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Prevalence of Work-Related Musculoskeletal Disorders Among Cameramen

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ABSTRACT

Aim of this study was to determine the prevalence of work-related musculoskeletal disorders among cameramen. They frequently experience physically demanding tasks such as working in uncomfortable postures, engaging in repetitive manual tasks and enduring long working hours. To assess pain sites Nordic Musculoskeletal Questionnaire was used among a total of 100 cameramen aged between 30-50. 86 of which reported Musculoskeletal pain/ discomfort. Notably, 47 individuals fell within the age group of 30-40 while the remaining 39 belonged to the age group 41-50. The findings concluded high occurrence of work-related musculoskeletal disorders among the population with the most affected regions being the lower back followed by the shoulder and the neck.

KEY WORDS: Prevalence, Work-related musculoskeletal disorders, Nordic Musculoskeletal Questionnaire, Cameramen.

INTRODUCTION

Television broadcasting began in India in 1959 as an experimental medium and has since grown in popularity.[1] It serves as a daily source of entertainment, produced by a skilled crew including camera operators. As a crucial member of a film or television crew, a camera operator, also referred to as a cameraman, is accountable for handling and operating a film or video camera.[2]

The job title of a camera operator in video production may vary depending on the specific technology employed, ranging from television camera operator to videographer. Key competencies of a skilled camera operator include the ability to effectively choreograph and frame a scene, carefully select lenses and lighting to achieve desired visual effects, and competently manage the video camera and accompanying equipment, such as camera cranes.[3]

In a television set, cameramen are typically divided into two groups. One group operates portable shoulder cameras, while the other group works with studio cameras fixed to the ground. The roles of these cameramen are interchangeable depending on job requirements and personnel availability. Portable shoulder cameras weigh around 10 kg or more and are designed for right-handed use, making it difficult for the operator to change shoulders during work, which can cause physical strain and stress.[4]

Cameramen operating fixed studio cameras must maintain a static posture for prolonged periods, which can be difficult to adjust during shots. Additionally, they often work for extended hours without sufficient breaks to meet recording schedules.[4] Tasks involving awkward postures for extended durations and manual handling of materials can lead to various musculoskeletal disorders, resulting in pain, injury, illness,

and reduced productivity at work, leading to poor quality of life. [5-7]

Musculoskeletal disorders are defined as a group of conditions that affect the musculoskeletal system, including nerves, tendons, muscles, joints, and supporting structures like intervertebral discs, etc. [7,8] These disorders occur when the physical capacity of muscles, joints, and ligaments is not balanced with external forces acting upon the body. According to the CDC (centres for disease control and prevention), Work-related musculoskeletal disorders are conditions in which the work environment and performance of work significantly contribute to the condition, or the condition is aggravated or prolonged by work conditions.[9] Workers who are exposed to various occupational hazards such as prolonged work durations, awkward working postures, and repetitive manual work, among others, commonly experience these disorders.

Since, little research has been done to understand the work-related musculoskeletal disorders experienced by cameramen and its prevalence, this research aimed at finding the commonly experienced pain/ discomfort among cameramen and its prevalence.

MATERIALS AND METHODS

The research comprised of 100 cameramen, aged between 30-50 years, each possessing at least one year of work experience. Prior to their involvement, ethical approval was obtained from the approval committee, and all the participants gave their consent. Subjects willing to participate were selected based on specific inclusion and exclusion criteria. Inclusion criteria required participants to be cameramen with at least one year of experience and a minimum daily working hour of 5 hours. On the other hand, individuals with pre-existing musculo-skeletal/neurological conditions, those taking pain medications, and those already undergoing physiotherapy care were excluded from the study. The purpose of the study and procedure was explained to them. A questionnaire survey was conducted using the Nordic Musculoskeletal Questionnaire. [12] The participants were given a detailed explanation of all the components of the questionnaire before being asked to complete it. Finally, data was collected from all the participants, and a comprehensive analysis was conducted to draw conclusion based on the gathered information.

STATISTICAL ANALYSIS

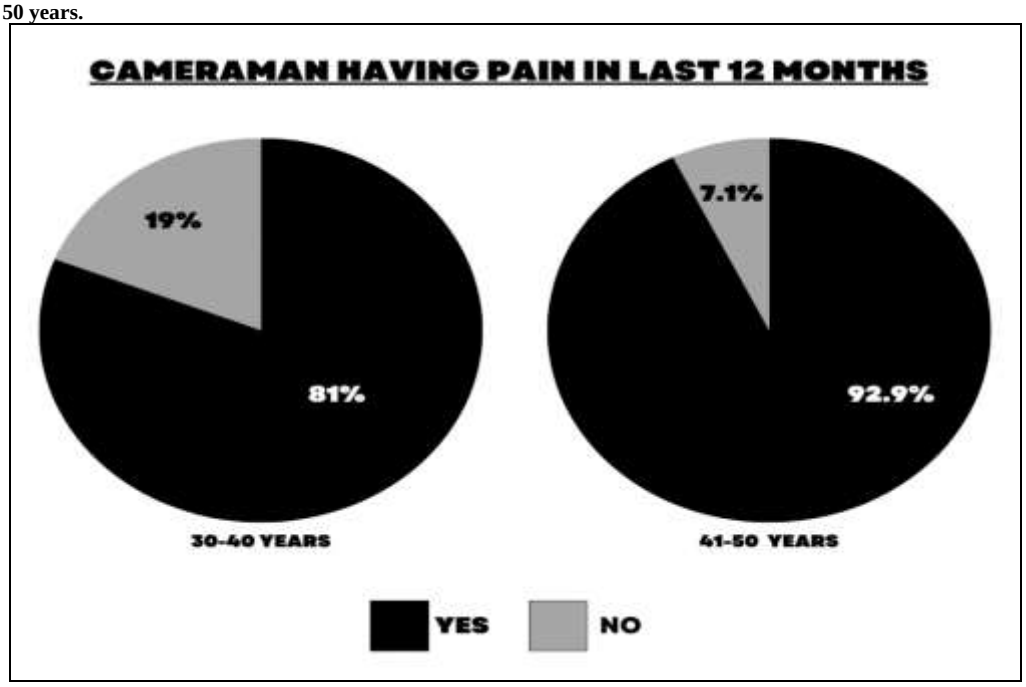
Data were collected on a data sheet and encoded for computer analysis. Tables were made using Microsoft Word and figures were plotted using Microsoft Excel. Computerized statistical analysis of the data was done.

RESULTS

TABLE 1: Represents the percentage prevalence of musculoskeletal disorders in cameramen.

Cameraman having pain in last 12 months	Age groups				Total	
	30-40 years		41-50 years			
	F	%	F	%	F	%
Yes	47	81	39	92.9	86	86
No	11	19	3	7.1	14	14
Total	58	100	42	100	100	100

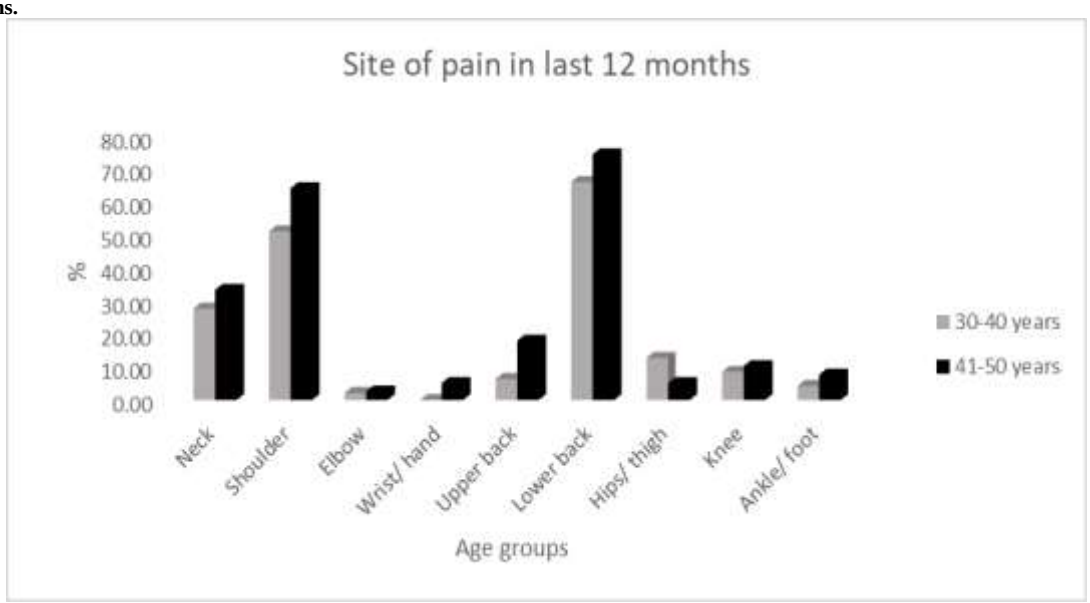
GRAPH 1: Represents the percentage prevalence of musculoskeletal disorders among cameramen for the age groups 30 to 40 years and 41 to 50 years.



INTERPRETATION:

81% of the 58 cameramen aged between 30-40 were having musculoskeletal disorders.
92.9% of the 42 cameramen aged between 41-50 were having musculoskeletal disorders.

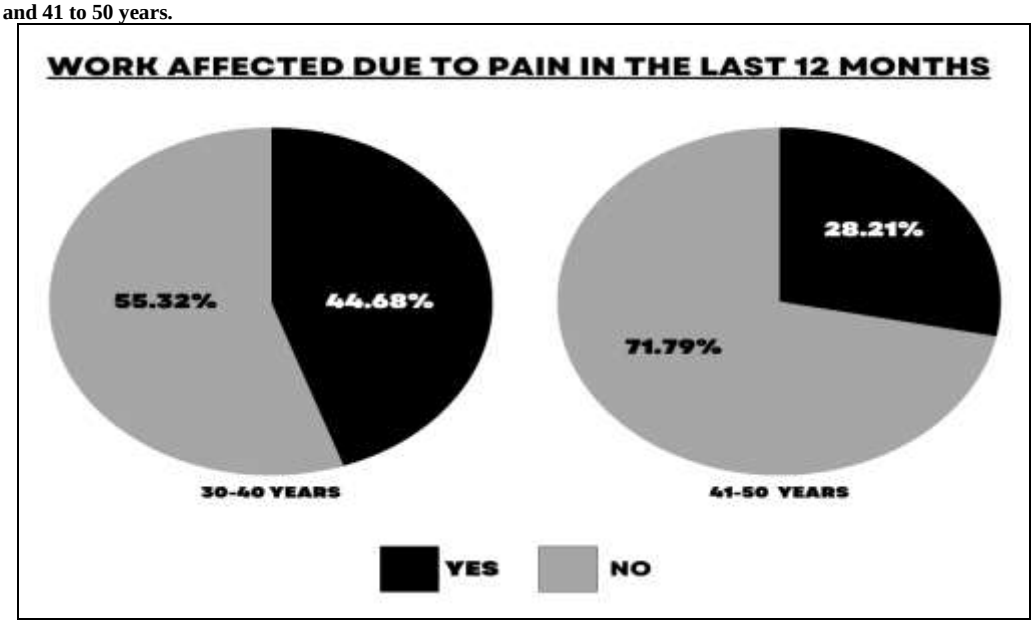
GRAPH 2: Represents the percentage of pain/discomfort experienced by the cameramen in different parts of the body in the last 12 months.



INTERPRETATION:

The lower back is more affected in both age groups with an overall percentage of 69.77%, followed by the shoulder at 56.98% and the neck at 30.23%.

GRAPH 3: Represents the percentage of people whose work was affected due to pain in the last 12 months for the age groups 30 to 40 years and 41 to 50 years.

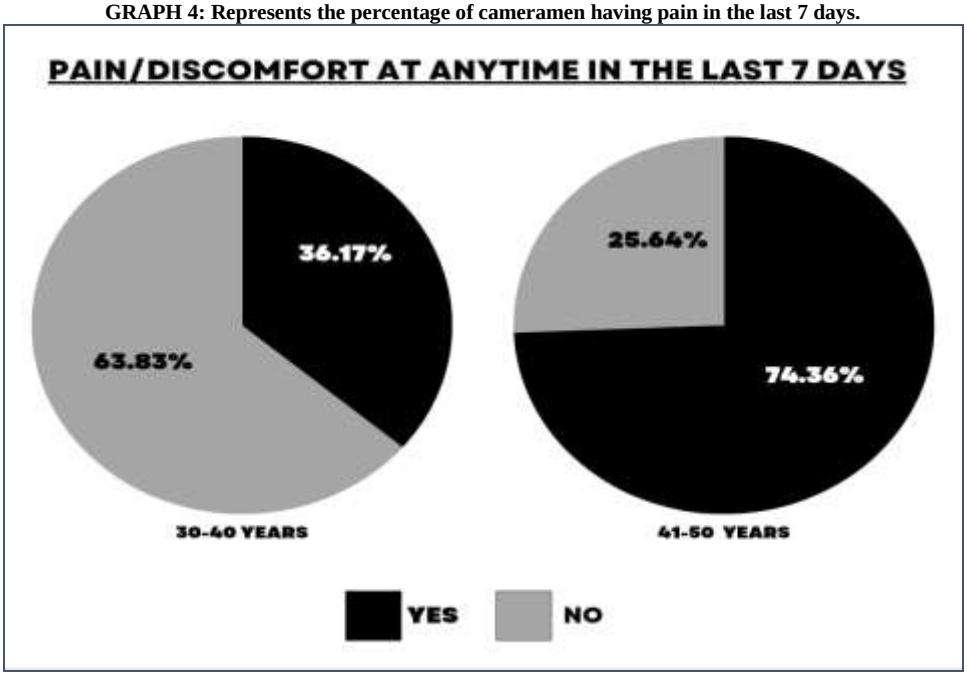


INTERPRETATION:

Out of 47 affected cameramen in the age group of 30 to 40 years, 44.68% had their work affected in the past 12 months.

Out of 39 affected cameramen in the age group of 41 to 50 years, 28.21% had their work affected in the past 12 months.

GRAPH 4: Represents the percentage of cameramen having pain in the last 7 days.



INTERPRETATION:

Out of 47 affected cameramen in the age group of 30 to 40 years, 36.17% had pain in the last 7 days.

Out of 39 affected cameramen in the age group of 41 to 50 years, 74.36% had pain in the last 7 days.

DISCUSSION

The primary objective of this research was to determine the prevalence of musculoskeletal disorders encountered by cameramen. The Nordic Musculoskeletal Questionnaire was implemented for the purpose of evaluation. The study consisted of a total of 100 participants, comprising 58 individuals in the age group of 30 to 40 years and 42 individuals in the age group of 41 to 50 years. All participants were exclusively male with a minimum work experience of one year. The participants used to work for 5 to 6 days per week for at least 8 to 14 hours per day.

The mean age, weight, height, BMI, years of work, and daily working hours of the participants were calculated to be 39.27 ± 6.26 years, 71.29 ± 10.71 kg, 1.68 ± 0.09 meters, 25.23 ± 3.14 kg/m2, 13.86 ± 6.94 years, and 11.88 ± 0.92 hours/day, respectively.

Among the 100 participants included in the study, 86 reported musculoskeletal pain or discomfort. Specifically, 47 individuals were in the age group of 30-40, while the remaining 39 participants belonged to the age group of 41-50. Majority of the participants from both age groups reported pain in their lower back region (69.77%), followed by pain in the shoulder (56.98%), neck (30.23%), and upper back (11.63%). However, minimal affection was observed in the hips/thighs, knees, ankle/foot, elbows, and hands within the past 12 months.

Cameramen, are required to maintain the same posture for several hours and stand for the duration of the shoot until the recording demands are met, work several hours without breaks to meet the recording schedules.[4] This working condition puts them at a high risk for development of low back pain which is also contributed by the lack of work ergonomics followed by the work place. A systematic review with meta-analysis titled "Association of occupational standing with musculoskeletal symptoms" establishes that prolonged occupational standing is significantly associated with the occurrence of low back pain and symptoms.[17] Furthermore, a study conducted on office workers revealed an increase in the intensity of low back and ankle-foot pain as well as a higher prevalence of low back pain during a one-hour laboratory-based standing task. This study determined 30 minutes of standing as a threshold for the development of pain in the lower back region.[18]

A study conducted on newsreel cameramen revealed that carrying a mobile camera on their shoulder may cause suprascapular nerve entrapment and shoulder pain, which can be considered an occupational disorder.[19] In our study, 56.98% of the participating cameramen reported shoulder pain, which may have been influenced by suprascapular nerve entrapment due to the contact stress and pressure generated by handling a portable shoulder camera. Therefore, it is possible that some of the shoulder pain complaints were attributed to the entrapment of the suprascapular nerve in these cameramen. A detailed assessment is required to confirm suprascapular nerve entrapment.

The likelihood of developing neck and shoulder disorders or pain has been found to be higher due to physical strains in the workplace, such as performing repetitive tasks, assuming awkward positions, working with arms raised above shoulder level, and lifting heavy objects.[20] Considering the demands of their profession, it is possible that the physical strain associated with their work may be a contributing factor to the increased prevalence of shoulder pain observed among cameramen.

The pain percentages for the hips/thighs, knees, elbows, and wrists were 9.30%, 9.30%, 2.33%, and 2.33% respectively. These discomforts may have arisen due to prolonged standing, and inadequate support for the arms and feet, leading to strain and discomfort in the limbs.

Of the 86 participants who reported musculoskeletal pain or discomfort, a considerable proportion of them experienced a hindrance in performing their regular work (home/office) due to pain, with

44.68% of participants in the age group 30-40 and 28.21% of participants in the age group 41-50. Moreover, a significant number of participants in both age groups reported pain in the last 7 days, with 36.17% and 74.36% of participants in the age groups 30-40 and 41-50, respectively. Overall, greater involvement of the lower back was observed compared to the other joints, lowest being elbow and wrist pain/ discomfort.

CONCLUSION

In conclusion, the present study shows a high occurrence of work-related musculoskeletal disorders among cameramen with greater involvement of the lower back followed by shoulder and neck pain. Considering the usage of a valid and reliable outcome measure, the study can be used to create awareness among the camera operators about adopting correct postures, following proper ergonomics and providing safety training. The study also highlights the harmful effects of improper postures on the body.

Limitations

Small sample size

Female camera operators and camera operators with pre-existing health conditions were not included in the study.

Suggestions

Work posture evaluation and work-station analysis with subsequent modifications can be done to prevent the work-related musculoskeletal disorders of camera operators.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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