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FACTORS RELATED TO WORK FATIGUE AMONG FLOATING BAGAN FISHERMEN IN BUAJANGKA VILLAGE, MOROWALI REGENCY IN 2026

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ABSTRACT

Background: Work fatigue is becoming an increasingly important concern in jobs with irregular working hours, including night shifts. Night work can disrupt workers' sleep patterns and biological rhythms, thus suboptimal recovery. Central Sulawesi Province's performance is reflected in fisheries production across its various districts and cities. According to data from the Central Sulawesi Provincial Maritime Affairs and Fisheries Office, total fisheries production in the region reached 640,751.03 tons in 2025, dominated by capture fisheries (328,393.08 tons) and aquaculture (312,357.95 tons).

Method: This study employed a quantitative observational analytical design with a cross-sectional approach. The study was conducted from October 12-18, 2026. Data analysis used the chi-square test. A total sample of 96 fishermen was obtained using total sampling.

Results: The results of this study show that there is a relationship between length of work and work fatigue (p=0.014), and there is a relationship between work posture and work fatigue (p=0.001).

Conclusion: Fishermen need to pay attention to rest periods, implement more ergonomic work techniques, and for relevant agencies to provide education and training on occupational health in coastal areas.

Keywords: Work Fatigue, Working Time, Working Posture

1 INTRODUCTION

Fishermen are a group of people whose livelihoods depend directly on marine resources, whether through fishing or cultivation. Economically, fishermen's income is very small and can only support their families for a few days.(1)Work fatigue is becoming an increasingly important concern in jobs with irregular working hours, including night shifts. Night

work can disrupt workers' sleep patterns and biological rhythms, resulting in less than optimal recovery.(2). For workers in the water sector, these conditions can be more complex because work activities can take place in a rotating work system or at times that coincide with the body's rest periods.(3).

Fatigue presents differently for each individual, but it all boils down to a loss of efficiency and a decrease in work capacity and endurance. Fatigue reduces work capacity and endurance, characterized by a feeling of tiredness, decreased motivation, and decreased activity.(4)According to the World Health Organization (WHO), fishing carries a high risk of drowning. The WHO estimates that more than 32,000 fishermen die on the job each year, or approximately 80 fishermen every day.(5). According to data from the Ministry of Maritime Affairs and Fisheries (KKP) based on KUSUKA data in 2024, the number of fishermen in Indonesia reached 3,228,209 people, consisting of 2,819,994 marine fishermen and 408,215 inland public water fishermen.(6).

Central Sulawesi Province is reflected in the fisheries production results in various districts/cities. Based on data from the Central Sulawesi Provincial Maritime Affairs and Fisheries Service in 2025, total fisheries production in this region reached 640,751.03 tons, dominated by capture fisheries at 328,393.08 tons and aquaculture at 312,357.95 tons. One of the coastal areas with quite high fisheries sector activity is Morowali Regency, with a breakdown of capture fisheries production of 40,225.30 tons and aquaculture at 418.31 tons, bringing the total fisheries production in this region to 40,643.61 tons.(7).

Fishermen were chosen for this study because their work has distinct characteristics and work demands compared to other jobs. Floating lift net fishermen not only catch fish but also perform various physical tasks on the lift nets in the water, such as hauling nets, lifting and moving the catch, and operating fishing equipment. These activities occur primarily at night and in the early morning, with long work patterns and rest periods that differ from those of most workers.

Length of service is the length of time a person spends performing an activity. The longer a person works in an organization, the better their work skills. Research conducted by Dinamika et al., (2024) obtained a chi-square test result, obtained a p-value of 0.000 (<0.005), meaning there is a relationship between the length of service of fishermen and the work fatigue experienced by fishermen in Wewangriu Village, Malili District, East Luwu Regency.

Unnatural work postures cause unnecessary muscle movements and waste energy, thus increasing the risk of fatigue and muscle injuries. Implementing an ergonomic work position will reduce the workload and significantly reduce fatigue or health problems related to work posture. Research conducted by Engka et al., (2022) found that respondents with a moderate risk level were 11 respondents (28.2%), those with a high risk level were 15 respondents (38.4%), and those with a very high risk level were 13 respondents (33.3%).

Based on a preliminary study in Buajangka Village, there are approximately 32 floating bagan, each generally operated by three fishermen, resulting in approximately 96 fishermen ranging in age from 21 to 55 years. During fishing activities, each group of fishermen departs using a ship or boat with approximately three people heading to the bagan located in the waters approximately one hour from land. Based on the results of preliminary data on 20 floating bagan fishermen, it was found that the majority of respondents experienced work fatigue in the severe category. A total of 12 people (60%) experienced severe work fatigue, while 8 people (40%) experienced mild work fatigue.

In addition to these activities, the floating bagan fishermen in Buajangka Village also have a different rest pattern than most workers. They sleep on the bagan at night after fishing, then return to land in the morning. Therefore, the fishermen return home every morning and return to the bagan in the afternoon.

This type of work means that floating bagan fishermen have a significantly different working schedule than those employed in other jobs. Fishermen depart in the afternoon, carry out their main activities at night, and return in the morning. This situation can vary the fishermen's rest and sleep times, especially since they still need time to rest and engage in other activities after returning from the sea.

Previous research has examined several factors related to work fatigue in fishermen, such as length of work and work posture. However, research examining both factors together in floating bagan fishermen in Buajangka Village is still limited, especially in nighttime work conditions with rest periods on the bagan and routine fishing patterns carried out within one work period. Based on this background, the researcher is interested in conducting a study entitled "Factors Related to Work Fatigue in Floating Bagan Fishermen in Buajangka Village, Morowali Regency in 2026".

2 METHODS

The type of research used in this study is quantitative observational with a cross-sectional approach. This research was conducted in Buajangka Village, Morowali Regency. The population in this study were 96 fishermen who work as floating bagan fishermen. The sampling method used in this study was total sampling. Thus, the number of samples in this study was 96 fishermen in Buajangka Village. The sampling technique in this study was total sampling, namely the number of samples is the same as the population. The dependent variable in this study is work fatigue, and the independent variables are Working Time and Work Posture.

3 RESULTS

Table 1: Respondent Characteristics

Respondent Characteristics	Amount	Percentage (%)
Age		
>40 Years	72	75
≤40 Years	24	25
Gender		
Man	96	100
Woman	-	-
Total	96	100

Source: Primary Data, 2026

Based on table 1, it is known that from a total of 96 respondents, the largest percentage is in the age range >40 years with a total of 72 (75%) respondents, while fishermen are in the age group <40 years with a total of 24 (25%) respondents. And it is known that from a total of 96 respondents, it shows that from a total of 96 fishermen respondents in Buajangka Village, the majority are male, as many as 96 (100%) respondents.

Table 2: Univariate Analysis

Variables	(n)	Percentage (%)
Work Fatigue		
Heavy	49	51%
Light	47	49%
Length of working		
≥8 hours/day	55	57.3%
<8 hours/day	41	42.7%
Work Posture		
Repair	50	52.1%
Evaluation	46	47.9%

Source: Primary Data, 2026

Based on table 2, work fatigue was found that 49 respondents (51%) experienced severe fatigue and 47 respondents (51%) experienced mild work fatigue. Based on work duration, 55 respondents (57.3%) had a work duration of ≥8 hours/day and 41 respondents (42.7%) <8 hours/day. For the distribution of respondents based on work posture, 50 respondents (52.1%) had an improvement work posture and 46 respondents (47.9%) had an evaluation work posture.

Table 3: Bivariate Analysis

Variables	Work Fatigue				Total		*p-value*
	Mild Fatigue		Severe Fatigue				
	n	%	n	%	n	%	
Length of working							
≥8 hours/day	34	61.8	21	38.2	55	100	0.014
<8 hours/day	15	36.6	26	63.4	41	100	
Total	49	51	47	49	96	100	
Work Posture							
Repair	39	78	11	22	50	100	0.001
Evaluation	10	21.7	36	78.3	46	100	
Total	49	51	47	49	96	100	

Source: Primary Data, 2026

4 DISCUSSION

4.1 The Relationship Between Length of Work and Job Fatigue

Length of service is one factor that can be related to work fatigue because the longer a person works, the more time and energy they spend on activities. Based on the results of the bivariate test, there is a significant relationship between length of service and work fatigue among floating bagan fishermen in Buajangka Village, with a p-value of 0.014 ($p < 0.05$).

Working hours exceeding 8 hours per day indicate that fishermen spend significant time fishing. In their daily work, fishermen engage in various activities, such as hauling nets, lifting their catch, and moving equipment. These activities generally occur from night to morning, requiring fishermen to expend energy during the fishing process. The longer the working hours, the more the body is exposed to activity and uses energy. If long working hours are not balanced with adequate rest, fishermen can more easily experience fatigue. Meanwhile, fishermen who work less than 8 hours per day have shorter working hours, although the level of fatigue experienced can vary depending on the activities performed during the work.

The analysis results showed that 34 respondents (28.1%) with a working period of more than 8 hours per day experienced severe work fatigue. Meanwhile, in the group of fishermen with a working period of less than 8 hours per day, there were 15 respondents (20.9%) who experienced severe work fatigue. These results indicate that severe work fatigue was found in both work period groups. Fishermen who work more than 8 hours per day are at risk of experiencing fatigue because their bodies are used to performing physical activities for a longer period. However, fishermen who work less than 8 hours per day can also experience severe fatigue if the work they do requires a lot of energy or is done repeatedly.

The results of this study are in line with Sunik Cahyawati et al., (2024) who obtained the results of statistical tests using chi-square on the variable of length of work with fatigue obtained a p-value of 0.000 ($p <0.05$). These results indicate that there is a relationship between length of work and work fatigue in traditional fishing workers in Tanah Merah Hamlet, Huamual Belakang District, West Seram Regency. Length of work is the length of time a person spends doing work activities in one day. The longer the time spent working, the less opportunity is available to rest and recover physical condition.(8).

The results of this study are in line with Asmiranda, (2026) who obtained bivariate analysis results showing that there is a significant relationship between the length of work and the level of work fatigue ($p = 0.027$). For fishermen, long working hours can increase physical demands because sea activities not only involve time to catch fish, but also to pull nets, lift the catch, and move equipment.(9).

The results of this study are in line with Tresia, (2026) who obtained the results of the analysis using the chi-square test showed a p-value = 0.040 ($p <0.05$), so it can be concluded that there is a significant relationship between working hours and work fatigue. If the working hours exceed the worker's physical abilities or are not accompanied by adequate rest time, this can result in decreased work ability, reduced focus, and increase the possibility of work-related fatigue.(10).

4.2 The Relationship Between Work Posture and Work Fatigue

Implementing an ergonomic work position will reduce the workload and significantly reduce fatigue or health problems related to work posture. Research on floating bagan fishermen in Buajangka Village, Morowali Regency, in 2026 showed a relationship between work posture and work fatigue, with a p-value of 0.000 (p<0.05).

Working postures requiring improvement indicate that fishermen's body positions during work have the potential to increase physical stress. While working on floating nets, fishermen perform various activities, such as pulling nets, lifting catches, and moving equipment. These activities sometimes require fishermen to bend, reach for objects, or lift loads in uncomfortable positions. Repeatedly performing these positions during work requires increased muscle work, leading to fatigue. Meanwhile, working postures in the evaluation category still require attention, as body positions during work are not necessarily completely safe and must be assessed according to their risk level.

The analysis showed that 39 respondents (25.5%) with work postures requiring improvement experienced severe work fatigue. Meanwhile, in the group of work postures requiring evaluation, 10 respondents (23.5%) experienced severe work fatigue. This indicates that severe work fatigue is more common among fishermen whose work postures require improvement. This condition may be related to physical activity performed in less ergonomic body positions. When fishermen have to bend or lift their catch with an incorrect body position, the muscles can receive a greater load and require more energy to complete the work. However, fishermen with work postures requiring evaluation can also experience severe work fatigue because fatigue is not only related to body posture, but also to workload, length of work, and rest periods.

The relationship between work posture and fatigue suggests that body position during work is crucial to understanding the fatigue experienced by floating bagan fishermen. A less ergonomic work posture can increase muscle strain during repetitive fishing activities. Fishermen need to adopt safer body positions when hauling nets, lifting catches, and moving equipment.

The results of this study are in line with Tresia, (2026) who obtained the Chi-Square test results showing a p-value = 0.024 (p < 0.05), so it can be concluded that there is a significant relationship between work posture and work fatigue. Correct work posture can reduce pressure on muscles, joints, and spine, so that employees can do their work more comfortably and efficiently. Conversely, improper work posture, such as bending, twisting the body, or maintaining a fixed position for a long time, can increase the load on the muscles and accelerate the onset of fatigue.

The results of this study are in line with Ganesh et al., (2023) obtained using the alternative Fisher's Exact Test, by testing the independent variable of work posture and the dependent variable of work fatigue, resulting in calculations with a significance value of 0.0001, or <0.05 Ho is rejected. So there is a relationship between work posture and work fatigue. Work posture is a determining point in analyzing the effectiveness of a job, if the work posture carried out by the worker is good and ergonomic, it can be ascertained that the results obtained by the worker will be good. However, if the work posture is not good, the worker will easily experience fatigue.(11).

5 CONCLUSION

Based on the results of research and discussion regarding factors related to work fatigue in floating bagan fishermen in Buajangka Village, Morowali Regency in 2026, the following conclusions can be drawn:

- There is a significant relationship between length of work and work fatigue among floating bagan fishermen in Buajangka Village, Morowali Regency in 2026.
- There is a significant relationship between work posture and work fatigue in floating bagan fishermen in Buajangka Village, Morowali Regency in 2026.
- Fishermen need to adopt more ergonomic body positioning or posture techniques when pulling in nets and lifting their catch to minimize muscle tension.
- Village governments and related parties are expected to provide education on the importance of occupational health and safety for fishermen, particularly regarding preventing work fatigue, regulating rest periods, managing work stress, and implementing safe working practices. These efforts are expected to raise fishermen's awareness of the risks of fatigue and help reduce the risk of accidents during fishing activities.
- For future researchers, this study is expected to serve as a reference for further examining factors related to work fatigue in fishermen. Future research could consider other variables, such as workload, nutritional status, job stress, sleep quality, length of service, and work environment factors, to gain a broader picture of the factors associated with work fatigue in floating bagan fishermen

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

Statement of informed consent

study has received ethical clearance from the Health Research Ethics Committee (KEPK) of the Southeast Sulawesi Provincial Chapter of the Indonesian Public Health Association (IAKMI), under reference number 135/KEPK-IAKMI/XI/2026, issued on November 10, 2026.

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