



A STUDY ON DIETARY OMEGA-3 FATTY ACIDS, MICRONUTRIENT INTAKE AND SLEEP QUALITY AMONG FISHING COMMUNITY IN MUMBAI, MAHARASHTRA

Home Science

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ABSTRACT

Background: Fishing communities represent a unique population with high access to omega-3-rich foods but are exposed to occupational factors that may negatively impact sleep quality. **Objectives:** This study aimed to assess dietary omega-3 fatty acid intake, micronutrient consumption (iron, zinc, calcium, and vitamin D), and sleep quality among adults aged 35–60 years in the fishing community of Mumbai, Maharashtra. **Methodology:** A cross-sectional study was conducted among 150 participants (75 males and 75 females). Anthropometric measurements were recorded, dietary intake was assessed using a 24-hour recall and food frequency questionnaire, and sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI). **Results:** The mean omega-3 intake (2.25 ± 0.59 g/day) exceeded recommended levels. However, calcium (43% RDA), zinc (67% RDA), and iron intake (especially in females) were inadequate. A high prevalence (85.3%) of poor sleep quality was observed. No significant association was found between omega-3 or micronutrient intake and sleep quality. Poor sleep was significantly associated with lower socioeconomic status. **Conclusion:** The findings suggest that occupational factors may outweigh nutritional influences on sleep quality in fishing communities. Nutritional interventions should focus on improving micronutrient intake alongside addressing lifestyle and occupational challenges.

KEYWORDS

Omega-3 Fatty Acids, Micronutrients, Sleep Quality, Fishing Community, PSQI

INTRODUCTION

Fishing communities form an important occupational group with distinct dietary and lifestyle characteristics. Due to their direct access to marine fish, they are expected to have higher intake of omega-3 fatty acids, particularly EPA and DHA, which are known to influence brain function and sleep regulation.

Omega-3 fatty acids contribute to serotonin production and melatonin synthesis, both of which play a critical role in regulating sleep patterns. Fish is also a natural source of melatonin, further supporting its role in sleep enhancement.

In addition to omega-3 fatty acids, micronutrients such as iron, zinc, calcium, and vitamin D are essential for neurotransmitter regulation and circadian rhythm maintenance. Deficiencies in these nutrients may contribute to poor sleep quality.

Despite nutritional advantages, fishing communities are exposed to irregular work schedules, early morning fishing activities, and physically demanding work. These occupational factors may disrupt sleep patterns and override the benefits of adequate nutrient intake.

Limited research has explored the combined relationship between omega-3 intake, micronutrients, and sleep quality in Indian fishing communities. This study addresses this gap by assessing these parameters in the Mumbai fishing population.

METHODOLOGY

A cross-sectional study was conducted among 150 adults aged 35–60 years from fishing communities in Mumbai. Participants were selected using purposive sampling.

Inclusion Criteria:

- Active fisherman / fisherwomen .
- Fishing community residing in Mumbai
- Fisherfolks within the age group of 35-60 years.

Exclusion Criteria:

- Fisherman / fisherwomen with diagnosed major psychiatric or neurological disorders
- serious chronic illnesses (advanced heart failure, end-stage renal disease, decompensated liver disease, recent stroke).
- Pregnant or lactating fisherwomen.

Ethical Consideration :

The ethics approval was obtained from Inter System Biomedical Ethics Committee (ISBEC) all participants provided written informed consent.

Data Collection:

- Sociodemographic Characteristics : Age, education, occupation, medical history
- Anthropometric measurements: Height, weight, BMI
- Dietary assessment: 24-hour recall (3 days) and Food Frequency Questionnaire
- Sleep assessment: Pittsburgh Sleep Quality Index (PSQI)

Statistical Analysis:

Data were analyzed using SPSS (version 25). Statistical tests included:

- Independent t-test
- ANOVA
- Chi-square test
- Pearson correlation

A PSQI score >5 indicated poor sleep quality.

RESULTS AND DISCUSSION

A total of 150 adults aged 35–60 years from the fishing community in Mumbai participated in the study. The mean age of participants was 47.2 ± 6.8 years. The mean Body Mass Index (BMI) was 24.76 ± 2.16 kg/m², indicating that the majority of participants were within the normal to overweight category based on Asian BMI cut-offs.

Dietary Intake

Analysis of dietary intake revealed that omega-3 fatty acid consumption was adequate among the study participants, with a mean intake of 2.25 ± 0.59 g/day. This can be attributed to the regular consumption of fatty fish such as mackerel and sardines, which are commonly available in fishing communities.

However, micronutrient intake was found to be suboptimal. The mean calcium intake was 259.21 mg/day, which is approximately 43% of the recommended dietary allowance (RDA). Similarly, zinc intake (7.98 mg/day) and iron intake, particularly among females, were below recommended levels. Vitamin D intake was relatively better but still inconsistent across participants.

These findings indicate that despite adequate access to fish, dietary diversity remains limited, leading to deficiencies in essential micronutrients. This is consistent with previous studies conducted in

fishing communities, where diets are predominantly cereal-based with limited intake of dairy and green leafy vegetables.

Sleep Quality

Assessment of sleep quality using the Pittsburgh Sleep Quality Index (PSQI) revealed that a majority of participants (85.3%) had poor sleep quality (PSQI score >5), while only a small proportion reported good sleep quality.

The high prevalence of poor sleep may be attributed to occupational factors such as early morning fishing schedules, irregular working hours, physical workload, and socioeconomic stress. These findings align with existing literature suggesting that fishing is a chronodisruptive occupation that negatively impacts sleep patterns.

Correlation between Nutrient Intake and Sleep Quality

Table 1: Correlation between Nutrient Intake and PSQI Score (n=150)

Nutrient Intake	Correlation Coefficient	p-value
Omega-3-fatty acids	-0.08	0.32
Iron	-0.10	0.21
Zinc	-0.07	0.38
Calcium	-0.05	0.47
Vitamin D	-0.09	0.29

Interpretation of Correlation Table

The correlation analysis showed a weak negative relationship between nutrient intake and PSQI score, indicating that higher intake may slightly improve sleep quality. However, none of these associations were statistically significant (p>0.05).

This suggests that dietary factors alone may not strongly influence sleep quality in this population. Occupational factors such as irregular schedules, early morning work, and physical stress likely play a more dominant role in determining sleep outcomes.

These findings are consistent with previous studies indicating that while omega-3 fatty acids and micronutrients contribute to sleep regulation, their effects may be limited in populations exposed to strong environmental and occupational stressors.

CONCLUSION

The study concludes that fishing communities in Mumbai have adequate omega-3 intake but suffer from significant micronutrient deficiencies and poor sleep quality.

The lack of association between nutrient intake and sleep suggests that occupational and socioeconomic factors play a stronger role in determining sleep health.

Interventions should focus on:

- Improving micronutrient intake (iron, calcium, zinc)
- Nutrition education
- Addressing occupational stress and irregular schedules

Future research should explore longitudinal and biochemical approaches to better understand the nutrition-sleep relationship.

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