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Effect of Core Stability Exercise on Lower Back Pain of Fish Boilers In Sentra of Kusamba's Boiling Place

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ABSTRACT

Low back pain (LBP) is pain felt in the lower back area, it can be local pain or racular pain or both. Core stability is a very important exercise to maintain stability and blood balance in the spine to the pelvic bone, core stability is effective in improving the ability to maintain position and movement from the trunk to the pelvis which is useful for moving, controlling pressure and movement during activities. This study aims to determine the effect of core stability exercise on lower back pain in fish workers at Sentra of Kusamba's Boiling Place. This type of research is a pre-experimental with a pre-post test one group design, the test used Wilcoxon signed rank test with a Bourbonnis pain scale observation sheet research instrument. The sample in this study was 67 respondents with a non-probability sampling technique with inclusion criteria, namely laborers/workers at Kusamba's Boiling Place aged 20-75 with mild to moderate pain, willing to be respondents, and willing to follow the exercises given. The results of the study showed that the average pre-test pain intensity was 5,39, after being given core stability exercise treatment, the average pain intensity was 2,60. The results of data analysis using the Wilcoxon signed rank test obtained a value of (0.001) or p <α (0.05). There is an influence between core stability exercise and lower back pain in Sentra of Kusamba's Boiling Place.

Keyword: Core Stability, worker, Laborer, Lower Back Pain, Fish Workers

ABSTRAK

Nyeri punggung bawah (NPB) adalah nyeri yang dirasakan didaerah punggung bawah, dapat merupakan nyeri lokal atau nyeri rakuler atau keduanya. Core stability adalah suatu latihan yang sangat penting untuk menjaga kestabilan maupun keseimbangan darah pada tulang belakang sampai ke tulang panggul, core stability efektif untuk meningkatkan kemampuan untuk menjaga posisi dan gerak dari trunk sampai pelvic yang berguna untuk berpindah, mengontrol tekanan dan gerakan saat aktivitas. Penelitian ini bertujuan untuk mengetahui pengaruh core stability exercise terhadap nyeri punggung bawah pemindang ikan di Sentra Pemindangan Kusamba. Jenis penelitian ini adalah pra eksperimen dengan rancangan pre-post test one group design, uji yang digunakan adalah wilcoxon signed rank test dengan instrument penelitian lembar observasi skala nyeri bourbonnis. Sampel dalam penelitian ini adalah 67 responden dengan tehnik non probability sampling dengan kriteria inklusi yaitu buruh/pekerja di Sentra Pemindangan Kusamba yang berusia 20-75 dengan nyeri ringan sampai nyeri sedang, bersedia menjadi responden, serta bersedia mengikuti latihan yang diberikan. Hasil penelitian menunjukkan rata-rata intensitas nyeri pre test adalah 5,39, setelah diberikan perlakuan core stability exercise diperoleh rata-rata intensitas nyeri menjadi 2,60. Hasil analisa data dengan uji wilcoxon signed rank test dapatkan nilai (0,001) atau p<α (0,05). Terdapat pengaruh antara core stability exercise terhadap nyeri punggung bawah di Sentra Pemindangan Kusamba.

Kata Kunci: *Core Stability, Pekerja, Buruh, Nyeri Punggung Bawah, Pemindang Ikan*

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Introduction:

Pain is an unpleasant sensory and emotional experience resulting from subjective tissue damage. Sensory complaints expressed as aches, pain, aches, and so on can be considered pain modalities (Wati et al., 2022). Study of Emril, A study under the supervision of the World Health Organization (WHO) stated that people in developing countries and developed countries suffer continuous pain with a ratio of between 5,3% and 33% (Jamal et al., 2022). In jobs that require prolonged sitting and incorrect positions can cause the muscles in the back to become tense, this can have consequences damage to surrounding soft tissue. If the situation continues, it will cause Pressure on the spinal cord can result in a hernia of the nucleus pulposu. NBP is a pain syndrome that occurs in the lower back region which is the result of various causes and disorders, this pain is often found in workplace, especially in jobs with incorrect body position activities.

Painful Lower Back (LBP) is pain in the back area between the lower costal corners (ribs) to lumbosacral (around the tailbone) (Noli et al., 2021). Indonesia is a country where workers come from various groups of workers, there are workers who require a lot of physical effort and there are also those who don't. Jobs that require strong and large physical strength are manual workers such as coolies, laborers and so on. These workers are more likely to suffer from pain disorders in their bodies. Fish fishers are often said to be laborers because in their work physical energy is the main capital.

Fish preservation is an effort to preserve and process fish using salting and smoking techniques. This processing is carried out by boiling or by heating the fish in a salted atmosphere for a certain time in a container. The fisher himself is the person who works in the fish preservation effort. In carrying out their work, workers are often required to sit bent over and lift objects, which can cause back pain, especially pain in the lower back. An unergonomic sitting position is a position bent forward with a back posture that is not straight when sitting, which can put pressure on the back, resulting in pain (Nur et al., 2024).

Based on data from the World Health Organization (WHO), lower back pain can occur at any age and is generally between the ages of 25-64 years, with peak prevalence at the age of 35-55 years with the prevalence occurring more often in women than men. Research by the Community of Rheumatic Diseases (COPORD) in Indonesia found that the prevalence of back pain was 13,6% in women and 18.2% in men. Total pain prevalence The whole thing has never been studied in Indonesia, but it is estimated that cancer pain is experienced by Around 12.7 million people account for around 5% of Indonesia's population, the incidence of rheumatic pain in Indonesia it reaches 23,6-31,3%, while low back pain (LBP) is as much as 40% population with a prevalence of 18,2% in men and 13,6% in women (Setyaningsih et al., 2022).

Lower back pain or low back pain is a musculoskeletal disorder resulting from injury or muscle tension, nor it could also be caused by conditions more specifically, such as a herniated disc (Arwinno, 2018).

Some back pain is caused by things that are not serious and can be treated by moving actively, but in some cases it can be very excruciating and really interfere with daily activities, whether activities or work. For people with low economic conditions and workers who rely on physical energy, this will certainly be very disturbing and hindering, considering that they have to pay for treatment, whether alternative or other medicines.To treat back pain itself, apart from medication, doing movements or exercises can relieve the symptoms of back pain, of course this will not cost money (Simanjuntak et al., 2020).

Based on a person's experience of pain, pain is often described as an annoying condition that often feels dominant in a certain part of the body, which is described as prickling, burning, twisting, like emotions, feelings of fear, nausea and drunkenness (Agustina & Khie Khiong, 2023). In its management, you must first know the type of pain, namely pain with mild symptoms and severe symptoms because each type of pain will have different management, pain can be treated with medication and conservative

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therapy. In pain management, some patients respond to conservative therapy. One way to treat mild pain is by doing physical exercises to strengthen the erector trum and abdominis muscles, and providing exercise by physiotherapy is one of the pain treatments that can be done (Liza et al., 2023).

Core Stability Exercise is a form of exercise that is effective in reducing back pain for workers who predominantly use physical strength. Core Stability Exercise is an exercise to stabilize the spine in the pelvis in a complex manner and also stabilize the shoulders. One of the therapeutic modalities in an effort to treat low back pain (NPB) is Core Stability. Core Stability Exercise was created by Mark Lorentz, this exercise is a form of proximal stabilizing exercise to enable mobility on the distal side, in other words core muscle training maintains trunk stability when the body performs functional movements (Emilia Kodir, L. S. Angliadi & SMF, 2018)

Methods:

This research was carried out Pre Experimental with a One Group Pre-test Post-test design, a pre-test will be carried out first before being given treatment, after that treatment will be given and finally a post-test will be carried out. This design does not have a comparison group (control), but the first observation (pretest) has been carried out which will make it possible to measure the changes that occur after the experiment is carried out (Barlia & Putro, 2022). Research ethical principles as a form of sense of responsibility towards efforts to recognize and defend human rights as part of research. Researchers in carrying out research aspects have paid attention to Komisi Etik Penelitian Kesehatan (KEPK) Sekolah Tinggi Ilmu Kesehatan Buleleng and the research proposal has been declared to have passed ethical review with ethical approval. No. 872/EC-KEPK-SB/I/2025. The inclusion criteria required are workers/laborers at the Kusamba's Boiling Place with aged 20-75 years who experience mild to moderate pain, are willing to be respondents, respondents do not consume pain relievers for four hours before exercise, respondents are willing to follow the exercises given. The exclusion criteria are uncooperative workers, workers who experience very severe pain (scale: 10) and those who experience fractures. Respondents will be dropped out if they are not willing to take part in the study until the specified time. Determination of the sample using the Slovin formula:

$$n = \frac{N}{1 + N.e^2}$$

$$n = \frac{80}{1 + 80\ (0,05)^2} = \frac{80}{1 + 80\ (0.0025)} = \frac{80}{1 + 0,1}$$

$$n = \frac{80}{1.2} = 67$$

Based on the results of the Slovin formula calculation, the sample that must be fulfilled is 67 workers/spinners who suffer from lower back pain at the Kusamba Central Pinning. The instrument used to measure pain before and after the intervention is the Bourbonnais pain scale with a pain scale category (0-10).

Results:

Table 1. Respondent Characteristics Based on Age Group

Variable	N	Mean	Min	Max	SD	95%CI
Age	67	40,52	30	51	4,095	39,52-31,52

The results of the univariate analysis of respondent characteristics in table 1 found that the average age of respondents was 40,52. The highest age was 51 years and the lowest age of respondents was 30 years with a standard deviation of 4,1.

Table 2. Respondent Characteristics Based on Length of Work

length of work	frequency	Presentase (%)
New	15	24,4
Intermediate	31	46,3
Old	21	31,3
Total	67	100,0

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Based on table 2, it can be concluded that the number of workers experiencing lower back pain is highest among middle-level workers, 31 people with a percentage of 46,3%, and the least among new workers, 15 people with a percentage of 24,4%.

Table 3. Pre Test Univariat (Before *Core Stability Exercise*)

	N	Mean	Min	Max	SD	95% CI
Pre test	67	5,39	2	7	1,029	5,14-5,64

Based on table 3, it shows that the average low back pain score before being given core stability therapy from 67 workers was 5,30 (95% 5,14-5,64), with a standard deviation of 1.029, the highest low back pain score was 7 and the lowest was 2. From the interval estimation it was concluded that it was 95% believed that the average level of lower back pain for workers in kusamba's boiling place was 5,14-5,64.

Table 4. Post test Univariat (After *Core Stability Exercise*)

	N	Mean	Min	Max	SD	95% CI
Post test	67	2,52	1	5	1,050	2,27-2,78

A Based on table 4, it shows that the average low back pain score after being given core stability therapy from 67 workers was 2,52 (95% 2,27-2,78), with a standard deviation of 1,050, the highest low back pain score was 5 and the lowest was 1. From the estimate interval concluded that it is 95% believed that the average level of lower back pain for fish fishers in central of kusamba's boiling place is 2.74-2,78.

Table 5. Analysis of the Effect of Core Stability Exercise Therapy on Lower Back Pain.

Core Stability Exercise	**Mean ±SD**	***P Value***	**95%CI**	
			Lower	Upper
Pre test	5,39±1,2	<0,001	2,672	3,060
Post test	2,52±1,1			

Table 5 above shows that the average pain scale before therapy was 5,39 and after therapy was 2,52, this shows that the average pain scale before and after therapy was different. The results of this test carried out using the Paired t-test show that sig. (2-talled) or p value (<0,001) and 95% CI value (2,672-3,060). Because the p value is smaller than 0,05 ($p<\alpha$) the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted. So it can be concluded that there is an effect of providing core stability exercise therapy on lower back pain for fish workers in Sentra of kusamba's boiling place.

Discussion :

Based on the results of Table 1, the age of respondents who are included in the early elderly or are classified as elderly will more often experience lower back pain while working. This is due to the increasing age and followed by doing heavy work. Everyone must experience a degenerative process due to the increasing age factor. The degenerative processes that occur include muscle shrinkage, subcutaneous fat shrinkage, and mineral shrinkage in bones. This mineral shrinkage in bones will cause bones to become brittle and at risk of fractures and bone injuries (Eviyani, 2018). Age has an effect on the decrease in a person's pain intensity. The older a person is, the more it will have an impact on the decrease in flexibility and muscle strength due to poor blood circulation due to poor blood vessel elasticity (Amrulloh, *et all*, 2017).

This study is supported by previous research conducted by on "The Effect of Core Stability Exercise and Mckenzie Exercise on Increasing Functional Activity in Tailors with Myogenic Lower Back Pain (LBP) Complaints in Tambong Village, Klaten Regency" with the results of 37 samples, the average age of those experiencing Lower Back Pain was 37,50 with a P value of 0,016 (sig> 0,05).

Based on table 2, it can be concluded that the number of employees experiencing lower back pain is highest among middle-level employees, 31 people with a percentage of 46,3%, and the least among new employees, 15 people with a percentage of 24,4%.

Adaptation is important in every job. Adaptation is needed so that workers can adjust to their work and work environment, just like fish workers who need to adapt. New or middle

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workers will tend to experience more back pain due to the adjustment process and are not yet accustomed to the work being done, but old workers also do not rule out the possibility of experiencing more serious pain because they experience pain for a long period of time. This can even result in changes in body posture in workers pekerja (Utomo, 2015).

Lower back pain (LBP) is a very common world health problem, which causes activity restrictions and also absence from work. Lower back pain does not cause death, but it causes individuals who experience it to become unproductive, which will cause a huge economic burden for individuals, families, communities and the government (Eviyani, 2018). Some conditions that may be triggering factors include work that requires excessive force or repetition of movements which can cause muscle and nerve injuries, awkward or unsupportive positions that cause excessive stretching, static positions or positions where the worker must be still or not move for a long time. time, activities like bending, sitting, lifting, and inadequate recovery time due to overtime and lack of rest (Aseng & Sekeon, 2021).

This statement is also supported by previous research by (Saputra et al., 2017), with the title "The Relationship Between Age, Years of Work and Length of Work on Complaints of Lower Back Pain in Loading and Unloading Workers at Manado Port" with the results of the analysis of each independent variable with complaints of lower back pain, namely age obtained P-values of 0,015 and r = 0,312, length of work P-values of 0,000 and r = 0,441, and length of work P-values of 0,580 and r = 0,073. Based on the research results, it was concluded that there was a relationship between age and years of work and complaints of lower back pain.

Based on the results of research at Sentra of Kusamba Boiling place, it was found that the majority of workers do not know how to treat back pain. When they feel back pain, they say they just sit and rest or drink water. Apart from that, they will also lie down their bodies in a place that they think is comfortable, and if the pain is still felt they will insist on continuing their work while holding it back so they can go home quickly and sleep at home quickly. This can mean that people who experience such pain really need sufficient time to recover their physical condition. For this reason, an idea emerged about how to minimize the pain experienced by the patient by using core stability exercises.

After core stability exercise was carried out for 2 weeks with a total of 6 meetings with respondents who fish fishers in Sentra of Kusamba Boiling place who experienced back pain, then a re-assessment of the level of pain felt was carried out using the Bourbonnais pain scale observation sheet. The results obtained showed a decrease in pain experienced by respondents, namely 67 people. The average (mean) back pain score for fish fishers in Sentra of Kusamba Boiling place after the intervention was given was 2.52 with a standard deviation of 1,050. The results of the study showed a decrease in the intensity of lower back pain. Respondents who experienced a decrease in pain intensity were because the respondents were very cooperative and serious in carrying out core stability exercises according to directions.

Previous research also obtained results with a value of sig.<α research conducted by (Hlaing et al., 2021) The CSE group demonstrated signifcantly more improvement than the STE group after 4 weeks of intervention. Improvements were in: proprioception [mean diference (95% CI): −0,295 (−0,37 to −0,2), efect size: 1,38, (p< 0,001), balance: single leg standing with eyes open and eyes closed on both stable and unstable surfaces (p< 0,05), and percentage change of muscle thickness of TrA and LM (p< 0,01). Although both exercise groups gained relief from pain, the CSE group demonstrated greater reduction of functional disability [efect size: 0,61, (p< 0,05)] and fear of movement [efect size: 0,80, (p<0,01)]. There were no signifcant adverse efects in either type of exercise program.

The results of the bivariate data analysis test using the Paired t-test showed that the average pain scale before therapy was given was 5,39 and after therapy was 2,52 with a p value (<0.001) and a 95% CI value (2,672-3,060), This shows that the average pain scale before and after therapy is different and means that there is an

influence of core stability exercise therapy on lower back pain.

Looking at the effect of core stability exercise on fish fishers' lower back pain in central of kusamba's boiling place by comparing the average (mean) results of back pain before being given the core stability exercise intervention, which was 5,39 and after being given the core stability exercise intervention, it was 2,52. This research proves the influence of core stability exercise on lower back pain of fish fishers in central of kusamba's boiling place.

Previous research that supports this is research by (Karima & Pertiwi, 2024) the difference between pre-test and post-test was obtained using the paired samples t-test showed a result of p=0,000 with the conclusion that core stability exercise had an effecton increasing functional ability in non-specific low back pain. This is also supported by research (Rahmawati, 2017) with the title "The Effect of Core Stability on Reducing Back Pain Due to Static Sitting at SMP N 3 Pakem" with the results after being carried out for 2 weeks with a frequency of 3 times a week, the hypothesis test results obtained were p = 0,007 (p < 0,05).

Treatment or actions to reduce pain can be done with pharmacological and non-pharmacological therapy. Non-pharmacological therapy is of course recommended first because there will be no effects if it is carried out according to the standards determined by the therapy. One non-pharmacological therapy is by providing physical exercises such as core stability exercises.

Core stability exercise works to improve postural stability with motor control exercises, namely co-contraction of the transversus abdominus and multifidus muscles. With the stabilizing effect the contraction can be compared to activating the deep muscle corset to support the vertebral segments which will improve posture, thereby reducing pressure on the discs intervertebralis which reduces pain (Khusnun et al. n.d.).

Conclusions:

Core stability is an exercise to maintain stability and balance in the spine to the pelvis, core stability is effective in improving the ability to maintain position and movement from the trunk to the pelvis which is useful for moving, controlling pressure and movement during activity. Core stability exercise works to improve postural stability with motor control exercises, transversus abdominus muscle and multifidus muscle, with the stabilization effect of contractions can be equated to activating deep muscle corsets to support vertebral segments that will improve posture, so that it will reduce pressure on the intervertebral discs which reduce pain.

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