Original Article

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Prevalence and Associated Factors of Depression Symptoms Among Aquaculture Workers in Hai Phong, Vietnam: A Cross-Sectional Study

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Abstract:

Objective: This study aimed to determine the prevalence and factors associated with depression symptoms among aquaculture workers in Hai Phong, Vietnam.

Material and Methods: The study involved 1,220 aquaculture workers in coastal and offshore areas of Hai Phong, Vietnam; from March 2022 to September 2022. It was a cross-sectional descriptive epidemiological study, utilizing direct interviews with aquaculture workers to identify depression symptoms and associated factors. The Depression-Anxiety-Stress Scale (DASS 21) was used to assess depression symptoms.

Results: The prevalence of depression symptoms among aquaculture workers was 28.7%, with 20.9% experiencing mild depression, 6.3% moderate depression and 1.5% severe depression. Several factors were associated with depression symptoms; including gender (OR=2.03; 95% CI 1.56-2.63), being single or divorced (OR=1.44; 95% CI 1.04-1.99), age ≥60 (OR=1.63; 95% CI 1.05-2.55) compared to those under 40, chronic illnesses (OR=3.16; 95% CI 2.43-4.11), poor sleep quality (OR=2.84; 95% CI 2.13-3.79), alcohol abuse (OR=1.36; 95% CI 1.06-1.75), and irregular physical exercise (OR=2.09; 95% CI 1.62-2.70).

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Conclusion: Depression disorder is a mental health concern among aquaculture workers. To alleviate depression symptoms, workers should consider lifestyle adjustments, incorporate regular physical exercise, and undergo routine health check-ups for timely counseling and treatment.

Keywords: aquaculture worker, associated factors, depression symptom, Hai Phong

Introduction

Mental disorders are characterized by clinically significant disturbances in an individual's cognition, emotional regulation, or behavior. It often involves distress or impairment in crucial areas of functioning[1,2]. Currently, mental disorders are quite prevalent; affecting up to 25% of the global population at some point in their lives. The most common mental disorders include depression, anxiety, and stress[3,4]. In particular, depression is the second leading cause of disease burden worldwide, following cardiovascular diseases, and is projected to become the leading cause by 2030[5]. Furthermore, depression is a leading cause of suicide: accounting for 75% of suicide cases[6]. According to the World Health Organization (WHO) in 2015, the global prevalence of depression and anxiety was 4.4% and 3.6%, respectively. The total number of people living with depression and anxiety disorders was 322 million and 264 million, respectively[6]. The prevalence of depression tends to increase over time, with an estimated 18.4% rise in the number of individuals displaying depression symptoms between 2005 and 2015[7]. The rates of depression and anxiety vary across countries, regions, and professions. In South Africa, the prevalence of depression ranges from 4.9% to 9.7%[8], whilst in the Asia-Pacific region, it ranges from 5.5% to 6.7%[9], and in Europe it ranges from 5% to 10%[10]. In Vietnam, the prevalence of depression symptoms also differs among regions and demographic groups. A study conducted on adults in Can Tho city showed that 16% of the participants exhibited depression symptoms, with 12.2% experiencing mild depression, 2.9% moderate depression, 0.7% moderately severe depression, and 0.2% severe depression[11]. Another study on individuals aged 60 and above living in rural areas of Vietnam revealed a prevalence of depression symptoms at 28.7%[12].

Workers in the aquaculture sector engage in strenuous and highly specialized labor and are frequently exposed to aquatic environments and influenced by harsh weather conditions. Additionally, the occupational safety and hygiene conditions for these workers are often inadequate, posing various health risks[13,14]. Currently, global research has primarily focused on the physical health of these workers, with insufficient attention given to their mental health. Therefore, this study aimed to: determine the prevalence and identify factors related to depression symptoms among aquaculture workers in both coastal and offshore areas of Hai Phong, Vietnam.

Material and Methods

Participants

A total of 1,220 aquaculture workers having work experience of two or more years were employed in various ponds and floating cages within coastal and offshore areas of Hai Phong, Vietnam; from March 2022 to September 2022.

Study design

It was a cross-sectional descriptive epidemiological study.

Sampling method

Randomized, stratified sampling.

Data collection

Direct interviews involving 1,220 aquaculture workers to assess depression symptoms using the Depression–Anxiety–Stress Scale (DASS 21).

Direct interviews conducted with aquaculture workers to determine various related factors: age, years of experience, gender, educational level, marital status, presence of chronic illnesses; working hours (day and night shifts), daily sleep duration (<6 hours, 6–8 hours, >8 hours); sleep quality (good, poor); smoking status; alcohol consumption; and physical activity (walking, running, cycling, sports participation and so forth).

Key definitions

Assessment of depression, anxiety, and stress symptoms using the DASS 21[15]. The DASS–21 comprises 21 questions and addresses three mental health issues: depression (7 questions), anxiety (7 questions), and stress (7 questions). Each question corresponds to a score ranging from 0 to 3, representing "Did not apply to me at all" to "Applied to me very much, or most of the time." Symptom severity is evaluated by calculating the total score for each set of 7 questions for each mental health issue, doubling the result and then comparing it with the assessment chart. The total score ranges from 0 to 42, corresponding to increasing symptom severity; specifically.

Depression severity assessment: total score 0–9: normal; 10–13: mild depression; 14–20: moderate depression; 21–27: severe depression; ≥28: extremely severe depression.

Sleep quality is assessed using the Pittsburgh Sleep Quality Index (PSQI), which is a self–reported questionnaire evaluating sleep quality and disturbances over a one–month period. It consists of 19 items derived from 7 components: "subjective sleep quality," "sleep latency," "sleep duration," "habitual sleep efficiency," "sleep disturbances," "use of sleeping medication," and "daytime dysfunction" (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction). Each item is scored from 0–3, based on the respondent's perception. The total score for these 7 components yields an overall score ranging from 0 to 21 points. Poor sleep quality is defined as a PSQI score >5[16]. The total Cronbach's alpha coefficient is 0.789. At the cutoff point of 5, the sensitivity and specificity are 87.76% and 75% respectively.

Regular physical activity: at least 30 minutes per day and on ≥5 days per week; irregular physical activity (1–4 days per week)[17].

Alcohol abuse criteria: interviewing seafarers regarding their alcohol and beer consumption in the past 7 days. Alcohol abuse is determined according to the WHO standards. Alcohol abuse: defined according to the WHO standards: men consuming more than 3 units of alcohol per day or 21 units per week; women consuming more than 2 units per day or 14 units per week. One alcohol unit is equivalent to 10 grams of pure alcohol contained in a beverage = 01 standard drink. One standard drink is equivalent to one 330 ml can of beer containing a 5% alcohol content, one 125 ml glass of wine having an 11% alcohol content, one 75 ml glass of strong wine containing 20% alcohol content, or one 30 ml shot of strong liquor measuring at a 30% alcohol content[18].

Smoking habits: non–smoker: individuals that have never smoked any type of cigarette. Smoker: individuals that currently smoke at least one cigarette every day.

Statistical analysis

The research data was processed using biostatistical methods, based on Statistics Package for Social Science (SPSS) for Windows 10 software. Frequency distribution and percentages were used to describe categorical variables. The chi^2 test was used to compare two ratios. Mean values were used to describe quantitative variables. The t-test was utilized to compare mean values. Odds ratio (OR) and 95% confidence interval (CI) were used to determine the relationship between risk factors and depression or anxiety in aquaculture workers. Risk factors were identified through multivariable logistic regression analysis.

Ethical considerations

The research topic has obtained approval from the Ethics Committee for Biomedical Research of the Vietnam National Institute of Maritime Medicine under Decision No. 05/2023/QD-VINIMAM. The aquaculture workers participating in the study do so entirely voluntarily.

Results

This study was performed on 1,220 aquaculture workers from both coastal and offshore areas of Hai Phong, in regards to their depression symptoms and associated factors, and yielded the following results.

Some characteristics of study subjects: the results (Table 1) indicated that age of aquaculture workers ranges from 20 to 65 years, with the following distribution: under 30 (18.7%), 30–39 (24.4%), 40–49 (29.8%), 50–59 (18.8%), and 60 years and above (8.3%). Females constituted 56.0%, while males made up 46.0%. The average work experience was 16.6±8.7 years, with the following breakdown: less than 10 years (24.4%), 10–19 (43.3%), 20–29 (21.5%), and 30 years or more (10.7%). Regarding marital status, 83.9% were married, while 16.1% were single or divorced. Education levels included illiterate (0.6%), elementary school (15.9%), junior high school (54.8%), high school (26.5%) and college/university (2.2%).

Table 1 Some characteristics of study subjects (n=1,220)

Variable	Number (%)
Gender	
Male	537 (44.0)
Female	683 (56.0)
Age (years)	
Mean±S.D.; Min-Max	41.8±11.7; 20-65
<30	228 (18.7)
30-39	298 (24.4)
40-49	363 (29.8)
50-59	229 (18.8)
≥60	102 (8.3)
Working experience (years)	
Mean±S.D.; Min-Max	16.6±8.7; 3-41
<10	119 (24.4)
10-19	212 (43.4)
20-29	105 (21.5)
≥30	52 (10.7)
Marital status	
Single	173 (14.2)
Married	1,024 (83.9)
Divorce	23 (1.9)
Educational level	
Illiterate	7 (0.6)
Elementary	194 (15.9)
Junior high school	668 (54.8)
High school	323 (26.5)
College/university	28 (2.2)

S.D.=standard deviation

Rate of depression symptoms among aquaculture workers: the prevalence of depression symptoms among aquaculture workers was 28.7%, with a breakdown of mild depression at 20.9%, moderate depression at 6.3%, severe depression at 1.5%, with no extremely severe depression (Table 2).

Multivariate analysis of factors related to depression symptoms among aquaculture workers, the results (Table 3) revealed the following: females had a 2.03 times higher risk of depression compared to males (95% CI 1.56–2.63; p–value<0.001); being single or divorced carried a 1.44 times higher risk of depression than being married (95% CI 1.04–1.99; p–value=0.028); individuals aged ≥60 had a 1.63 times higher risk of depression compared to those under 40 (95% CI 1.05–2.55; p–value=0.031); having a chronic illness poses a 3.16 times higher risk of depression than not having a chronic illness (95% CI 2.43–4.11; p–value<0.001); sleeping less than 6 hours per day carries a 1.68 times higher risk of depression compared to sleeping over 8 hours per day (95% CI 1.02–2.63; p–value=0.042); poor sleep quality resulted in a 2.84 times higher risk of depression than good sleep quality (95% CI 2.13–3.79; p–value<0.001); alcohol abuse presented a 1.36 times higher risk of depression than non–abuse (95% CI 1.06–1.75; p–value=0.015); infrequent physical exercise posed a 2.09 times higher risk of depression than regular exercise (95% CI 1.62–2.70; p–value<0.001). There was no significant correlation found between education level, smoking, and depression.

Table 2 Rate of depression symptoms among aquaculture workers (n=1,220)

Variable	Number (%)
Depression symptom	
No	870 (71.3)
Yes	350 (28.7)
Levels of depression	
Mild	255 (20.9)
Moderate	77 (6.3)
Severe	18 (1.5)
Extremely severe	0 (0.0)

Table 3 Multivariate analysis of factors related to depression symptoms of aquaculture workers

Variable	Total	Depression n (%)	No depression n (%)	Adjusted OR (95% CI)	p–value
Gender					
Female	683	239 (35.0)	444 (65.0)	2.03 (1.56–2.63)	<0.001
Male	537	111 (20.7)	426 (79.3)		

Table 3 (countinued)

Variable	Total	Depression n (%)	No depression n (%)	Adjusted OR (95% CI)	p-value
Marital status					
Single, divorce	196	70 (35.7)	126 (64.3)	1.44 (1.04–1.99)	0.028
Married	1,024	280 (27.3)	744 (72.7)		
Educational level					
Secondary school or lower	869	252 (29.0)	617 (71.0)	1.01 (0.77–1.34)	0.911
High school or higher	351	98 (27.9)	253 (72.1)		
Working time					
Night	381	133 (34.9)	248 (65.1)	1.45 (1.12–1.89)	0.007
Daytime	839	217 (25.9)	622 (74.1)		
Age (years)					
<40	526	142 (27.0)	384 (73,0)	Control group	
40–59	592	169 (28.5)	423 (71.5)	1.05 (0.81–1.40)	0.691
≥60	102	39 (38.2)	63 (61.8)	1.63 (1.05–2.55)	0.031
Chronic illness					
Yes	370	172 (46.5)	198 (53.5)	3.16 (2.43–4.11)	
No	850	178 (20.9)	672 (79.1)		<0.001
Sleeping time per day (hours)					
>8	126	31 (24.6)	95 (75.4)	Control group	
6–8	811	221 (27.3)	590 (72.7)	1.13 (0.73–1.75)	0.575
<6	283	98 (34.6)	185 (65.4)	1.68 (1,02–2,63)	0.042
Sleep quality					
Poor	765	281 (36.7)	484 (63.3)	2.84 (2.13–3.79)	<0.001
Good	455	69 (15.2)	386 (84.8)		
Current smokers					
Yes	497	151 (30.4)	346 (69.6)	1.13 (0.88–1.45)	0.339
No	723	199 (27.5)	524 (72.5)		
Alcohol abuse					
Yes	516	165 (32.0)	351 (68.2)	1.36 (1.06–1.75)	0.015
No	704	185 (26.3)	519 (73.7)		
Regular exercise					
No	422	166 (39,3)	256 (60.7)	2.09 (1.62–2.70)	<0.001
Yes	798	184 (23.1)	614 (76.9)		

OR=odd ratio, CI=confidece interval

Discussion

Depression disorder is characterized by feelings of sadness, loss of interest or pleasure, guilt or low self-worth, disturbed sleep or appetite, fatigue, and poor concentration. Depression can persist or recur, significantly impairing an individual's ability to function in work, learning or daily life activities. Severe depression can lead to suicidal behavior[6]. Using the DASS 21 scale to assess depressive symptoms, the results (Table 2) indicated that the prevalence of depression symptoms among aquaculture workers was 28.7%; including mild depression (20.9%), moderate depression (6.3%), and severe depression (1.5%). The rate of depression symptoms in this study is higher than Marzuki et al. research on fishermen in Teluk Bahang, Penang, Malaysia using the Patient Health Questionnaire-9 (PHQ9) where in, the depression rate was 10.7%[19]. The prevalence of depression symptoms among residents of Ninh Kieu District, Can Tho City, Vietnam, is 16.0%; according to the Patient Health Questionnaire-9 (PHQ9). Specifically, 12.2% have mild depression, 2.9% have moderate depression, 0.7% have moderately severe depression and 0.2% have severe depression[11]. In another study, focusing on depression among women in a fishing community; using the Mini International Neuropsychiatric Interview by Sheehan supplemented by ICD-10 Diagnostic Classification, the prevalence of depression disorders was 7.5%[20]. Yalamanchi et al. study on aquaculture workers in India showed a depression symptom prevalence of 46.7%[14]. Additionally, another study on the mental health and quality of life of aquaculture workers in Malaysia reported the prevalence of depression, anxiety, and stress as 48%, 40.4%, and 26%, respectively[21]. Therefore, the prevalence of depression symptoms among aquaculture workers is quite high. To explain this, we believe that the aquaculture profession is labor-intensive and demanding, with workers frequently being exposed to outdoor conditions and harsh weather (hot in summer, cold in winter). These precarious working conditions combined with the physically demanding nature of the job, contribute to the elevated risk of health issues; including mental disorders[14,22]. The prevalence of depression symptoms in this study is lower compared to that observed in studies involving fishermen, industrial workers and the elderly[23–25]. A study on depression symptoms, based on the self-rating depression scale among Chinese fishermen during the coronavirus disease 2019 (COVID-19) pandemic, showed a prevalence of mild, moderate and severe depressive symptoms as 23.35%, 9.30%, and 9.07%, respectively[23]. Another study on depression symptoms among the general population in China during the COVID-19 period, using the Patient Health Questionnaire-9, revealed a prevalence in individuals experiencing depression symptoms among the general population as 31.6%[26]. The prevalence of depression symptoms among industrial workers in Vietnam, assessed using the Patient Health Questionnaire-9, was 38.6%[24]. Another study on depression symptoms in Indian industrial workers (using the DASS 21 scale) found that the prevalence of depression symptoms was 36%[27].

Multivariate analysis of factors related to depressive symptoms reveals that females have a 2.03 times higher risk of depression than males (95% CI 1.56-2.63; p-value<0.001). Being single or divorced increases the risk of depression by 1.44 times compared to those with a family (95% CI 1.04-1.99; p-value=0.028). These results are consistent with the study by Arslantas et al., indicating that females, individuals living alone, and those with a history of chronic illness are at a higher risk of depression[28]. Several other studies have also shown that females have a higher risk of depression than males[29–31]. Aquaculture workers with chronic illnesses have a 3.16 times higher risk of depressive symptoms than those without chronic illnesses (95% CI 2.43-4.11; p-value<0.001). The study

by Duong et al. similarly demonstrates that comorbid chronic illnesses increase the risk of depression symptoms (OR=2.79; p-value=0.005)[11]. This study also had similar results to Yamashita et al. (OR=2.46, p-value<0.001)[32]; wherein sleeping less than 6 hours per day increases the risk of depression by 1.68 times compared to sleeping more than 8 hours per day (95% CI 1.02-2.63; p-value=0.042). Poor sleep quality increases the risk of depression by 2.84 times compared to good sleep quality (95% CI 2.13-3.79, p-value<0.001). This research findings similar to the study by Shi et al[26]. A study by Wenzhe Qin et al. also showed that poor sleep quality increases the risk of depression symptoms compared to good sleep quality (OR=2.78, 95% CI 1.54-5.01). Furthermore, alcohol abuse increases the risk of depression by 1.36 times compared to non-alcohol abuse (95% CI 1.06-1.75, p-value=0.015); hence, alcohol abuse is another risk factor for depression symptoms. However, individuals with anxiety and depression may also engage in alcohol consumption. The study by Do HN, Nguyen et al. also showed that alcohol consumption increases the risk of depression (OR=2.38; 95% CI: 1.72-3.28)[33]. Infrequent physical exercise increases the risk of depression by 2.09 times compared to regular physical exercise (95% CI 1.62-2.70; p-value<0.001).

This study's research results are similar to those of Wenzhe Qin et al.; indicating that less time spent on leisure or exercise is associated with depression symptoms (1-3 sessions per week compared to ≥4 sessions per week (OR=1.72 95% CI 0.71-4.14); no exercise compared to ≥4 sessions per week (OR=3.93 95% CI 1.67-9.26)[23]. The study by Noh et al. also showed that infrequent physical exercise increases the risk of depression (OR=1.48; 95% CI 1.13-1.94)[34]. Some studies have also suggested that exercise is an intervention to prevent and treat anxiety and depression[35-37].

Conclusion

The prevalence of depression symptoms among aquaculture workers is relatively high (28.7%); indicating a community mental health issue in Vietnam. Various contributing factors have been identified including: female gender, living alone, working night shifts, older age, chronic illness, poor sleep quality, alcohol abuse and infrequent physical exercise. To mitigate depression symptoms, workers should consider lifestyle adjustments, increase regular physical exercise, and undergo routine health check-ups for timely counseling and treatment.

Conflict of interest

The authors confirm that there are no potential conflicts of interest to declare.

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