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Musculoskeletal Problems in Fishermen Workers to Improve Community Economy in Bahuluang Village, Kep. Selayar, South Sulawesi

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Abstract: *The purpose of this community service program is to minimize musculoskeletal problems in fishing workers in order to improve the economy of the community in Bahuluang Village. Bahuluang village has musculoskeletal problems that are quite high in the review of the data at the Lowa Health Center, this occurs due to ergonomic deficiencies when working as a fisherman in terms of measurement REBA (Rapid Entire Body Assessment) which results obtained a medium level of 7 subjects, High Level 6 subjects and very high risk 6 subjects. Also reviewed from interviews and specific examinations with the results of all fishing workers, namely 20 subjects complained of back pain with a diagnosis of lumbar physiotherapy Type 1 there are 10 subjects, lumbar type 2 there are 5 subjects, lumbar type 3 there are 2 subjects, and Sups. HNP (Hernia Nucleus Pulposus) there are 3 subjects. Complaints and problems were followed up with counseling related to the correct ergonomic position at work, stretching before work, and the first treatment at the time of injury with the PRICE method. The evaluation obtained after completing community service, there was a decrease in REBA (Rapid Entire Body assessment) scores of 9 subjects could be ignored and 11 subjects with low scores and from the results of interviews and specific examinations complaints of back problems have been reduced. In addition, some fishermen have started to work with normal hours of 7 hours in 6 days and have a positive impact, namely increasing the economic income of the Bahuluang community*

Keywords: *ergonomic; musculoskeletal; REBA; physiotherapy treatment*

Introduction

Efforts to minimize musculoskeletal issues among fishermen involve providing physiotherapy treatment for such complaints, delivering training on ergonomic work positions, offering initial care during injuries, and ensuring proper stretching during

work breaks to prevent muscle fatigue. Selayar Islands is a region in the South Sulawesi Province with a land area of 1,357.15 km2. The largest area is located in the Bontosikuyu District, while the smallest area is in the Benteng District, encompassing 11 districts, 5 of which are on the main island and 6 are situated outside the main island.[1] [2]

One island in the Selayar Islands is Bahuluang Island, located in the Istimewa Bahuluang Village, within the administrative region of Bontosikuyu, Selayar Islands stretch from north to south with boundaries including Tambolongan Village to the south, the Flores Sea to the north, and the Flores Sea to the west. This island has a population of around 332 people, consisting of 160 females and 172 males, with the majority engaged in fishing activities. Bahuluang Island is identified in the Selayar Regency as having distinct characteristics, as evidenced by data from the Village Medium-Term Development Plan (RPJM) covering the years 2012 to 2018, where the primary livelihood is fishing, accounting for 90.91% of the population.[3] The people of South Sulawesi, especially the Bugis, Makassar, and Mandar ethnic groups, have long been recognized for their exceptional maritime skills.[4]

Discussing fishermen, there has been no significant development in the fishing gear used by fishermen on Bahuluang Island. The commonly used fishing gear includes nets, fishing rods, traps, and fish traps. The routine and non-ergonomic use of these fishing gears every day for an extended period can lead to musculoskeletal problems. Several risk factors contribute to musculoskeletal disorders (MSDs), and these risk factors are categorized into environmental and occupational factors.[5] Musculoskeletal disorders, commonly referred to as musculoskeletal disorders (MSDs), involve joints, ligaments, and tendons. Complaints typically arise when muscle contractions occur within the range of 15-20% of maximal muscle strength. When the percentage of muscle contraction exceeds 20%, blood flow to the muscles decreases in accordance with the degree of contraction due to workload.[6] Musculoskeletal issues represent 42-58% of all work-related diseases

[1] Ngadi Ngadi, "Dinamika Pendapatan Penduduk Di Wilayah Pesisir Kabupaten Kepulauan Selayar," *Jurnal Sosial Ekonomi Kelautan dan Perikanan* 8, no. 2 (2017): 128–177.

[2] Agus Agus and Masri Ridwan, "Pemetaan Objek Wisata Alam Kabupaten Kepulauan Selayar Berbasis Sistem Informasi Geografis Arcgis 10.5," *Pusaka: Journal of Tourism, Hospitality, Travel and Business Event* 1, no. 1 (2019): 45–50.

[3] Maridana Ethrawaty Fachry, "Analisis Potensi Pengembangan Aktifitas Masyarakat Dalam Pemanfaatan Sumberdaya Yang Berkelanjutan," *Jurnal Administrasi dan Kebijakan Kesehatan Indonesia* 25, no. 2 (2015): 105779.

[4] Andi Andrie Arief, "Studi Mengenai Pengetahuan Lokal Nelayan Pattorani Di Sulawesi Selatan," *Jurnal Hutan dan Masyarakat* 3, no. 2 (2008): 8208.

[5] Ria Avilia Oley, Lery F Suoth, and Afnal Asrifuddin, "Hubungan Antara Sikap Kerja Dan Masa Kerja Dengan Keluhan Musculoskeletal Pada Nelayan Di Kelurahan Batukota Kecamatan Lembeh Utara Kota Bitung Tahun 2018," *KESMAS: Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi* 7, no. 5 (2018).

[6] Anggi Ayudea Agustina Engka, Oksfriani Jufri Sumampouw, and Wulan Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang," *KESMAS: Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi* 11, no. 4 (2022).

worldwide and account for 40% of the total healthcare costs for workers.[7]

Musculoskeletal problems, encompassing joints, ligaments, and tendons, can affect fishermen who work in awkward postures, such as bending, squatting, and placing both hands below and above the shoulders. Such non-ergonomic work activities can lead to musculoskeletal disorders (MSDs), particularly among workers, including fishermen, whose activities are muscle-intensive. Ergonomics, as studied by Artayasa,[8] is the science that studies human behavior in relation to the tasks they perform. It can be said that ergonomics involves adapting job tasks to the human body's conditions to reduce the stress faced. The application of ergonomics in the workplace aims to decrease the number of work-related accidents, thereby enhancing work productivity and employee well-being.[9] If musculoskeletal issues persist among fishermen, who constitute the majority of the workforce in Bahuluang village, it can impede their ability to work optimally, resulting in a decline in fish income, thereby affecting the economic well-being of the community in Bahuluang village.

The prevalence of musculoskeletal disorders (MSDs) in Indonesia is 11.9%, with a diagnosis-based percentage of 24.7%. The prevalence based on doctor-diagnosed MSDs in Indonesia is 7.3%, with West Sulawesi having the lowest rank at 3.2%.[10] The prevalence of musculoskeletal disorders (MSDs) in 2018, based on doctor diagnoses and categorized by age, indicates the lowest prevalence at ages 15-24 (1.2%) and the highest at ages >75 (18.9%).[11] Based on data from the Ministry of Health,[12] it is stated that all workers, including fishermen, are at risk of suffering from musculoskeletal disorders (MSDs). According to data from the Basic Health Research in 2018, the prevalence of MSDs among fishermen is 7.40%. The issue can be observed through the Rapid Entire Body Assessment (REBA) method, which can be rapidly applied to assess work positions and postures of the neck, back, arms, wrists, and legs. This makes REBA highly suitable for evaluating fishermen's work positions when using fishing gear. The goal of REBA is to provide an assessment of the risk of body posture that may lead to musculoskeletal

[7] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[8] I. Nyoman Artayasa, "Ergonomics and Tri Hita Karana Conception in Balinese Traditional Houses," *Mudra Jurnal Seni Budaya* 25, no. 3 (2010): 275–280.

[9] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[10] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[11] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[12] Kementerian Kesehatan Republik Indonesia, *Riset Kesehatan Dasar 2018* (Jakarta: Badan Penelitian dan Pengembangan Kesehatan, 2018).

disorders (MSDs).[13]

The data obtained from the Lowa Community Health Center in 2022 on the prevalence of musculoskeletal disorders in the Selayar Islands, specifically Bahuluang village, reveals a total of 1,972 patient visits. Among these visits, 96 individuals, or 4.8%, were diagnosed with musculoskeletal disorders. The patients, on average, are fishermen who complain of shoulder pain, back pain, muscle pain in the arms and legs, as well as neck pain. These issues are attributed to the excessive use of muscle strength, working hours beyond normal limits, and improper working postures.

Moreover, the residents of Bahuluang lack healthcare facilities, requiring them to travel to the Selayar Islands, specifically to the Lowa Community Health Center. Unfortunately, this health center does not have physiotherapy professionals. To address these issues, the researcher proposes physiotherapy interventions and provides education on initial injury management, ergonomic work positions, and preventive measures to avoid injuries during work.

This Community Service aims to minimize musculoskeletal problems among fishermen, thereby enhancing the economic well-being of the community in Bahuluang village, Selayar Islands, South Sulawesi.

Method

The method employed in conducting research on musculoskeletal issues among fishermen in Bahuluang Village, Selayar Islands, South Sulawesi, is the ethnographic method. This method, which has been utilized for an extended period, involves direct interaction or even residing with the community. During this period of living and interacting, ethnographers provide a holistic description to offer a comprehensive portrayal of the cultural life of the community. Additionally, an ethnographer can conduct in-depth interviews and observations to gain a deeper understanding of specific social details considered significant and interesting. In summary, ethnography can be understood as a research method used to study human culture. This research is systematically conducted to create a realistic and authentic depiction of the community.[14]

The subjects of the community service are the residents of Bahuluang village who work as fishermen, both male and female, residing in a remote island along the coastal area. They are willing to participate in a two-week assistance program, totaling 20 individuals. Subjects were recruited by gathering residents in the field of Bahuluang

[13] Muhamad Fahariman Yudiardi et al., "Penilaian Postur Kerja Dan Risiko Musculoskeletal Disorders (Msds) Pada Nelayan Bagan Apung Dengan Menggunakan Metode Reba Assessment Of Work Posture And Risk Of Musculoskeletal Disorders (Msds) On Floating Lift Net Fisherman Using Reba Method," *Jurnal IPTEKS PSP* 8, no. 1 (2021).

[14] Abdul Manan, *Metode Penelitian Etnografi* (AcehPo Publishing, 2021); Yoki Yusanto, "Ragam Pendekatan Penelitian Kualitatif," *JOURNAL OF SCIENTIFIC COMMUNICATION (JSC)* 1, no. 1 (2020).

village and conducting interviews related to the inclusion criteria.

Table 1. Assistance Subjects in Bahuluang Community

Gender	Number of Respondents	Age Range
Male	8	40-45
Female	12	30-35

The preparation phase involved mapping the issues faced by the service subjects by collecting and exploring problems or issues related to musculoskeletal problems in fishermen. This was done to minimize these issues and enhance the economic well-being of the community in Bahuluang village, Kepulauan Selayar, South Sulawesi.

The service team then conducted direct observations and interviews with the fishermen in Bahuluang village to gather information about their daily activities, working hours, and musculoskeletal complaints experienced by the fishermen. The team organized a focused group discussion with healthcare professionals, including physiotherapists, general practitioners, and nurses, to formulate educational materials, training, and appropriate messages for the community service.

The service assistance phase was carried out directly in Bahuluang village, Kepulauan Selayar, South Sulawesi. The assistance activities included:

1. **Socialization of Activities:** The team presented information consent to the registered community members willing to participate in the entire program, providing guidance on how the education would be conducted.
2. **Service Phase:** The service team conducted interviews and specific examinations for all subjects to identify musculoskeletal problems experienced by the subjects. On the interview day, the service subjects were asked to fill out a pre-activity questionnaire consisting of two parts: general data and 10 Likert-scale questions with 5 attitude options (SS: Strongly Agree, S: Agree, KS: Disagree, TS: Strongly Disagree, STS: Strongly Disagree) related to ergonomic positions during work and musculoskeletal problem handling.

After all service subjects completed the pre-activity questionnaire, the service team, armed with specific examination results, immediately provided physiotherapy interventions tailored to the reported complaints. The patients experienced pain in the shoulders and back due to ergonomic issues during work. Ergonomics, defined as the adjustment of job tasks to the human body's conditions, aims to reduce stress and ensure comfort, which also impacts occupational safety.[15] This assistance program is conducted for a duration of 2 weeks, paying attention to the ergonomic positions of the subjects

[15] Irham Fanani Basya et al., *Aspek Ergonomi Pada Aktivitas Penangkapan Ikan Kapal Pancing Ulur Di Ppn Prigi Trenggalek Ergonomic Aspects on Fishing Activities of Fishing Boat Stalling in the VAT of Prigi Trenggalek*, n.d.

during work through the measurement of Rapid Entire Body Assessment (REBA). Direct consultations are available throughout the assistance period.

Result

Preparation Phase

During the preparation phase, it was identified that ergonomic issues during fishing work lead to musculoskeletal problems. The lack of ergonomics during work results in an uneven distribution of load on specific muscles, causing the emergence of pain issues. Moreover, inadequate initial handling when pain arises exacerbates the problem, leading to an increase in pain and a reduction in fishermen's working hours. This issue was discussed with expert informants to create educational materials.

Implementation Phase

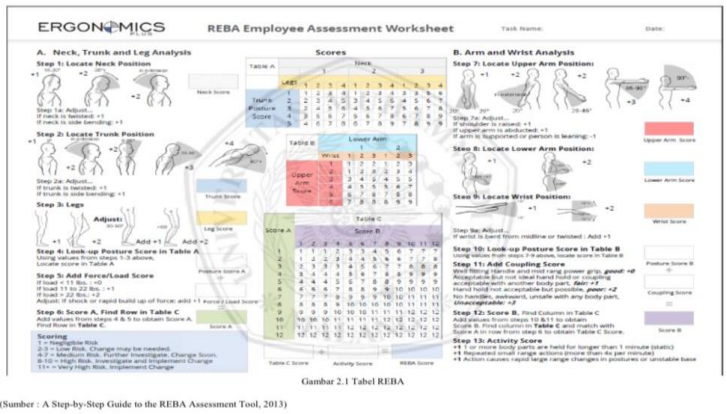
Twenty participants volunteered to be involved in this activity. Through interviews, specific examinations, and education and training on body ergonomics during work, initial handling during injuries, and proper stretching to reduce the potential for injuries conducted on May 16, 2022, it was found that 20 residents had complained of back and shoulder pain for approximately 1-2 years. Both male and female subjects experienced back pain, and among them, 4 male and 2 female subjects also complained of shoulder pain. The results showed a decrease in working hours, before the onset of pain complaints, fishermen could work for 7 hours a day for 6 days, but due to the emergence of pain complaints, fishermen could only work for 5 hours a day for 6 days.

Table 2: Musculoskeletal Issues Data of Bahuluang Village Residents

Gender	Back Pain	Shoulder Pain	Work Duration Before Pain	Work Duration After Pain
Male	8	4	7 Hours/ 6 days	5 hours/ 6 days
Female	12	2	7 Hours/ 6 days	4 Hours/ 6 days

The observational method reveals that one of the triggers for musculoskeletal problems among fishermen is the lack of ergonomics in their work. Referring to the REBA measurements presented in Table 2, the assessment results indicate a moderate risk level for 7 subjects, a high risk level for 6 subjects, and a very high risk for 6 subjects. The risk levels are primarily associated with the positions of bending and pulling nets.

In these risk conditions, if such activities are consistently performed, it can lead to disturbances in the back and waist, resulting in complaints of pain. The continuous strain on the back during these activities could be a significant contributor to musculoskeletal issues among fishermen.



Gambar 1. Pengukuran REBA (*Rapid Entire Body Assesment*)

Tabel 3. Nilai REBA (*Rapid Entire Body Assesment*) Masyarakat Desa Bahuluang

Keterangan	**Bisa diabaikan**	**Rendah**	**Sedang**	**Tinggi**	**Sangat tinggi**
Score REBA	0	0	7	6	6

Based on the interview results, observations, and REBA measurements, the Community Service Team conducted specific examinations on the subjects. The findings revealed Fisiotherapeutic diagnoses, with 10 subjects diagnosed with Lumbal Type 1, 5 subjects with Lumbal Type 2, 2 subjects with Lumbal Type 3, and 3 subjects with Sups. HNP (Hernia Nucleus Pulposus). The subjects reported experiencing these issues for approximately 1-2 years. In response to the identified problems, the researchers implemented interventions tailored to each subject's specific complaints.

Table 4 Fisiotherapeutic Diagnosis Results

Diagnosis	Age Range
LBP Lumbal Type 1 (10)	35-45
LBP Lumbal Type 2 (5)	30-35
LBP Lumbal Type 3 (2)	40-45
Sups. HNP (3)	40-45

Table 5 Community of Bahuluang Village's Treatment When Pain Occurs

Diagnosis	Massage	Spread Massage oil	No Treatment

After receiving therapeutic treatment, the subjects were asked about the actions they took if the pain reoccurred. The results indicated that 100% of the residents of Desa Bahuluang never sought medical attention for their complaints but opted for self-treatment using massage oil. According to the data, 16 subjects used massage as a form of treatment, 2 subjects applied warm oil, and 2 subjects did not seek any treatment at all. This assistance continued for 2 weeks.

Education on body ergonomics while working, initial treatment when an injury occurs, and performing stretching to reduce the potential for injuries were provided. The education covered general information about ergonomic body positioning and its impact when the body is not ergonomic, proper first aid procedures during injuries and the consequences of incorrect initial treatment, as well as correct stretching before work to reduce the potential for injuries. Creating more focused educational materials would greatly assist the community in implementing these recommendations in their daily lives.

Figure 2. Matter of Ergonomics While Working (left), Initial Treatment During Injury (center), and Stretching (right)

Education Result

After the 2-week mentoring program, there was a decrease in pain and an improvement in body ergonomics while working, as well as an increase in working hours

for fishermen, evaluated using REBA measurements and post-activity questionnaires

Table 6 REBA Score

Note					
Ignored	Low	Middle	High	Very High	
Score REBA	9	11	0	0	0

Table 7 Evaluation of fishermen's working hours after mentoring using post-activity questionnaires

Diagnosa Pendampingan	Hours kerja Setelah
LBP Lumbal Type 1 (10)	7 Hours/ 6 days
LBP Lumbal Type 2 (5)	7 Hours/ 6 days
LBP Lumbal Type 3 (2)	7 Hours/ 6 days
Sups. HNP (3)	7 Hours/ 6 days

Discussion

The Community Service Activity involves 20 participants who willingly participated in the program. Through interviews, specific examinations, and educational training on body ergonomics during work, first aid for injuries, and proper stretching techniques to reduce the potential for injuries, the obtained results from Table 1 include 20 residents working as fishermen experiencing lower back and shoulder pain for approximately 1-2 years. Both male and female subjects, 20 in total, reported lower back pain, while 4 male subjects and 2 female subjects also complained of shoulder pain. The results revealed a reduction in working hours; before the onset of pain complaints, fishermen could work for 7 hours a day, 6 days a week. However, due to the emergence of pain complaints, fishermen were only able to work for 5 hours a day, 6 days a week.

Addressing the issue of fishermen, there has been no significant development in fishing equipment used by fishermen on Pulau Bahuluang. The majority of fishermen use routine equipment such as nets, fishing rods, sero, and bubu daily for extended periods, which lack ergonomic design and may lead to musculoskeletal problems. Various risk factors contribute to musculoskeletal disorders (MSDs), with these risk factors categorized into environmental and occupational factors.[16] Musculoskeletal disorders

[16] Oley, Suoth, and Asrifuddin, "Hubungan Antara Sikap Kerja Dan Masa Kerja Dengan Keluhan

(MSDs), also commonly known as musculoskeletal disturbances, encompass joints, ligaments, and tendons. Complaints arise when muscle contractions occur at around 15-20% of the maximum muscle strength. When the percentage of muscle contraction exceeds 20%, blood flow to the muscles decreases proportionally with the degree of contraction due to workload.[17] Musculoskeletal problems represent up to 42-58% of all work-related illnesses worldwide and account for 40% of the total healthcare costs for workers.[18] Thus, these factors lead the subjects involved to experience complaints of pain in the shoulder and lower back areas. Working hours are one of the four organizational factors that can be a potential source of stress for employees in the workplace.

According to Article 79 paragraph 1 of Law No. 13 of 2003 concerning Manpower, it is mentioned that "Employers are obliged to provide rest and leave time for workers/laborers." Based on the above problem formulation, working hours should be regulated to a maximum of 40 hours per week, divided into 8 hours per day for 5 working days or 7 hours per day for 6 working days. If in reality, work exceeds 7 or 8 hours according to regulations, there is overtime, while if work involves a decrease in working hours according to regulations, there can be a decrease in the income sector.[19]

Figure 3. The fishermen of Bahuluang Community

Furthermore, from the community service activities using the observation method, one of the triggers for musculoskeletal problems is the lack of ergonomics when working as a fisherman, as indicated by the REBA measurements in Table 2. The assessment results show a moderate level for 7 subjects, a high level for 6 subjects, and a very high risk for 6 subjects. At this risk level, it tends to involve bending and pulling the net. If done continuously, this condition can lead to disorders in the back and waist, such

Musculoskeletal Pada Nelayan Di Kelurahan Batukota Kecamatan Lembeh Utara Kota Bitung Tahun 2018."

[17] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[18] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[19] Wahyu Purnomo and Elya Kurniawati, "Standarisasi Penentuan Jam Kerja, Lembur, Dan Cuti Pada Perusahaan Multinasional Di Indonesia," *Jurnal Manajemen* 2, no. 1 (2019): 1–17.

as complaints of pain due to continuous loading on the back.

Discussing ergonomics, which is the science of studying human behavior with work, it can be said that ergonomics is about adjusting work tasks to the human body's conditions to reduce the stress faced. The implementation of ergonomics in work life aims to reduce the number of work accidents, thus increasing work productivity and employee well-being. However, if the work is not done with the correct ergonomic positions, it can lead to musculoskeletal problems.[20]

Continuous non-ergonomic conditions can lead to disturbances in the back and waist, such as complaints of pain due to the continuous load on the back. Bending is one of the awkward positions, where the body part deviates from the neutral position, a significant deviation from the normal position that is not advantageous. The deviation of a body part from the neutral position, a significant deviation from normal, will increase the workload on muscles, requiring more energy. This results in an inefficient transfer of energy from muscles to the skeletal system, making the activity inefficient, and therefore, it needs to be avoided and corrected.[21]

Discussing the issue of non-ergonomics during work, this problem can be assessed using the Rapid Entire Body Assessment (REBA) method, which can be quickly applied to evaluate the working positions and postures of the neck, back, arms, wrists, and legs. This makes REBA highly suitable for assessing the working positions of fishermen when using fishing gear. REBA aims to provide an assessment of the risk of body posture positions that can lead to musculoskeletal disorders (MSDs). The REBA method is a postural analysis tool that is highly sensitive to work that involves sudden changes in position, often due to handling unstable and unpredictable containers. Data processing is performed by generating the necessary images for REBA ergonomic analysis.[22]

From the results of REBA measurements, interviews, and observations, the Community Service Team conducted specific examinations on the subjects and obtained the diagnosis of Physiotherapy Lumbal Type 1 in 10 subjects, Lumbal Type 2 in 5 subjects, Lumbal Type 3 in 2 subjects, and Sups. HNP (Hernia Nucleus Pulposus) in 3 subjects with complaints lasting approximately 1-2 years. Researchers provided interventions based on the problems reported by the subjects.

In the related topic, low back pain, or lower back pain, is an excessive contraction of the muscles in the lower back due to repeated muscle contractions or use that causes

[20] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

[21] Fahariman Yudiardi et al., "Penilaian Postur Kerja Dan Risiko Musculoskeletal Disorders (Msds) Pada Nelayan Bagan Apung Dengan Menggunakan Metode Reba Assessment Of Work Posture And Risk Of Musculoskeletal Disorders (Msds) On Floating Lift Net Fisherman Using Reba Method." Jurnal IPTEKS PSP. Vol. 8 (1) April 2021: 14 – 23 P-ISSN: 2355-729X. E-ISSN: 2614-5014

[22] Fahariman Yudiardi et al., "PENILAIAN POSTUR KERJA DAN RISIKO MUSCULOSKELETAL DISORDERS (MSDs) PADA NELAYAN BAGAN APUNG DENGAN MENGGUNAKAN METODE REBA ASSESSMENT OF WORK POSTURE AND RISK OF MUSCULOSKELETAL DISORDERS (MSDs) ON FLOATING LIFT NET FISHERMAN USING REBA METHOD."

muscle tension. Prolonged muscle tension can lead to pain. In the case of low back pain, there are several types: Type 1, where the issue is in lumbar 3 to lumbar 4; Type 2, problematic in lumbar 4 to lumbar 5; and Type 3, problematic in lumbar 5 and sacrum 1.[23]

Meanwhile, Hernia Nucleus Pulposus (HNP) is a condition where protrusion occurs in the intervertebral disc due to injury and incorrect mechanical load over an extended period. Additionally, the primary factor causing HNP is degeneration when the elasticity of the annulus fibrosus decreases, leading to a tear in the annulus fibrosus.[24]

Table 4. Health care in Bahuluang Village.

Understanding the issues faced by the subjects, the outreach team conducted further interviews regarding how the subjects handle the pain if it arises. The results indicate that 100% of the residents of Bahuluang Village have never sought medical attention for their complaints and instead opt for remedies like massage oil and massages. According to the data, 16 subjects choose massage, 2 subjects use warm oil, and 2 subjects do not undertake any treatment.

In the event of an injury during work that leads to specific areas experiencing pain, appropriate care should be provided. Injuries are unforeseen, unintentional, and unplanned incidents. Based on the location of occurrence, injuries are divided into three categories: (1) workplace injuries, (2) traffic accident injuries, and (3) household accident injuries. According to the Basic Health Research (RISKESDAS) in 2018, accidents resulting in injuries that disrupt daily activities have increased in Indonesia, reaching 9.2% from 8.2% in 2013 and 7.5% in 2007. Therefore, providing first aid in the event of an injury is a form of initial assistance given to prevent the condition from worsening

[23] Nur Tofik Hidayat, "Penatalaksanaan Fisioterapi Pada Kasus Low Back Pain Myogenic Dengan Modalitas Infrared, Transcutaneous Electrical Nerve Stimulation Dan William Flexion Exercise Di Rsud Ir. Soekarno Sukoharjo" (Universitas Muhammadiyah Surakarta, 2018).

[24] Yunisa Ida Cahyati, "Penatalaksanaan Fisioterapi Pada Kondisi Hernia Nucleus Pulposus Pada L5-S1," *Skripsi* (2015).

before professional medical help is available. This assistance must be provided quickly and accurately, as improper handling can have adverse effects.[25]

Appropriate treatment for injuries can use the PRICE method, where P (Protection) involves reducing movement in the injured area, R (Rest) involves briefly resting the injured area, I (Ice) entails applying ice compression for 15 minutes, C (Compression) involves applying pressure to the swollen area, and E (Elevation) requires raising the swollen area above the heart. If there is no swelling at the time of injury, only Protection, Rest, and Ice compression are necessary.[26]

Subsequently, further treatment can be provided in the form of stretching. This includes static stretching, which involves moving one or more muscle groups by shifting body positions and maintaining the position for a predetermined period, and dynamic stretching, a stretching technique that involves a controlled swinging movement to move a specific part of the body to the limits of joint range of motion.[27]

Despite the initial injury care and proper stretching to reduce the potential for injury, attention must also be given to ergonomics in the workplace. During the assistance sessions, the outreach team provided education on ergonomics in the workplace. Musculoskeletal issues experienced by the residents of Bahuluang Village, as shown in Table 3, are primarily due to non-ergonomic body positions during prolonged fishing activities, which become a daily routine during favorable seasons. Jobs that require heavy lifting with poor and unnatural body postures lead to quicker fatigue, indirectly adding to the workload. This issue results in abnormal working postures and unusual muscle movements, leading to energy wastage, fatigue, and the risk of muscle damage. Employing ergonomic work positions significantly reduces fatigue and posture-related health problems among workers.[28]

Working hours have an impact on workers, especially in strenuous occupations. Work is a human activity performed over extended periods, and continuous engagement

[25] Selvi Rahmawati, Waluyo Rudiyanto, and Nurul Utami, "Peningkatan Keterampilan Penanganan Pertama Pada Cedera Akibat Kecelakaan Rumah Tangga Di Desa Sidosari Kecamatan Natar Lampung Selatan," *JPM (Jurnal Pengabdian Masyakat) Ruwa Jurai* 6, no. 1 (2021): 135–139.; Dwi Novrianda et al., "Diseminasi Ilmu Pertolongan Pertama Kecelakaan Pada Anak Di Rumah Di Wilayah Kerja Puskesmas Ambacang," *Jurnal Hilirisasi Ipteks* (2018).

[26] Khairul Imam et al., "Pelatihan Penanganan Cidera Olahraga Akut Dengan Metode PRICE Pada Atlet Bulutangkis PB Metla Raya," *Dharma Bakti* 5, no. Februari 2022 (2022): 3–6.

[27] A M Utama Bandi, "Pembentukan Karakter Anak Melalui Aktivitas Bermain Dalam Pendidikan Jasmani," *Jurnal Pendidikan Jasmani Indonesia* 1, no. 1 (2011): 1–9.; Sunarno Basuki, "Pembentukan Karakter Melalui Modifikasi Permainan Dalam Pembelajaran Pendidikan Jasmani," *Multilateral Jurnal Pendidikan Jasmani Dan Olahraga* (2017); Didik Purwanto and Addriana Bulu Baan, "Pengaruh Aktivitas Pendidikan Jasmani Terhadap Keterampilan Motorik Kasar Anak Usia Dini," *Jurnal Obsesi Jurnal Pendidikan Anak Usia Dini* (2022); I Komang Ngurah Wiyasa, "Peningkatan Hasil Belajar Pendidikan Jasmani Melalui Model Kontekstual Berbasis Karakter," *Jurnal Pendidikan Jasmani Indonesia* (2021).

[28] Indah Aprilia, Julianus Hutabarat, and Sony Haryanto, "Analisis Risiko Kesehatan Dan Keselamatan Kerja (K3) Berbasis Ergonomi Pada Pekerja Pemasangan Atap Bangunan Di CV. Bejo Abadi Kabupaten Pasuruan," *Jurnal Valtech* 5, no. 2 (2022): 95–105.

in such activities can lead to bodily discomfort, particularly in the muscles. Ergonomics can be described as the science, art, and application of technology to achieve harmony or balance between all facilities and human capabilities and limitations, both physically and mentally. The implementation of ergonomics in the field of employment is expected to reduce workplace accidents, thus enhancing labor productivity and improving the quality of life for workers. In the guidance session on ergonomic work positions, the team recommended several favorable positions for working.[29]

Firstly, when lifting the fish-catching gear onto the boat, it is advisable to have two individuals assisting in pulling it onto the boat, with one person providing support from below. The fisherman pulling the fishing gear should have one foot forward and the other foot serving as a pivot, ensuring a stable stance.

Secondly, when transferring fish into Styrofoam, it is recommended not to bend over but to squat or sit upright.

From the results of the guidance and assistance provided over the course of two weeks, there was a reduction in pain and an improvement in ergonomic practices during work. The increase in working hours for fishermen was evaluated using the REBA measurement and post-activity questionnaire. The results showed that nine subjects had REBA scores that could be ignored, and 11 subjects had low scores, as depicted in Table 4, Figure 7, and Figure 8. Moreover, several fishermen have started working regular hours, i.e., 7 hours per day, resulting in a positive impact on the economic income of the Bahuluang community.

Table 5. Community Outreach in the Village of Bahuluang

The existing conditions provide an opportunity to enhance training related to ergonomics in the workplace, initial response to injuries, and appropriate stretching to reduce the potential for injuries. In addition to being a form of correct intervention in the event of an injury and alleviating associated complaints, such training and education will also positively impact the income of the fishermen in the village of Bahuluang. This is due to reduced injury risks, decreased musculoskeletal complaints, and improved

[29] Engka, Sumampouw, and Kaunang, "Postur Kerja Dan Keluhan Muskuloskeletal Pada Nelayan Di Desa Borgo Satu Kecamatan Belang."

occupational safety, allowing fishermen to work a standard 7-hour day for 6 days a week.

Conclusion

The musculoskeletal issues experienced by the community of Bahuluang Village, Kepulauan Selayar, South Sulawesi, who earn a living as fishermen, with complaints of back pain, are caused by one of the triggers, namely the lack of ergonomics during work, with a moderate-level category value of 7 subjects, high-level 6 subjects, and very high-risk 6 subjects. In the interview results, all subjects experienced lumbar problems, and the team conducted specific examinations, resulting in a diagnosis of Physiotherapy Lumbar Type 1 in 10 subjects, Lumbar Type 2 in 5 subjects, Lumbar Type 3 in 2 subjects, and Sups. HNP (Hernia Nucleus Pulposus) in 3 subjects, based on these findings, the team provided interventions tailored to the reported issues. The team also conducted education on proper ergonomic positions during work, pre-work stretching, and initial injury management using the PRICE method. Over the two weeks of community service carried out by the team, the final evaluation on May 28, 2023, involved measuring REBA, as well as assessing perceived complaints through interviews and specific examinations. The results indicated a reduction in musculoskeletal complaints among fishermen, and their working positions were becoming ergonomic, with a REBA category value of 9 subjects considered negligible and 11 subjects with low values. Additionally, several fishermen had started working regular hours, namely 7 hours a day for 6 days, resulting in a positive impact on the economic income of the Bahuluang community.

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