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RESEARCH ARTICLE

PREVALENCE OF MUSCULOSKELETAL DISORDER AMONG MOTOR BIKE MECHANICS

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Background: Musculoskeletal disorder have been reported as one of the most significant cause for long term pain which further leads to physical disability that affects millions of people across the world. The bike mechanics are involved in great physical task due to sitting in awkward posture and they are also subjected to repetitive motion because of handling vibrating tools with force for long time. **Objective:** To analyse the prevalence of musculoskeletal disorder among motor bike mechanics. **Methodology:** It is an non-experimental 100 subjects of age ranging from 35-45 of only men were selected according to the inclusion and exclusion criteria. **Outcome Measure:** Nordic musculoskeletal disorder questionnaire. **Results & Conclusion:** From this study, concludes that the prevalence of work related musculoskeletal disorder among mechanics was predominantly found in lower back, shoulder and knee regions.

INTRODUCTION

Musculoskeletal disorder have been reported as one of the most significant cause for long term pain which further leads to physical disability that affects people across the world. Illness are specific in some cases which has known anatomical or physiological cause which can be clearly distinguished from eachother. Musculoskeletal disorders (MSDs) are injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and supporting structures of the upper and lower limbs, neck, and lower back that are caused, precipitated or exacerbated by sudden exertion or prolonged exposure to physical factors such as repetition, force, vibration, or awkward posture (Bernard, 1997). The symptoms of musculoskeletal discomfort are pain, disable or loss of function, inflammation, stiffness of various region, sleeping disturbance, paresthesia, fatigue etc. Fatigue is one of the major symptom which leads to muscular imbalance when muscular imbalance persist it develops musculoskeletal disorder. Musculoskeletal disorder because of work related are Work related musculoskeletal disorder (Salik, 2014).Inflammatory and degenerative disorders initiated or aggravated largely by the performance of work or in associated work settings (Collins, 2011; Punnett, 2004) In developing countries the work related musculoskeletal disorder is been precisely increasing because of the development of industrialization.

Occupations such as motor bike mechanics are related to high risk of developing work related musculoskeletal disorder because of handling manual mechanical task. The bike mechanics are involved in great physical task due to sitting in awkward posture and they are also subjected to repetitive motion because of handling vibrating tools with force for long time. Lower back, shoulder, knee, wrist are the regions significantly affected in the motor bike mechanics because of their inappropriate body posture and potentially harmful techniques and obscure working hours. In accordance to it the mechanics are exposed to noise pollution etc. However the work related musculoskeletal disorder doesn't receive proper attention towards policy makers and many health workers in developing countries. In India according to our knowledge there was less study done to find out musculoskeletal problem on motor bike mechanics, musculoskeletal disorder can be prevented by early intervention strategy. Intervention plans should contain ergonomics education of health and evolution. In mechanics musculoskeletal disorder is due to improper body position, continual repeated movements.

AIM OF THE STUDY: To rule out the prevalence of work related musculoskeletal disorders among motor bike mechanics, **NEED OF THE STUDY:** The need for the study was to rule out the common work related musculoskeletal disorder faced by motor bike mechanics. As there are limited studies done on work related

study was done to promote awareness of musculoskeletal disorder among motor bike mechanic. Methodology: it is an Non-experimental with observation type and 100 samples collected through convenient sampling in Chennai and chengalpattu. Inclusion criteria: Only men are included in the study, Age between 35-45 years., Experience should be more than 3 years, Manual road side mechanics. Exclusion Criteria: Recent injuries or fracture, Those who underwent recent surgeries, Metabolic disorder, Any neurological condition, Subjects who are not willing to participate in this study.

PROCEDURE: The subjects were selected according to inclusion and exclusion criteria. The whole procedure was explained clearly in detail to the subjects and written informed consent form was taken from each subject. Nordic musculoskeletal questionnaire was given to the selected subjects and was asked to fill them accurately without leaving any question enough timing was given to answer the questions. Assistance was given if needed such as explaining questions & options and translation if needed. After completing the data, a questionnaire is taken for evaluation.

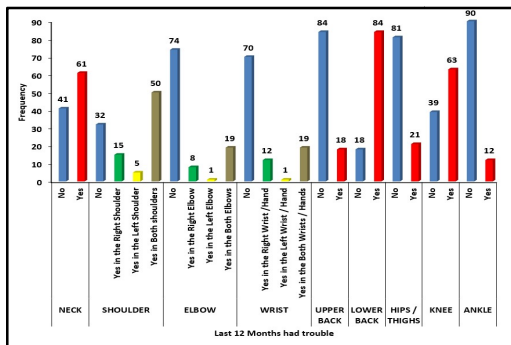
Outcome Measure: Nordic Musculoskeletal Disorder Questionnaire.

STATISTICAL ANALYSIS: The obtained data were tabulated and the data was analyzed using SPSS 20.0 for Microsoft Windows 7. Frequency distribution with percentages was used to find the prevalence

Table I. Prevalence Of Pain Over Various Region Of The Body During The Last 12 Months Among Mechanics

Last 12 Months had trouble		Frequency	Percentage
Neck	No	41	40.2
	Yes	61	59.8
Shoulder	No	32	31.4
	Yes in the Right Shoulder	15	14.7
	Yes in the Left Shoulder	5	4.9
	Yes in Both shoulders	50	49.0
Elbow	No	74	72.5
	Yes in the Right Elbow	8	7.8
	Yes in the Left Elbow	1	1.0
	Yes in the Both Elbows	19	18.6
Wrist	No	70	68.6
	Yes in the Right Wrist /Hand	12	11.8
	Yes in the Left Wrist / Hand	1	1.0
	Yes in the Both Wrists / Hands	19	18.6
Upper back	No	84	82.4
	Yes	18	17.6
Lower back	No	18	17.6
	Yes	84	82.4
Hips / thighs	No	81	79.4
	Yes	21	20.6
Knee	No	39	38.2
	Yes	63	61.8
Ankle	No	90	88.2
	Yes	12	11.8

TABLE 1 shows, the percentage of pain was calculated over various regions of the body, so that their pain percentage can be more accurately in the last 12 months.

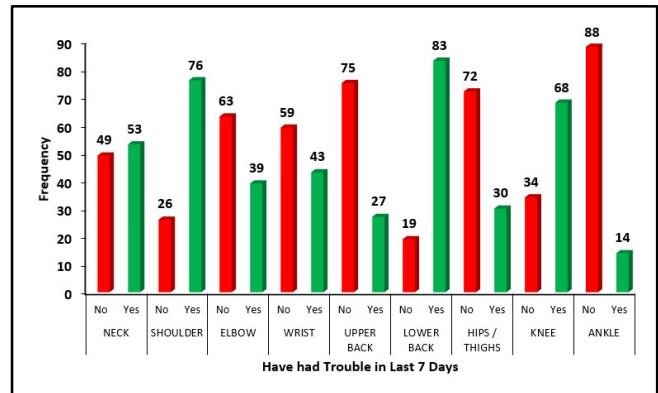


Graph I. Prevalence of pain over various region of the body

Table II. Prevalence of discomfort during last 7 days among mechanics

Have had Trouble in Last 7 Days		Frequency	Percentage
NECK	No	49	48.0
	Yes	53	52.0
SHOULDER	No	26	25.5
	Yes	76	74.5
ELBOW	No	63	61.8
	Yes	39	38.2
WRIST	No	59	57.8
	Yes	43	42.2
UPPER BACK	No	75	73.5
	Yes	27	26.5
LOWER BACK	No	19	18.6
	Yes	83	81.4
HIPS / THIGHS	No	72	70.6
	Yes	30	29.4
KNEE	No	34	33.3
	Yes	68	66.7
ANKLE	No	88	86.3
	Yes	14	13.7

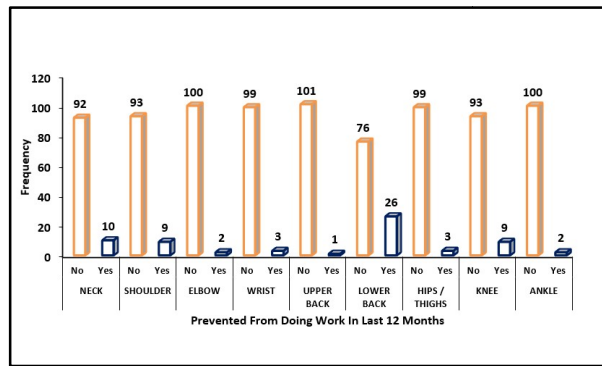
The percentage of pain noted in lower back was (82.4%), shoulder (68.6%), knee (61.8%), neck (59.8%), wrist (31.4%), elbow (27.4%), hips & thighs (20.6%), upper back (17.6%), ankle (11.8%).



Graph II. Prevalence of discomfort during last 7 days among mechanics

Prevented From Doing Work In Last 12 Months		Frequency	Percentage
NECK	No	92	90.2
	Yes	10	9.8
SHOULDER	No	93	91.2
	Yes	9	8.8
ELBOW	No	100	98.0
	Yes	2	2.0
WRIST	No	99	97.1
	Yes	3	2.9
UPPER BACK	No	101	99.0
	Yes	1	1.0
LOWER BACK	No	76	74.5
	Yes	26	25.5
HIPS / THIGHS	No	99	97.1
	Yes	3	2.9
KNEE	No	93	91.2
	Yes	9	8.8
ANKLE	No	100	98.0
	Yes	2	2.0

TABLE 2 shows subjects were asked to mark that they had trouble/pain at any times during last 7 days for all the nine regions. The pain percentage are lower back (81.4%), shoulder (74.5%), knee (66.7%), neck (52%), wrist (42.2%), elbow (38.2%), hips & thighs (29.4%), upper back (26.5%), ankle (13.7%). Table 3 shows mechanics were asked to mark that they had been prevented from trouble or pain during the last 12 months.



Graph III. Prevalence of disturbance over various region during past 12 months among mechanics

The pain percentage are lower back (25.5%), neck (9.8%), shoulder& knee (8.8%), wrist & hips & thighs (2.9%), elbow & ankle (2%), upper back (1%).

RESULTS

According to Table 1 & Graph 1 the total subjects taken, the percentage of pain is calculated over various regions of the body during the last 12 months. So, that their pain percentage can be more accurately seen in different regions. The percentage in lower back 82.4%, shoulder (68.6%), knee (61.8%), neck (59.8%), wrist (31.4%), elbow (27.4%), hips & thighs (20.6%), upper back (17.6%), ankle (11.8%). According to table 2 & Graph 2 the subjects were asked to mark that they had trouble/pain at any times during last 7 days for all the nine regions. The pain percentage are lower back (81.4%), shoulder (74.5%), knee (66.7%), neck (52%), wrist (42.2%), elbow (38.2%), hips & thighs (29.4%), upper back (26.5%), ankle (13.7%). According to table 3 & Graph 3 mechanics were asked to mark that they had been prevented from trouble or pain during the last 12 months. The pain percentage are lower back (25.5%), neck (9.8%), shoulder& knee (8.8%), wrist & hips & thighs (2.9%), elbow & ankle (2%), upper back (1%).

DISCUSSION

The aim of the study was to find out the prevalence of work related musculoskeletal disorder among 100 (male subjects) motor bike mechanics in and around Chennai. Fatigue is one of the major symptom which lead to muscular imbalance when muscular imbalance persist it develops musculoskeletal disorder. In developing countries, the worker lated musculoskeletal disorder is been precisely increasing because of the development of industrialization. Occupations such as motor bike mechanics are related to high risk of developing work related musculoskeletal disorder because of handling manual mechanical task. In table 1 mechanics were asked to fill the questionnaire stating ache, pain, discomfort, numbness at any time during last 12 months. The percentage in lower back (82.4%), shoulder (68.6%), knee (61.8%), neck (59.8%), wrist (31.4%), elbow (27.4%), hips & thighs (20.6%), upper back (17.6%), ankle (11.8%). In table 2 mechanics were asked to mark that they had trouble or pain at any times during the last 7 days for all the 9 region. The pain percentage are lower back (81.4%), shoulder (74.5%), knee (66.7%), neck (52%), wrist (42.2%), elbow (38.2%), hips & thighs (29.4%), upper back (26.5%), ankle (13.7%). In table 3 mechanics were asked to mark that they had been prevented from trouble or pain during the last 12 months. The pain percentage are lower back (25.5%), neck (9.8%), shoulder& knee (8.8%), wrist & hips & thighs (2.9%), elbow & ankle (2%), upper back (1%). Karmegam Karuppiyah *et al* (2014) reported that work related factors such as posture, force exertion and vibration were contributing factors in increasing the risk of MSD for auto repair mechanics compared to other physical risk

Mujtababaqar *et al.* (2016) reported that the motorcycle mechanics are vulnerable to WMSS at high prevalence rate due to poor working environment, prolonged working hours and lack of training and ergonomically oriented work practices. Shamimaakter *et al* (2016) stated that automobile workers are in risk due to the demand of poor ergonomic working environment by analysing posture and pattern of movements. Mostly, the working hours and break time of motor bike mechanics are irregular compared to other jobs because of their occupational characteristics. The awareness and preventive measures among them are comparatively less. Hence insisting and implementing ergonomic guidance to mechanics will be essential from preventing musculoskeletal disorder in future.

Conclusion

This study concludes that there is an increased prevalence of musculoskeletal pain among motor bike mechanics. Among motor bike mechanics there was a specific pain in lower back, shoulder and knee most commonly due to improper ergonomic, physical burden. The problem needs immediate attention for the benefits of motor bike mechanics.

Limitation of The Study: Sample is less, Only one geographical area was selected, Postural analysis was not done.

RECOMMENDATION OF THE STUDY: Large sample can be done, Postural correction can be done.

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