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Research Article

Analysis of Risk Factors for *Low Back Pain* in Labor Fishermen in Namosain Village, Kupang City

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Abstract: *Background: Low Back Pain* is a symptom and not a diagnosis. Some cases of symptoms conform to the pathological diagnosis with great accuracy, but in most cases, the diagnosis is uncertain and long-lasting. Developed countries such as the United States, the prevalence of LBP in one year ranges from 15% -20%. Meanwhile, in Indonesia, based on data from the Ministry of Health's research in 2006 regarding diseases and accidents that occur in traditional fishermen and divers, it is stated that a number of fishermen on Bungin Island, West Nusa Tenggara suffer from joint pain (57.5 percent) and mild hearing loss to deafness (11.3 percent). The research objective was to analyze the risk factors for *low back pain* in labor fishermen in Namosain Village, Kupang City. *Methods:* This type of research is an analytical survey research with adesign *cross sectional* which was conducted in the Namosain Village, Kupang City. The study population was 267 fishermen. The selected sample was 73 fishermen with *accidental sampling*. Data were collected through questionnaires and observation sheets and then analyzed using *Fisher's exact* test and multiple logistic regression tests. *Conclusion:* The variables of vibration, work period, work load and work attitude have an influence on the incidence of low back pain in labor fishermen in the namosain village, Kupang city.

Keywords: *Low back pain*, vibration, tenure, workload, work attitude and labor fishermen.

INTRODUCTION

Low Back Pain (LBP) is a symptom and not a diagnosis. In some cases the symptoms match the pathological diagnosis with high accuracy, but in most cases, the diagnosis is uncertain and lasts a long time [1].

Developed countries such as the United States, the prevalence of LBP in one year ranges from 15% - 20%, while based on patient visits to the doctor is 14.3% [2]. In one year there are more than 500,000 cases of lower back pain and within 5 years the incidence increases by 59%. The prevalence per year reaches 15 - 45% with a prevalence point of 30%. As many as 80-90% of cases of LBP will heal on their own within 2 weeks. Of the 500,000 cases, 85% of sufferers are aged 18-56 years [3].

Low back pain usually occurs in jobs related to muscle use such as fishing. According to Kusnadi [4] in Sirajudin [5], fishing is a job to catch fish in the sea that is carried out by someone. Work as a fisherman includes menial jobs that rely a lot on muscles, so there is a risk of low back pain. The statement above is in accordance with Riskesdas [6] which states that the

prevalence of joint disease based on work, namely fishermen, is 7.40%. This is also supported by the research of Ila Rocha Falcão, *et al.* [7] which states that a high prevalence rate of MSD (*musculoskeletal disorders*) is found in shellfish fishermen in Saubara, Bahia, Brazil. This is also in accordance with data from the Ministry of Health's research results in 2006 regarding diseases and accidents that occur in traditional fishermen and divers, which states that a number of fishermen on Bungin Island, West Nusa Tenggara suffer from joint pain (57.5 percent) and mild hearing loss to deafness. (11.3 percent).

The city of Kupang itself is a coastal area that has huge marine fishery potential for fishermen. This is in accordance with the 2014 BPS data for Kupang City which describes the total number of fishermen as many as 3201 people, 1064 full-time fishermen and 856 additional side fishermen. Based on this, fishermen with a large number of them are susceptible to disease due to occupational accidents, especially when fishermen rely more on muscle strength, so that diseases of the muscle system and connective tissue are very likely to occur. It is also in accordance with thedata city's health profilekupang in 2012 which showed diseases of the muscular system and jaringan binder included in the

order of 4 of the 10 most prevalent diseases that occur in the city of Kupang.

Based on thedata *low back pain* above, the researchers conducted an initial survey of fishermen in Kelurahan Namosain Kota Kupang is due to the fact that this kelurahan is a coastal area so that it has a fairly large number of fishermen, besides that there are also large fishing boats in the area. Based on this also, the researcher interviewed 10 fishermen in the area and got it. The results were 6 out of 10 fishermen stated that feeling low back pain was related to his job. On the basis of the results of this initial interview and the data

above, the researchers are interested in taking the title of "Analysis of Risk Factors forGenesis *Low Back Pain* AtFishermen Village Namosain Labor in Kupang City".

RESEARCH METHODS

Type of research is an analytical survey research with adesign *cross sectional* conducted in Namosain Village, Kupang City. The population of this study was labor fishermen in the Namosain Village, Kupang City, with a total of 267 fishermen. While the sample of this study was 73 fishermen.

RESULTS

Table-1: Frequency distribution based on *low back pain*, work other than fishermen, age, years of work, body mass index, length of work, smoking habits, work attitude, workload and vibration

Variable	Frequency (n)	Percentage (%)
Low back pain		
Experiencing LBP	62	84,9
Not experiencing LBP	11	15,1
Occupations other than fishermen		
There are	17	23
None	56	76,7
Age		
$\geq$ 35 years	43	58,9
< age 35 years	30	41,1
Work period		
$\geq$ work 5 years	52	71,2
< work 5 years	21	28,8
Body max index		
Thin	29	39,7
Normal	40	54,8
Fat	4	5,5
Length of work		
> 8 hours	68	54,8
$\leq$ 8 hours	5	5,5
Smoking habits		
Heavy smokers	3	4,1
Moderate smokers	43	58,9
Light smokers	27	37,0
Work attitude		
High risk	49	67,1
Medium risk	20	27,4
Low risk	4	5,5
Workload		
Heavy workload	4	5,5
Medium workload	38	52,1
Light workload	31	42,5
Vibration		
> 0.5 m / s^2	50	68,5
$\leq$ 0.5 m/s^2	23	31,5

Based on Table 1. Shows the respondent data 73 Most of the fishermen who experienced *low back pain were* 62 people (84.9%) with no other job apart from being fishermen as many as 56 people (76.7%).

Based on age, the majority of fishermen aged $\geq$ 35 years were 43 people (58.9%) with 40 respondents (54.8%) with normal bodies. While the most smoking

habit was moderate smokers by smoking 10-20 cigarettes per day as many as 43 people (58.9%).

Based on the working period, the most fishermen work ≥ 5 years as many as 52 people (71.2%) with a length of work > 8 hours as many as 68 people (93.2%). While the workload factor, the majority of fishermen with a moderate workload were 38 people (52.1%).

Based on work attitudes, the most respondents with high-risk work attitudes LBP were 49 people (67.1%) and the most respondents received vibrations throughout the body > 0.5 m / sec^2 as many as 50 people (68.5%).

Table-2: Cross tabulation between the incidence of *low back pain* with age, years of work, bodyindex, length of work, smoking habits, work attitudes, workload and vibration

	Low back pain		
Independent variables	**Yes**	**No**	**P**
Age			
≥ age 35 years	37	6	0,752
< age 35 years	25	5	
Body mas index			
Skinny	25	4	1,000
Normal + fat	37	7	
Length of work			
> 8 hours	57	11	1,000
≤ 8 hours	5	0	
Smoking habits			
Heavy smokers + moderate	38	8	0,736
Light	24	3	
Work attitude			
High risk work attitude	45	4	0,033
Medium + low risk work attitude	17	7	
Workload			
Heavy workload + moderate	39	3	0,045
Light workload + light	23	8	
Vibration			
> 0.5 m / s^2	46	4	0,029
≤ 0.5 m/ s^2	16	7	

Based on table 2. Shows that the variable working period (p = 0.027), work attitude (p = 0.033), work load (p = 0.045) and vibration (p = 0.029) have a significant relationship to the incidence of low back pain in labor fishermen in Namosain Village, Kupang City. This is indicated by a p value < 0.05.

Table-3: Cross tabulation betweenincidents *low back pain* with work attitude, workload and vibration

			95% CI for EXP (B)	
Variable	Sig.	Exp (B)	Lower	Upper
Work attitude	0,015	7,675	1,477	39,871
Workload	0,038	5,701	1,097	29,617
Vibration	0,013	7,925	1,538	40,825
Constant	0,138	0,282		

Based on table 3. The vibration factor has the smallest p value, namely p = 0.013, which means that the vibration factor has the greatest influence compared to other factors. While the value of Exp (B) = 7,925, which means that labor fishermen who are exposed to vibrations *whole body* > 0.5 m / sec^2 have a tendency to be 7,925 times more likely to be exposed to *low back pain* than those who are not affected by vibrations *whole body*.

DISCUSSION

A. The relationship of age to the incidence of *low back pain*

Age as a characteristic characteristic of people in epidemiological studies is an important variable because there are quite a number of diseases found with various frequency variations due to Noor's age, [8] in Widjaya *et al.*, [9]. This is in line with the conclusion obtained by Pratiwi *et al.*, [2] in Zelin, that the increasing age of a person will be accompanied by a decrease in physical capacity and functional ability. One symptom of the aging process is bone

degeneration, which can increase the risk of low back pain. This happens when a person is aged 40 years and over, so that his work ability decreases.

Based on research conducted by researchers on 73 fishermen, the results of bivariate analysis using the *fisher exact test* in the form of p value = 0.752 which indicates that there is no relationship between age risk factors and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City. The results of this study are also in accordance with the results of Karisma's study, 2017 which states that there is no significant relationship between age and the incidence of *low back pain* in fishermen.

Based on the field survey, it shows that most fishermen aged ≥ 35 years have an athletic body, which means that the body frame as a giver of body shape has good bone density. This is in line with the statement of Purnamasari, 2011 that the process of bone density formation is strongly influenced by the hormone estrogen in women and the hormone testosterone in men. This statement shows that even though age has continued, in men the susceptibility to *low back pain* due to reduced bone density is rather difficult because the production of the hormone testosterone is always there, while in women the risk of LBP is higher due to menopause which means that the production of the hormone estrogen stops.

B. Relationship between body mass index and *low back pain*

Body mass index is a simple tool to monitor the nutritional status of adults, especially in relation to underweight and overweight, so maintaining a normal weight can prevent a person from various diseases.

In the bivariate analysis using the Fisher Exact Test on 73 fishermen, it shows that there is no relationship between the risk factors for bodyindex and the incidence of *low back pain* massin labor fishermen in Namosain Village, Kupang City. This is also supported by Andrusaitis *et al.* [10] which states that there is no relationship between height, weight and body mass index on the incidence of low back pain. Another study by Samara *et al.*, [4] also reported that there was no significant relationship between Body Mass Index and the incidence of Lower Back Pain.

Based on field observations, it shows that both normal and abnormal body weight still experience LBP. This observational data contradicts the theory in Hadyan's study, 2017 which states that people with increased BMI cause additional weight on the spine so that there will be an increase in compression pressure so that the risk of tearing in the spinal structure can increase. This means that people with no increase in BMI will not put additional weight on the spine so they are not at risk of LBP. However, this study is in accordance with Munir's research, 2012 which explains

that along with the increase in BMI, the perceived strength that a person produces at work will also be greater. People who have bigger bodies tend to be able to lift heavier items. If this is done in the correct position, there will be no over-stretching of the muscles, so that there is no LBP.

C. Relationship of tenure toevents *low back pain*

The working period is the accumulation of a person's work activities carried out in a long period of time, which if these activities are carried out continuously over a period of years it can cause health problems. Physical stress over a period of time results in reduced muscle performance, with symptoms of reduced movement. The stresses will accumulate every day over a long period, resulting in deterioration of health which is also known as clinical or chronic fatigue.

Based on the results of the bivariate analysis, the results are p = 0.027. This means that there is a relationship between the risk factor of workingand the incidence of *low back pain* tenurein labor fishermen in Namosain Village, Kupang City. This is in accordance with the research by Fatoni & Swasti [2] who tested the correlation between work tenure and complaints of low back pain. From the results of the correlation test, it was found that the value of p = 0.018 because p <0.05 so that in this study the factor of the respondents' tenure had a relationship with complaints of low back pain. This research is also in accordance with the theory put forward by Hasyim in Tarwaka [6] which states that the working period causes a continuous static load if workers do not pay attention to ergonomic factors, it will be easier to cause complaints of low back pain.

D. Therelationship between the length of work and the occurrence of *low back pain*

The optimal length of time a person works in a day is generally between 6 - 8 hours. Extending working time beyond this capacity usually results in a decrease in productivity related to conditions of fatigue, work accidents and occupational diseases. This is in accordance with Suma'mur [11] where the longer the working time, the more likely unwanted things will occur.

However, in the tests carried out, the researcher got different results from Suma'mur's [11] statement, namely that there was no relationship between risk factors for length of work and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City, this is indicated by the value of p = 1,000. The results of this study are also in accordance with Wahab's research [12] which states that there is no significant relationship between length of work and *low back pain* in fishermen in Batu Karas village. Based on field observations, the majority of fishermen go to sea from the afternoon and return home in the morning so that the time spent working exceeds 8

hours of work. However, during the sea from late afternoon to early morning, not all heavy work activities are continuous, such as throwing and trawling, but there are also rest periods so that the length of time working at sea does not really affect lower back pain in fishermen.

E. The relationship between smoking andevents *low back pain*

Smoking habits can cause back pain because smokers have a tendency to experience problems with blood circulation, including to the spine [13]. This is in accordance with the research conducted by Soleha [14] which found that there was a significant relationship between smoking habits and complaints of the lumbago, especially for jobs that require muscle mobilization, because nicotine in cigarettes can cause reduced blood flow to the tissues.

However, the results showed that there was no relationship between the risk factors for smoking and the incidence of *low back pain* among labor fishermen in the Namosain Village, Kupang City. The results of this study are in line with previous research conducted by Kartana [15] who found that there was no relationship between smoking habits and complaints of *low back pain which was* marked with a value of p = 0.734.

F. The relationship of work attitudes toevents *low back pain*

Work attitude is a supporting factor for back pain. Theoretically, it is found that the position of the body and work attitude that is not correct or exceeds the ability to be one of the causes of back pain [11].

Based on the results of the study, it was found that the relationship between risk factors for work attitudes and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City. The results of this study are also in line with research by Anisa which states that there is a relationship between work position and *low back pain* in fishermen in Kedung Cowek Village. This, too, is in accordance with the statement of Bridger, 1995 in Astuti, 2007 which states that wrong, awkward, and unusual work attitudes will increase the risk of injury to the musculoskeletal system.

G. Relationship of workload toevents *low back pain*

According to the Health Law No.36 of 2009, it states that workload is the product of the amount of work and time and amount of work that must be borne by a position / organizational unit. Every worker can work without endangering himself and the community around him, so it is necessary to make harmony between workload, work capacity and work environment to obtain optimal work productivity.

Based on the results of the bivariate analysis of the workload on 73 fishermen, it was found that the relationship between workload risk factors and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City. This is also supported by research by Beckhoff *et al.* 2016 which states that fishermen with moderate workloads experience an increase inpain scores by *musculoskeletal* 32% and fishermen with high workloads experience an increase inpain scores by *musculoskeletal* 60% compared to fishermen with low workloads.

H. Relationship of vibration toevents *low back pain*

Whole body vibration (WBV) is a general term used when the vibration (mechanical oscillation) of whatever frequency is transferred to the human body. Humans are exposed to vibrations through existing contact surfaces in a mechanical vibrating state. Humans are generally exposed to various forms of inner vibrations everyday life. This can be the driver's seat, a moving train platform, through tooling electricity, a training platform, or any of the countless other devices. This is a form potential occupational hazard, especially after years of exposure.

Based on the research results, it shows that the majority of fishermen are exposed to vibrations exceeding 0.5 meters per second squared so that they experience a greater risk of *low back pain*. These results are in accordance with the Regulation of the Minister of Manpower and Transmigration Number PER.13 / MEN / X / 2011 of 2011 concerning the threshold value of physical and chemical factors in the workplace, which states that the NAV of vibrations in direct or indirect contact with the whole body is set at 0, 5 meters per second squared (m / sec^2). This means that if the vibration exceeds 0.5 meters per second squared it will cause disturbances in the body. This Regulation of the Minister of Manpower and Transmigration is in line with Haikal's research which states that *whole body vibration* is the cause of *low back pain*.

CONCLUSION

a. There is no relationship between the age factor and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

b. There is no relationship between the bodyindex factors on the incidence of *low back pain* massin labor fishermen in Namosain Village, Kupang City.

c. There is a relationship between the factor of tenure and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

d. There is no relationship between the length of work and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

e. There is no relationship between the smoking habit factor and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

f. There is a relationship between work attitude factors and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

g. There is a relationship between the workload factor and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

h. There is a relationship between vibration factors and the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City.

i. There is a simultaneous influence of work tenure, work attitude, workload and vibration on the incidence of *low back pain* in labor fishermen in Namosain Village, Kupang City

REFERENCES

1. Wagiu, S. A. (2005). Pendekatan Diagnostik *Low Back Pain* (LBP). FK UI. Jakarta.
2. Fatoni, H., & Swasti, K. G. (2009). Hubungan Sikap dan Posisi Kerja dengan Low Back Pain pada Perawat di RSUD Purbalingga. *Jurnal Keperawatan Soedirman*, *4*(3), 131–139.
3. Atmantika, N. B. (2014). Hubungan Antara Intensitas Nyeri Dengan Keterbatasan Fungsional Aktivitas Sehari-Hari Pada Penderita Low Back Pain Di RSUD Dr. Moewardi Surakarta. Universitas Muhammadiyah Surakarta.
4. Samara, D., Sulistio, J., Rachmawati, M. R., & Harrianto, R. (2005). Sikap membungkuk dan memutar selama bekerja sebagai faktor risiko nyeri punggung bawah. Universa Medicina, *24*(3), 132–133.
5. Sirajudin, A. (2017). Hubungan Manual Material Handling Dan Faktor-Faktor Lain Dengan Kejadian *Low Back Pain* Kelurahan Kangkung Kecamatan Bumi Waras Bandar Lampung.
6. Tarwaka, S., & Sudiajeng, L. (2004). Ergonomi untuk keselamatan, kesehatan kerja dan produktivitas. Uniba, Surakarta, 34–50.
7. Falcão, I.R., Rego, R.C.F., Couto, M.C.B.M., Pena, P.G.L., Andrade, L.L., Muller, J.D.S., Viana, W.D.S., dan Lima, V.M.C. (2017). *Factors associated with musculoskeletal disorders in artisanal fisherwomen/shellfish gatherers in Saubara, Bahia, Brazil.* Cien Saude Colet, *24*(7). Retrieved-from- http://www.ncbi.nlm.nih.gov/pubmed/ 31340273
8. Noor, A. M., Moloney, G., Borle, M., Fegan, G. W., Shewchuk, T., & Snow, R. W. (2008). The use of mosquito nets and the prevalence of Plasmodium falciparum infection in rural South Central Somalia. *PloS one*, *3*(5), e2081.
9. Widjaya, M. P., Aswar, H., & Pala'langan, S. (2014). Faktor-faktor yang berhubungan dengan kejadian low back pain pada pekerja furniture. *Medula*, *1*(2).
10. Andrusaitis, S. F., Oliveira, R. P., & Barros Filho, T. E. P. (2006). Study of the prevalence and risk factors for low back pain in truck drivers in the state of São Paulo, Brazil. *Clinics*, *61*(6), 503-510.
11. Suma'mur, P. K. (2009). Higiene perusahaan dan kesehatan kerja (HIPERKES). *Jakarta: Sagung Seto*, 116-32.
12. Karisma. (2017). Epidemiologi Keluhan *Low Back Pain* Pada Kelompok Nelayan Tradisional Amertha Segara, Denpasar Tahun 2017. Universitas Udayana: Bali.
13. Septiawan, H. (2013). *Faktor yang berhubungan dengan keluhan nyeri punggung bawah pada pekerja bangunan di PT Mikroland Property Development Semarang Tahun 2012* (Doctoral dissertation, Universitas Negeri Semarang).
14. Soleha, M., Elvistra, H. L., Fitri, N., & Triyani, T. (2009). Patterns of Bacterial Resistance to Antimicrobials in Jakarta. *Proceeding Center for Biomedical and Pharmaceutical. Jakarta: Health Research Agency*.
15. Kartana, T. J. (2010). Kontribusi Faktor Determinasi Dan Upaya Peningkatan Kinerja Guru Teknik Mesin Sekolah Menengah Kejuruan. *Cakrawala: Jurnal Pendidikan*, *4*(8).

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