TO ASSESS THE MUSCULOSKELETAL DISORDERS AND QUALITY OF LIFE AMONG UNORGANIZED SECTOR CONSTRUCTION LABORER WORKERS.

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ABSTRACT

Background and objectives: Musculoskeletal disorders are the most common causes of severe long-term pain and physical disability that affects hundreds of millions across the world 63.2% of construction workers had at least one MSD, workers suffer from lack of good accommodation, basic sanitation, health facilities, stressful working conditions, and poor social life. So the main aim was to find the region of musculoskeletal disorders, and Quality of life in construction workers.

Method: The study was conducted with 120 subjects and was conventional type. Nordic Musculoskeletal Questionnaire, and World Health Organization Quality Of Life (WHOQOL)-BREF scales was used during the study and segregated.

Result: After segregation of data, region affection was seen most commonly lower back, knee and shoulder (NMQ scale) , workers scored poor in the environmental domain of (WHOQOL)-BREF.

Conclusion: From the results, it was concluded that there is high prevalence musculoskeletal disorders, quality of life is moderately affected.

Key words: Musculoskeletal Skeletal Disorders, Construction workers, Quality of life (WHOQOL)-BREF scales, NORDIC Questionnaire.

Background

In India, construction worker is running parallely in two sectors-organized and unorganized. The majority of the construction laborers are working in unorganized sectors. The working methods are much primitive and traditional in unorganized sectors than in organized sectors. In unorganized sectors, the laborers are generally recruited by the labor contractors on daily wage basis. The laborers neither get any training before recruitment nor have any awareness about ergonomic risks related to the work.[1]

The building construction laborers are one of the most numerous and vulnerable segments of the unorganized labor in India.[2]

In unorganized sectors, the construction laborers have to manually handle a variety of materials such as bricks, soil, sand, stone chips, cement bags, mixers, wooden planks or concrete slabs that differ in size, shape and weight. The frequencies of handling of these materials also differ throughout the day, from day to day and from site to site. These manual materials handling tasks require lifting, loading, carrying, pushing, pulling, unloading and delivering activities.[3]

A number of studies have evaluated the prevalence of different types of work related musculoskeletal disorders (WMSD) among construction workers. This leads to increased risk of developing musculoskeletal symptoms and affects the quality of life of these workers, causing lost time or absenteeism, increasing work restriction or disability than any other group of diseases.[4]

The construction industry has one of the highest rates of musculoskeletal disorders with 75% of the health problems reported by construction workers were musculoskeletal.Construction workers mostly reported complaints in their back and in lower extremities and they have a reduced ability to perform tasks and in the most serious cases they could even become permanently disabled [5]

The load of physical work associated with awkward prolong working postures and manual handling of materials by the construction workers can cause various musculoskeletal pains and disorders.[6]

Most studies on work-related musculoskeletal symptoms were limited to office, service, or manufacturing industries. However, the construction industry is considered as one of the most hazardous industries for work-related musculoskeletal symptoms.[7,8]

Nordic questionnaire comprises a body map with nine clearly known body regions comprising neck, shoulders, elbows, upper back, lower back, wrists/hands, hips/thighs/buttocks, knees, ankles or feet. These questionnaires were self-administered to determine any musculoskeletal discomfort.[9]

The World Health Organization (WHO) defined QOL as individual's perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship to salient features of the environment. [10]

The unorganized sector of the construction industry is characterized by informal employment practices and a lack of social protections, making it a particularly challenging environment for workers. [11]

In this context, the health and well-being of construction laborers in the unorganized sector are often compromised due to poor working conditions, long working hours, and exposure to occupational hazards. [12]

Aim and Objectives

Aim: To determine Musculoskeletal Disorder, and Quality of life of construction laborer workers.
Objectives:

1) To find out Musculoskeletal disorder among construction worker by using Nordic questionnaire
2) To find Quality of life among construction worker by using WHOQOL-Bref.

METHODOLOGY:

- Study design: Cross-sectional study.
- Study population: Constructional worker from unorganized sector.
- Sampling method: convenience sampling.
- Sample size: n=120 constructional workers

INCLUSION CRITERIA:

1] Person"s own willingness
2] Male and Female
3] Work experienced >1year
4] Workers working for more than 8 hours per day

EXCLUSION CRITERIA:

1] Any pre-existing medical conditions (diabetes, hypertension, etc), history of trauma.
2] Any musculoskeletal or spinal deformity.
3] Any Neurological, Psychological or cardiopulmonary conditions.

OUTCOME MEASURE:

Nordic Musculoskeletal Questionnaire (NMQ) A general questionnaire of 40 forced-choice items identifying areas of the body causing musculoskeletal problems. Completion is aided by a body map to indicate nine symptom sites. Respondents are asked if they have had any musculoskeletal trouble in the last 12 months and last 7 days which has prevented normal activity. NMQ is used to assess the nature and severity of self-rated musculoskeletal symptoms. Reliability: 0.71-0.97(Balogun et al., 2018)

WHOQOL-BREF Questionnaire QOL of the respondents were determined using the validated version of the World Health Organization Quality of Life-Brief Version (WHOQOL-BREF). It contains the 26-item version where only 24 items are necessary for the QOL assessment. It is a self-reported questionnaire containing four domains namely physical health (7 items), psychological status (6 items), social relationships (3 items) and environmental conditions (8 items), and the results were obtained by applying equations that determined the raw scores (RS). The minimum and maximum values of the RS for domain I – „physical", varied between 7 and 35; domain II – „psychological", between 6 and 30; domain III – „social", between 5 and 15; and finally, domain IV – „environment", varied between 8 and 40. All items were scored on a Likert scale of 1–5. Domain scores were scaled in the positive direction, i.e. a higher score denotes a higher QOL. Reliability: 0.65-0.95 (Kwok et al., 2020)

RESULT

Musculoskeletal disorders The present survey showed that there is high prevalence of musculoskeletal disorder among construction workers and the area of affection were low back(45%) followed by knee(31.66%), shoulder (30.83%), ankle(22.5%), elbow(21.66%), neck(20.83%), upper back(20%), hand/wrist(11.66%), hip/thigh(10.83%). This study shows that there is high prevalence of MSDs in female (80.76%) as compared to Male (78.72%). The incidence of Musculoskeletal disorders (MSDs) among construction workers is positively associated with age and experience meaning that as workers get older, they become more prone to developing MSDs.

Quality of life As to QOL, the „social relationship" (69.87%) domain obtained the highest score, while the „environmental" domain (57.99%) had the lowest score.

Statistical Analysis

- Data was screened for normal distribution by using Age variable(Graph 1)

- Prevalence of musculoskeletal disorders is according to Region wise, Experience wise, Age wise and Gender wise.

- Mean of WHOQOL-bref was found and paired t-test was applied to determine significance within all four domains.
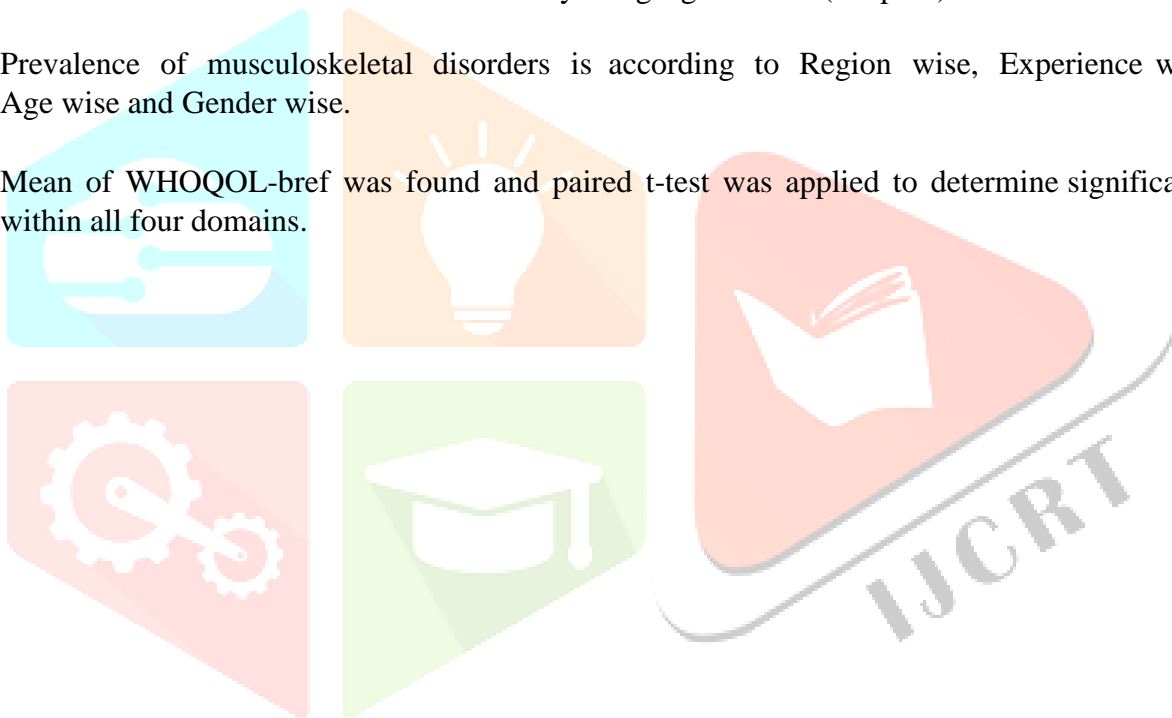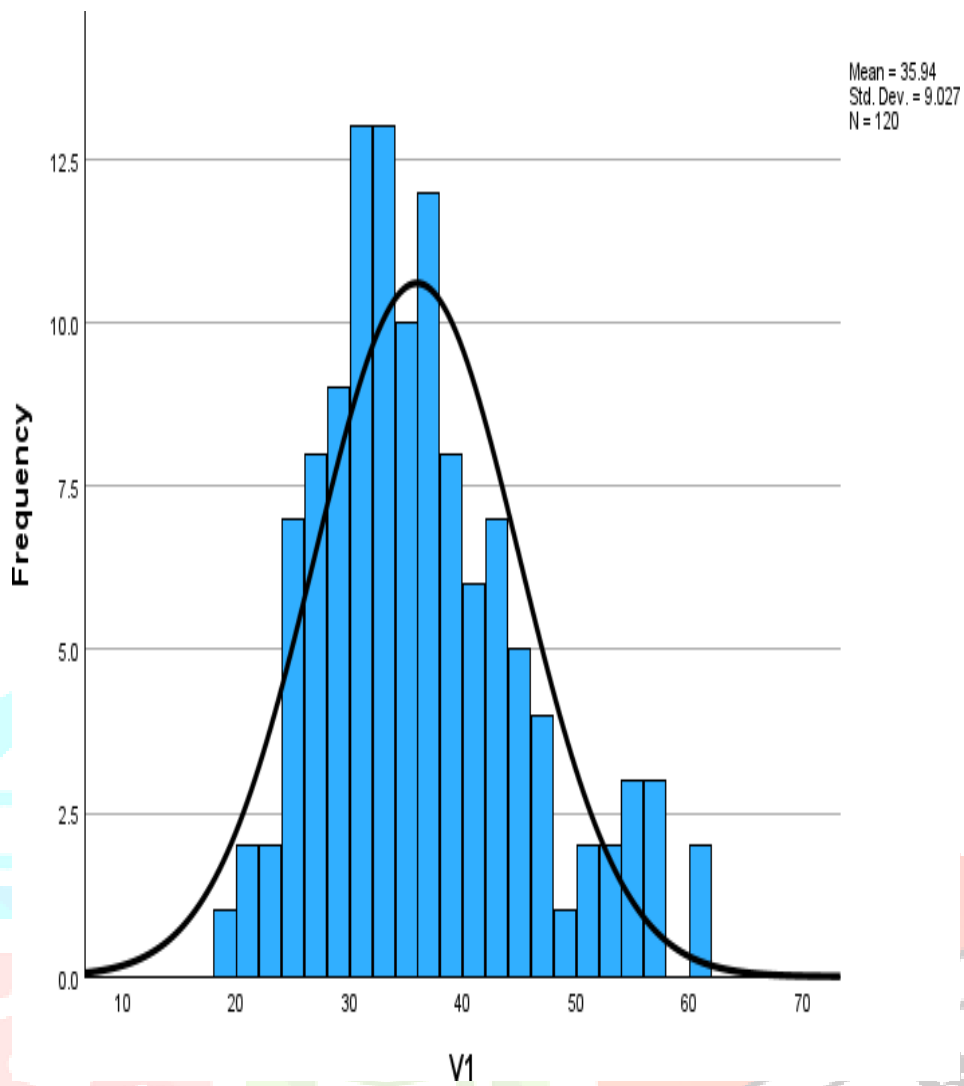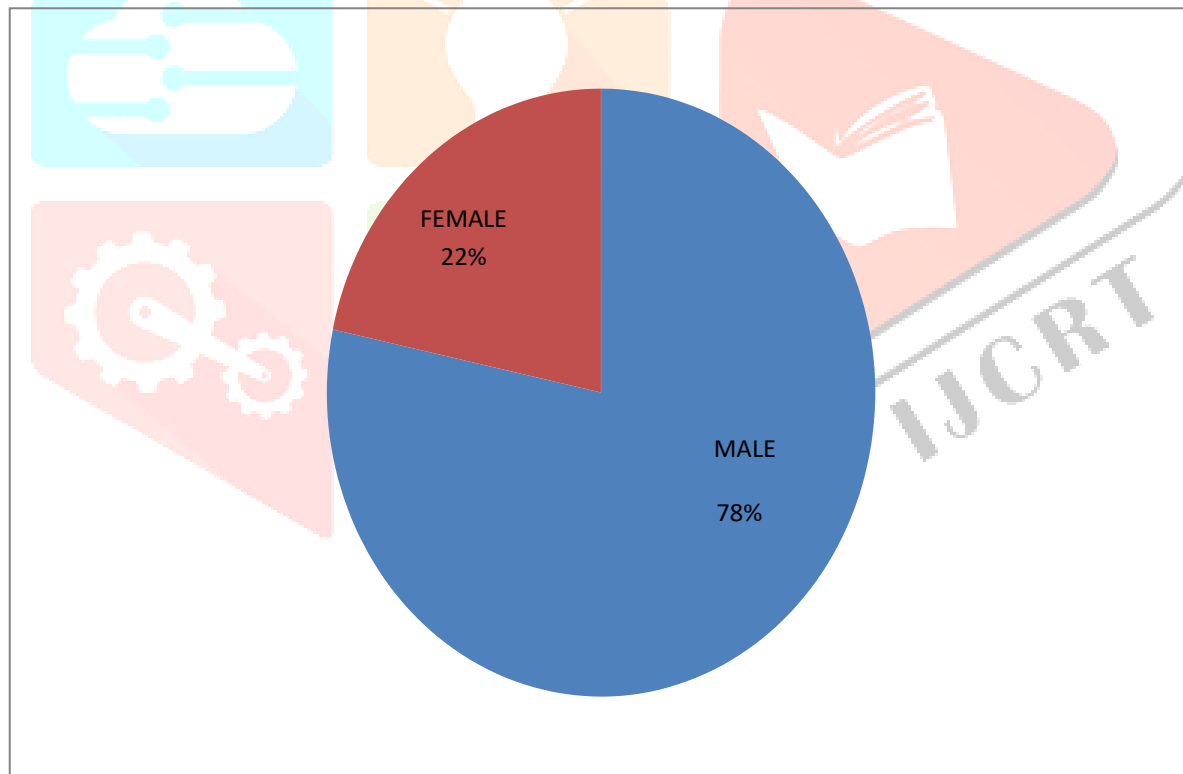
Graph: 1 NORMAL DISTRIBUTION ACCORDING TO AGE WISEBASELINE DATA

Frequency Distribution (Age)

- In this study total 120 constructional workers were recruited

Variable	Mean ± SD
AGE	35.75±9.02
MALE	94(78.33%)
FEMALE	26(21.66%)
WORK EXPERIENCE	12.28±9.29 10.30 2.35
WORKING HOUR	10.30±2.35

Table: 1 BASELINE CHARACTERISTICS OF THE PARTICIPANTS

The above table shows the baseline characteristics of the participants according to variables with means of them, the variables are AGE with mean 35.75, gender prevalence with male (78.33%) and female (21.66%), work experience with mean 12.28 and working hours with mean 10.30

Graph 2: DISTRIBUTION ACCORDING TO GENDER

Musculoskeletal disorders

The present survey showed that there is high prevalence of musculoskeletal disorder among construction workers and the area of affection were low back(45%) followed by knee(31.66%), shoulder (30.83%), ankle(22.5%), elbow(21.66%), neck(20.83%), upper back(20%), hand/wrist(11.66%), hip/thigh(10.83%).

This study shows that there is high prevalence of MSDs in female (80.76%) as compared to

Male (78.72%).

The incidence of Musculoskeletal disorders (MSDs) among construction workers is positively associated with age and experience meaning that as workers get older, they becomemore prone to developing MSDs.

Body part	No. of affected Subject	Percentage
Neck	30	10%
Shoulder	42	13%
Elbow	30	9%
Hand/Wrist	19	6%
Upper Back	26	8%
Lower Back	61	19%
Hip/Thigh	14	4%
Knee	41	13%
Foot/Ankle	32	10%
No Pain	25	8%

Table : 2 REGION WISE AFFECTION OF MSDs

No. of affected Subject
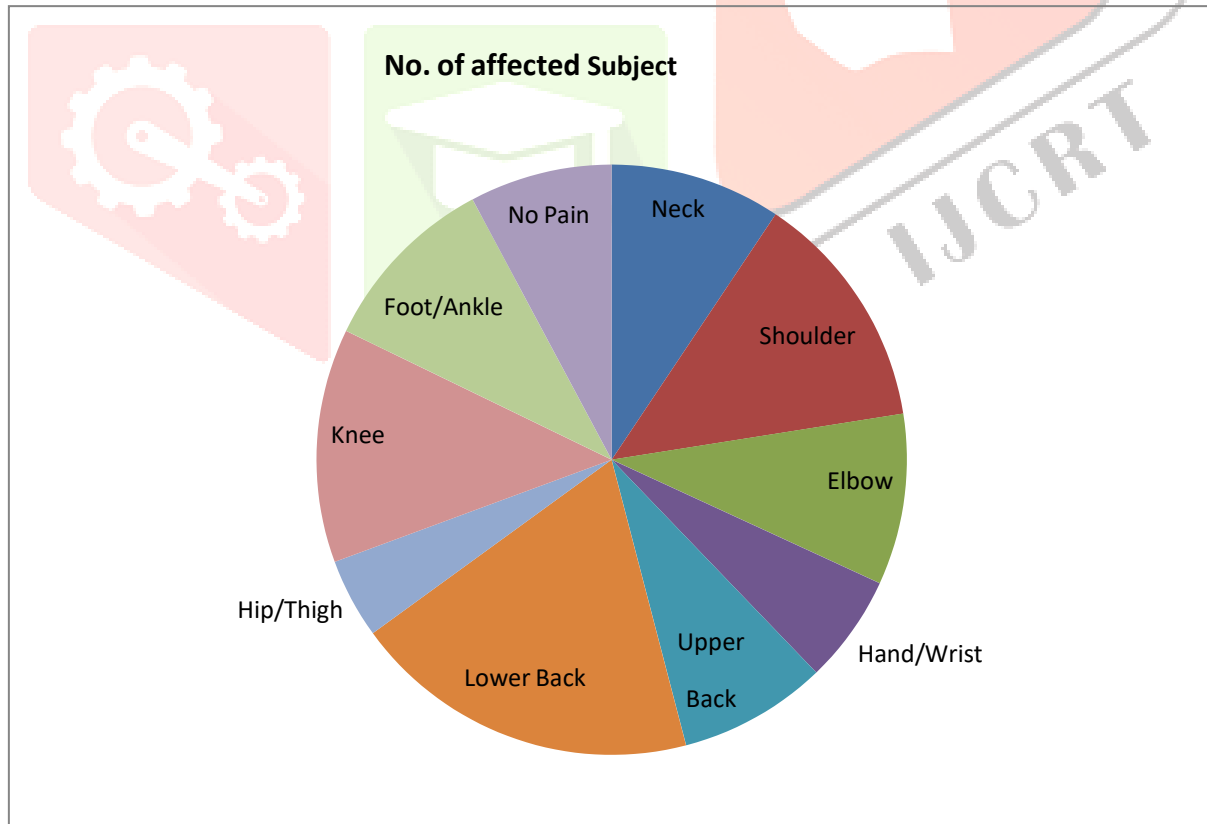
Body part	No. of affected Subject	Percentage
Neck	6	9
Shoulder	5	7
Elbow	3	5
Hand/Wrist	4	6
Upper Back	8	12
Lower Back	24	35
Hip/Thigh	3	4
Knee	9	9
Foot/Ankle	6	13

Graph : 3 NO. OF AFFECTED SUBJECT

Table: 3 MSD DURING LAST 7 DAYS

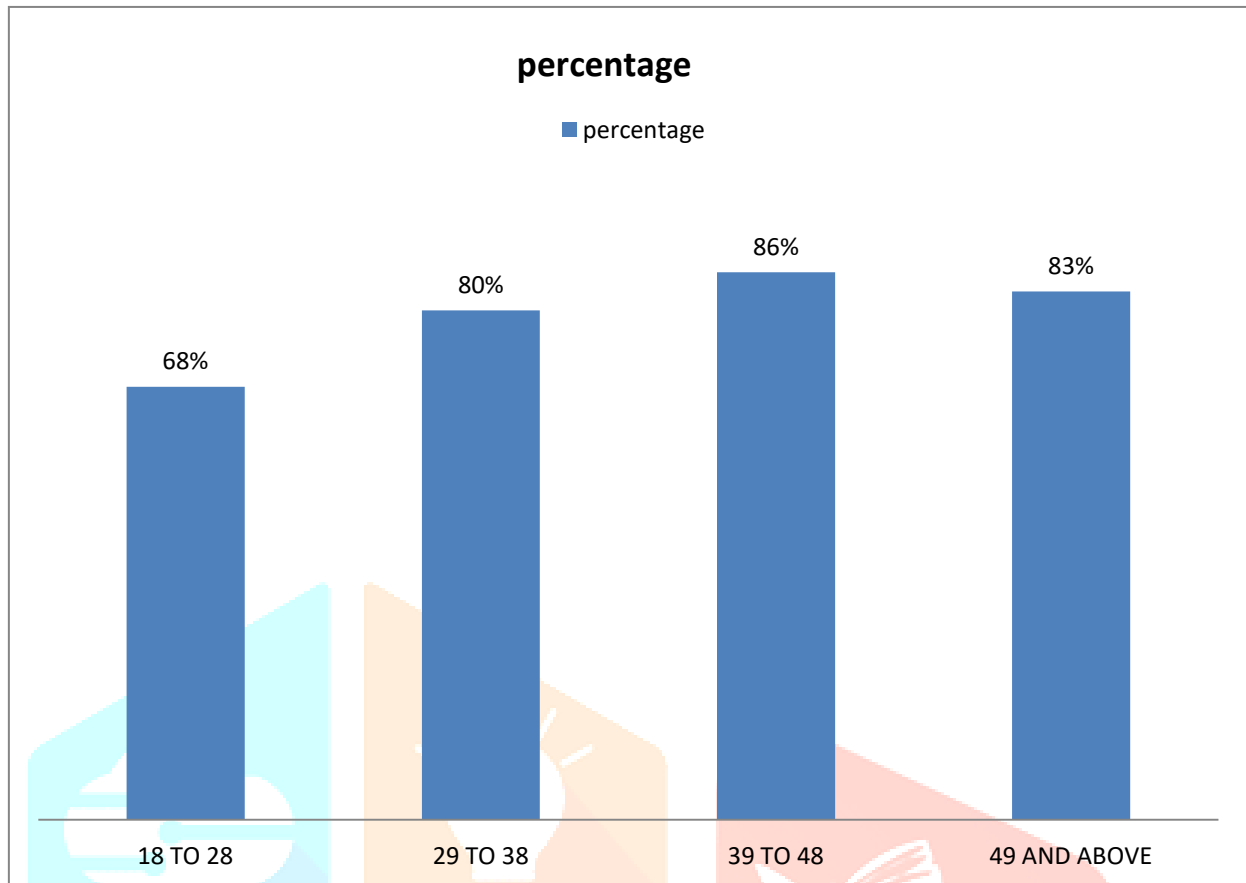| Gender	Subjects(n)	Affected	Percentage
Male	94	74	78.72%
Female	26	21	80.76%
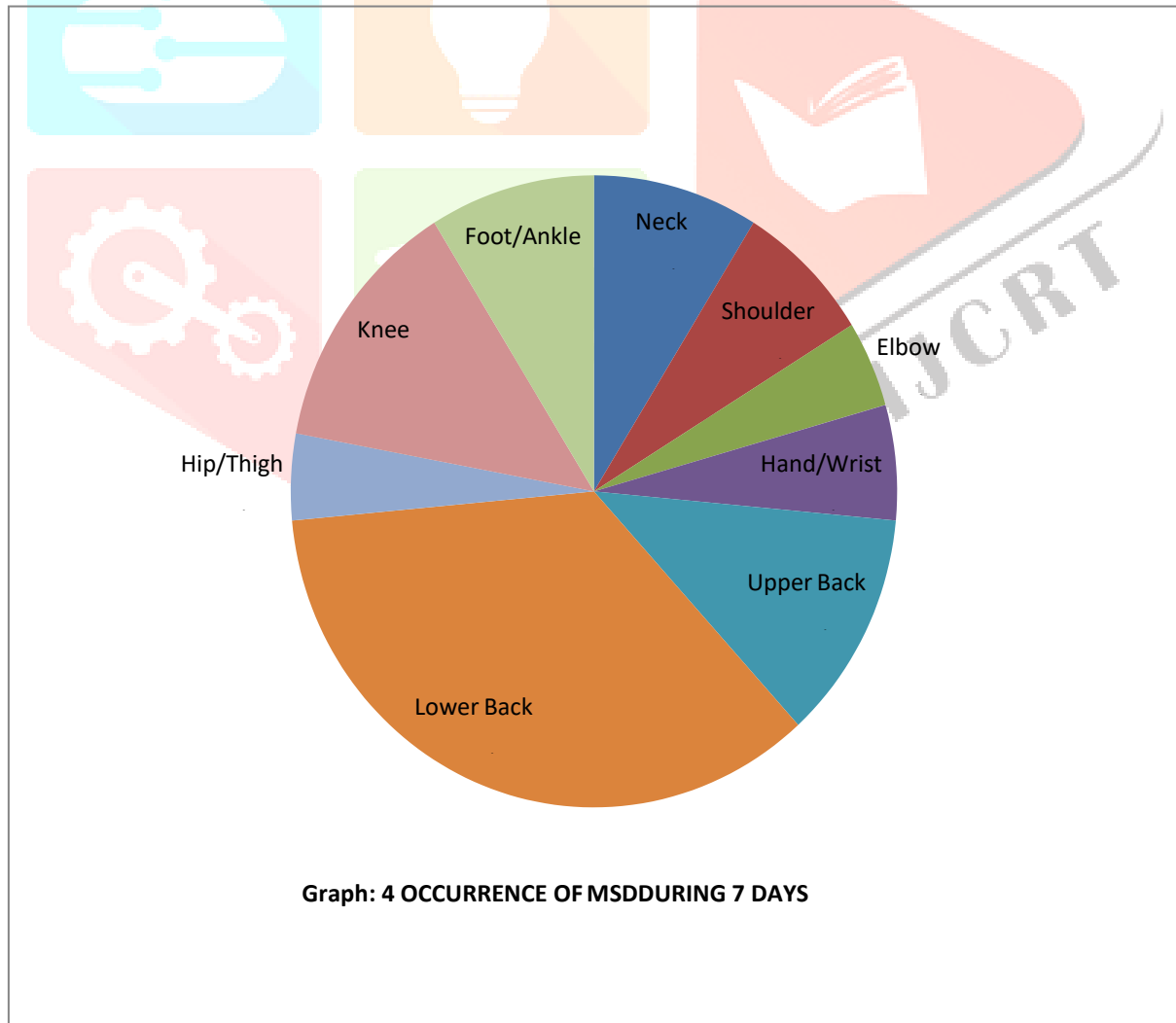
Graph: 4 OCCURRENCE OF MSDDURING 7 DAYS

Table: 4 GENDER WISE PREVALENCE
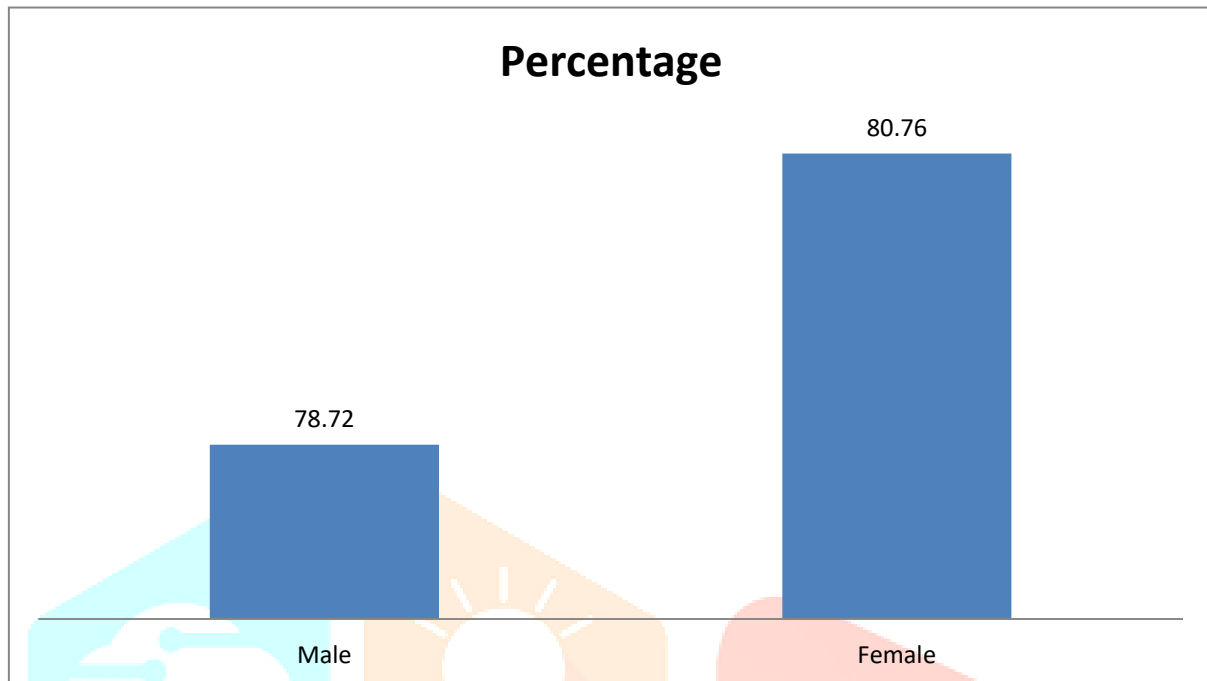
Graph : 5 GENDER WISE PREVALENCE

AGE	Subjects	Affected	percentage
18 TO 20	25	17	68%
29 TO 38	55	44	80%
39 TO 48	28	24	86%
49 AND ABOVE	12	10	83%

Table : 5 AGE WISE PREVALENCE OF MSD

percentage

■ percentage

| 86% |
| 80% |
| 83% |
| 68% |

18 TO 28   29 TO 38   39 TO 48   49 AND ABOVE

Graph: 6 AGE WISE PREVALENCE OF MSD

| Experience	Subjects(n)	Affected	Percentage
1 to 10 Year	60	45	75
11 to 20 Year	39	32	82.05
21Year and Above	21	18	85.71

TABLE: 6 EXPERIENCE WISE PREVALENCE OF MSD
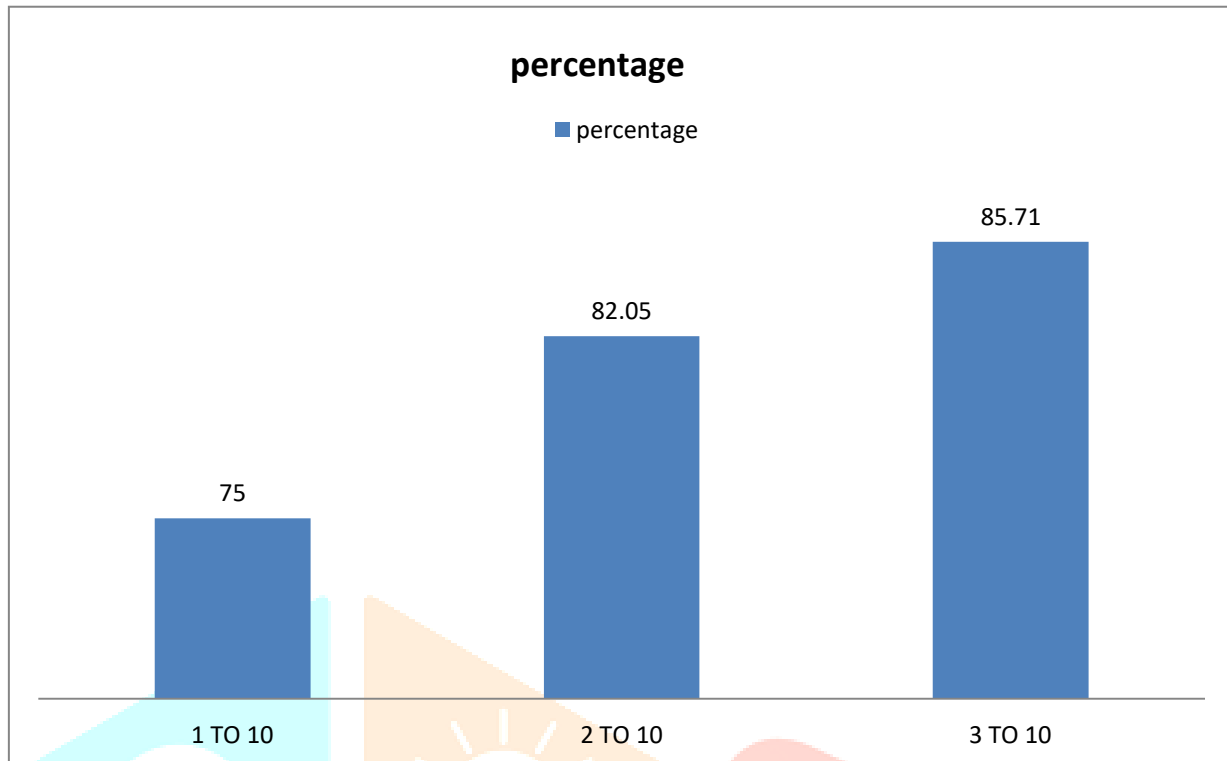
Graph : 7 EXPERIENCE WISE PREVALENCE

Quality of life

As to QOL, the „social relationship" (69.87%) domain obtained the highest score, while the „environmental" domain (57.99%) had the lowest score.

DOMAIN	MEAN± SD
PHYSICAL HEALTH	63.65±8.36
PSYCHOLOGICAL	62.91±8.90
SOCIAL RELATIONSHIP	69.87±15.87
ENVIRONMENT	57.99±8.01

Table: 7 MEAN AND SD OF WHOQOL BREF DOMAIN
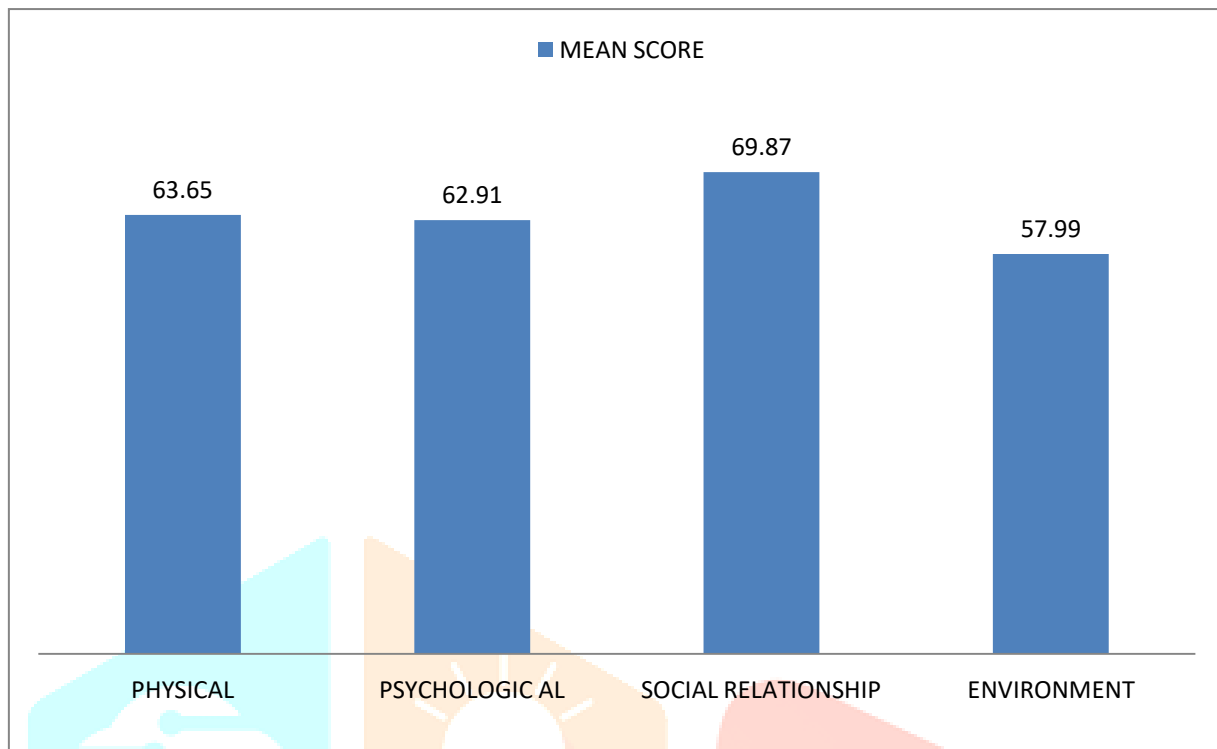
Graph: 8 MEAN OF WHOQOL BREF DOMAIN

DISCUSSION

The present study revealed a high prevalence of low back pain among construction workers, followed by knee, shoulder and ankle disorders. Tania C et al conducted a similar study on construction workers and concluded the prevalence of WMSDs to be highest in low back, followed by shoulder, wrist and hand. Findings of this study are similar to the findings of our study where lower back (45%) , knee (31.66%) and shoulder disorders (30.83%) are highly affected. According to the study of Bindra et al. 2015, the prevalence of low back pain in Indian population has been found to vary between 6.2% (in general population) and 92% (in construction workers). Affection of low-back disorders was higher in females as compared to males in the present study. Nor Azlin M Nordin et al and Bork et al stated that changes in spinal posture and weakening of joint structure related toa history of pregnancy increases the risk of musculoskeletal symptoms.

These reasons may explain why the female workers reported a higher incidence of injuries than their male counterparts in the present study. Pensri P et al reported a positive relationship between prolonged standing and lower extremities symptoms with prevalence rates similar to the present study. Pensri P et al. also found out that the construction workers have a high risk of 50% for musculoskeletal injuries, higher than other industrial workers. The repeated postural changes like bending forward or standing and weight bearing may cause backache, low back pain and neck pain and so on (Tiwary G et al). Limitations of the present study are that the memory and ability to recall musculoskeletal disorders over the past 12 months was not taken into consideration. No follow-up data was taken.

Doe,smith et. al (2022) studied on the association between work experience and musculoskeletal pain among construction workers, the results showed a significant positive association between work experience and

musculoskeletal pain, indicating that the more experienced construction workers are more likely to experience such pain. The authors suggest that this may be due to a combination of factors, including the accumulation of physical strain over time, the lack of ergonomic design in construction work, and the lack of effective injury prevention programs.

Smith, jones et .al (2021) studied on Age related musculoskeletal pain among construction workers which shows age is a significant risk factor for musculoskeletal pain among construction workers.

A total of 120 construction workers including male and female with the age more than 18 and work experience for atleast 1 year were included in this study.

Present study shows that within 4 domains that is Physical domain, Psychological domain, Social domain and Environmental domain. The Social domain scores the highest with 69.87 and Environmental domain scores lowest with 57.99.

From all four domains it scores social domain with 69.87 followed by physical (63.65), psychological (62.91), and lastly environmental 57.99.

Workers were dissatisfied with the facilities provided to them including health care. During the interview, many participants stated that had to travel long distances to access health care. Similar results were found in other studies that assessed the living condition of workers.

As for „QOL", the „social relationship" domain, which evaluates personal relationships, social support and sexual activity facets, scored the highest, the lowest score was found in the „environmental" domain. The environment in which the construction workers were exposed to during work was hot, humid and full of dust and grime due to excavation work, cement, sand and gravels, which may be the reason for the environmental domain score to lag behind all other domains.

Tania Chakraborty, Sanjib Kumar Das, have similar study on QOl Of construction workers with high domain score in social domain and lowest in environmental.

Mean scores of various domains of QOL were 63.65 (physical), 62.91(psychological), 69.87(social), and 57.99(environmental). Among all the four domains, the workers scored poor in the environmental domain, which mainly deals with living and working conditions, safety, leisure activities, and health care.

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Smith, jones et.al (2021) studied on Age related musculoskeletal pain among construction workers which shows age is a significant risk factor for musculoskeletal pain among construction workers.

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