet

Email: [jaspreetghuman786@gmail.com](mailto:jaspreetghuman786@gmail.com)



**Kaur Harjeet<sup>2</sup>**



**Singh Gurtej<sup>3</sup>**

**ABSTRACT**

The objective of this study was to compare the prevalence of musculoskeletal disorders among National cadet corps and Non-national cadet corps university students. Population of study included students between the age group of 17 to 25. Total of 122 students (22 NCC cadets and 100 Non-NCC students) were selected on the basis of convenient random sampling method. Nordic musculoskeletal discomfort questionnaire was used as an outcome measure. According to musculoskeletal pain and discomfort in the last 12 months the most affected region among NCC cadets is Neck region (18.2%) and least affected areas are Lower back (4.5%) and Hips/Thigh region (4.5%) It is observed that most affected area among Non-NCC cadets is Neck region (45%) and least affected area is Elbow region (11%) according to musculoskeletal pain and discomfort in the last 12 months. According to musculoskeletal pain and discomfort in the last 7 days the most affected region among NCC cadets is Upper Back region (18.2%) and least affected areas are Shoulder (4.5%), Elbow (4.5%), Wrist/Hand (4.5%) and Hip/Thigh region (4.5%). It is observed that most affected area among Non-NCC cadets is Lower Back region (32%) and least affected areas are Elbow region (12%) and knee region (12%) according to musculoskeletal pain and discomfort in the last 7 days. This present study concludes that there is more musculoskeletal pain and discomfort among Non-NCC cadets (University students) as compared to NCC cadets.

**Keywords:** National cadet corps, Musculoskeletal & NCC Cadets.

**INTRODUCTION**

NCC (National Cadet Corps) is a department of the Indian government's Ministry of Defense which provides training facility to males in high school and college military



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education and training in order to develop their personality, sense of responsibility, discipline along with their professional abilities (Asha, 2017). NCC plays a major role in molding the character among youth by providing an environment where one could exercise the leadership qualities (Mohan Kumar, 2015). Training activities of NCC cadets include developing their leadership qualities, disaster management skills, adventure activities, self defense activities and also various activities for social service. Musculoskeletal disorders include complaints or disorders of the muscles, ligaments, joints, and skeletal system caused by body position that is not ergonomic, especially when done for a long period of time (Tjahayingtyas A, 2019). Musculoskeletal pain among NCC cadets can occur due to exposure to intense physical demands to be followed regularly during their training program. University students are also highly affected by various musculoskeletal problems due to long hours in static or infrequent postures due to lengthy study hours and high stress conditions, and workload in using a laptop (Borhany T, 2018). Musculoskeletal disorders can be exacerbated such as sitting for long period of time in static posture (Phedy P, 2016).

Further, work-related musculoskeletal disorders can cause impairment, discomfort, disability, persistent pain in joints, muscle, bones, ligaments and tendons, with or without physical manifestations, where the most common symptom is pain (Mohammadi, 2013). The pain can be acute or chronic, focal or diffuse in which low back pain is the most common example of chronic musculoskeletal pain (Ogunlana MO, 2019). Musculoskeletal disorders (MSD) constitute the most common reason for discontinuing cadet service within different populations and the prevalence of these disorders is steadily increasing worldwide (Taanila H, 2015). According to previous research studies various risk factors for developing musculoskeletal disorders include age, tall body height, low aerobic fitness and endurance, extremes in flexibility, prior injury, participation in recreational sports activity, a history of prior limited Physical activity, and even older running shoes (Halvarsson A, 2019).

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**OBJECTIVE OF THE STUDY**

The objective of this study was to analyze and compare the prevalence of musculoskeletal disorders among National Cadet Corps and Non-National Cadet Corps (University students).

**DESIGN OF THE STUDY**

The study is descriptive in nature. Before the commencement of study, a voluntary online consent was received from each subject who took part in this study. This survey study was carried out among students of RIMT University. Population of study included students between the age group of 17 to 25. Non-NCC cadets were selected randomly from various departments of RIMT University and all NCC cadets were selected from NCC department of RIMT University. A convenient Random sampling method was adopted to recruit the subjects for the study. Total of 122 students (22 NCC cadets and 100 Non-NCC students) are included in the present study. Nordic musculoskeletal discomfort questionnaire was used to assess musculoskeletal pain and discomfort in past 12 months and in the past week among 9 different body regions.

**RESULTS**

The data was entered into Microsoft Excel and using SPSS for analysis.


Region	Ache, pain, discomfort or numbness <b>present in last 12 Months</b>		Trouble at any time <b>present during the last 7 days</b>	
	NCC Students (N=22)	Non-NCC Students (N=100)	NCC Students (N=22)	Non-NCC Students (N=100)
Neck	(4) 18.2 %	(45) 45 %	(3) 13.6 %	(20) 20 %
Shoulders	(3) 13.6 %	(33) 33 %	(1) 4.5 %	(18) 18 %
Elbows	(2) 9.1 %	(11) 11 %	(1) 4.5 %	(12) 12 %
Wrists/Hands	(2) 9.1 %	(23) 23 %	(1) 4.5 %	(13) 13 %
Upper Back	(3) 13.6 %	(27) 27 %	(4) 18.2 %	(21) 21 %
Lower Back	(1) 4.5 %	(35) 35 %	(3) 13.6 %	(32) 32 %




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One or Both Hips/Thighs	(1) 4.5 %	(18) 18 %	(1) 4.5 %	(15) 15 %
One or Both Knees	(2) 9.1 %	(16) 16 %	(2) 9.1 %	(12) 12 %
One or Both Ankles/Feet	(2) 9.1 %	(12) 12 %	(2) 9.1 %	(13) 13 %

Table 1. Shows distribution of subjects having more musculoskeletal pain and discomfort among Non-NCC cadets (University students) as compared to NCC cadets.

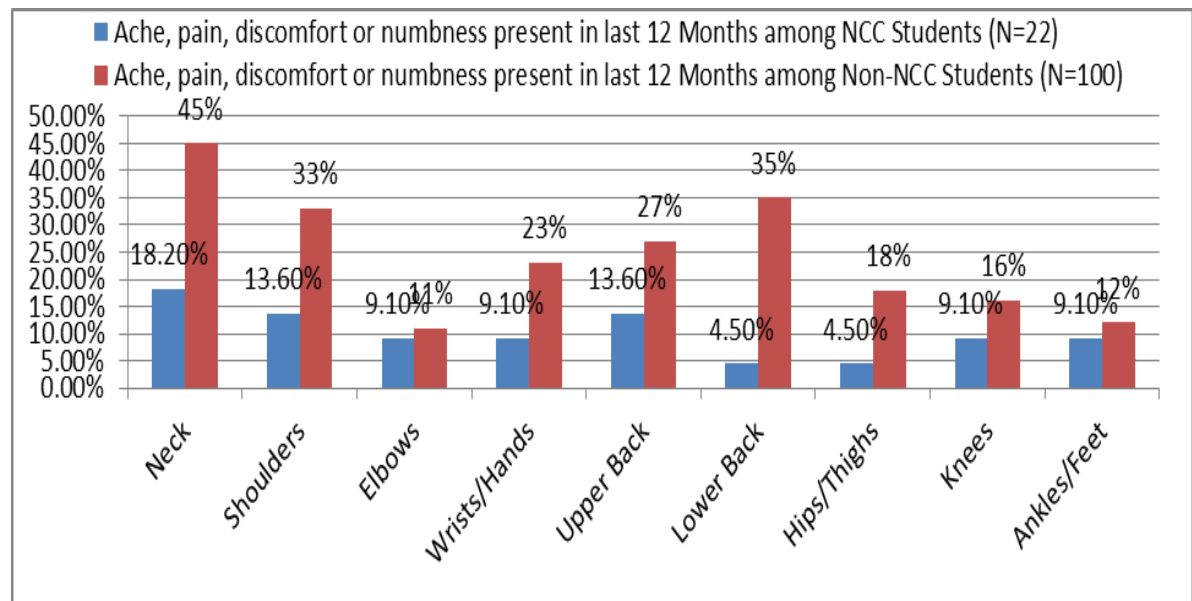


Figure 1: Distribution of subjects having musculoskeletal pain and discomfort in last 12 months on the basis of Nordic musculoskeletal discomfort questionnaire.

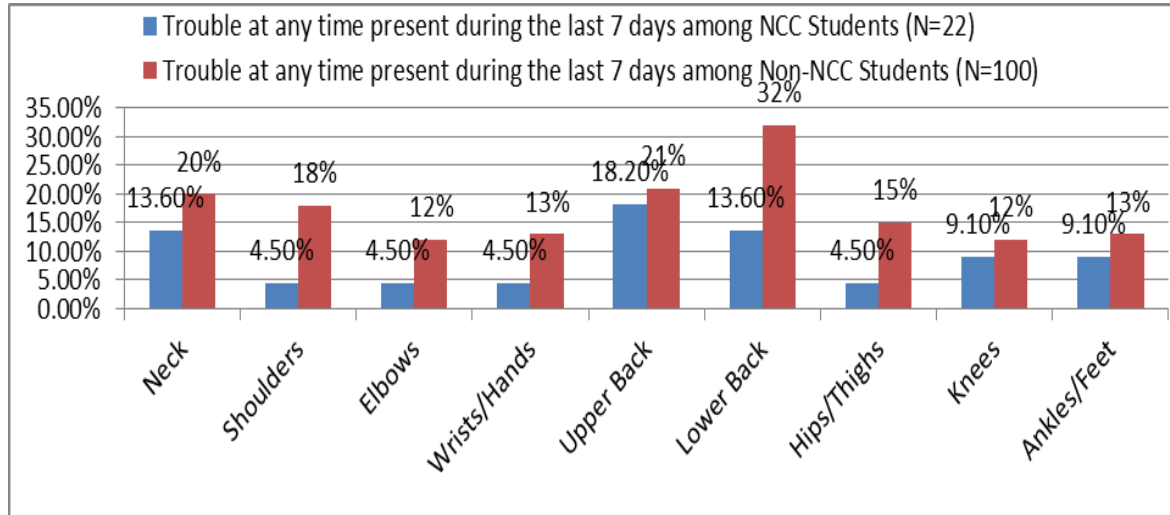
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**Figure 2: Distribution of subjects having trouble at any time during the last 7 days on the basis of Nordic musculoskeletal discomfort questionnaire.**

Ache, pain, discomfort or numbness present in last 12 Months		NCC Students (N=22)	Non-NCC Students (N=100)
Shoulder	Right	(2) 9.1 %	(13) 13 %
	Left	0 %	(8) 8 %
	Both	(1) 4.5 %	(12) 12 %
Elbow	Right	(2) 9.1 %	(7) 7 %
	Left	0 %	(2) 2 %
	Both	0 %	(2) 2 %
Wrist/Hand	Right	0 %	(14) 14 %
	Left	(1) 4.5 %	(3) 3 %
	Both	(1) 4.5 %	(6) 6 %

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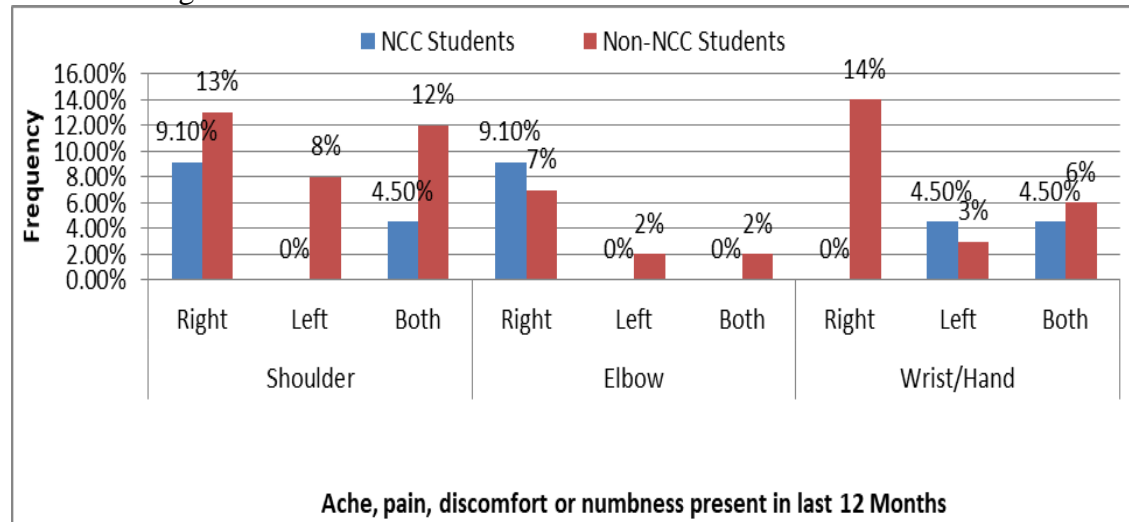
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Table 2. shows distribution of subjects having more musculoskeletal disorders in Right side followed by both sides and least affected side is left side among shoulder, elbow and wrist/hand region.



**Figure 3: Distribution of subjects having musculoskeletal pain and discomfort in Right, Left or Both aspects of Shoulder, Elbow and Wrist/Hand region in last 12 months on the basis of Nordic musculoskeletal discomfort questionnaire.**

**DISCUSSION**

Total 22 NCC cadets with mean age group of  $19.27 \pm 1.42$  and 100 Non-NCC cadets with mean age group of  $21.05 \pm 1.62$  were included in the study. According to height of subjects, the mean height of NCC cadets was 5 feet. 46 inches  $\pm 0.37$  and mean height of Non-NCC cadets was 5 feet. 50 inches  $\pm 0.33$ . According to weight of subjects, the mean weight of NCC cadets was  $55.81 \text{ kg} \pm 9.67$  and mean weight of Non-NCC cadets was  $60.11 \text{ kg} \pm 11.14$ . According to department of subjects, 13.63% NCC cadets and 12% Non-NCC cadets were from Bsc. Nursing, 13.63% NCC cadets and 8% Non-NCC cadets were from BCA, 4.54% NCC cadets and 7% Non-NCC cadets were from Legal studies, 9.09% NCC cadets and 9% Non-NCC cadets were from OTAT, 13.63% NCC cadets and



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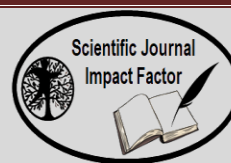
28% Non-NCC cadets were from Radiology, 13.63% NCC cadets and 8% Non-NCC cadets were from Pharmacy, 18.18% NCC cadets and 5% Non-NCC cadets were from BA, 13.63% NCC cadets and 6% Non-NCC cadets were from Physical Education. Whereas, 12% Non-NCC students were from Physiotherapy department and 5% Non-NCC students were from Bsc. Agriculture department. It was observed that 31.8% NCC cadets and 19% Non-NCC cadets were from 1<sup>st</sup> year, 31.8% NCC cadets and 15% Non-NCC cadets were from 2<sup>nd</sup> year, 36.4% NCC cadets and 40% Non-NCC cadets were from 3<sup>rd</sup> year whereas 26% Non-NCC cadets were from 4<sup>th</sup> year.

According to musculoskeletal pain and discomfort in the **last 12 months** the most affected region among NCC cadets is Neck region (18.2%) and least affected areas are Lower back (4.5%) and Hips/Thigh region (4.5%) It is observed that most affected area among Non-NCC cadets (University students) is Neck region (45%) and least affected area is Elbow region (11%) according to musculoskeletal pain and discomfort in the last 12 months. According to musculoskeletal pain and discomfort in the **last 7 days** the most affected region among NCC cadets is Upper Back region (18.2%) and least affected areas are Shoulder (4.5%), Elbow (4.5%), Wrist/Hand (4.5%) and Hip/Thigh region (4.5%). It is observed that most affected area among Non-NCC cadets (University students) is Lower Back region (32%) and least affected areas are Elbow region (12%) and knee region (12%) according to musculoskeletal pain and discomfort in the last 7 days. According to musculoskeletal pain and discomfort in Right, Left or Both aspects of Shoulder, Elbow and Wrist/Hand region in last 12 months it was found that there are more musculoskeletal disorders in Right side followed by both sides and least affected side is left side among shoulder, elbow and wrist/hand region.

Jitendra and Vishwambhar conducted a study in 2021 to determine muscular endurance of students: A comparison of NCC cadets, yoga practitioners and sports persons in which it was concluded that mean muscular endurance of sports persons is the highest, followed by NCC cadets and yoga practitioners in that order. According to a study conducted by Tone et al in 2007 it was found that Physical activity is associated with a low prevalence of musculoskeletal disorders. A total of 32% of the subjects reported musculoskeletal disorders often or very often in one or more parts of the body in



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the past 12 months. The most common musculoskeletal disorders were in the lower back (15% often or very often), shoulders (12% often or very often) and neck (11% often or very often). After adjustment for confounders, physical activity was inversely associated with musculoskeletal disorders for all body sites except elbows, knees and feet.

**CONCLUSION**


Following conclusions were drawn from the findings of the current study:


1. This present study concludes that there is more musculoskeletal pain and discomfort among Non-NCC cadets (University students) as compared to NCC cadets according to Nordic Musculoskeletal Discomfort Questionnaire.


Hence, preventive & Interventional measures must be developed by educational authorities that promote to decrease the musculoskeletal disorders among both NCC cadets and Non-NCC cadets. This study will further help in motivating youth to join NCC training program as it is also beneficial in increasing their physical fitness and there is also low prevalence of musculoskeletal disorders among NCC cadets as compared to Non-NCC cadets.

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