



Beyond the Waters: Unveiling the Occupational Hazards of Dal Lake's Women Fish Retailers in Jammu and Kashmir

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Abstract

Union Territory of Jammu and Kashmir contributes 31% to India's cold water fish production and, Dal Lake is important for fisheries in this region. Many local women around the lake engage in fish capture and marketing, facing various occupational hazards that are often unreported. Thus, a study was done to assess occupational hazards and injuries faced by women fisher retailers using interview and observation methods. A List of occupational hazards was prepared through interactions with key informants and a review of literature. These were classified as cold weather, physical, biological, ergonomics, and psychosocial hazards. A sample of 60 fisherwomen was selected based on their active participation in fish capture and marketing activities within the lake region. Frostbite (90%) was the most frequent cold-weather injury, while cuts from fish fins or knives (96.6%) were the most common physical injuries. Biological hazards, primarily fish bites, affected 86.6% of fisherwomen. Ergonomic issues included back and neck pain from carrying heavy fish tubs, and psychosocial challenges involved anxiety (96.6%) and stress (73.3%) due to regional instability and the COVID-19 pandemic. Control measures were limited to traditional remedies like turmeric and henna, with no structured safety practices in place. This study emphasizes the need to integrate occupational safety measures in fisheries development planning to better support these essential workers.

Keywords:

Occupational Hazards, Women Fish Retailers, Kashmir, Cold water fisheries, Dal Lake

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Introduction

Hazardous working conditions, strenuous labour, long work hours, and harsh weather are the most common hazards faced in commercial fishing operations (NIOSH, 2020). The fishing industry has more occupational hazards than other occupational categories in the world (Udolisia *et al.*, 2010). The repetitive nature of work has been reported as a risk in fish processing workers who work in cold environments (Nag *et al.*, 2016). Kolawole and Bolobilwe (2019) reported that the most common injuries associated with fishing included fish bone pricks, body injuries and traumas due to incidental falls into rivers in the Okavango Delta, Botswana. In the context of India, Sharma and Sethulakshmi (2019) reported occupational safety issues in marine fishers of Kerala. Prusty and Sharma (2019) reported on injuries faced by shrimp farm workers in Odisha.

The Blue Growth Initiative of the Food and Agriculture Organization of the United Nations states that decent work in fisheries and aquaculture will promote the sustainable management of the fisheries sector (FAO, 2018). The ILO (International Labour Organization) sets the principle that workers must be protected from sickness, disease and injury resulting from their occupation. A safe and healthy environment enhances productivity. The attainment of sustainable development in

terms of occupational health conveys the contentment of material needs through work and other production processes without creating danger to one's health, environment, and the community resource base in the short as well as long term. Occupational health is a fundamental element and consists of a social and health dimension of the principle of sustainable development (Olaoye & Ojebiyi, 2020).

Few studies have also focused on the occupational hazards faced by fisher men in India like Sharma and Sethulakshmi (2019); Prusty & Sharma (2019) but studies on occupational hazards faced by women fish workers and women fishers are negligible like Sharma et.al. (2007) reported about ergonomic issues faced by women workers in West Bengal; Sharma and Ray (2002) reported about the extreme temperatures in which women workers work in Mumbai.

However, there is a knowledge gap on occupational hazards and injuries faced by women fish retailers of UT of Jammu and Kashmir. Thus, this study is an effort to address the gap by studying occupational hazards faced by fisherwomen of Dal Lake, which supports a number of livelihoods.

Materials and Methods

Dal is a Tibetan word that means 'still'. Dal Lake is referred to as the 'Jewel in the crown of Kashmir'. The Dal Lake is Srinagar city's largest water body and has been divided into two parts: (a) Lokut-Dal and (b) Bud-Dal because of the causeways and the marshy land (Fazal & Amin, 2013). Dal Lake is the second-highest fish-producing lake in the UT of Jammu and Kashmir and supports the livelihood of around 900 fishing households. The lake has a maximum length of 7.44 km and a maximum depth of 5.4m (Qadri & Yousuf, 2007). Besides snow trout and common carp, a variety of other fish species are also found in the lake. Fishing is carried out using traditional gear, among which cast net is the dominant gear (Bhat et al., 2020). A boat made of wooden planks, locally called as *Naav*, is the common craft used (Azhar et al., 2020).

The winter season here begins in December and ends in February and receives a major part of the precipitation from western disturbances in the winter months (Shafiq et al., 2018). Winter in Kashmir is characterized by duskier surroundings, bone-chilling cold, dense fog, reduced visibility, accumulation of snow and slippery roads leading to disruption of all kinds of traffic movements. People working in such environments face difficulty. Winter in Kashmir is traditionally divided into three periods- 40 days of *Chillai kalan* followed by *Chillai khurud* and *Chillai bacha*, which lasts 20 and 10 days, respectively. *Chillai kalan* (21 December to 31 January) is the harshest and coldest period. The temperatures dip to as much as -9°C in winter and go up to 38°C in summer (Shafiq et al., 2019). The top crust of the lake freezes in the winter. Dal Lake and several other water bodies froze at minus 8.4°C (TOI, 2021).

Due to the absence of official records on the number of women working in and around Dal Lake, a purposive sampling approach was employed. A sample of 60 women fish retailers was selected based on their active participation in fish marketing activities within the lake region. This sample size was chosen to ensure a robust representation of the population's demographics and occupational roles while accounting for logistical feasibility. Sampling was designed to capture a diverse range of experiences across different age groups, and daily routines, thereby maximizing the relevance and generalizability of findings regarding occupational hazards faced by women fisher retailers in this region. Data collection was conducted through direct interviews and observations, ensuring that participants provided detailed accounts of the hazards and injuries they encountered in their work especially in fish marketing.

A list of potential hazards was prepared through interactions with key informant fisher women and a literature review. A photograph sourced from the internet was used to explain the terms for injuries/diseases that are not locally used, such as frostbite, burnt skin, asthma, and hypothermia. Hazards were categorized as hazards due to cold weather, physical, biological, ergonomics, and psychosocial. Interviews were used to record responses, which were then quantified. A hazard is defined as something that has the potential for harm and, in practical terms, is associated with a condition or activity that, if left uncontrolled, can result in an injury or illness (OHS, 2013). Percentages were calculated to identify the most common hazards with their injuries. Activities that lead to injuries were also recorded, and control measures were adopted.

Results and discussion

Women fish retailers locally known as *Gadhi-wajen* / *Gadhi Hanzen* play an indispensable role in their family's survival. About 63% of fisherwomen belonged to the age group of 35-50 years, and about 37% belonged to the age group above 50 years. All women fish retailers practised Islam and had Dar as a sub-caste. About 93% of these women were semi-literate as they could only read Quran, and 7% had attained only primary education. About 21% of these women accompany their male counterparts in fishing activities. Most studies in Dal Lake have focused only on fishermen like Quresh et al. (2017), Mir et al. (2022; 2023a, 2023b).

Fisherwomen of Dal Lake wake up early in the morning. Fishermen catch fish during the evening and late-night hours, but for women, the work extends into the day-long sale of catch in all seasons and extreme winters. However, many of them accompany their men for fishing during the early morning in the summer. After finishing the household work (cooking, cleaning, etc.), they leave with a tub full of fish, lunch, hookah, weighing scales and other handy tools for selling either door-to-door or on the roadsides and footpaths of



Fig. 1: Women fish retailer carrying fish tub to the market



Fig. 2: Women fish retailer leaving for the market in early morning



Fig 3: Fire pot (*Kangiri*)

main markets of Srinagar during the summers as well as harsh winters (Fig. 1 and 2). Many of them even go to other districts to sell fish. During winter, they also carry *Kangiri* (firepot) (Fig. 3), which keeps them warm throughout the day.

They brave several social and political odds to keep her roadside stall running. Their struggles also include arguments with Srinagar Municipal Corporation for selling fish on roadsides. They sell fish in the areas which are frequently smashed by violence, thus surviving grenade blasts, violent encounters and stone pelting.

Besides all these issues, they face various hazards while selling fish. Women fish retailers reported five types of occupational hazards: hazards due to cold weather, physical, biological, ergonomics, and psychosocial. The same are discussed below.

Hazards due to cold weather

Women fish retailers of Dal Lake reported that extremely cold temperatures caused fever, chest infection and cold, reduced sensation in feet, frostbite, eye irritation, dry skin, hypothermia, and asthma. Hazards and injuries due to cold weather reported by fisher women of Dal Lake are presented in Table 1.

It is clear from Table 1 that among injuries due to cold weather, frostbite (Fig. 4) was most common and was reported in 90% of women fish retailers. These women sell fish in freezing cold snow. (Fig. 5) The tub carried by fisher women contains fish kept in cold water. While selling the fish, they come in direct contact with cold water for long periods of time, due to which they develop frostbite, which is characterized by swelling and continuous itching.

They use traditional control measures like keeping feet and hands in salt hot water mixed with locally available herbs like turmeric and henna (*Lawsonia inermis*) for relief from frostbite. As per Niazi et al. (2020), a notable improvement was seen in the symptoms of contact dermatitis, like itching, skin edema, skin thinning, sweating, and pain by using henna. Nag and Nag (2007) reported that the use of latex protective gloves by fisher folk reduced hand freezing and did not show any cold-induced symptoms on hands. However, the use of gloves was not observed/reported in the present study. It has been reported that hazards caused by long exposures to low temperatures can lead to permanent tissue damage (EHS, 2020). So, the hazards faced by women fish retailers need attention and intervention.

Table 1: Occupational hazards and injuries faced by women fish retailers of Dal Lake

| Hazard | Injury/problem | Activity | Percentage |
|-------------------------------|------------------------------|---|------------|
| Long exposure to cold weather | Frostbite | Cleaning fish with extreme cold water | 90.00 |
| | Fever, chest infection, cold | Selling fish in extreme cold throughout day | 86.60 |
| | Reduced sensation in feet | | 83.30 |
| | Dry skin | | 66.60 |
| | Eye irritation due to cold | | 26.60 |
| | Hypothermia | | 33.30 |
| Asthma | 6.60 | | |

Table 2: Physical hazards and injuries faced by women fish retailers of Dal Lake

| Hazards | Injury/problem | Activity | Percentage |
|------------------|------------------------|--|------------|
| Fish fin/knife | Cuts | Cleaning fish for customers | 96.60 |
| Kangri | Burnt Skin (Nare Taet) | Prolonged use of Kangiri while marketing | 80.00 |
| Frozen path/road | Falls | Walking on frozen slippery roads | 50.00 |



Fig 4: Hands of Women fish retailer with frostbite



Fig 5: Women fish retailers selling fish on snow covered roads

The occurrence of fever, chest infection, and cold was frequent and reported by 86% of the fishers, and only in cases of high fever did they avoid going for marketing. Shiryayeva *et al.* (2015) have also reported that runny nose and respiratory problems like nasal congestion, sneezing, and cough were the most common work-related symptoms among fishermen and fish workers in cold work environments of Russia and Norway respectively, which is similar to the results of the present study.

The sensation of extremely cold temperatures was reported to be reduced by the use of woollen clothes with double layered *Pheran* (traditional winter attire of Kashmir), *Kangri* (fire pot), *Noon chai* (Kashmiri salt tea), and few elderly also reported smoking hookah (tobacco pipe).

Physical hazards

Physical hazards are defined as hazards in the environment that can injure workers with or without contact (OSHA, 2020). Physical hazards and injuries reported by women fish retailers of Dal Lake are presented in Table 2.

It is clear from Table 2 that among injuries due to physical hazards, cuts on hands while cleaning fish for customers were most common and reported by 96.6% of these women. Ngaruiya *et al.* (2019) have also reported that fisherwomen in Kenya also experienced pricks from fish fins and spines during the gutting, scale removal, and processing, which is similar to the present study.

Table 3: Biological hazards and injuries faced by women fish retailers of Dal Lake

| Hazards | Injury/problem | Activity | Percentage |
|--------------|------------------|-----------------------------------|------------|
| Fish bites | Cut/Pain/Itching | Carrying fish tubs with live fish | 86.60 |
| Insect bites | Pain/Itching | Selling fish on road sides | 76.60 |

Table 4: Ergonomics hazards and injuries faced by women fish retailers of Dal Lake

| Hazard | Injury/problem | Activity | Percentage |
|-------------------------------|----------------|---|------------|
| Loaded fish tubs | Back pain | Carrying heavy load of fish tub on head to the markets | 80.00 |
| | Neck pain | | 73.30 |
| Prolonged sitting on roadside | | Knee/leg pain Sitting at one place for long periods of time | 66.60 |



Fig 6: Burnt skin due to use of Kangiri

It was reported that these women use *Kangiri* (fire pot) (Fig. 3) to combat bone-chilling cold while selling fish on roadsides/footpaths. The prolonged use of *Kangiri* leads to burnt skin, locally known as *Nare taet*. This was reported by 80% of women. It was observed that the skin of the exposed area had turned brown in colour (Fig. 6). This is a serious issue as it has been reported that prolonged use of *Kangiri* may result in Bowen's disease and also cancer (Hassan, 2016).

Falls were also common on frozen paths and slippery snow-covered roads and reported by 50% of these women.

Biological hazards

Biological hazards are hazards caused by living organisms that can infect or transmit diseases/injuries to human beings (OSHA, 2020). Biological hazards and injuries reported by women fish retailers of Dal Lake are presented in Table 3.

It is clear from Table 3 that among the biological hazard's injuries, fish bites were more common and reported by 86.6% of fisherwomen. Udolisa et al.

(2010) reported that fishers of Nigeria reported fish bites from sharks and pricks from catfishes and stingrays.

Studies related to injuries during fish handling are done in other countries. Ajmal et al. (2003) reported on catfish spine envenomation (venom is injected by the bite or sting of a venomous species) in Tunisia.

In addition to this, as these women fish retailers lack official markets and sit on roads for selling, they get insect bites which lead to severe itching. About 76.6% of these women reported insect bites like spiders and mosquitoes.

Ergonomics hazards

Ergonomic hazards include repetitive movement, manual handling, workplace/job/task design, uncomfortable workstation height, and poor body positioning (NASP, 2018). Ergonomics hazards and injuries reported by women fish retailers of Dal Lake are presented in Table 4.

It is clear from Table 4 that among ergonomics injuries, back and neck problems due to carrying the loaded fish tub on the head to the markets were common. The tub contains 4-7 Kg of fish and water. They carry these tubs on their heads for a considerable distance, thus leading to back and neck problems. Back pain was reported by 80% of women fish retailers, and neck pain was reported by 73.3% of these women. These bone problems sometimes lead to absence from work, thus affecting their livelihoods.

Leg and knee pain were also reported due to prolonged sitting on the roadside. Sharma (2002) has reported on the ergonomics problems of women prawn peelers and the repetitive strain injuries they face when they adopt similar postures. Sharma et al. (2007) also reported ergonomic problems of women fish farm workers in West Bengal, similar to the present study.

Psycho-social hazards

Psycho-social hazards are the hazards that arise from several psycho-social factors that workers may find to be unsatisfactory, frustrating, or demoralizing. Psycho-social hazards included political instability, problems due to the COVID-19 lockdown and conflicts.

It has been reported that psycho-social hazards can lead to stress and mental and blood pressure problems (WHO, 1984). Psycho-social hazards and problems

Table 5: Psycho-social hazards and problems faced by women fish retailers of Dal Lake

| Hazards | Problem | Reason/s reported | Percentage |
|-----------------------|----------------------|--|------------|
| COVID-19 | Anxiety / depression | Less demand/marketing of fish | 96.60 |
| Political instability | Anxiety | Periodic cycles of disturbances | 96.60 |
| | High Blood pressure | | 80.00 |
| Conflict | Stress | Arguments with officials for use of space for fish marketing | 73.30 |

reported by women fish retailers of Dal Lake are presented in Table 5.

It is clear from Table 5 that among psycho-social problems, anxiety due to COVID-19 lockdown and political instability was more common and reported by 96.6% of these women. High Blood pressure due to political instability was also reported by 80%. In the present study, women fish retailers battle the ups and downs of doing business in this disturbed region. They reported that they are agonized and have already suffered significant losses due to years of unrest when commercial activities come to a near-standstill. In addition to the conflicts and disturbances in the region, the COVID-19 pandemic and lockdowns also impacted the fisheries sector in this region. The income of women fish retailers was affected due to reduced/lost consumer demand. Restriction of mobility and self-isolation reduced the demand for fish, which had negative economic impacts on fisher women's livelihoods and incomes, leading to anxiety and stress. Similar results have been reported by Bhat *et al.* (2020) that mental problems caused by the COVID-19 lockdown have impacted the psychological well-being of individuals. Bhat and Sharpe (2021) have also reported that anxiety due to disturbances and stresses due to long working hours were the psycho-social constraints faced by fishermen and fisherwomen in the lakes of Kashmir. In addition to a lack of economic opportunities, women fish retailers had a fear of being exposed to a greater risk of infection, as markets are a place of close contact and have little hygiene and sanitation facilities. This has also been reported by the FAO (2021). The pandemic led to income loss due to job loss or reduced income due to the COVID-19 lockdown and also gave birth to domestic problems.

Conclusion

The findings of this study highlight the significant occupational hazards faced by women fish retailers, locally known as *Gadhi-wajen* or *Gadhi Hanzen*, in Dal Lake. These women play a vital role in the region's fish trade, enduring various environmental, physical, biological, ergonomic, and psychosocial challenges in their daily work. The most prevalent hazard injuries include frostbite, cuts from fish fins or knives, fish bites, back and neck pain from carrying heavy loads, and psychological stress due to political instability and the COVID-19 pandemic. Despite their hardships, they have limited access to formal safety measures, relying on traditional remedies for relief. The lack of structured safety practices exacerbates their vulnerability to long-term health issues and economic instability. Therefore, it is crucial for policymakers, fisheries development planners, and relevant authorities to recognize the unique challenges faced by these women and integrate appropriate occupational safety measures, health interventions, and support systems into the region's fisheries sector. This would not only improve their well-being but also ensure the sustainability and growth of this important livelihood sector.

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