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Research Article

## Prevalence Of Musculoskeletal Pain Among Traffic Police In Gautam Budh Nagar (U.P)

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### ABSTRACT:

**Background:** Musculoskeletal Disorders and pains is a matter of concern in both developed and non-developed countries and has been reported as a work-related musculoskeletal disease (WMSDs). Traffic police officers are subjected to occupation related exposures in work are as that increased the risk of development of musculoskeletal disorder.

**Objective:** To identify the incidence rate of musculoskeletal pain among traffic police in Gautam Budh Nagar (UP).

**Methods:** A 250 traffic police officers were recruited in this survey study. Nordic musculoskeletal questionnaire were used to determine the musculoskeletal pains at different both region with respect to time. Prevalence of MSK pains by sociodemographic characteristics were tested with Chi-square test using SPSS 28.0 software version and the descriptive data was calculate using standard methods on Excel sheet.

**Results:** The mean age of the subjects is  $32.108 \pm 5.814$ (SD) years; height is  $169.18 \pm 9.157$  (SD) Cms and weight  $64.196 \pm 10.929$  (SD) Kgs. The findings stated the higher prevalence of 47.5% and 41.2% was reported for age between 30 and 39 years and 20 and 29 years. However, the statistical analysis showed significance difference in prevalence of MSK Pain among subjects of different age group with  $X^2 = 8.795$ ;  $P = 0.012$ ) and among genders (Male and Female)  $X^2 = 9.282$ ;  $P = 0.002$ . The results stated that, over the past 12 months, the most affected body part was Upper back  $n = 208$  (83.2%) followed by Hips/thighs 207 (82.8%). Ankles/feet 202 (80.8%) followed by low back 200 (80%) found to be the common body parts that leads to frequent limitation in doing activities.

**Conclusion:** The study concluded that the prevalence of musculoskeletal pain is higher in association with age and gender among traffic police in Gautam Budh Nagar (UP).

**Key Words:** Nordic musculoskeletal questionnaire, Work related musculoskeletal diseases, Pains.

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### INTRODUCTION:

Musculoskeletal disorders (MSDs) are defined as pains that affect the structure of body including ; ligaments, tendons, joints, muscles, nerves, and blood vessels of

the neck, limb and back (1,2). Musculoskeletal pain results from repetitive strains and overuse activities. The pain intensity experienced by an individuals can be mild, moderate, and severe (3).

Musculoskeletal pains are divided as per different level of body segments as follows: Shoulder, Neck, Arms/hands, Lower back, legs, knees, and foot (4).

Whenever musculoskeletal injuries are related to their work, they are considered as work-related musculoskeletal disorders. Musculoskeletal diseases are one of the main health problems related to work in different professions among which, the police activity stands out due to their physically demanding character. The Traffic Police constable plays a significant role to keep traffic moving where the population is Dense (5).

The musculoskeletal pains are caused by occupation has been a topic of discussion for years. However, it has been accepted that development of musculoskeletal disorders are related to occupational and non-occupational factors as per the National Research Council. Leisure activities and lifestyle factors are considered as non-occupational factors whereas, physical, psychological, social aspects of work are considered as occupational factors (6).

Traffic police has been trained with various training methods associated with stress management, skills development (interpersonal and personal) and information about different areas. Musculoskeletal pain among traffic police are frequently occurred and mainly associated with works (7). In previous study, it has been stated that 270 traffic police of Mumbai city of India has reported low back pain using Nordic musculoskeletal questionnaire (NMQ) (8). A study on UK traffic police reported more low back pain cases among driving participants while prevalence of shoulder pain is higher among those who are involved in lifting, standing or motorcyclist police (9).

A survey study of Korea on traffic police reported 14.7% of pain in arm/elbows, 16.8% among hands/wrists, 26.9% in legs, 31.1% in neck, 41.3% in back and 44.1% reported in shoulders (10).

In the U.S, around 3200 case every year has been greatly affected workers with musculoskeletal pains that results to loss of work day, and 29% claims has been represented due to injuries and illnesses (11).

The symptoms of musculoskeletal disorders reported among traffic polices occurs in various regions of the human body with a high incident rate for low back and upper and lower limb (12,13). Other study on prevalence rate of work related musculoskeletal clinical manifestations among traffic cops in india reported Severe pain (Chronic) in low back (38%), 36% in shoulder girdles, and short term (acute) pain of 14.9% and 13% in low back and shoulder girdle (14).

Traffic police are the only group of employees of government organisation those are strongly entailed in operating the transportation of entire town throughout the day. They allow easy moving vehicles on the road. They are not only involved in managing traffic on roads, managing road side traffic troublesome, charging charges for breaking the traffic regulations, but also manage to arrange the special passages for VIPs on road by not hampering the way of general public, maintaining roads effectively traffic free during occasions.

They keep standing on their feet whole time and this is why it is considered as one of the most stressful job

physically as well mentally. Their work type makes them prone to develop WMSDs (15,16,17)

#### **Musculoskeletal disorder and Pain:**

Musculoskeletal disorders are considered as major health issue world-wide and as described earlier as most commonly reported work-related disorder among workers (18). 1/3<sup>rd</sup> of the working population of india experiences some sort of musculoskeletal pains in different body regions (back, neck, shoulders, arms and lower extremities). (19,20). Musculoskeletal disorder can range in severity as episodic or chronic. As per World Health Organisation (WHO) Musculoskeletal disorders are considered to be occupation related when the performance of work and the work environment contribute to development or exaggerating the condition (21).

Pain is considered as most common symptom of musculoskeletal disorders and is defined as an unpleasant feeling (such as a prick, tingle, sting, burn, or ach) that can be due to damage of tissues. The musculoskeletal pain experience is always individual based and can be linked to one or more body region. It has been reported that pain can exist without having any tissue damage or any pathophysiological cause (22). Most of the studies investigated pain based on self-reporting tool. Musculoskeletal pains are typically reported as frequency and intensity of pain in specific part of body (23). Multi-site pains are most commonly reported than single-site pains (24). Multiple pains are more have greater relation to limit work abilities and sickness absence than single pain site (25,26)

#### **Development of musculoskeletal disorders:**

Factors that contribute to development of musculoskeletal disorders/pains can be non-occupational or occupational. Non-occupational related can be due to leisure activities or lifestyle factors while the work-related factors can be due to physical and psychological aspects of work (27).

Physical factors includes heavy Lifting, standing for prolonged time, more work with arms, repetitive same motion, full body or body segment vibrations, squatting/kneeling and static muscular load for prolonged time, external load on body (28,29).

Psychological factors may include working organisation and social factors such as high demands of works as well as low control of one's own work activities and less social support from co-workers and guides or leaders (30).

#### **Rationale:**

Musculoskeletal pains is the most common sign of musculoskeletal disorders reported among traffic police. Musculoskeletal pain are reported using self-reporting questionnaire (31). Up to date, Musculoskeletal pain has not been investigated among traffic police in Budh Nagar (U.P). Multi-site musculoskeletal pain among the traffic police. Multi-segmental pain among traffic police in Gautam Budh Nagar has not been previously investigated.

The current study will contribute to the knowledge with new insights onto musculoskeletal pains in different

body regions among traffic police in Gautam Budh Nagar.

**Research Question:**

What is the prevalence of musculoskeletal pain among traffic police in Gautam Budh Nagar (UP) ?

**Objective:**

To find out the prevalence of musculoskeletal pain among traffic police in Gautam Budh Nagar (UP).

**HYPOTHESIS:**

**Null Hypothesis:**

There is no significant musculoskeletal pain among traffic police in Gautam Budh Nagar (U.P).

**Alternate Hypothesis:**

There is significant musculoskeletal pain among traffic police in Gautam Budh Nagar (U.P).

**METHODOLOGY:**

**Study design:**

The design was cross-sectional study.

**Sample size and Sample method:**

Total sample size of the study was 250 taken by convenient sampling.

**Target population:**

Traffic police age group between 20-45 years.

**Source of data collection:**

Standardized scale- Nordic Musculoskeletal Questionnaire distribution among traffic police.

**Inclusion criteria:**

- Traffic police working for at least more than 1 year in Gautam Budh Nagar
- Traffic police with age between 20-45 years
- No prior history of any other pain except WRMD's

**Exclusion criteria:**

- Subjects with any recent trauma.
- Subjects have prior history of any other pain except WRMD's
- Subjects with history of any psychological disorders.
- Traffic police with more than 45 years.

**Instrumentations/Tools:**

**1. The Nordic Musculoskeletal questionnaire:**

The Nordic Musculoskeletal Questionnaire (NMQ) was developed from a previous project which is funded by the Nordic Council of Ministers. The NMQ is a well structured questionnaire. The musculoskeletal problems were well reported when the questionnaire was administered on musculoskeletal issues and work related aspects (41,42).

**Items:**

Section 1: tool has 40 items. It has different body regions causing musculoskeletal problems/pains. The

individuals has to complete the questionnaire by marking the points on body diagram to show signs and symptoms region (neck region, both shoulder, Upper back area, both elbow, low back, wrist/hands, hips/thighs, knees and ankles/feet). Subjects were asked if they experienced any musculoskeletal pain/ache in the past 12 months and past 7 days that restricted them from doing work.

Section 2: It has add on questions associated with body segments. In this section we have asked about the time of the trouble, and musculoskeletal issue from past 7 days.

The sensitivity of this tool is ranged between 66% and 92% and specificity between 71% and 88% (43). Reliability of this tool is ICC= 0.945) which indicates excellent reliability (44).

**Materials Used:**

- Questionnaire
- Pencil
- Pen

**Informed Consent:**

For this study, purpose of the research as well the consent form was verbally explained to all participants. Subjects were allowed to withdraw their names from this study any time. Subjects were ensured that their confidentiality will be maintained. Informed consent is attached in Appendix Section.

**Procedure:**

In this study, data was collected by questionnaire form on a paper. Questionnaire form included both open and close ended questions. Prior to data collection, each subjects were verbally informed about the title, objective, need of the study and the informed consent form was obtained from all subjects. When the subjects signed the consent form then they were asked to filled out questionnaire that took about 15 minutes for complete process on each subject.

**DATA ANALYSIS:**

The Statistical Package for social science (SPSS) 28.0 software version (SPSS inc., IBM Corp, NY) was used for data analysis. Significance value was pre-set at level of  $p \leq 0.05$ . Standard statistical methods were used for the calculation of means and standard deviation using Excel sheet. Chi-square test was used for data analysis to identify the prevalence of MSK pain among traffic police.

**RESULTS:**

**Socio-demographic Information:**

The study was performed on 250 subjects. The mean age of the subjects is  $32.108 \pm 5.814$ (SD) years; height is  $169.18 \pm 9.157$  (SD) Cms and weight  $64.196 \pm 10.929$  (SD) Kgs as shown in Table 4.1. Among 250 subjects,  $n=99$  (39.6%) is at the age between 20-29 years ,  $n=115$ (46%) is at age between 31-39 years and 36 (14.4%) at age >40 years. as shown in **Figure 4.1**.

**Table-4.1:** Descriptive characteristics of subjects.

Variables	Mean	S.D
Age (years)	32.108	5.814
Height (cm)	169.180	9.157
Weight (kg)	64.199	10.929
BMI	22.707	4.797

*S.D: Standard deviation*  
*BMI: Body Mass Index*

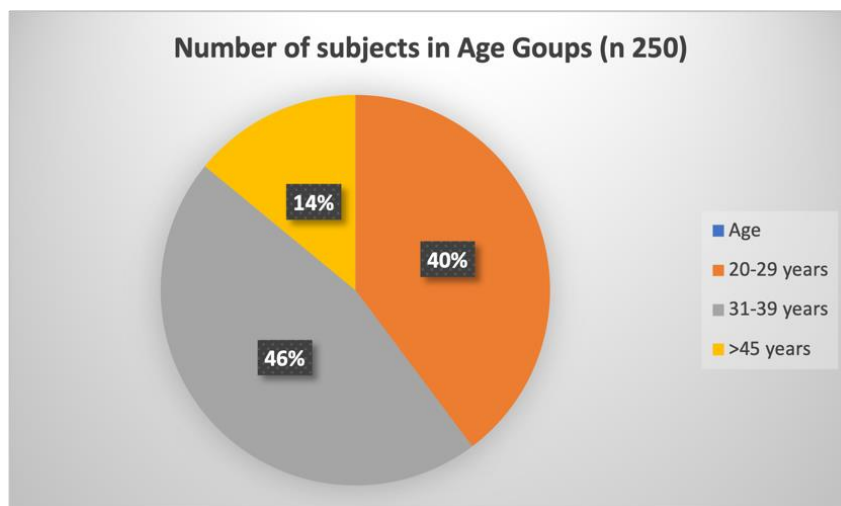


Figure 4.1 Age group of all participants in %

Both Males and Females were included. Among 250 subjects, there were 78 females (31.8) and 172 males (68.8%) followed by 55 (21%) of the females reported MSK pain and 23 has no pain (9.2%) while 149 males reported MSK pain (60%) and 23 had no pain (9.2%) as shown in Figure 4.2.

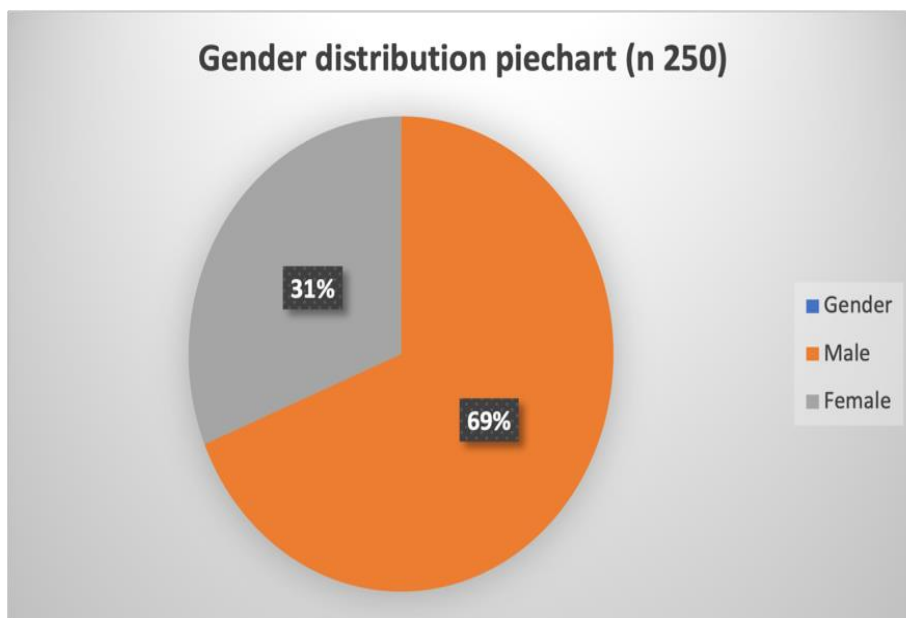


Figure 4.2 Gender distribution of all subjects

**Table 4.2: BMI of all subjects n=250**

BMI	Number of subjects (%)
<18.4	45 (18%)
18.5-24.9	131 (52.4%)
25-25.9	58 (23.2%)
>30	16 (6.4%)

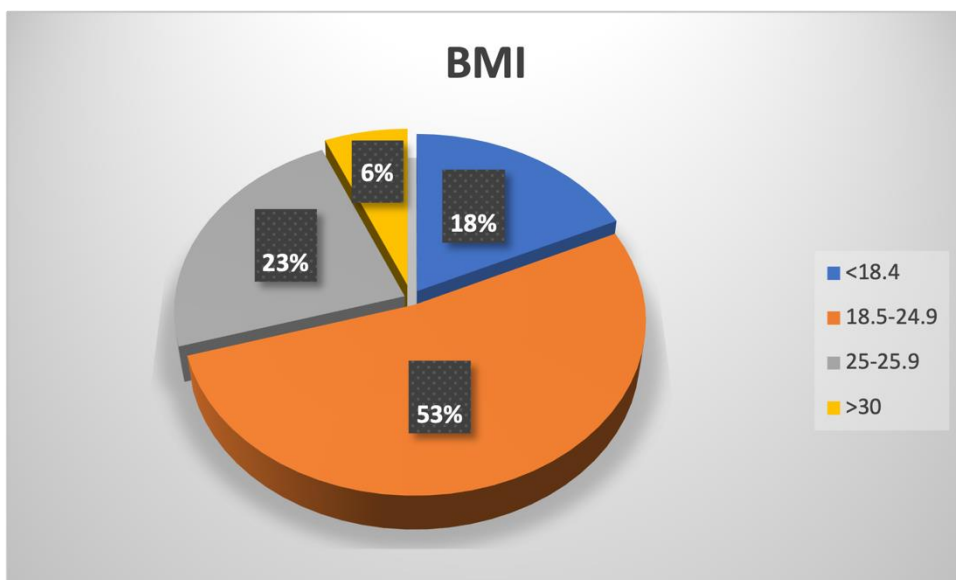


Figure 4.3 Body Mass index of all subjects.

**Prevalence of Musculoskeletal pain by socioeconomic characteristics using chi-square test.** Higher prevalence of 47.5% and 41.2% was reported for age between 30 and 39 years and 20 and 29 years as shown in Figure 4.4 While 11.3% of age >40 years. Male reported higher prevalence of 59.6% as compared to females 22% as shown in Table 4.3 and Figure 4.5.

However, the statistical analysis showed significance difference in prevalence of MSK Pain among subjects of different age group with  $X^2 = 8.795$ ;  $P = 0.012$  and among genders (Male and Female)  $X^2 = 9.282$ ;  $P = 0.002$  as shown in Table 4.3

Characteristics		MSK Pain n (%)	$X^2$	df	P
Age (years)	20-29 (n 99)	84 (41.2%)	8.795	2	0.012
	30-39 (n 115)	97 (47.5%)			
	>40 (n 36)	23 (11.3%)			
Gender	Male (n 172)	149 (59.6%)	9.282	1	0.002
	Female (n 78)	55 (22%)			

MSK: Musculoskeletal;  $X^2$ : Chi-Square; P: Level of Significance at <0.05\* , 0.001\*\*

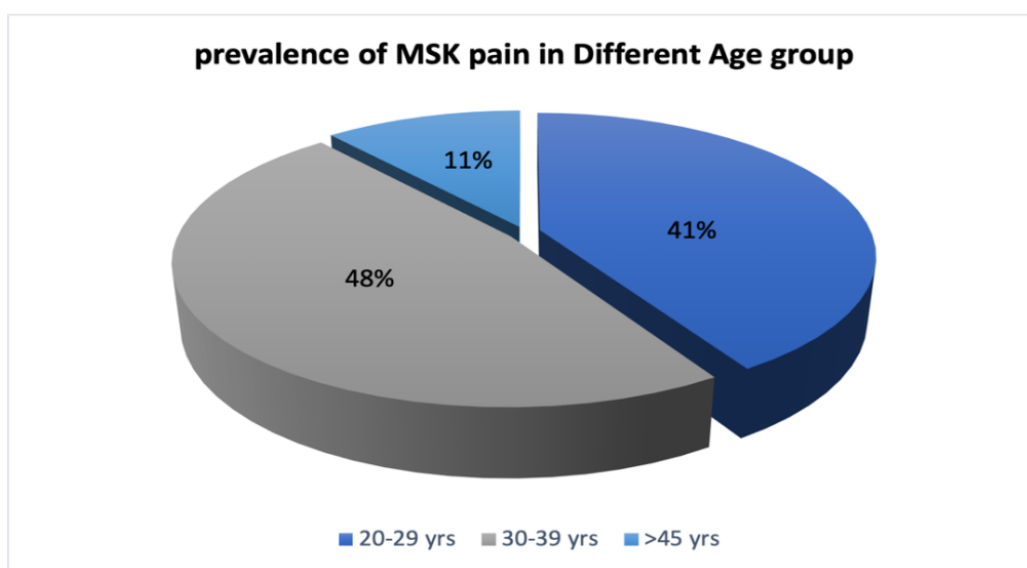


Figure 4.4 Prevalence of MSK pain among different age group

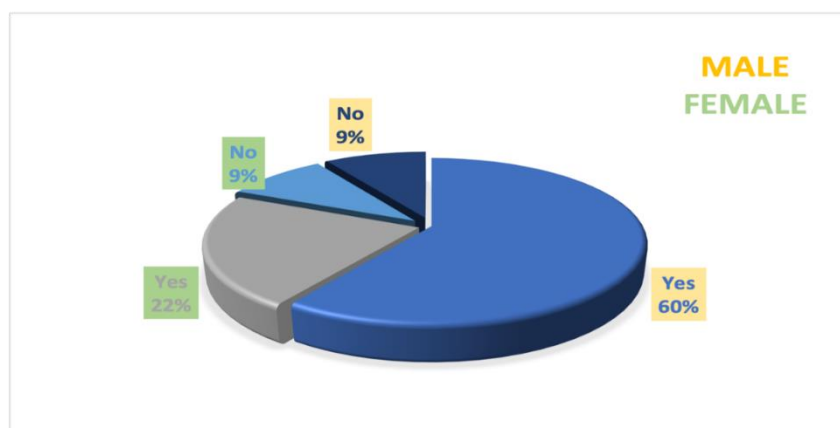


Figure 3.5 Prevalence of MSK pain among genders

Affected body region		20-29 years	30-39 years	>45 years
Neck	No	15 (15.2%).	35 (30.4%)	11 (30.6%)
	Yes	84 (84.8%)	80 (69.6%)	25 (69.4%)
Shoulder	No	54 (54.5%)	50 (43.5%)	6 (16.7%)
	Yes	45(45.5%)	65 (56.5%)	30 (83.3%)
Elbow	No	34 (34.3%).	23 (20%)	3 (8.3%)
	Yes	65(65.7.8%)	92 (80%)	33 (91.7%)
Wrist/hand	No	58 (58.6%).	34 (29.6%)	7 (19.4%)
	Yes	41 (41.4%)	81 (70.4%)	29 (80.6%)
Upper back	No	30 (30.3%)	33 (28.7%)	13 (36.1%)
	Yes	69 (69.7%)	82 (71.3%)	23 (63.9%)
Lower back	No	20 (20.2%)	50 (20%)	63 (25.2%)
	Yes	79 (79.8%)	32 (27.8%)	7 (19.4%)
Hip/thigh/buttock	No	14 (14.1%)	28 (24.3%)	5 (13.9%)
	Yes	85 (85.9%)	87 (75.7%)	31(86.1%)
Knees	No	67 (67.7%)	49 (42.6%)	3 (8.3%)
	Yes	32 (32.3%)	66 (57.4%)	33 (91.7%)
Ankle/feet	No	41 (41.4%)	38 (33%)	7 (19.4%)
	Yes	58 (58.6%)	77 (67%)	29 (80.6%)

Affected body region	Association between age group 20-29,30-39 and <40 years		
	X <sup>2</sup>	df	P
Neck	7.600	2	0.022
Shoulder	15.396	2	<0.001
Elbow	11.660	2	0.003
Wrist/hand	25.876	2	<0.001
Upper back	.713	2	0.700
Lower back	2.118	2	0.347
Hip/thigh/buttock	4.295	2	0.117
Knees	39.402	2	<0.001
Ankle/feet	5.820	2	0.054

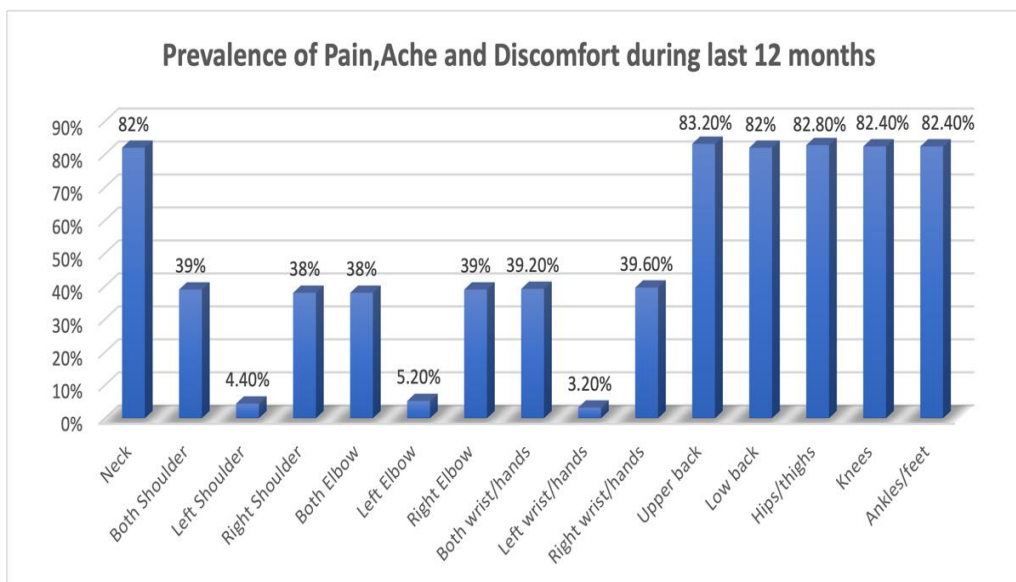
X<sup>2</sup>: Chi-Square; P: Level of Significance at <0.05\* , 0.001\*\*



**Prevalence of Ache, Pain and Discomfort among subjects in different body regions during last 12 months:**

Over the last 12 months, the most affected body part was Upper back n= 208 (83.2%) followed by Hips/thighs 207 (82.8%), Knees/ankles/feet 206

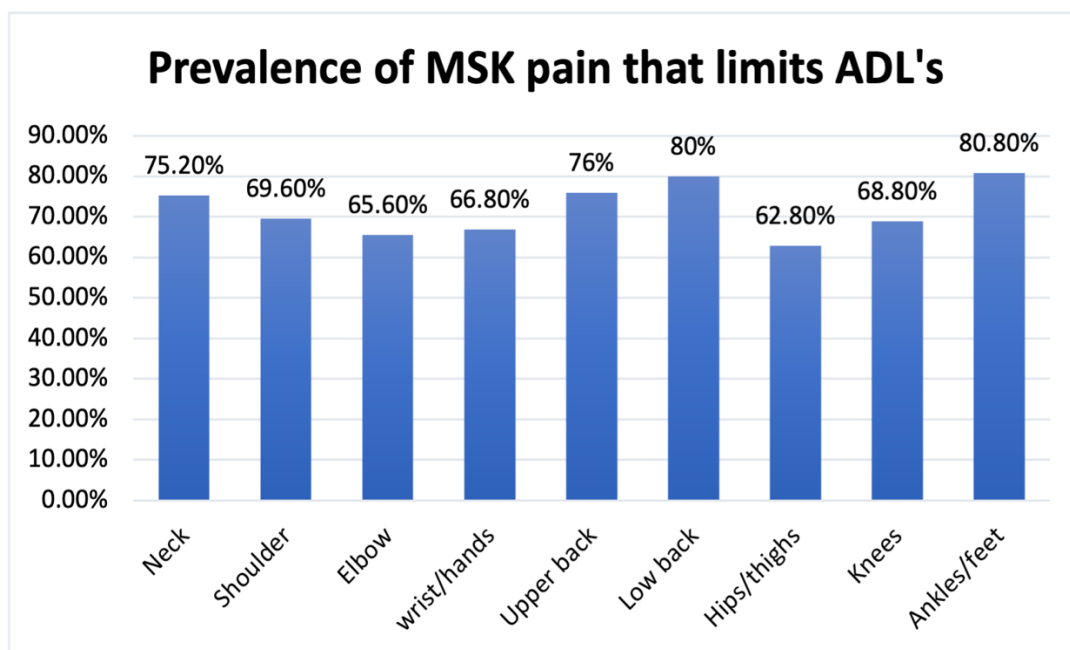
(82.4%), Low back/Neck 205 (82%) and among shoulder, elbow wrist/hands, the less affected part was left shoulder 11 (4.4%), left elbow 13 (5.2%) and left wrist/hand 8 (3.2%) as illustrated in **Table 4.6** and **Figure-4.6**



**Figure 4.6** Prevalence of MSK pain during last 12 months in %

**Prevalence of MSK pains prevented subjects from doing ADL's:**

Ankles/feet 202 (80.8%) followed by low back 200 (80%) were the commonest body regions that leads to restriction in doing activities or work and the less frequent was Hips/thighs 157 (62.8%) as illustrated in **Table 4.6** and **Figure 4.7**.



**Figure 4.7**Prevalence of MSK pain that limits the subjects from doing ADL's

**Prevalence of MSK pain causing trouble during last 7 days:**

Ankles/feet 206 (82.4%) followed by low back 187 (74.8%) was the body parts that caused maximum trouble from last 7 days as illustrated in **Table 4.6** and **Figure 4.8**.

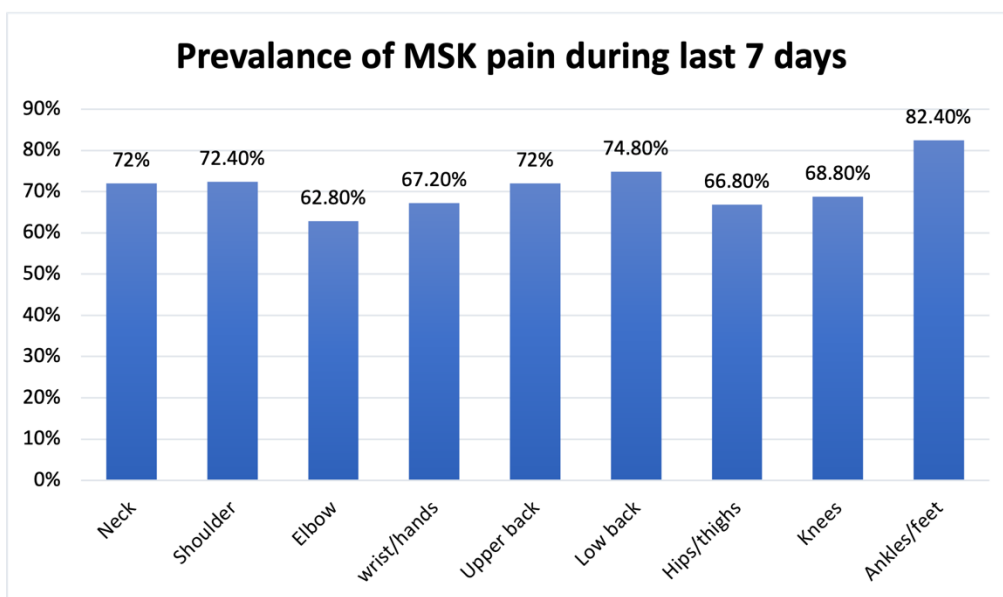


Figure 4.8 Prevalence of MSK pain in different body region caused trouble in last 7 days

Affected body region		Pains, Ache & discomfort during Previous 12 months (%)	Prevented from work in last 12 months (%)	Any trouble in last 7 days (%)
Neck	No	45 (18%).	62 (24.8%)	70 (28%)
	Yes	205 (82%)	188 (75.2%)	180 (72%)
Shoulder	No	45 (18%)	76 (30.4%)	69 (27.6%)
	Yes	205 (82%)	174 (69.6%)	181 (72.4%)
	Right	96 (38%)		
	Left	11 (4.4%)		
	Both	98 (39%)		
Elbow	No	43 (17.2%).	86 (34.4%)	93 (37.2%)
	Yes	207 (82.8%)	164 (65.6%)	157 (62.8%)
	Right	98 (39%)		
	Left	13 (5.2%)		
	Both	96 (38%)		
Wrist/hand	No	45 (18%).	83 (33.2%)	82 (32.8%)
	Yes	205 (82%)	167 (66.8%)	168 (67.2%)
	Right	99 (39.6%)		
	Left	8 (3.2%)		
	Both	98 (39%)		
Upper back	No	42 (16.8%)	60 (24%)	70 (28%)
	Yes	208 (83.2%)	190 (76%)	180 (72%)
Lower back	No	45 (18%)	50 (20%)	63 (25.2%)
	Yes	205 (82%)	200 (80%)	187 (74.8%)
Hip/thigh/buttock	No	43 (17.2%)	93 (37.2%)	83 (33.2%)
	Yes	207 (82.8%)	157 (62.8%)	167 (66.8%)



<b>Knees</b>	<b>No</b>	44 (17.6%)	78 (31.2%)	78 (31.2%)
	<b>Yes</b>	206 (82.4%)	172 (68.8%)	172 (68.8%)
<b>Ankle/feet</b>	<b>No</b>	44 (17.6%)	48 (19.2%)	44 (17.6%)
	<b>Yes</b>	206 (82.4%)	202 (80.8%)	206 (82.4%)

## DISCUSSION

The study aimed to identify the incidence rate of musculoskeletal pains among traffic police in Gautam Budh Nagar (UP). The majority of subjects in current study were males, same as with previous study from Nigeria performed in 2019 (45).

In this study, findings suggested the higher prevalence of musculoskeletal pain age group between 30-39 years. The current study stated a higher prevalence rate of Musculoskeletal pain in traffic police. Our findings support that previous study with prevalence rate of 81% among traffic police in Nigeria (45). One more previous study showed the similar results with 75% 12-months prevalence rate among police officers in Brazil (46). The prevalence among traffic police in this study reported more than among nurses (67.8%) in Ibadan (47).

From present study findings, the greatest 12-month prevalence was reported in Upper back  $n=208$  (83.2%) followed by Hips/thighs 207 (82.8%), Knees/ankles/feet 206 (82.4%), Low back/Neck 205 (82%). The results from previous studies is consistent with findings of current study (46,48,49). A study among traffic police by Hassan et al, Bangladesh reported 80% incidence rate, whereas Ana et al showed 51.4% incidence rate in traffic police officers in Brazil (46,48). A previous study from Nigeria showed prevalence of 69.5% traffic police reported low back pain. This could be due to incorrect workstation or working or standing in wrong posture for long time (49).

The pattern of MSK pain among different body regions has negatively affected ADLs in majority of traffic police officers. In current study, Ankles/feet 202 (80.8%) followed by low back 200 (80%) was the commonest body parts that leads to frequent limitation in doing activities or work. A previous study by choobineh and kasson et al reported the low back pain be the major cause of disability among traffic police (50) that is consistent with the results of present study. In present study, there were significance difference in the incidence rate of MSK pain in traffic police of different age groups and different gender. The higher prevalence of 47.5% and 41.2% was reported for age between 30 and 39 years and 20 and 29 years. The outcomes implies that middle age is related with higher incidence of MSK pains and supports the findings of past studies (51). This study reported males have higher prevalence 60% of MSK pain as compared to females (22%). The findings of this study are similar to previous study by Rufa'i and Oyeyemi et al, 2019 (35). In their study, he reported higher prevalence 82.6% in males with MSK pain as compared to female (70%) (35).

## Limitations and Future Scope:

The study location was restricted to one district. The study was done on traffic police officials only. Age group of subjects were restricted to 20-45 years. Convenient sampling was used for recruitment of the subjects. They both added to the future recommendations of the present study.

## CONCLUSION

The findings of current study concluded, there were higher incidence rate of musculoskeletal pains in different body areas among traffic police in which Upper back being the most affected body part  $n=208$  (83.2%) followed by Hips/thighs 207 (82.8%).

The prevalence of musculoskeletal pain among traffic police were highly associated with Age and Gender with  $p < 0.05$

Based upon the results of current study, it is crucial to prevent/reduce the occurrence of MSK Pain among traffic police and to promote health as well as improve their QOL.

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