IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

MUSCULOSKELETAL DISORDERS AND SELF-REPORTED DISCOMFORT AMONG FISHERMEN IN MUMBAI KOLIWADAS

*Zahra, H., R. and **Roopa, R.

* Corresponding Author, Student

Department of Community Resource Management, College of Home Science Nirmala Niketan, (Affiliated to the University of Mumbai), Mumbai – 400 020, Maharashtra State, India

** Assistant Professor

Department of Community Resource Management, College of Home Science Nirmala Niketan, (Affiliated to the University of Mumbai), Mumbai – 400 020, Maharashtra State, India

Abstract: An exploratory study was conducted to investigate the prevalence of Musculoskeletal Disorders (MSDs) and self-reported discomfort among fishermen residing in the Koliwada communities of Mumbai. MSDs are recognized as significant occupational health issues affecting the muscles, tendons, ligaments, nerves, joints, and surrounding soft tissues of the body. These conditions often manifest as pain, discomfort, and limitations in mobility. Fishermen, in particular, face an elevated risk of developing MSDs due to the repetitive and physically demanding nature of their work, as well as the prolonged periods spent in awkward postures. The study revealed that the most commonly affected areas among fishermen are the back, neck, shoulders, arms, and hands. Symptoms associated with MSDs can range from mild discomfort to severe pain, significantly impacting the fishermen's ability to perform their work tasks and engage in daily activities. It is crucial to adopt a multifaceted approach to prevent MSDs among fishermen, encompassing ergonomic interventions aimed at improving work practices and reducing physical strain. Additionally, education and training on proper lifting techniques and body mechanics play a vital role in preventing these disorders. Early recognition and timely treatment of MSDs are also essential to prevent long-term disability and chronic pain among fishermen. By addressing these occupational health challenges, the overall well-being and productivity of fishermen can be enhanced, contributing to the sustainability of the fishing industry. The findings of this study underscore the importance of implementing preventive measures and providing necessary support to mitigate the impact of MSDs on the occupational health of fishermen in Mumbai Koliwadas.

Keywords: Ergonomics, Fishermen, Musculoskeletal Discomfort, Occupational Health, Safe Work.

I. INTRODUCTION:

Musculoskeletal disorders (MSDs) are a common health issue among fishermen, and are often caused by repetitive strain injuries, awkward postures, and heavy lifting associated with their work. MSDs can affect various parts of the body including the neck, shoulders, back, hips, knees, and hands, and can lead to chronic pain, disability, and loss of function.

Work-Related Musculoskeletal Disorders (WRMSDs) are common among fishermen due to the physically demanding nature of their work. Fishermen are exposed to a range of physical stressors that increase their risk of developing MSDs, including prolonged periods of standing, frequent bending and twisting, exposure to cold and damp conditions, and the use of vibrating equipment. These disorders affect the muscles, tendons, ligaments, and other soft tissues of the body. The main causes of WRMSDs among fishermen include repetitive motions, forceful exertions, awkward postures, and prolonged periods of static positioning. Additionally, fishermen may work long hours with little time for rest or recovery, which can exacerbate existing injuries and lead to further damage. Prevention and management of MSDs in fishermen can involve a range of strategies including ergonomic interventions, exercise programs, and education and training on safe lifting and handling techniques.

A major reason to conduct this study is to highlight the many challenges that fishermen face daily. Also, a knowledge gap exists as very few studies have been conducted on the fishermen of Mumbai. In comparison to fishermen across the world, Indian fishermen majorly belong to a lower economic class (Khatua, 2022), therefore the financial factor plays a major role (Jayaselvi, 2016). When the financial status is taken into consideration, necessities such as life jackets, safety equipment, getting medical treatment for when injuries occur, etc. turn into liabilities. These are some of the main necessities that are needed while working a job full of hazards such as this one and are taken into consideration by fishermen over the world. The population of our study is many a time the sole breadwinners for the entire family and therefore bringing in the factor of dependency which can indirectly

lead to over-working which can over some time worsen issues. Moreover, this is a male-dominated field. Being in the lower part of the economy and as sole breadwinners, this population had struggled to climb the economic ladder which eventually led to kin of these fishermen taking over their father's occupation and turning into a family's profession.

Having lived in the coastal metropolitan city the researchers are aware of the various hazards faced daily, polluted sea waters, and densely populated areas, to name a few leads to difficulties in making decent catches, requiring an increase in working hours to travel further to find good quality fish. Working with polluted water can have consequences such as skin disorders, skin infections, and ingestion of harmful chemicals can prove extremely hazardous. Health takes a major setback in situations where the money factor is not supportive, similarly, fishermen start getting into the business young and retire quite old and therefore go through a lot of different phases in their life while being at the same job and have to think about supporting their family during most of their lifetime, so even if they get injured at work, doctors' visits can create holes in their already low income.

Some of the problems faced: financial, physical as well as health-related. All these aspects are completely important, nevertheless, the focus of this study would be the Occupational health hazards that fishermen have to face especially Musculoskeletal disorders which are the result of heavy physical work such as pulling, throwing of heavy nets into the ocean, awkward body postures while transferring the fish from one place to another. Other occupational challenges are skin diseases that occur because of contaminated water, various harmful marine life, and direct contact with sunlight for long periods. Irregular sleep schedule caused due to various reasons such as not following a proper diet or having improperly planned work timings, for example, long hours of work which can increase up to 2-3 weeks at a time, excluding the duration of travel needed to reach distant places in the ocean to obtain the desired fish. Awkward sleeping postures mentioned in said situation, at a time 7 to 8 workers sleeping in a small cabin can result in major body aches and pains. Body injuries such as cuts that are more or less quite common in this occupation take more time to heal due to the daily contact of salt present in the water as well as contamination in the ocean water can increase the risk of infections. These are a few of the many health issues that fishermen come across while working.

II. OBJECTIVES:

The specific objectives of this study are to (i) understand the demographic profile of fishermen in Mumbai's coastal region; (i) associate body pains/aches experienced with specific tasks; and (iii) recommend ergonomic solutions to alleviate bodily discomfort and the onset of occupational disorders among fishermen.

III. MATERIALS AND METHOD:

An exploratory study was conducted among 175 (18 – 70 years) randomly selected fishermen from Mumbai and its coastal fishing villages to identify the prevalence of bodily discomfort due to work-related reasons. A self-constructed and validated questionnaire was used to collect data. A self-constructed and validated questionnaire was used to collect information. The questionnaire was divided into three sections each for collecting General information; Work-related information; and the QEC (Quick Exposure Checklist). The QEC was designed at the Robens Centre for Health Ergonomics and is an open-source practical method of assessing exposure to WRMSD risk factors in the workplace (www.surrey.ac.uk/robens/erg).

The self-constructed and validated questionnaire was used to conduct a focussed interview through which the information was elicited. The data so collected were coded and systematically entered in the MS Excel spreadsheet. Pivot charts were constructed to analyze the data to draw out the relation between the several aspects of the research.

IV. RESULTS AND DISCUSSION:

Demographic profile: Demographic profile includes personal and common information about individuals that as age, and education level. This information helps the researchers to study the background of the participants.

The data provide insights into the demographics, education qualifications, musculoskeletal disorders, and work schedules of fishermen.

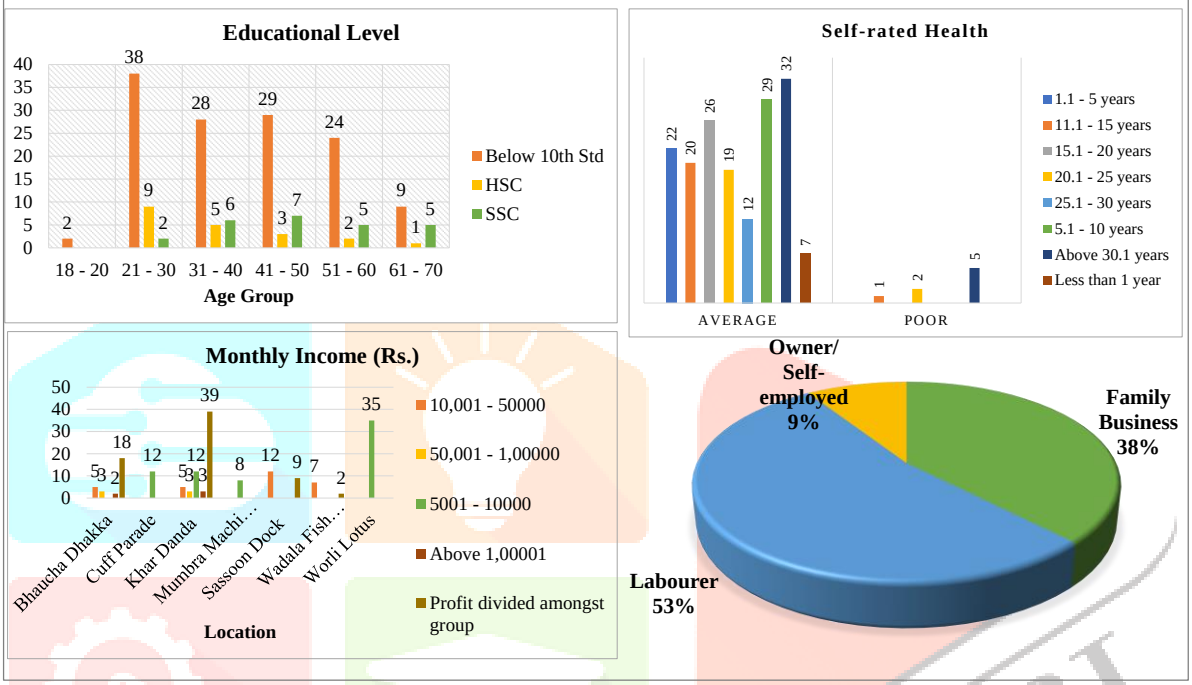
- The age groups of 21-30, 31-50, 51-60, and 61-70 accounted for 49(28%), 38(22%), 32(18%), and 16(9%) of participants, respectively.
- The highest percentage of participants 49(28%), belonged to the age group of 21-30, indicating a significant representation of younger individuals in the fishing community.
- The majority [130 (74.3%)] of surveyed fishermen had education qualifications below the 10th standard, and 35(20%) had completed education up to the Higher Secondary Certificate (HSC) level.

Work Schedule: Fishermen spend most of their time on boats, with an average duration ranging from 10 hours to 10 days. When off the boat, they typically have a break of 5-10 hours. Understanding these aspects helps us grasp the demographic composition, educational diversity, occupational challenges, and work-life dynamics within the fishing community. This knowledge can guide the development of targeted interventions, educational programs, injury prevention measures, and improved working conditions for the well-being and productivity of fishermen.

Fishermen engage in various tasks and activities during their daily fishing operations. Some of these tasks include:

- Throwing nets: Fishermen throw nets into the water to catch fish. This requires strength and coordination to ensure the net is properly spread out and positioned.
- Lifting heavy equipment: Fishermen lift heavy equipment such as fishing nets, ropes, and gear. These items can be bulky and weigh a significant amount, requiring physical strength and exertion.
- Operating engines or other equipment: Fishermen operate engines and other equipment on their boats to navigate the waters, set up fishing gear, and haul in their catch. This involves handling controls, monitoring equipment, and performing maintenance tasks.
- Setting and retrieving fishing gear: Fishermen set up and retrieve various types of fishing gear, such as traps, lines, or pots, depending on the fishing method used. This involves deploying and retrieving the gear with precision and strength.
- Sorting and processing the catch: Once the fish are caught, fishermen sort and process the catch, which may include removing unwanted species, cleaning, gutting, and storing the fish properly.
- Repairing and maintaining equipment: Fishermen regularly maintain and repair their fishing gear, nets, boats, and other equipment to ensure their effectiveness and longevity. This may involve tasks such as mending nets, fixing engine issues, or replacing worn-out parts.

Fig 1: Profile of Sample



Musculoskeletal Disorders: Musculoskeletal disorders (MSDs) commonly faced by fishermen include lower back pain (LBP), shoulder pain, elbow pain, wrist pain, and knee pain.

- Lower back pain is highly prevalent [161 (92%)]among fishermen due to the strain from lifting heavy nets filled with fish and engaging in repetitive bending, twisting, and lifting movements.
- Shoulder pain [144 (82.3%)] is the next most affected body site according to the QEC results. This can again be attributed to the repetitive motions involved in lifting heavy nets and performing tasks requiring shoulder engagement.
- Wrist pain [98 (56%)] and elbow pain [93 (53.1%)] are caused by the repetitive nature of handling and managing heavy nets, while knee pain may result from prolonged kneeling, crouching, and working on uneven surfaces aboard vessels.
- Manual handling is a physical activity that commonly takes place in all fishing activities. such manual handling involves lifting, pulling, pushing, caring, or moving loads. Incorrect manual handling may result in back injury or other musculoskeletal problems among fishermen

The specific body area sites depend on the nature of the tasks performed by the fishermen. For example, lifting heavy equipment and throwing nets may predominantly affect the upper body, including the shoulders, back, and arms. Operating engines or performing repetitive tasks could affect the hands, wrists, and fingers. The body site affected would vary depending on the physical demands and movements associated with the specific tasks performed by the fishermen.

Summary of Results: The analysis of data obtained from 175 participants revealed key findings regarding the factors contributing to discomfort among fishermen in their occupational setting. The average age of the participants was determined to be 40.2 years, with the highest number of fishermen falling within the age range of 21 - 30 years. It was observed that their circadian rhythm was disrupted due to irregular work schedules, leading to potential adverse effects on their overall well-being.

Musculoskeletal disorders (MSDs), including cuts and bruises, were frequently reported among fishermen, primarily attributed to the use of rusted and sharp fishing equipment. The strenuous task of handling heavy nets after fishing rounds was identified as a major cause of multiple MSDs, such as lower back pain (LBP), shoulder pain, neck pain, wrist pain, and arm pain.

Furthermore, prolonged exposure to the sun during fishing activities resulted in fatigue, sunburn, and dehydration among the fishermen. This highlights the significance of implementing measures to protect them from the harmful effects of sun exposure.

One of the major accidents reported by fishermen was the collision of their ships with submerged rocks, posing significant risks to their safety and the integrity of their vessels.

Considering these findings, it becomes evident that the discomfort experienced by fishermen can be attributed to a combination of factors related to their work environment and tasks. To address these issues, intervention strategies should be implemented, such as promoting proper work schedules to regulate circadian rhythm, ensuring the use of safe and well-maintained equipment, providing ergonomic training, emphasizing sun protection and hydration practices, and raising awareness about the risks associated with underwater rock collisions.

By adopting preventive measures and addressing these factors, the aim is to improve the occupational health and well-being of fishermen, reducing discomfort and enhancing their overall work performance.

V. RECOMMENDATIONS:

The hierarchy of control is a method to mitigate the onset of work-related musculoskeletal disorders (WRMSDs) among fishermen in Mumbai:

- **Elimination:** Physically removing the hazards.

- Implement safer work practices that eliminate the need for high-risk activities, such as finding alternative methods for handling heavy loads.

- **Substitution:** Replacing the hazards such as old tools can be replaced with new and well-designed tools which avoid injuries.

- Using mechanical lifting equipment such as a crane lifting device
- Replace old and unsafe tools with newer, well-designed alternatives that prioritize ergonomic factors and reduce the risk of injuries.
- Introduce mechanical lifting equipment, such as crane lifting devices, to minimize manual handling and strain on fishermen's bodies.

- **Engineering Controls:** Engineering controls in the context of fishermen refer to physical modifications or interventions designed to minimize hazards and improve safety in the fishing environment. E.g.,

- Safety equipment and devices: Installing and regular maintenance of safety equipment such as guardrails, handrails, non-slip surfaces, and safety nets on fishing vessels to prevent falls overboard and provide a safe working environment.
- Automated and mechanized systems: These systems can reduce physical exertion and minimize the risk of musculoskeletal injuries
- Ergonomic equipment design: Incorporate ergonomic design principles into the development of fishing equipment, tools, and workstations. This may involve designing equipment with adjustable heights, ergonomic handles, and proper weight distribution to reduce strain and fatigue.
- Noise and vibration control: This can involve the use of sound insulation, vibration-damping materials, and regular maintenance of machinery.

- **Administrative Controls:** Changing the way people work such as

- Training fishermen with good practice and the use of good handling techniques.
- Adoption of good posture and proper biomechanics
- Providing comprehensive training programs for fishermen, focusing on good work practices, proper handling techniques, and the importance of maintaining good posture and biomechanics.
- Establishing regular breaks and rotation of tasks to prevent prolonged exposure to repetitive or strenuous activities.
- Encouraging the use of stretching exercises and warm-up routines before starting work to prepare the body for physical exertion and reduce the risk of injury.

- **Personal Protective Equipment** and Other **Personal Controls**: Protecting the workers

- Ensuring that fishermen are provided with appropriate personal protective equipment, such as gloves and headgear, to protect them from specific hazards encountered in their work.
- Promoting the adoption of stretching exercises as a routine practice before starting work to improve flexibility and reduce the risk of strains or sprains.

By implementing these control measures in conjunction with the hierarchy of control, the risk of WRMSDs can be significantly reduced among fishermen, enhancing their occupational health and well-being.

VI. SCOPE OF THE STUDY:

The scope of the study on work-related musculoskeletal disorders (WRMSDs) among Mumbai fishermen extends beyond the mere understanding of the prevalence and factors contributing to these disorders. The study holds the potential to benefit the fisher community by informing targeted interventions and improvements in occupational health and safety practices. Furthermore, it also identifies areas for further research and exploration.

One important aspect is the possibility of conducting a biomechanical study on fishing activities, aiming to develop a safe handling module that can be incorporated into training programs for fishermen. This module would provide them with essential knowledge and techniques to handle materials in a better, more efficient, and effective manner, reducing the risk of musculoskeletal injuries.

Moreover, the results of the study can be utilized to design and implement comprehensive ergonomic training programs for fishermen. By incorporating the study findings into training initiatives, the fisher community can be empowered with practical skills to improve their work practices and reduce the occurrence of WRMSDs.

Additionally, further research opportunities arise from this study. In-depth investigations can be conducted to explore the extent of injuries and infections experienced by fishermen following the identified WRMSDs. This would contribute to a deeper understanding of the long-term consequences and impact on the fisher community's health.

Furthermore, a biomechanical analysis of handling nets after fishing rounds could shed light on specific ergonomic challenges and suggest strategies for reducing strain and musculoskeletal disorders in this particular task.

Researchers could delve into studying the nature and extent of occupational health disorders among fishermen in more detail. This would involve investigating various aspects of their work environment, including physical demands, exposure to hazards, and the prevalence of different health conditions, leading to a comprehensive understanding of the occupational health landscape within the fisher community.
Lastly, the findings of this study can be valuable for policymakers and lawmakers in developing policies and regulations aimed at safeguarding the occupational health and well-being of fishermen. By understanding the specific challenges faced by the fisher community and the impact of WRMSDs, policymakers can create targeted measures to support and protect their interests.

In summary, this study on WRMSDs among Mumbai fishermen not only provides insights into the prevalence and causes of musculoskeletal disorders but also offers opportunities for practical interventions, further research, and policy development. By leveraging the study's results, the fisher community can benefit from improved training programs, enhanced ergonomics, and better occupational health practices, ultimately fostering a safer and healthier working environment for fishermen.

VII. AUTHOR STATEMENT:

- Acknowledgment: The authors would like to extend their heartfelt appreciation to the fishermen and the leaders of the fishing community/villages for their indispensable collaboration and support throughout this research endeavour.
- Informed Consent: Before their involvement, a total of 160 participants voluntarily provided written informed consent, affirming their comprehension of the research goals, methods, and possible implications.
- Declaration of Conflict of Interest: The authors declare that there are no competing interests that could compromise the impartiality or credibility of the conducted research.
- Funding: This study was self-funded, and no external financial grants or assistance from governmental or non-governmental organizations were received. The authors independently carried out the research without any external influence or sponsorship.

VIII. REFERENCES:

[1]https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=research+ergonomic+on+fisher+men+&btnG=#d=gs_qabs&t=1660288154641&u=%23p%3Dnf28Phm9iLgJ

[2]https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=research+on+fishermen&oq=research+on+fisherm#d=gs_qabs&t=1660291084890&u=%23p%3DBQwdU1b4s4kJ

[3]https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=journal+articles+about+fisherman+health+problems&oq=journal+articles+about+fishermen+he#d=gs_qabs&t=1660397063873&u=%23p%3D-Y4V2SfR4nMJ

[4] research on fishermen safety in India - Google Scholar

[5] International Labour Organization. S*afety and health training manual for the commercial fishing industry in Thailand (*2014). ISBN: 9789221284697

[6] OSHA *Commercial Fishing. OSHA Fall Protection Safety Fact Sheet*. fall protection safety-commercial fishing-factsheet.pdf (osha.gov). U.S. Department of Labor

[7] Rao, R. (2018). Introduction to Ergonomics. ISBN 978-93-5321-450-0.