

Master of Science in Public Health



*Prevalence of musculoskeletal disorders and quality  
of life among bike riders of Rawalpindi*

By

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**(2022)**

*“Prevalence of musculoskeletal disorders and Quality of  
life among bike riders in Rawalpindi”*

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**(362811-PIO/MSPH-2020)**

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I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

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## ABSTRACT

**Objectives:** The purpose of this study was to investigate the prevalence of musculoskeletal disorders and quality of life among bike riders in Rawalpindi. The idea of this study was to reveal the sociodemographic factors affecting Quality of life and causing musculoskeletal problems so that the study results could be used in future to overcome those factors to improve the Quality of life of bike riders and prevent musculoskeletal problems in bike riders.

**Methods:** A cross sectional study was conducted among bike riders in Rawalpindi. This study included a total of 335 participants riding bike as an occupation from more than 6 months. Different sociodemographic factors were taken and quality of life and musculoskeletal problems were accessed.

**Results:** The results of the study showed that musculoskeletal disorders among bike riders are highly prevalent with low back pain (71.9%) and upper back pain (48.4%) being the most common. Quality of life of bike riders is also compromised. Moreover, statistically significant association was found in sociodemographic characteristics of riders with quality of life that includes physical health ( $X^2=V$ ,  $P=0.0001$ ), income ( $X^2=13.477$ ,  $P=0.004$ ), and significant association with musculoskeletal problems was also observed, i.e. age of respondent ( $X^2= 67.851$ ,  $P=0.0001$ ), work hours/day ( $X^2=18.307$ ,  $P=0.0001$ ) with  $p<0.05$ . The association between quality of life and musculoskeletal disorders was statistically significant as well i.e.  $X^2= 14.045$  with  $P= 0.0001$

**Conclusion:** The study revealed that quality of life of bike riders is compromised and musculoskeletal disorders among bike riders are highly prevalent. Statistically significant association was found in sociodemographic characteristics of riders with quality of life and musculoskeletal problems. Association between quality of life and musculoskeletal problems was also statistically significant.

**Keywords:** Bike Rider, Disorders, Musculoskeletal, Occupational, Pain.

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## LIST OF ABBREVIATIONS

- LBP - Lower Back Pain
- MSK - Musculoskeletal
- NMQ - Nordic Musculoskeletal Questionnaire
- QLESQ - Quality of Life Enjoyment and Satisfaction Questionnaire
- QOL - Quality of Life

## **CHAPTER I: Introduction**

Disorders of the muscles, nerves, tendons, joints, cartilage, and spinal discs are referred to as musculoskeletal problems. Musculoskeletal problems that are caused by working in a particular environment or doing a certain task and the condition that lasts longer or is worsened by working in that environment is referred to be work related (CDC., 2020). Workplaces where workers are subjected to physical and mental workload are linked to musculoskeletal disorders (Hossain et al., 2018).

Nowadays, it is commonly acknowledged that the aetiology of musculoskeletal problems is multifactorial and includes psychological, social, and physical aspects. Age and working in an unsuitable role both significantly raise musculoskeletal problems risk. Moreover, psychological factors which are typically more strongly linked with pain-related impairment than biological and mechanical factors play a bigger part in the onset of pain and the transition from acute to chronic pain in working class people (Nilufer et al., 2011).

Disorders of the musculoskeletal system among drivers are one of the several issues that have been addressed and are now a rising public health issue globally (Ramasamy et al., 2017). There are very fewer studies recognizing prevalence of musculoskeletal disorders in motorcyclists using motorbikes, both for daily commuting and recreational purposes. Despite the fact that prior research has been done to determine the presence of musculoskeletal disorders among riders who ride motorbikes for a living, such as transport providers and postal carriers (Hafzi et al., 2011).

A greater effort has been made in past few years to look into the origins of musculoskeletal problems and to take measures to prevent them. This has led to a growing understanding among employees, employers, and government organisations that there is a direct correlation between elements of the workplace environment and the development of musculoskeletal disorders, which in turn cause significant absence from work and lower productivity (Buckle., 2005).

Globally, the general public is affected by musculoskeletal problems, which is a major health issue. Musculoskeletal issues are a concern in the transportation industry as well, particularly in western nations with a variety of forms of transportation (Hafzi et al., 2011). Both industrialized and underdeveloped nations have addressed musculoskeletal problems, which are quite common in parts of the body such as lower back, neck, shoulders, and upper limbs (Bandpei et al., 2014).

Low back pain is the most prevalent ailment, and musculoskeletal problems are the second most prevalent cause of disability in the world, determined by years lived with disability. With an ageing, sedentary, and more obese population, it is predicted that disability caused by MSK illnesses will increase much farther. From 1990 to 2010, disability related to MSK disorders, particularly osteoarthritis, is expected to have increased by 45% (Storheim et al., 2014).

The idea of quality of life basically refers to how a person evaluates the general "goodness" of various areas of their existence. These evaluations cover emotional responses to events in life, disposition, feeling of fulfilment and contentment in life, and satisfaction with one's job and interpersonal connections (Theofilou et al., 2013).

Employees now place more value on work-life balance and cultural shifts than they did in the past, when the emphasis was on addressing people's most fundamental needs. Even the most fundamental demands have changed and become more diverse as a result of changes in working conditions and living standards. In these conditions, both the well-being of employees and the quality of their working lives have emerged as crucial topics for organizational behaviour research. It became essential to concentrate on developing indicators and enhancing these work conditions in order to attract more productive and content workers, which are one of the most crucial components of companies (Duyan et al., 2013).

Bike is considered as one of the fast and fuel-efficient means of transport. In present conditions of living, which demands low cost means of commute that can provide fast living standards, bike is a necessary part for both urban and rural areas. Now a days bike riding is used for occupational purposes. Compared to other means of transport, bike riders are exposed to a large number of physiological and psychological factors (Anoop et al., 2019).

Motorcycles are frequently used for work-related activities. The cumulative effects of professional stress factors including pressure to meet deadlines, goal pressure, and an excessive desire for rewards, as well as extended work hours, can impact performance and cause musculoskeletal problems (Murphy et al., 1986).

Car drivers are constantly subjected to discomfort while they are driving, which results in musculoskeletal problems on their parts of the body. On a motorbike, this may be associated to the biomechanical element of the rider's seating arrangement. Considering the limitations of the scooter as a workstation, riding comfort is important for a motorcyclist's physical condition and posture (Amrutkar et al., 2011).

Bikers' actions differ depending on the incidental social and personal strain present at the time. Furthermore, different people have different senses of "danger" and "safety. Long-term uncomfortable posture used when riding a bike causes musculoskeletal conditions associated to driving, the most prevalent of which is low back strain, neck stiffness and spinal problems. In addition to musculoskeletal problems, psychological pressures including meeting deadlines, attaining lofty goals, and receiving excessive rewards are detrimental (Dutta et al., 2017).

Depending on the usage, motorcycle riders are subjected to a more stationary position with limited mobility for an extended period of time (Gyi et al., 1998). Long periods of time spent in one position will result in blood flow being restricted, which distresses various body areas and produces muscular stiffness and discomfort (Alias et al., 2016).

In Malaysia, motorcycles are considered to be one of the most efficient and affordable forms of transportation. The International Ergonomics Association described ergonomics as a scientific field that seeks to develop and enhance human well-being when engaging with industrial products. Malaysian research on motorcycle ergonomics is scarce, especially when it comes to the interactions between riders and their vehicles (Karmegam et al., 2009).

Motor bikes are among the most often used forms of transportation in India. Occupational riders are particularly susceptible to two-wheeler riding-related problems due to their constant riding. There is a certain riding position for each bike rider. Long-term uncomfortable posture causes musculoskeletal problems that are associated to driving and cause pain and discomfort for the rider. Since the two-wheeler system may be thought of as an interface between man and machine,

which is more susceptible to a mismatch in features, it is crucial to understand the hazards involved. Fewer studies have focused on the musculoskeletal problems that motorcycle riders experience while driving (Anoop et al., 2019).

### **1.1. Rationale:**

This study aimed to determine the prevalence of musculoskeletal disorders and quality of life among bike riders of Rawalpindi.

### **1.2. Objectives:**

- To assess the prevalence of musculoskeletal disorders among bike riders in Rawalpindi.
- To measure the Quality of life of bike riders in Rawalpindi.
- To find out the determinants causing musculoskeletal disorders and effecting quality of life of bike riders.

## CHAPTER II: Literature Review

According to years lived with disability, musculoskeletal disorders rank second most common reason of disability throughout the world, with low back pain being the most prevalent ailment. According to estimates, between 1990 and 2010 there was a 45% rise in musculoskeletal disorder-related disability (Vos et al., 2012). Effective health promotion measures have the ability to improve management of disability (Buchbinder et al., 2001) and proof in favor of advice for low back pain prevention strategies including weight loss and exercise (Heuch et al., 2013).

Over the past several decades, musculoskeletal problems have increased in prevalence around the globe. It eventually occurs in work-related disability among workers, which has significant financial consequences owing to workers' compensation and medical costs (Alexopoulos et al., 2004). Numerous work-related variables have been recognized as predisposing the disorders, including repetitive motions for neck and shoulder problems, psychosocial pressures for back, neck, and shoulder complaints, and overexertion and uncomfortable postures for back pain (Szymanska et al., 2002). In Greece, few researches have been conducted on the incidence of multiple musculoskeletal problems and their interdependencies in occupational groups (Alexopoulos et al., 2003).

Musculoskeletal disorders were identified as one of the primary debilitating ailments among the aged population by the World Health Organization in 2002. The World Health Organization has recognised four primary debilitating musculoskeletal conditions: osteoarthritis, rheumatoid arthritis, osteoporosis, and backache (Woolf et al., 2003). The UN and WHO launched and supported the Bone and Joint Decade 2000-2010 partnership in 1998, with the main objective of reducing the burden and expense of MSK disorders (D Woolf & Anthony, 2000).

Over the last decade, occupational health practitioners throughout the world have become more aware about the substantial burden of sickness linked with musculoskeletal problems of the neck and upper limbs. These diseases are thought to be related with excessively repetitive employment and are caused, at least in part, by ergonomic conditions (Stock & S. R. 1991).

The most common chronic ailments afflicting the American population include musculoskeletal disorders. They significantly influence people's quality of life, the usage of health-care resources, and the national economy (Felts et al., 1989). Disorders of the musculoskeletal systems are the major cause of work-related impairment in both men and women (Ficke, R. C, 1992). Back pain is the leading cause of disability among Americans under the age of 45. Approximately one-third of individuals in the United States have acute joint pain, stiffness, or restriction of mobility at some point in their life. Furthermore, almost two-thirds of US individuals experience back ache at some point in their life. According to Lawrence and colleagues (1998), back pain becomes more common with age, but it also has a substantial impact on the well-being of children and young people.

Around one million Canadian adults are estimated to have physical disabilities related to a musculoskeletal condition. As compared to men, women are more likely to report disabling musculoskeletal condition. There was an increase in the prevalence rate of musculoskeletal conditions in individuals aged 85 years and older. The results of the study also revealed that mobility was more compromised than agility (Reynolds et al., 1992).

Despite previous research into the frequency of Musculoskeletal illnesses among bike riders, there is insufficient data on the prevalence of musculoskeletal diseases among motorcyclists who use motorbikes for everyday commuting and recreational activities (Mirbod et al., 1997). The



possibility of acquiring musculoskeletal disorders from riding a motorbike alone is still an issue that must be addressed. This is because persons suffering from musculoskeletal disorder symptoms may have a lower quality of life. Numerous studies have found that those who suffer from low back pain are more inclined to delay their job responsibilities (Pope et al., 1993).

A study was conducted in 2019 to find the association of musculoskeletal disorders with work schedule of people. It was found that work schedule was strongly related to Musculoskeletal disorders in various body regions. There was a significant frequency of musculoskeletal disorders, especially in the knees, upper back, lower back, neck, and shoulders (Bazazan et al., 2019).

Quality of life has evolved as an essential aspect of clinical research and patient treatment during the last two decades. When appropriately assessed, quality of life has been used to classify distinct patients or groups of patients, anticipate health outcomes of patients, and evaluate therapeutic strategies. The phrase "quality of life," as used in medical literature, may not have a definite or unique meaning. Many researchers appear to replace "quality of life" for other terminology meant to characterise a patient's health, such as "health status" or "functional status" (Gill et al., 1994).

Motorcycles are considered to be an important mode of transportation both locally and globally. Motorbikes and cars are used as the two main modes of transportation in Malaysia. Motorcycles, on the other hand, are favored because they are small, nimble, burn less gasoline, travel quickly through congested zones (towns or cities), are less expensive to purchase and cheaper to maintain than other big vehicles (McInally S. 2003). Considering the benefits, motorbike riding is a difficult and dangerous activity. Motorbike riders are exposed to and susceptible to a wide range of risks. The development of musculoskeletal problems and pain in the human body is correlated to both prolonged static working position and bad posture. There is a requirement to investigate motor

bikers' fatigue. A survey of the literature, however, finds that there is hardly any actual scientific proof or information addressing bikers tiredness (Horberry et al. 2008, Haworth and Rowden 2006).

A cross-sectional study was conducted among students of medicine of Dow University of Health Sciences, Karachi Pakistan. The purpose of this research was to identify the incidence of low back pain among motor bikers. The study comprised of male medical students who ride motorcycle. The questionnaire items focused on low back pain, usual bike rider posture, change in position, consultation for low back pain, changes in daily routine owing to low back pain, reduced mobility due to low back pain, and reduced recreational activity due to low back pain. According to the study's findings, low back discomfort is prevalent in motorcycle riders. Age, riding duration per day, and change in posture were shown to be significantly greater among motorcycle students suffering from low back ache (Memon et al., 2019).

A research was done on Indian occupational bike riders. The goal of this study was to find out how prevalent musculoskeletal issues are among occupational bike riders. The Nordic musculoskeletal questionnaire was used to detect musculoskeletal problems associated with driving and their influence on occupational obligations. According to the study's findings, prolonged exposure to static postures and deviations from normal body posture enhances the severity of the condition. These sorts of exposures are more likely to result in musculoskeletal problem. Furthermore, the findings revealed that driving-related musculoskeletal diseases were unaffected by age, gender, or vehicle type (Anoop et al., 2019).

There has been relatively little study on the incidence of musculoskeletal problems and quality of life among motorcycle riders in Pakistan and throughout the world. The researches cited in the

literature review focused mostly on musculoskeletal problems. There is little information available regarding the quality of life enjoyment and happiness of occupational bike riders. The current study focuses on occupational bike riders' musculoskeletal disorders as well as their overall life satisfaction and contentment.

## **CHAPTER III: METHODOLOGY**

### **3.1. STUDY DESIGN:**

The study design chosen to conduct this research was cross-sectional study design in which the participants were studied at specific point in time.

### **3.2. STUDY SETTING:**

This study was conducted on bike riders of Rawalpindi.

### **3.3. DURATION OF STUDY:**

The study duration was from March, 2022 to September, 2022. This study took three months' time to collect data and interpret the results.

### **3.4. SAMPLE SIZE:**

Sample size was calculated using the OpenEpi software. Sample size came out to be 335 for the study. Almost 360 questionnaires were filled and error containing forms were filtered from the collected questionnaires. The collected was thoroughly examined, analyzed and interpreted to get the results.

### **3.5. SAMPLING TECHNIQUE:**

Quality of Life Enjoyment and Satisfaction Questionnaire and Nordic Musculoskeletal Questionnaire were used and data was collected by convenience sampling technique.

### **3.6. SAMPLE SELECTION:**

This study was limited to bike riders of Rawalpindi.

#### **3.6.1 Inclusion criteria:**

- People riding bike as an occupation in Rawalpindi.
- People riding bike for more than 20 hours per week in Rawalpindi.

- People riding bike as an occupation from at least six months.

### **3.6.2 Exclusion criteria:**

- Bike riders not giving consent.
- Bike riders with previous history of any musculoskeletal disorder or injury.

### **3.7. DATA COLLECTION PROCEDURE:**

The Quality of Life Enjoyment and Satisfaction Questionnaire and Nordic Musculoskeletal Questionnaire were used. The questionnaire underwent meticulous revision to further fulfill the objectives of the study. No major changes affecting the validity or reliability of the survey were made, and the questionnaire was administered in English. The Quality of Life Enjoyment and Satisfaction Questionnaire pooled information about the quality of life and Nordic Musculoskeletal Questionnaire evaluated musculoskeletal disorders.

### **3.8. DATA ANALYSIS PROCEDURE:**

All statistical analyses were performed using SPSS Statistics for Mac. Categorical variables were presented as frequencies and percentages, whereas continuous variables were summarized as the mean  $\pm$  standard deviation. Prevalence was calculated by measuring frequency and percentages. Pearson Chi-Square test was applied to check associations, P-Value was set at 0.05 for tests applied.

### **3.9. ETHICAL CONSIDERATION:**

- **IRB approval** was taken from the Ethical Review Board (IRB) of Al-Shifa School of Public Health after synopsis presentation.
- **Informed consent form (ICF)** was signed by every participant before starting in-depth interviews. The ICF is attached in annexure-IV.

- The information collected from the participants was only used for the purpose of research. All the information and data was kept strictly confidential.
- **Permission letter** was taken from the authorities to collect data from their employees.

## CHAPTER IV: RESULTS

### 4.1. Descriptive Results:

A total of 335 participants were interviewed and the response rate was 100%. Participants were only male bike riders of age 18-66 years, all of them were bike riders who ride bike for occupational purpose residing in the area of Rawalpindi.

#### 4.1.1. Socio Demographic Factors of Study Participants:

A total of 335 people volunteered for the study. The 335 participants varied in age, marital status, educational status, smoking habit, exercise routine, and current income. Approximately 34.9% (117) were between the ages of 18 and 30. 41.5% were between the ages of 31 and 45, while 23.6% were over 45. In terms of marital status, approximately 58.8% (197) of participants were married, 28.7% (96) were single, 7.5% (25) were divorced, and 5.1% (17) were widowed. 6.3% (21) of the 335 bike riders were uneducated, which means they had no education. 43.6% (146) completed secondary school, 38.5% (129) completed higher secondary school, and 11.6% (39) received a bachelor's degree. According to the data collected, 56.4% (189) of bike riders smoked on a regular basis, while 43.6% (146) did not. Taking bike riders' exercise routines into account, approximately 4.5% (15) bikers exercised regularly, 8.1% (27) exercised 2-3 times per week, 6.3% (21) exercised 4-6 times per week, and 81.2% (272) bike riders did not exercise at all. Participants' income ranged from less than 20,000 to more than 30,000. 3.9% (13) of the 335 bike riders earned less than 20,000. Approximately 25.7% (86) earned between 20,000 and 25,000. 60.6% (203) earned between 26,000 and 30,000, while 9.9% (33) earned more than 30,000.

**Table 1: Socio Demographic Factors of study participants**

<b>Variable</b>	<b>Options</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
<b>Age of respondent</b>	18-30	117	34.9
	31-45	139	41.5
	45+	79	23.6
<b>Marital status</b>	Married	197	58.8
	Single	96	28.7
	Divorced	25	7.5
	Widowed	17	5.1
<b>Educational status</b>	None at all	21	6.3
	Matriculation	146	43.6
	Higher Secondary	129	38.5
	Graduation	39	11.6
<b>Smoking habit</b>	Yes	189	56.4
	No	146	43.6
<b>Routine of exercise</b>	Daily	15	4.5
	2-3 times/week	27	8.1
	4-6 times/week	21	6.3
	Never	272	81.2
<b>Current income</b>	Less than 20000	13	3.9
	20000-25000	86	25.7
	26000-30000	203	60.6
	More than 30000	33	9.9



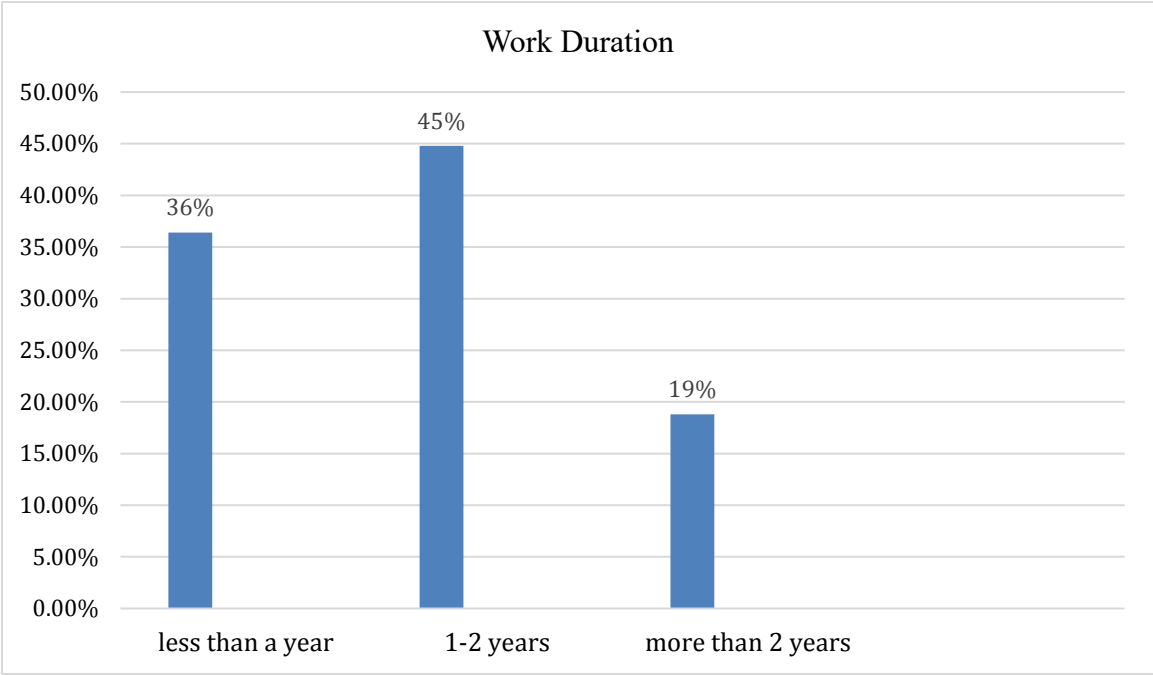
**Mean and Standard Deviation of Socio demographic variables:**

Total 335 questionnaires were filled by collecting data from the bike riders and the response rate was 100%. Computed Mean±SD of family size (4.89±1.29) whose minimum value was 2 and maximum value was 8, working hours per day (9.34±1.54) whose value ranged from 6 to 12 and working hours per week (6.09±0.63) whose value ranged from 5 to 7 are mentioned in table 2.

**Table 2: Mean and Standard Deviation of socio demographic variables:**

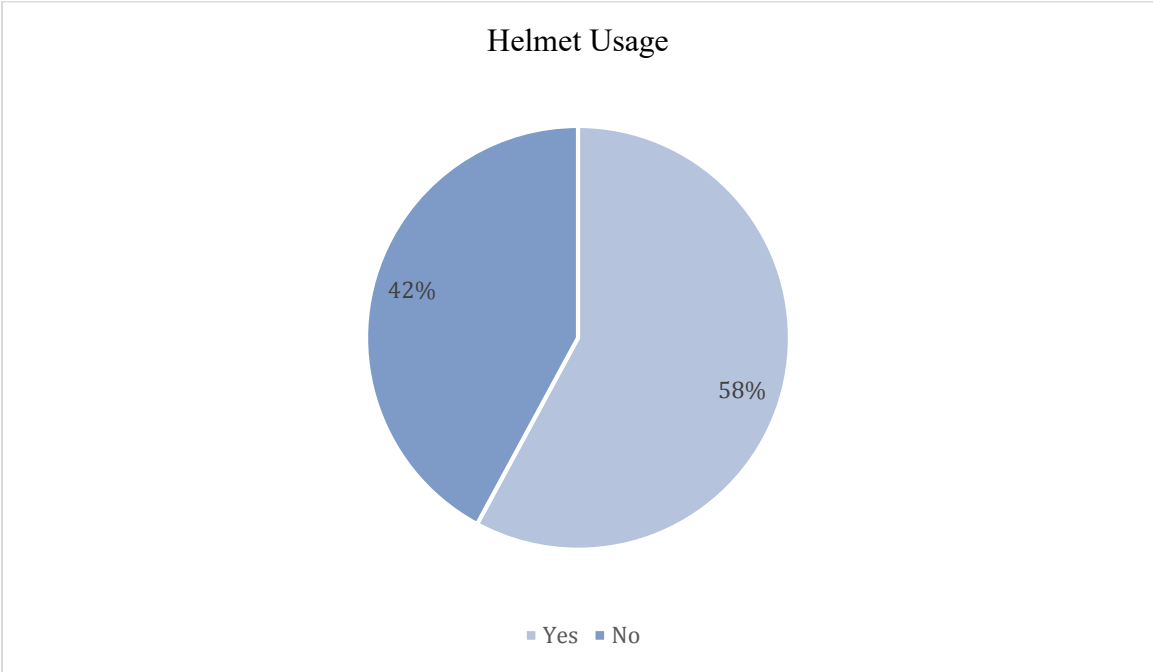
<b>Variable</b>	<b>Mean±SD</b>	<b>Minimum Value</b>	<b>Maximum Value</b>
Family size	4.89±1.29	2	8
Working hours/day	9.34±1.54	6	12
Working hours/week	6.09±0.63	5	7

The data collected on work duration revealed that 36.4% (122) of the 335 participants had been working as an occupational bike rider for less than a year. 44.8% (150) of participants had been working for 1-2 years, while 18.8% (63) had been working for more than 2 years.



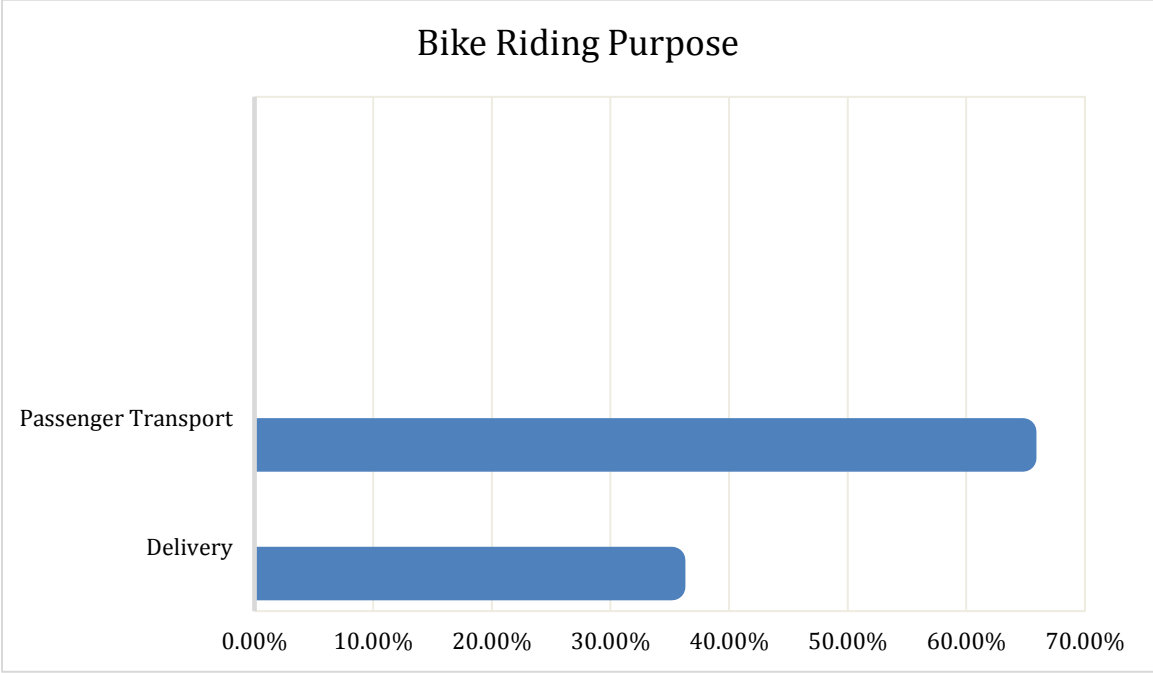
**Figure 1: Work duration of occupational bike riders**

This pie chart presents that 57.9% (194) of 335 occupational bike riders were concerned about wearing helmet while riding a bike, while 42.1% were not concerned.



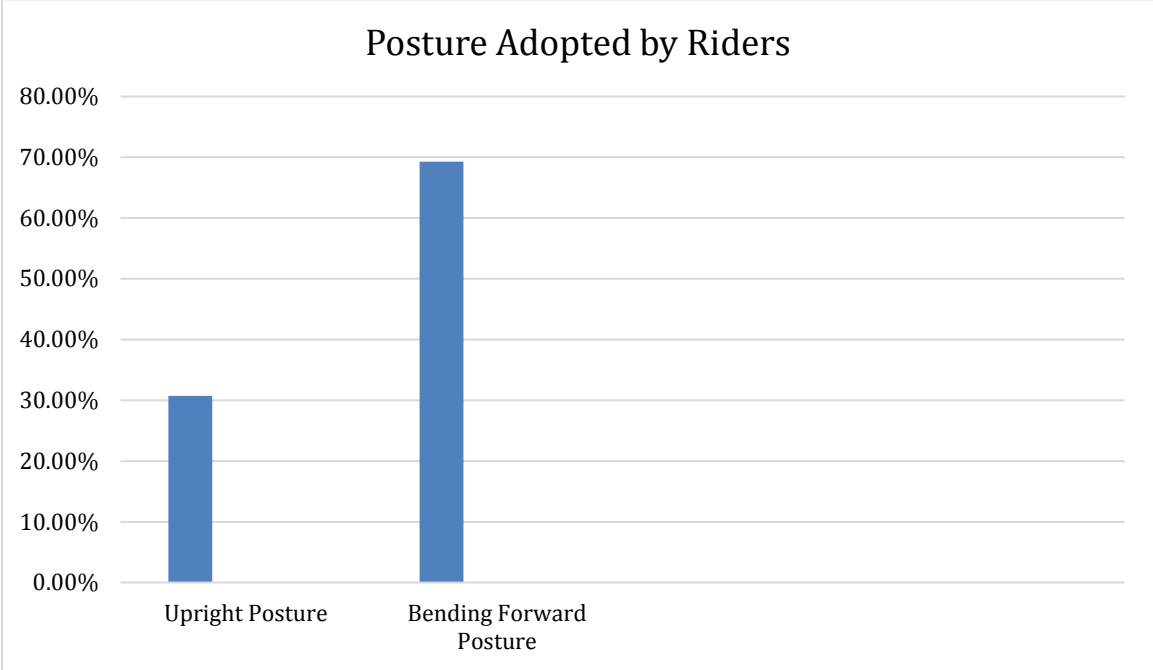
**Figure 2: Helmet usage among occupational bike riders**

Among the participants, the riders' purpose for bike riding was delivery and passenger transportation. 35.2% (118) of participants were riding a bike for delivery, while 64.8% (217) were riding a bike for passenger transportation.



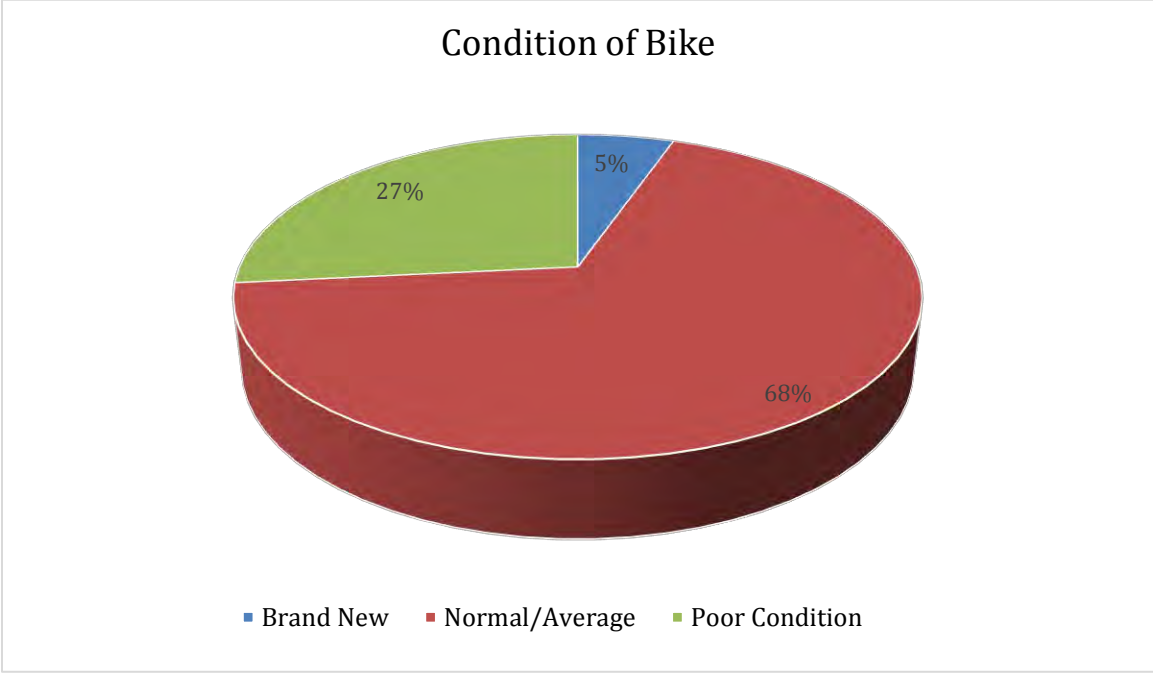
**Figure 3: Purpose of riding a bike**

Participants adopted upright and bending forward postures while riding bikes for various purposes. 30.7% (103) participants adopted upright posture while riding a bike, while 69.3% (232) adopted bending forward posture.



**Figure 4: Posture adopted by occupational bike riders**

While gathering data, the condition of the rider's bikes was also taken into account. The condition ranged from new to normal/average to poor. 5.4% (18) of riders had a brand-new bike, 68.1% (228) had a bike in normal/average condition, and 26.6% (89) had a bike in poor condition.



**Figure 5: Condition of bike of occupational bike riders**

#### **4.1.2. Quality of Life Enjoyment and Satisfaction Questionnaire:**

The Quality of Life Enjoyment and Satisfaction Questionnaire evaluated occupational bike riders on a variety of scales, including physiological condition, relationships, emotional health, psychosocial functioning, life satisfaction, and contentment. Physical health data collected revealed that 2.4% of bike riders had very poor physical health, 20.9% had poor physical health, 40% had fair physical health, 27.8% had good physical health, and 9% had very good physical health. The questionnaire was also used to assess the mood of bike riders. 1.2% reported having a very bad mood, 33.1% had a bad mood, 33.4% had a fair mood, 26.6% had a good mood, and 5.7% had a very good mood. Work variable results revealed that 2.1% reported their work as very poor, 37% reported poor work, 37.6% reported fair work, 20.9% reported good work, and 2.4% reported very good work. QLESQ evaluated bike riders' participation in household chores. 1.2% of bike riders reported very poor engagement in household chores, 25.7% reported poor engagement, 42.4% reported fair engagement, 24.2% reported good engagement, and 6.6% reported very good engagement. Bikers' social interactions varied greatly from very poor to very good. Very poor social relationships were reported by 2.1%, followed by poor social relationships by 28.7%, fair social relationships by 35.8%, good social relationships by 19.4%, and very good social relationships by 14%. Family relationships were rated as very poor by 3%, poor by 18.8%, fair by 44.8%, good by 22.1%, and very good by 11.3%. The questionnaire results revealed that the majority of bike riders, 36.4%, rated their leisure time activities as poor. 28.4% engaged in fair leisure activities, 17.6% engaged in good leisure activities, 11.6% engaged in very poor leisure activities, and 6% engaged in very good leisure activities. In addition to passenger transportation and delivery, bike riders were evaluated for their ability to function in daily life. 0.6% of bike

riders had very poor ability to function in daily life, 17% had poor functioning in daily life, 43% had fair functioning in daily life, 35.5% had good ability to function in daily life, and 3.9% had very good ability to function in daily life. Bike riders' sexual drive, interest in sexual activity, or performance was rated by 10.1% as very poor, 7.8% as poor, 33.1% as having fair sexual functioning, 38.8% as having good sexual drive, and 10.1% as very good. The economic status of bike riders was rated as very poor by 2.1%, poor by 47.2%, fair by 43.3%, good by 6.6%, and very good by 0.9%. These percentages show that the majority of occupational bike riders have poor economic status. The living and housing situation were also evaluated in the questionnaire for quality of life enjoyment and satisfaction. The findings revealed that 2.4% had very poor living and housing conditions, 34.9% had poor, 46.6% had fair, 14.9% had good, and 1.2% had very good living and housing situation. 1.2% of bike riders reported having a very poor physical ability to get around without feeling dizzy, unsteady, or falling. 2.1% reported poor ability, 31.6% fair ability, 51.6% good ability, and 1.2% very good ability to get around physically without feeling dizzy. The vision in terms of ability to do work or hobbies was reported by 0.9% as very poor, 17% as poor, 40.3% as fair, 33.7% as good and 8.1% as very good. Overall sense of wellbeing in questionnaire was reported by 1.8% as very poor, 40.3% as poor, 31.9% as fair, 20.3% as good and 5.7% as very good. The QLESQ also inquired about participants' medication satisfaction. 29.9% said they were not taking any medication. 1.2% reported very poor medication satisfaction, 5.1% reported poor satisfaction, 46% reported fair satisfaction, 15.8% reported good satisfaction, and 2.1% reported very good satisfaction. Overall life satisfaction and contentment were reported as very poor by 6%, poor by 33.7%, fair by 41.5%, good by 16.4%, and very good by 2.4% in the previous week.



**Table 3: Quality of Life Enjoyment and Satisfaction Questionnaire**

<b>Variable</b>	<b>Options</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
Physical health	Very poor	8	2.4
	Poor	70	20.9
	Fair	134	40
	Good	93	27.8
	Very good	30	9.0
Mood	Very poor	4	1.2
	Poor	111	33.1
	Fair	112	33.4
	Good	89	26.6
	Very good	19	5.7
Work	Very poor	7	2.1
	Poor	124	37
	Fair	126	37.6
	Good	70	20.9
	Very good	8	2.4
Household activities	Very poor	4	1.2
	Poor	86	25.7
	Fair	142	42.4
	Good	81	24.2
	Very good	22	6.6
Social relationships	Very poor	7	2.1
	Poor	96	28.7
	Fair	120	35.8
	Good	65	19.4
	Very good	47	14
Family relationships	Very poor	10	3
	Poor	63	18.8
	Fair	150	44.8
	Good	74	22.1
	Very good	38	11.3
Leisure time activities	Very poor	39	11.6
	Poor	122	36.4
	Fair	95	28.4
	Good	59	17.6
	Very good	20	6
Ability to function in daily life	Very poor	2	0.6
	Poor	57	17
	Fair	144	43
	Good	119	35.5
	Very good	13	3.9

Sexual drive, interest and/or performance	Very poor	34	10.1
	Poor	26	7.8
	Fair	111	33.1
	Good	130	38.8
	Very good	34	10.1
Economic status	Very poor	7	2.1
	Poor	158	47.2
	Fair	145	43.3
	Good	22	6.6
	Very good	3	0.9
Living/housing situation	Very poor	8	2.4
	Poor	117	34.9
	Fair	156	46.6
	Good	50	14.9
	Very good	4	1.2
Ability to get around physically without feeling dizzy or unsteady or falling	Very poor	4	1.2
	Poor	7	2.1
	Fair	106	31.6
	Good	173	51.6
	Very good	45	13.4
Your vision in terms of ability to do work or hobbies	Very poor	3	0.9
	Poor	57	17
	Fair	135	40.3
	Good	113	33.7
	Very good	27	8.1
Overall sense of well being	Very poor	6	1.8
	Poor	135	40.3
	Fair	107	31.9
	Good	68	20.3
	Very good	19	5.7
Medication if taking any	Very poor	4	1.2
	Poor	17	5.1
	Fair	154	46
	Good	53	15.8
	Very good	7	2.1
	Not taking any	100	29.9
Overall life satisfaction and contentment during the past week	Very poor	20	6
	Poor	113	33.7
	Fair	139	41.5
	Good	55	16.4
	Very good	8	2.4

### **4.1.3. Nordic Musculoskeletal Questionnaire:**

According to data gathered using the Nordic musculoskeletal questionnaire, 34.6% of bike riders experienced neck pain at some point in the previous year. Shoulder problems were reported by 41.8% of participants, upper back problems by 48.4% of bike riders, and elbow problems by 20%. Wrist/hand problems affected 27.2% of bike riders, lower back problems affected 71.9%, and hip/thighs problems affected 32.5%. Bike riders also reported knee (26%) and ankle/foot (28.4%) pain. The questionnaire also revealed that during the last 12 months, bike riders were prevented from carrying out normal tasks due to trouble in neck (23.6%), shoulders (25.4%), upper back (29.6%), elbows (11.6%), wrists/hands (15.5%), lower back (59.7%), hips/thighs (18.2%), knees (14%) and ankles/feet (12.5%). The questionnaire also inquired if bike riders had to see a doctor because of their condition. The data revealed that the percentage of bike riders who visited a physician for neck is 17.9%, shoulders (23.3%), upper back (24.2%), elbows (8.7%), wrists/hands (10.7%), lower back (53.1%), hips/thighs (13.4%), knees (10.4%) and ankles/feet (14.9%). Lastly, Nordic musculoskeletal questionnaire assessed the current physiological condition of occupational bike riders. The findings revealed that 25.1% of participants had neck pain, 21.8% had shoulder pain, 30.7% had upper back pain, 11% had elbow pain, 13.4% had wrist/hand pain, 59.4% had lower back pain, 19.1% had hip/thigh pain, 14.6% had knee pain, and 16.7% had ankle/foot pain in the previous 7 days.

**Table 4: Nordic Musculoskeletal Questionnaire**

<b>Variable</b>	<b>Options</b>	Have you at any time during the last 12 months had trouble in f (%)	During the last 12 months have you been prevented from carrying out normal activities because of trouble in f (%)	During the last 12 months have you seen physician for this condition f (%)	During the last 7 days have you had trouble in f (%)
Neck	No	219(65.4)	256(76.4)	275(82.1)	251(74.9)
	Yes	116(34.6)	79(23.6)	60(17.9)	84(25.1)
Shoulders	No	195(58.2)	250(74.6)	257(76.7)	262(78.2)
	Yes	140(41.8)	85(25.4)	78(23.3)	73(21.8)
Upper back	No	173(51.6)	236(70.4)	254(75.8)	232(69.3)
	Yes	162(48.4)	99(29.6)	81(24.2)	103(30.7)
Elbows	No	268(80)	296(88.4)	306(91.3)	298(89)
	Yes	67(20)	39(11.6)	29(8.7)	37(11)
Wrists/Hands	No	244(72.8)	283(84.5)	299(89.3)	290(86.6)
	Yes	91(27.2)	52(15.5)	36(10.7)	45(13.4)
Lower back	No	94(28.1)	135(40.3)	157(46.9)	136(40.6)
	Yes	241(71.9)	200(59.7)	178(53.1)	199(59.4)
Hips/Thighs	No	226(67.5)	274(81.8)	290(86.6)	271(80.9)
	Yes	109(32.5)	61(18.2)	45(13.4)	64(19.1)
Knees	No	248(74)	288(86)	300(89.6)	286(85.4)
	Yes	87(26)	47(14)	35(10.4)	49(14.6)
Ankles/Feet	No	240(71.6)	293(87.5)	285(85.1)	279(83.3)
	Yes	95(28.4)	42(12.5)	50(14.9)	56(16.7)

## 4.2. Inferential Results:

### 4.2.1. Association of Quality of life enjoyment and satisfaction questionnaire with Sociodemographic:

Chi-square for independence was performed in order to investigate the association between independent and dependent variables. A statistically significant association was found between demographic characteristics of participants and main outcome variable of study i.e. Quality of life with  $p < 0.05$ . Age of respondents with  $X^2 = 53.249$ ,  $P = 0.0001$ , Marital status with  $X^2 = 71.432$ ,  $P = 0.0001$ , Educational status with  $X^2 = 8.669$ ,  $P = 0.034$ , Exercise routine with  $X^2 = 14.536$ ,  $P = 0.002$ , Income with  $X^2 = 13.477$ ,  $P = 0.004$ , Family size with  $X^2 = 36.610$ ,  $P = 0.0001$ , work days/week with  $X^2 = 24.657$ ,  $P = 0.0001$ , Work duration with  $X^2 = 51.027$ ,  $P = 0.0001$ , Posture adopted with  $X^2 = 15.315$ ,  $P = 0.0001$ , Bike condition with  $X^2 = 69.132$ ,  $P = 0.0001$  while Smoking habit with  $X^2 = 1.741$ ,  $P = 0.191$ , work hours/ day with  $X^2 = 0.020$ ,  $P = 0.887$ , Helmet usage with  $X^2 = 3.290$ ,  $P = 0.070$  and Bike riding purpose with  $X^2 = 2.644$ ,  $P = 0.104$  were statistically non-significant.

**Table 5: Association of Quality of life enjoyment and satisfaction questionnaire with Sociodemographic**

Variable	Options	Poor (%)	Good (%)	Chi-Square	p-value
<b>Age of respondent</b>	18-30	0.9%	99.1%	53.249	<b>.0001</b>
	31-45	19.4%	80.6%		
	45+	41.8%	58.2%		
<b>Marital status</b>	Married	15.7%	84.3%	71.432	<b>.0001</b>
	Single	4.2%	95.8%		
	Divorced	52%	48%		
	Widowed	76.5%	23.5%		
<b>Educational status</b>	None at all	33.3%	66.7%	8.669	<b>.034</b>
	Matriculation	15.1%	84.9%		
	Higher Secondary	22.5%	77.5%		
	Graduation	7.7%	92.3%		

<b>Smoking habit</b>	Yes No	20.6% 15.1%	79.4% 84.9%	1.714	.191
<b>Routine of exercise</b>	Daily 2-3 times/week 4-6 times/week Never	0.0% 3.7% 0.0% 22.1%	100% 96.3% 100% 77.9%	14.536	<b>.002</b>
<b>Current income</b>	Less than 20000 20000-25000 26000-30000 More than 30000	65.4% 51.5% 36.8% 34.4%	34.6% 48.5% 63.2% 65.6%	13.477	<b>.004</b>
<b>Family size</b>	1-3 4-6 7-10	22.9% 36.3% 100.0%	77.1% 63.7% 0.0%	36.610	<b>.0001</b>
<b>Work hours/day</b>	0-4 5-8 9-12	0.0% 18.3% 20%	100% 81.7% 80%	.020	.887
<b>Work days/week</b>	5 hours 6 hours 7 hours	0.0% 16.8% 32.9%	100% 83.2% 67.1%	24.657	<b>.0001</b>
<b>Work Duration</b>	Less than a year 1-2 years More than 2 years	3.3% 18.7% 46%	96.7% 81.3% 54%	51.027	<b>.0001</b>
<b>Helmet usage</b>	Yes No	14.9% 22.7%	85.1% 77.3%	3.290	.070
<b>Bike riding Purpose</b>	Delivery Passenger transport	13.6% 20.7%	86.4% 79.3%	2.644	.104
<b>Posture adopted</b>	Upright posture Bending forward posture	5.8% 23.7%	94.2% 76.3%	15.315	<b>.0001</b>
<b>Bike Condition</b>	Brand new Normal/average Poor condition	0.0% 8.3% 47.2%	100% 91.7% 52.8%	69.132	<b>.0001</b>

#### 4.2.2. Association of Nordic Musculoskeletal Questionnaire with sociodemographic:

Chi-square for independence was performed in order to investigate the association between independent and dependent variables. A statistically significant association was found between demographic characteristics of participants and main outcome variable of study i.e. Musculoskeletal Disorders with  $p < 0.05$ . Age of respondents with  $X^2 = 67.851$ ,  $P = 0.0001$ , Marital status with  $X^2 = 56.462$ ,  $P = 0.0001$ , Smoking habit with  $X^2 = 5.447$ ,  $P = 0.020$ , Exercise routine with  $X^2 = 12.927$ ,  $P = 0.005$ , Income with  $X^2 = 20.267$ ,  $P = 0.0001$ , Work hours/day with  $X^2 = 18.307$ ,  $P = 0.0001$ , Work days/week with  $X^2 = 13.606$ ,  $P = 0.001$ , Work duration with  $X^2 = 21.287$ ,  $P = 0.0001$ , Helmet usage with  $X^2 = 12.170$ ,  $P = 0.0001$ , Posture adopted with  $X^2 = 7.971$ ,  $P = 0.005$ , Bike condition with  $X^2 = 28.604$ ,  $P = 0.0001$  while Educational status with  $X^2 = 4.624$ ,  $P = 0.201$ , Family size with  $X^2 = 1.822$ ,  $P = 0.402$  and Bike riding purpose with  $X^2 = 2.114$ ,  $P = 0.146$  were statistically non-significant.

**Table 6: Association of Nordic Musculoskeletal Questionnaire with sociodemographic**

Variable	Options	Had no discomfort (%)	Had discomfort (%)	Chi-Square	p-value
<b>Age of respondent</b>	18-30	63.2%	36.8%	67.851	<b>.0001</b>
	31-45	27.3%	72.7%		
	45+	8.9%	91.1%		
<b>Marital status</b>	Married	27.4%	72.6%	56.462	<b>.0001</b>
	Single	64.6%	35.4%		
	Divorced	12%	88%		
	Widowed	0%	100%		
<b>Educational status</b>	None at all	14.3%	85.7%	4.624	.201
	Matriculation	35.6%	64.4%		
	Higher Secondary	38%	62%		
	Graduation	38.5%	61.5%		
<b>Smoking habit</b>	Yes	30.2%	69.8%	5.447	<b>.020</b>
	No	42.5%	57.5%		

<b>Routine of exercise</b>	Daily 2-3 times/week 4-6 times/week Never	26.7% 59.3% 57.1% 32%	73.3% 40.7% 42.9% 68%	12.927	<b>.005</b>
<b>Current income</b>	Less than 20000 20000-25000 26000-30000 More than 30000	30.8% 50% 46.6% 54.5%	69.2% 50% 53.4% 45.5%	20.267	<b>.0001</b>
<b>Family size</b>	1-3 4-6 7-10	26.5% 37.3% 31.6%	73.5% 62.7% 68.4%	1.822	0.402
<b>Working hours/day</b>	0-6 7-9 10-12	78.9% 28.6% 25.8%	21.1% 71.4% 74.2%	18.307	<b>.0001</b>
<b>Working days/week</b>	5 6 7	48.1% 38.8% 20%	51.9% 61.2% 80%	13.606	<b>.001</b>
<b>Work duration</b>	Less than a year 1-2 years More than 2 years	50% 31.3% 17.5%	50% 68.7% 82.5%	21.287	<b>.0001</b>
<b>Helmet usage</b>	Yes No	43.3% 24.8%	56.7% 75.2%	12.170	<b>.0001</b>
<b>Bike riding purpose</b>	Delivery Passenger transport	40.7% 32.7%	59.3% 67.3%	2.114	.146
<b>Posture observation</b>	Upright posture Bending forward posture	46.6% 30.6%	53.4% 69.4%	7.971	<b>.005</b>
<b>Bike condition</b>	Brand new Normal/average Poor condition	61.1% 44.3% 12.4%	38.9% 55.7% 87.6%	28.604	<b>.0001</b>



**4.2.3. Association of Quality of life enjoyment and satisfaction questionnaire with Nordic Musculoskeletal Questionnaire:**

Chi-square for independence was performed in order to investigate the association between independent and dependent variables. A statistically significant association was found between Quality of Life and Prevalence of Musculoskeletal disorders with  $p < 0.05$ . Chi-square was 14.045 with  $P = 0.0001$

**Table 7: Association of Quality of life enjoyment and satisfaction questionnaire with Nordic Musculoskeletal Questionnaire**

<b>Variable</b>	<b>Options</b>	<b>Had no discomfort</b>	<b>Had discomfort</b>	<b>Chi-square</b>	<b>p-value</b>
Q-LES-Q	Poor Q-LES-Q Good Q-LES-Q	14.8% 40.1%	85.2% 59.9%	14.045	<b>.0001</b>

## CHAPTER V: DISCUSSION

Disorders of the muscles, nerves, tendons, joints, cartilage, and spinal discs are referred to as musculoskeletal problems. Musculoskeletal problems that are caused by working in a particular environment or doing a certain task and the condition that lasts longer or is worsened by working in that environment is referred to be work related (CDC., 2020). Disorders of the musculoskeletal system among drivers are one of the several issues that have been addressed and are now a rising public health issue globally (Ramasamy et al., 2017). There are very fewer studies recognizing prevalence of musculoskeletal disorders in motorcyclists using motorbikes, both for daily commuting and recreational purposes (Hafzi et al., 2011). In this study, prevalence of musculoskeletal disorders among bike riders in Rawalpindi was accessed. According to data gathered using the Nordic musculoskeletal questionnaire, 34.6% of bike riders experienced neck pain at some point in the previous year. Shoulder problems were reported by 41.8% of participants, upper back problems by 48.4% of bike riders, and elbow problems by 20%. Wrist/hand problems affected 27.2% of bike riders, lower back problems affected 71.9%, and hip/thighs problems affected 32.5%. Bike riders also reported knee (26%) and ankle/foot (28.4%) pain. The questionnaire also revealed that during the last 12 months, bike riders were prevented from carrying out normal tasks due to trouble in neck (23.6%), shoulders (25.4%), upper back (29.6%), elbows (11.6%), wrists/hands (15.5%), lower back (59.7%), hips/thighs (18.2%), knees (14%) and ankles/feet (12.5%). The questionnaire also inquired if bike riders had to see a doctor because of their condition. The data revealed that the percentage of bike riders who visited a physician for neck is 17.9%, shoulders (23.3%), upper back (24.2%), elbows (8.7%), wrists/hands (10.7%), lower back (53.1%), hips/thighs (13.4%), knees (10.4%) and ankles/feet (14.9%). Lastly, Nordic musculoskeletal questionnaire assessed the current physiological condition of occupational bike

riders. The findings revealed that 25.1% of participants had neck pain, 21.8% had shoulder pain, 30.7% had upper back pain, 11% had elbow pain, 13.4% had wrist/hand pain, 59.4% had lower back pain, 19.1% had hip/thigh pain, 14.6% had knee pain, and 16.7% had ankle/foot pain in the previous 7 days.

A study on musculoskeletal disorders among bike riders was conducted in India that support our results. Nordic Musculoskeletal questionnaire was used and the results were analyzed for identifying the prevalence of riding related musculoskeletal disorders. Results found that the most trouble in the previous year was due to the lower back (83%), followed by the upper back (43.8%), shoulder (37.5%), and neck (29.2%). The majority of the subjects (77.1%) reported that their normal activities are being hampered by a lower back problem. Other significant problems interfering with normal activities include upper back (37.5%), shoulder (27.1%), and neck (22.9%) problems. The subjects reported that 66.7% of them had lower back pain and 25% had upper back pain in the previous seven days. They also reported shoulder and neck pain with a significant value of 10.4%. The majority of subjects (68.8%) sought professional help to address a lower back problem. In the previous 12 months, 35.4% sought medical advice for an upper back problem, 25% for a shoulder problem, and 20.8% for a neck problem. Participants responded that the duration of the problem is persistent for the lower back, upper back, shoulders, and neck when compared to the other. These findings suggest that two-wheeler riders are predisposed to musculoskeletal disorders in the lower back, upper back, shoulder, and neck regions of their bodies (Anoop et al., 2019).

In current study, results indicated that Quality of life among bike riders in Rawalpindi was compromised in many aspects including physical health, work satisfaction, mood, income, relationships and other. The various demographic characteristics were tested for their association

with Quality of life and statistically significant association was found in the results. The results found that people in age group 18-30 and 31-45 had less compromised quality of life as compared to people aged 45+ years. Similar findings were reported in another study that was conducted to determine the impact of major chronic conditions on health-related quality of life varies with age at the individual and population levels. When comparing people aged 30-44 years to people over 45 years, the impact of chronic conditions on Health-related Quality of life increased fourfold. This was primarily due to an increase in prevalence, but the severity of some conditions varied with age as well. Musculoskeletal disorders had the greatest and most consistent impact on the population across all ages (Saarni et al., 2007).

The current study also revealed that bike riders had low income which is also affecting their quality of life. Similar study was done in Northeast China in 2015 to assess the effects of low income on health-related quality of life. The results of this study showed that Health related Quality of life was made worse by low income level, older age, disease, and unemployment. It was notably clear among the low-income group that income level had a considerable effect on health-related quality of life (Zhang et al., 2015).

In the current study, the various demographic characteristics were tested for their association with Musculoskeletal disorders. The results indicated the statistically significant association in demographic characteristics with musculoskeletal disorders. The study found that people in older age groups i.e. aged 45+ are more prone to musculoskeletal disorders than younger age groups. However, people in younger age are also prone to musculoskeletal disorders. A similar research was undertaken in 2013 to determine the relationship between age, physical job demands and musculoskeletal problems. According to study findings, elder people are at a higher risk to develop

Musculoskeletal disorders. At the same time, the study shows that Musculoskeletal disorders affects even the youngest age group (Heiden et al., 2013).

Our study found that working hours per day are strongly associated with musculoskeletal disorders. The similar study that supports our results was conducted in 2019 to find the association of musculoskeletal disorders with work schedule of people. It was found that work schedule was strongly related to Musculoskeletal disorders in various body regions. There was a significant frequency of musculoskeletal disorders, especially in the knees, upper back, lower back, neck, and shoulders (Bazazan et al., 2019).

The current study also investigated association between Musculoskeletal disorders and Quality of life. The statistically significant association was found in the results. A similar study that supports the results of our study was conducted in 2019 in Golestan Province, Iran. The purpose of this study was to look at the relationship between musculoskeletal problems and quality of life. According to the findings, there was a significant association between musculoskeletal problems and quality of life. Study found that Musculoskeletal problems can have a severe impact on one's quality of life (Azhdardor et al., 2019).

## **CONCLUSIONS AND WAY FORWARD**

The purpose of this study was to investigate the prevalence of musculoskeletal disorders and quality of life among bike riders in Rawalpindi. The idea of this study was to reveal the sociodemographic factors affecting Quality of life and causing musculoskeletal problems so that the study results could be used in future to overcome those factors to improve the Quality of life of bike riders and prevent musculoskeletal problems in bike riders.

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## Appendix A -

### Proposed Budget:

TASK	COST (PKR)
1. Travelling	15,000
2. Printing	6,500
3. Internet	7,000
4. Stationary	1,500
5. Publication	10,000
6. Miscellaneous	8,000
<b>Total</b>	<b>48,000</b>

### Timeline (Gantt Chart):

Main activities	March 2022	April 2022	May 2022	June 2022	July 2022	August 2022
<b>Selection of topic</b>						
<b>Literature review</b>						
<b>Synopsis writing</b>						
<b>IRB approval</b>						
<b>Pilot testing</b>						
<b>Data collection</b>						
<b>Data analysis</b>						
<b>Research writes up</b>						
<b>Thesis defense</b>						

## Appendix B – Consent Form

### INFORMATION SHEET:

**TOPIC:** “Prevalence of musculoskeletal disorders and Quality of life among bike riders in Rawalpindi”

**PURPOSE:** It is mandatory submission in partial fulfilment of the requirement for the degree of Master in Public Health from Quaid-e-Azam University Islamabad.

I’m the student of Master of Science in Public Health and I am conducting my research on “**Prevalence of musculoskeletal disorders and Quality of life among bike riders in Rawalpindi**”. I think you are the best who can give me the right and appropriate information. I assure you that the information will be kept confidential and will not be disclosed in front of anyone and will only be used for research purpose.

### CERTIFICATE OF CONSENT:

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and I am free to withdraw at any time, without giving a reason and without cost, I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

**Name of participant** \_\_\_\_\_

**Signature of Participant** \_\_\_\_\_

**Date:** \_\_\_\_\_ (DD/MM/YY)

## Appendix C – IRB LETTER



**AL-SHIFA SCHOOL OF PUBLIC HEALTH  
PAKISTAN INSTITUTE OF OPHTHALMOLOGY  
AL-SHIFA TRUST, RAWALPINDI**

No. MSPH-IRB/13-04  
24<sup>th</sup> March, 2022

**TO WHOM IT MAY CONCERN**

This is to certify that **Muhammad Saad Sarfraz S/O Sarfraz Hussain** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **“Prevalence of musculoskeletal disorders and Quality of life among bike riders in Rawalpindi”**.

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish  
Head  
School of Public Health, PIO  
Al-Shifa Trust, Rawalpindi

## Appendix D - Research Questionnaire

### **“Prevalence of musculoskeletal disorders and Quality of life among bike riders in Rawalpindi”**

#### **Research Questionnaire**

**Please read all questions carefully and tick the most appropriate answer. You are requested to fill all information accurately so that appropriate results can be derived. All information will be kept confidential**

1. Your age?
  - 1) 18-30
  - 2) 31-45
  - 3) 45+
  
2. What is your marital status?
  - 1) Married
  - 2) Single
  - 3) Divorced
  - 4) Widowed
  
3. What is the highest education you received?
  - 1) None at all
  - 2) Matriculation
  - 3) Higher Secondary School Certificate
  - 4) Graduation/Professional Degree
  
4. Do you Smoke?
  - 1) Yes

- 2) No
5. What is your routine of exercise?
- 1) Daily
  - 2) 2-3 times a week
  - 3) 4-6 times a week
  - 4) Never
6. Your current income?
- 1) Less than 20000
  - 2) 21000-25000
  - 3) 26000-30000
  - 4) More than 30000
7. Family size \_\_\_\_\_?
8. How many hours do you work per day \_\_\_\_\_?
9. How many days do you work per week \_\_\_\_\_?
10. How long have you been working as a bike rider?
- 1) Less than a year
  - 2) 1-2 years
  - 3) More than 2 years
11. Do you wear helmet?
- 1) Yes
  - 2) No



12. For what purpose do you ride bike?

- 1) Delivery
- 2) Passenger transport

13. Posture observation of bike rider \_\_\_\_\_?

- 1) Upright Posture
- 2) Bending Forward Posture

14. Condition of bike \_\_\_\_\_?

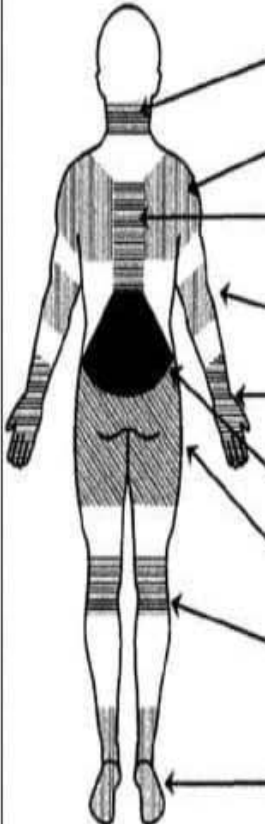
- 1) Brand new
- 2) Normal (average)
- 3) Poor Condition

## Quality of Life Enjoyment and Satisfaction Questionnaire

Taking everything into consideration, during the past week how satisfied have you been  
with your.....

	Very Poor	Poor	Fair	Good	Very Good
.....physical health?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....mood?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....work?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....household activities?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....social relationships?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....family relationships?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....leisure time activities?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....ability to function in daily life?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....sexual drive, interest and/or performance?*	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....economic status?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....living/housing situation?*	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....ability to get around physically without feeling dizzy or unsteady or falling?*	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....your vision in terms of ability to do work or hobbies?*	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....overall sense of well being?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....medication? (If not taking any, check here <input type="checkbox"/> and leave item blank.)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
.....How would you rate your overall life satisfaction and contentment during the past week?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

## Nordic Musculoskeletal Questionnaire:

	Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in:	During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this trouble in:	During the last 12 months have you seen a physician for this condition:	During the last 7 days have you had trouble in:	
	NECK	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	SHOULDERS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	UPPER BACK	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	ELBOWS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	WRISTS/HANDS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	LOWER BACK	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	HIPS/THIGHS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	KNEES	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
ANKLES/FEET	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	