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Complaints of Low Back Pain among Seaweed Female Workers in Takalar District: A Mixed-Method Study

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Abstract

The purpose of this study is to know the factors that are associated with the incidence of low-back pain in female seaweed workers.The design of this study use combining quantitative and qualitative approaches (mixed-method). The samples were 103 female workers. The complaint of low back pain measured with Nordic Body Map (NBM) and REBA Questionnaire used to measure work postures. To test the association between variables, it used Chi-Square test. Qualitative Data obtain through Focus Group Discussion. The results of the relationship analysis show that the age of workers (0.000), BMI (0.004), working hours (0.000), workload (0.003), and work position (0.000).Worker age, BMI, working hours, workload, work position are associated with the incidence of low back pain in female seaweed workers in Takalar district.

Keywords: Female; Low-back Pain; Seaweed; Worker

1. Introduction

Occupational safety and health are organized to achieve optimal work productivity so that every worker can work without endangering himself and the surrounding community (WHO, 2006). Takalardistrict is one of the districts that is the center for the development of the seaweed industry in South Sulawesi. This area of land produces 474,346 tons of wet seaweed per year where most of the people who live in this coastal area work as seaweed workers(Banto, 2013).

As workers in the informal sector, seaweed workers only use traditional tools and work positions that do not meet ergonomic standards. Of course, this group of workers cannot be separated from the risk of occupational accidents and occupational diseases. Seaweed workers perform strenuous physical activities such as lifting weights, bowing, pushing, pulling, moving or rotating weights using their hands or other body parts. Most of these physical activities do not meet the Occupational health and safety rules and principles which cause ergonomic problems such as low back pain, musculoskeletal disorders and work fatigue. Low back pain due to manual material handling work, 50% of which is caused by lifting weights, 9% from pushing

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and pulling weights(Thamrin et al., 2018).One of the important findings of this study is that 88% of seaweed farmers experience complaints of low back pain and 94% of them do their jobs in an ergonomic work position (work posture)(Thamrin et al., 2019).

As well as qualitative research related to the promotion of occupational health and safety for ergonomic problems and work fatigue which is in the process of being resolved, it was found that the majority of seaweed farmers complained of increased low back pain symptoms, especially when they had returned home and rested at home.(Thamrin et al., 2019)Complaints in the form of stiffness in the waist for years, stiff waist, difficulty moving, and constant fatigue can cause physical disability.Wahyu et al (2019)26% of American adults reported LBP for at least one day of three months duration(Nurrahman, 2016).

In Indonesia, data shows that 25% of injuries suffered by workers are the result of mishandling of material handling.(Manurung, 2013)Meanwhile, the results of a study by the Ministry of Health of the Republic of Indonesia showed that 40.5% of workers had complaints of health problems that were suspected to be related to work, namely 16% of skeletal muscle diseases called back pain (Tatilu, 2014).So that in this study we want to know the factors that are associated with the incidence of low-back pain in female seaweed workers.

2. Methods

The design of this study use combining quantitative and qualitative approaches (mixed-method). The samples were 103 female workers taken from four districts, namely; Mangarabombang, Mappakasunggu, Sanrobone and North Galesong. A qualitative approach was done by Focus Group Discussion (FGD) and in-depth Interview. The FGD was conducted by presenting ten seaweed farmers from each of the selected villages in each sub-district. Thus there will be 4 FGD groups with a total of 40 participants. In-depth interviews are conducted by interviewing stakeholders.

The complaint of low back pain measured with Nordic Body Map (NBM) that showed which body part that hurt. Furthermore, a Rapid Entire Body Assessment (REBA) Questionnaire Sheet was used to measure work postures. To test the association between variables, this study performed Chi-Square test.

3. Results and Disscussion

Table 1 Demographics of Seaweed Female Workers

Variables	n	%
Age		
10-19	11	10.7
20-29	11	10.7
30-39	24	23.3
40-49	26	25.2

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50-59	21	20.4
>=60	10	9.7
Education		
Not completed in primary school	35	34.0
Graduated from elementary school	36	35.0
Graduated from junior high school	17	16.5
Graduated from high school	15	14.6
Years of Work (years)		
5	6	5.8
6	7	6.8
7	8	7.8
8	43	41.7
9	39	37.9
Low Back Pain Complaints		
Minor Complaints	20	19.4
Medium Complaints	83	80.6
Total	103	100.0

Source: Primary Data, 2020

Table 1 presents quarter of female workers were in the age group between 40 to 49 years old. Regarding educational status of female seaweed workers it shows 35% out of 103 female worker who graduated from elementary school. Female seaweed workers who don't graduated from elementary school were 34%. The majority of the female workers have been working as seaweed farmers for 8 years.

Table 2 The Relationship between Independent Variables and Complaints of Low Back Pain

Variable	Low Back Pain Complaints				Total		p-value
	Minor Complaints		Medium Complaints				
	n	%	n	%	n	%	
Worker Age							
Young Workers	22	88.0	3	12.0	25	100	***p*= 0,000**
Old Worker	7	0	71	91.0	78	100	
BMI							
Normal	21	41.2	30	58.8	51	100	***p*= 0.004**
Fat	8	15.4	44	84.6	52	100	
Working hours							
Appropriate	26	40.6	38	59.4	64	100	***p*= 0,000**

Not appropriate	3	7.7.	36	92.3	39	100	
Workload							
Light	25	53.2	22	46.8	47	100	***p*= 0.003**
Moderate	4	7.1	52	92.9	56	100	
Body posture							
Ergonomics	25	64.1	14	35.9	39	100	***p*= 0,000**
No Ergonomics	4	6.3	60	93.8	64	100	
Total	**20**		**83**		**103**	**100**	

Table 2 shows that there is a relationship between worker age and complaints of low back pain, with p value= 0.000. The analysis showed that there was a relationship between BMI and complaints of low back pain, with p value= 0.004. Then for the working hours variable, it shows that there is a relationship between length of work and complaints of low back pain with p value= 0.000. Workload with complaints of low back pain has a visible relationship, with p value= 0.003. Likewise, there is a relationship between body posture and complaints of low back pain, with p value= 0.000.

In the process of cultivating seaweed, nurseries are one of the heavy lifting jobs. Seeding is done in a squatting position and for a long time. The work of seaweed nurseries is often done by women. Therefore, female seaweed workers are very vulnerable to experiencing lowback pain. In this study, all samples were female workers who carried out seaweed nurseries. It has been reported that women tend to experience low back pain in the shoulders and neck more than men workers (Mahmud et al., 2011). This was also showed by Mahmud et al (2012) andMahmud & Rahman (2012) as they found women workers are more vulnerable (72%) to pain in the upper body and neck regions compared with men workers (51%).

Table 1 shows that all female seaweed workers experience low back pain and from interviews 80.6% are included in complaints of moderate low back pain. Most of the times the worker bend, sitting and squat for a long time. The seed nursery of seaweed is mostly done manually and repetitive in bad squat position for hours. They don't have set working time but in growing season the seaweed female worker tend to work overtime(Thamrin et al., 2019).In the process of working seaweed, the work of women is considered not too heavy because it is done while sitting.

Complaints of low back pain can occur in both young and old workers. However, the longer the worker is, the greater the complaints she feels. The longer the work period, the more complaints will be felt due to decreased endurance followed by increased fatigue and longer exposure to risk factors. This has resulted in increasing complaints of low back pain(Thamrin et al., 2019).As a confession from a worker:

"*If mention about tired, off course I am must be tired, but because it's like this, we just do the job. Having worked like this from a young age* "

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Low back pain symptoms was the highest in the age group of 60 years and more and in the manual workers.These results imply that older workers are more vulnerable to Low Back Pain because physical high burden are relatively higher in manual workers and the older age itself even increases the risk of Low back pain in that older workers generally have worked for longer period of times than younger workers, so there could be the cumulative effect. Therefore, it is important to draw up any preventive measures or intervention programs to decrease LBP especially for aged workers. Moreover, the social structure in which aged people have a lot of physical labor should be changed(Mora et al., 2006).

BMI is connected with the magnitude of symptoms particularly in the lower part of back. In addition, the association differed between individuals who had either a high or low physical workload(Van den Berg et al., 2009).Obese worker indicates a higher risk of developing symptoms while also being less likely to have a resolution of those symptoms than normal weight worker. A high amount of adipose tissue around the muscles and joints can limit a person's movements, stressing musculoskeletal tissues potentially resulting in pain(Park et al., 2010).Another study found that obese individuals have distinct less shoulder range of motion than individuals with normal weight(Lee et al., 2018).These results are in a recent report of study shows a significant relationship between BMI and low back pain.

The results of another studyshowed that as the working hours increased, the prevalence of upper and lower limb pain that workers experienced were also higher compared to the reference group of weekly working hours. The relationship between long working hours and the risk of work-related low back can be explained by as the working hours increase, time exposed to the physical demands during work increases as well and this consequently could affect the higher prevalence of musculoskeletal diseases. In addition increase in working hours can cause relative reduction in recovery time of accumulated fatigue and leisure time to relieve stresses. As a result, such factors complexly and cumulatively influence on the worker's musculoskeletal system(Kalantari et al., 2016). As a confession from a worker:

"*in the morning take the seeds first, then bring them to the location and then take the rest forthe next seeding. Usually morning until evening sir, usually when I work until 3 days it's just finished sir*"

The result in line with study in Teheran, individual physical workload had a significant relationship with the prevalence of low back pain. They also acknowledge that people with low back pain often suffered heavier physical workload. High level of physical activity during working can increase the incidence of low back pain. As a confession from a worker:

"*yes the knee and back hurt sir, because of heavy lifting and squatting for a long time*"

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There is a significant relationship between job positions and LBP complaints. the relationship pattern was tested using the chi-square analysis test with the result of p-value of 0.000.(Setiawan, Anggraini, & Rahmatika, n.d.)Wholebody vibration, physical work, lifting heavy loads and an uncomfortable working position (rotating and bending the trunk, static position) were positively correlated with injuries. Moreover, such factors as the number of hours worked in the field, type of work, work experience, age, low physical fitness and a decreased range of spine movement increase pain frequency. The same differences in prevalence of low back pain might be finding between white-collar workers and other workers with physical load(Tomczyszyn et al., 2018).According to a confession from a worker:

"..because from morning to night in a squatting position for a long time working the seaweed seeds .."

The longer years of working, BMI, working hour per day, workload and working position is factor-factors related to low back pain among female seaweed worker. The relation showed by analysis result and confession by the worker itself.

Conclusion

Worker age (0.000), BMI (0.004), working hours (0.000), workload (0.003), and work position (0.000), are associated with the incidence of low back pain in female seaweed workers in Takalar district. Seeding is done in a squatting position and for a long time. This improper working position and for a long time is what causes the high complaints of low back pain in female workers. This study has limitations, so it is recommended for another researcher to investigate more about this topic. Low back pain can be reduced with better working conditions and practice for seaweed female workers as solutions for the problems that have been identified through this research.

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