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Gendered Perspectives on Fish Consumption: A Comparative Analysis of Women and Men in Kerala, India

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Abstract

The study conducted in Kerala, India aimed to assess consumption and perception differences among women and men fish consumers regarding health, safety, and quality issues. Using a purposive random sampling method, 263 women and 137 men fish consumers from coastal districts (Ernakulam and Kozhikode) and inland districts (Kottayam and Palakkad) of Kerala were surveyed. The sample represented a diverse range of socio-demographic characteristics, including gender, age, family size, education, occupation, and place of residence. Per capita fish consumption was estimated at 2.9 kg/month with a household consumption of 11.6 kg/month. Consumer perceptions reveal significant concerns about fish quality and safety and inefficiency of government mechanism in enforcement. The study found that women had a significantly higher perception than men regarding the nutrition and health benefits of fish, highlighting their efforts to meet the nutritional needs of their families. The findings suggest that while men may benefit from more customized information about the health advantages of fish, women may require tailored information on quality and safety risks associated with fish consumption. The study underscores the importance of customized scientific communication regarding the nutrition and health benefits of fish, specifically tailored for both genders.

Keywords: Consumption, fish, Kerala, perception, women.

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Introduction

Seafood offers exceptional nutritional value, often surpassing the health advantages of land-based meat products (Bogard et al., 2015). Known for its abundance of unsaturated fatty acids, amino acids, vitamins, and minerals, coupled with its low-fat content (Yaktine & Nesheim, 2007), fish occupies a prominent place in global cuisine as health food (Burger et al., 1999; Turan, Kottelat, Kirankaya, & Engin, 2006), contributing significantly to the sustainability, safety, and nutritional value of diverse diets. Globally, fish is acknowledged as the third major source of dietary protein, following cereals and milk (FAO, 2020). Numerous studies (Brunsø, 2003; Gross, 2003) consistently indicate that consumers perceive fish as a healthier choice among non-vegetarian foods. The fisheries sector plays a pivotal role in addressing global hunger, promoting food security, and enhancing nutrition (Bennett et al., 2021). Fish constitutes 20% of the total animal protein intake for 3.1 billion people, and per capita fish consumption has notably risen from 9.0 kg in 1961 to 20.2 kg in 2022 (FAO, 2022).

As per the National Sample Survey Organization (NSSO) report in India, the monthly per capita fish consumption in urban and rural areas is reported to be 0.27 kg and 0.25 kg, respectively. Despite the Indian Council of Medical Research (ICMR) recommending a fish consumption target of 12 kg/year, this goal remains unmet, with a predicted per capita fish consumption of 6.6 kg in 2030 according to the World Bank (World Bank, 2013). The Government of India aimed to achieve 20 million metric tons of fish production by 2022-23 through the "Blue Revolution" flagship scheme (Shasani, De, & Das, 2020), but this target was not realized. Some states, including Tripura, Chhattisgarh, Manipur, Kerala, and Odisha, report higher average annual per capita fish consumption. The Union Territory of Andaman and Nicobar Islands recorded the highest per capita

fish consumption at 77.84 kg/year in 2020-21 (DoF, 2022). The annual per capita consumption of fish for the entire Indian population is estimated to be around 5-6 kg, while for those who include fish in their diet, the consumption rises to 8-9 kg. The annual per capita fish consumption in India stood at 6.31 kg, although Kerala reported a significantly higher consumption rate of 17.93 kg per year (DoF, 2022). The media has extensively highlighted concerns about fish adulteration, leading to increased consumer awareness regarding health, safety, and quality aspects associated with fish consumption.

Consumers often face challenges in making food choices, balancing conflicting factors such as health benefits and safety risks (Verbeke, Sioen, Pieniak, Camp, & Henauw, 2004). The purchasing decisions of consumers are primarily influenced by factors such as quality, nutritional value, and price of fish. (Hanmantrao, Ananthan, Sekhar, & Biswajit, 2011). Additionally, the economic aspects of food choices are significantly linked to considerations of food quality and safety (Grunert, 2005). It is crucial to understand how individuals perceive the conflicting information regarding health risks and benefits associated with fish consumption (Van Dijk, Fischer, Honkanen, & Frewer, 2011). Psychological factors, including early perceptions and learning, play a pivotal role in shaping fundamental and enduring food choices (Koster & Mojet, 2007). Consumer perceptions regarding food quality evolve over time and are currently intertwined with considerations of nutrition, well-being, and health. Governments have the responsibility to address consumer concerns and expectations through their food safety assurance or health departments, with science and innovation playing a pivotal role in this endeavour (Troy & Kerry, 2010).

Recent literature highlights a gap in understanding gendered consumer perceptions of the health benefits, quality, and safety of fish for consumption. Exploring these perceptions is essential as men and women often differ in their views, which can influence consumption patterns and dietary choices. Gender-specific attitudes and beliefs play a critical role in shaping public health strategies, marketing approaches, and educational programs, ensuring they address the unique concerns of all genders. Gender roles, shaped by social and cultural expectations, often position women as primarily responsible for cooking and food preparation, making them more concerned about food safety and nutritional content. In contrast, men may prioritize taste and convenience. Gender relations, which describe interactions and power dynamics between genders, further influence these perceptions. Understanding these differences enables stakeholders to design targeted interventions that cater to diverse needs, resulting in more inclusive and effective policies. This study therefore aims to examine gender-based consumer perceptions of the nutrition, health benefits, quality, and safety of fish, providing actionable insights for the public health system in Kerala, India.

Materials and Methods

The study adopted a purposeful random sampling approach, focusing on both coastal and inland districts in Kerala, India. Specifically, Kozhikode and Ernakulam were chosen to represent coastal districts, while Palakkad and Kottayam represented inland districts. The selection of these districts aimed to capture the diversity of fish consumption habits across different geographical regions. A total of 100 households engaged in fish consumption were randomly selected from each district, resulting in a final sample size of 400. This sample size was determined to ensure statistical significance and robustness in the analysis while considering practical constraints with regard to timeframe and resource availability. To collect primary data, a structured interview schedule was developed after conducting an extensive review of literature, engaging in field interactions, and consulting with experts. The interview schedule covered socio-personal characteristics of consumers, fish consumption behaviour, and aspects related to consumer perception. Perception statements were formulated under three conceptual dimensions: nutritional-health benefits of fish, quality concerns, and safety issues in fish consumption. Personal interviews were conducted during December 2018 to March 2020, with one adult respondent per household, primarily responsible for fish purchase and (or) cooking. Respondents were asked to evaluate perception statements on a 5-point Likert scale, ranging from 'strongly agree' to 'strongly disagree.' The collected data were analysed using various statistical methods, including frequency analysis and non-parametric tests such as Friedman's test and Mann-Whitney U test. These analyses enabled to explore differences in perception among different demographic groups, including gender, and to draw

meaningful insights into gendered perspectives on fish consumption in Kerala.

Results and Discussion

The survey, conducted with 400 respondents, reveals a diverse socio-personal profile (Table 1). The gender distribution is skewed towards women, comprising 65.9% of participants, compared to 34.1% men. Among households, 60% have spouses who were employed, while 40% have homemakers as spouses. Educational qualifications are evenly distributed, with 32.4% of respondents having secondary education and an equal percentage holding graduate degrees. Respondents are geographically spread across rural (48.8%), semi-urban (20.3%), and urban (31.0%) areas. The majority fall within the age range of 36–60 years (54.4%), and occupations vary widely, including farming (4.0%), labour (8.0%), and self-employment (24.3%). Monthly family income also shows considerable variation, with 42.3% of households earning between Rs. 10,000 and Rs. 25,000.

Comparing the findings with national data reveals significant alignment with key demographic and socio-economic indicators. The gender distribution in the sample closely mirrors the overall population, with a slightly higher representation of women, consistent with broader trends in the region. Similarly, the distribution of respondents across rural, semi-urban, and urban areas reflects the general population distribution in Kerala, underlining the geographical diversity captured in our sample. Educational attainment levels among the respondents, spanning various levels from secondary to graduate education, correspond closely with statistics for Kerala, suggesting a representative sample in terms of educational background. However, the distribution of monthly family income brackets within our sample differs well with the broader income distribution patterns observed at the national level due to higher percapita income in Kerala. These results offer a comprehensive overview of the demographic and socio-economic characteristics of the surveyed population, laying the foundation for understanding their perceptions and behaviours related to fish consumption.

The monthly fish consumption within the surveyed households varied significantly, ranging from one kg to 50 kg with an average of 11.6 kg/month. Per capita fish consumption was estimated at 2.9 kg/month ranging between 0.11 kg and 9.33 kg per month (Table 2). Similar estimates of high percapita fish consumption from Kerala have been reported recently by Sajeev et al. (2022). The majority of respondents (60.9%) fell into the medium fish consumption category, consuming between 1.07 kg and 4.81 kg per capita per month. Approximately 19.5% of respondents were categorized as low fish

Table 1. Distribution of respondents based on socio-personal variables (n= 400)

Particulars	Category	%	Particulars	Category	%
Gender	Male	34.1	**Working status of**	Employee	60.0
	Female	65.9	**spouse**	Home maker	40.0
Education	Primary	13.9	**Place of residence**	Rural	48.8
	Secondary	32.4		Semi urban	20.3
	Graduate	32.4		Urban	31.0
	Post graduate	21.3	**Age (Years)**	Below 25	9.0
Occupation	Farming	4.0		26 -35	29.6
	Fishing	1.5		36-60	54.4
	Labour	8.0		61 and older	7.0
	Fish vending	4.0	**Monthly family**	Less than 10000	11.0
	Self employed	24.3	**Income (Rs.)**	10000-25000	42.3
	Private casual	13.8		25000-50000	30.8
	Private salaried	21.5		50000-1lakh	14.5
	Govt. service	22.5		1lakh and above	1.5

Table 2. Monthly fish consumption of the respondent households (%, n= 400)

Fish consumption	Minimum	Maximum	Mean	Std. Deviation
Consumption of the household (Kg/ Month)	1.00	50.00	11.6	7.26
Per capita consumption (Kg/ Month)	0.11	9.33	2.9	1.87

Table 3. Difference in nutritional and health benefit perception of consumers

Perception Statements	Mean Rank	χ^2	p
Eating fish is recommended for all age groups	3.96	204.68	0.000
Fish is the most nutritious food	3.95		
Fish is healthier than red meat	3.81		
Fatty fish consumption can improve the development of bones	3.22		
Regular fish consumption stimulates brain development	3.10		
Fish consumption reduces the risk of cardiovascular diseases	2.96		

eaters, consuming less than 1.07 kg per capita per month, while another 19.5% were identified as heavy fish eaters, consuming more than 4.81 kg per capita per month.

The majority of fish consumers in Kerala (81.5%) have a moderate perception of the nutritional and health benefits of fish consumption, while 11.3% have a high perception, and 7.3% hold a low perception. The non-parametric Friedman test indicates a significant difference in perceptions about the nutritional and health benefits of fish (Table 3). These findings suggest that, in Kerala, people recognize fish as a highly nutritious food suitable for all age groups, reflecting a promising awareness of the general health benefits derived from fish consumption. However, the results also indicate that while consumers strongly perceive the nutritional benefits, their awareness of the specific health benefits of eating fish is comparatively lower. This aligns with findings from fish consumer surveys in Odisha and Karnataka, where awareness about specific health benefits of fish were found low (Tanuja, Jeeva, Rout, & Srivastava, 2020; Sajeev, Ramesha, Chethan, & Gopika, 2023). Reviews also highlight the limited use of scientific evidence from nutritional research in programs designed to combat under-nutrition in the country (Asha, Suseela, Prasad, & Ravishankar, 2020).

The results regarding fish quality perception reveal significant concerns among fish consumers in the state, particularly regarding the quality of fish sourced from other states and the maintenance of quality during transportation (Table 4). Dissatisfaction with market cleanliness and challenges in adequately assessing fish quality in the market are prominent sentiments among consumers (Sajeev, Radhakrishnan et al., 2021; Sajeev, Joshy et al., 2021). Recent reviews underscore the issue, citing inadequate cold storage and transportation facilities at the retail level as contributors to poor-quality fish reaching consumers (CII & Yes Bank, 2020). A study conducted in Palakkad district of Kerala further reinforces the importance of quality as a key factor influencing consumer behaviour, with a demonstrated willingness to pay a premium of 10-15% for the best quality fish (Geethalakshmi, Ashaletha, Raj, & Nasser, 2013).

The results of the Friedman test indicate a significant difference in the perception statements regarding the safety of fish (Table 5). The statement with the highest mean rank (3.67) was "Government machinery is not effective in ensuring safe fish to consumers," while the lowest mean rank (3.06) was for the statement "Fish contain heavy metals and many harmful contaminants." These findings suggest that fish consumers in the state hold strong concerns about the safety of fish, despite underestimating significant risks such as heavy metals and other harmful contaminants. It is essential to educate the public about the risks and warnings associated with food, as people often underestimate some risks while overestimating others (Burger et al., 1999). Empowering consumers with knowledge

Table 4. Difference in fish quality perception of consumers

Perception statements	Mean Rank	χ^2	p
Local fish is of better quality than the fish coming from other states	4.55	131.799	0.00
Fish quality is influenced by time taken to reach market after capture	4.46		
Cleanliness of market contributes to quality of fish	4.18		
There is no quality certification system to convey the freshness of fish	3.93		
Consumers are unable to properly assess fish quality in the market	3.88		
Authorities have left consumers to be duped by vendors w.r.t fish quality	3.65		
Farmed fish is of lower quality than wild captured fish	3.35		

Table 5. Difference in fish safety perception of consumers

Perception statements	Mean Rank	χ^2	p
Government machinery is not effective in ensuring safe fish to consumers	3.67	50.99	0.000
There is no certification system to convey the safety of fish	3.64		
Spoilt fish from other states is widely sold in Kerala markets	3.64		
Fish in our markets contain adulterants	3.57		
Eating some fishes causes allergy in many people	3.41		
Fish contain heavy metals and many harmful contaminants	3.06		

about their rights can help build confidence in food production systems (Fox, Mitchell, Dean, Elliott, & Campbell, 2018).

The Mann-Whitney U test results comparing the perception of men and women on various statements related to fish consumption are presented in table 6. The results show significant differences in perception between men and women in several aspects of fish consumption. Women tend to have a higher perception that fish consumption reduces the risk of cardiovascular diseases, (p=0.024). Similarly, women show a greater awareness that the quality of fish is influenced by the time taken to reach the market after capture (p=0.002). The perception that eating some fishes causes allergies is also more pronounced in women (p=0.002). Moreover, women express a stronger concern about the absence of a certification system to convey the safety of fish, (p= 0.001). When considering the overall nutritional-health perception, women exhibit a significantly higher mean rank compared to men, (p= 0.033). These findings highlight gender-related variations in perceptions related to different aspects of fish consumption.

Women demonstrated a significantly higher perception of the health benefits of fish, reflecting their efforts to meet the nutritional needs of their families. In contrast, men, due to their greater exposure to fish markets and related environments, expressed stronger concerns about fish quality during transportation and the absence of a certification system that ensures safety of fish. These gender differences in perception suggest that men would benefit from more tailored information on the health benefits of fish, while women require targeted information addressing the quality and safety risks associated with fish consumption.

The relatively lower awareness of specific health benefits from fish implies a need for future health awareness programs in Kerala to focus more on disseminating scientific data about the specific health advantages of this commonly preferred food. In the current context of rising lifestyle diseases, providing greater publicity and access to scientific dietary information through the public health system can benefit the population. In response to the consumer concerns in Kerala, the government should consider policy changes to facilitate scientific and hygienic fish transportation within the state and ensure the quality of fish imported from other states. Emphasizing hygienic fish markets and implementing it in domestic fish markets across Kerala is crucial. Increasing awareness among stakeholders

Table 6. Differences in perception of men vs. women fish consumers

Perception statements	Mean rank		U	p
	Men	Women		
Fish consumption reduces the risk of cardiovascular diseases	169.24	194.31	13190.500	.024
Fish quality is influenced by time taken to reach market after capture	210.83	176.45	12811.000	.002
Eating some fishes causes allergy in many people	168.88	203.88	13440.000	.002
There is no certification system to convey the safety of fish	212.27	174.26	12341.500	.001
Overall nutritional- health perception	182.95	208.82	15565.500	.033

about treating fish as a food item that should be properly packed and certified for freshness and quality is essential. Significant efforts are required to establish proper quality assessment and certification processes for fish in domestic markets throughout Kerala. Educational programs focused on potential safety hazards in fish are crucial for cultivating a balanced public perception of the safety risks associated with fish consumption and it is imperative for the fishery and health extension systems in Kerala to address consumer concerns effectively. Additionally, the government should establish a mandatory certification system to ensure fish is free from adulterants and harmful contaminants. This certification should apply to both locally caught fish and those sourced from other states.

In Kerala, both women and men have a higher per capita fish consumption compared to most of other Indian states. Additionally, women record a significantly higher perception than men regarding the nutritional and health benefits of fish, highlighting their dedication to meeting their family's nutritional needs. The study suggests that men would benefit from more tailored information on the health advantages of fish, while women express a need for customized information addressing quality and safety risks associated with fish consumption. Overall, the findings emphasize the importance of enhancing the customization of scientific communication about the nutritional and health benefits of fish, specifically tailored to the unique needs of both genders.

This consumer perception study puts forth several recommendations for the fisheries extension system and health department machinery in Kerala. Firstly, the government can implement stringent regulatory measures to ensure the quality assurance of fish during transportation, storage, and marketing. Additionally, as a long-term strategy, it is suggested that government initiate a decentralized system for assessing fish safety, employing scientific methods in harbours, landing centres, and markets. Furthermore, empowering consumers to independently assess possible adulterants in fish is recommended. These measures collectively aim to enhance the safety, quality, and transparency in the fish supply chain in Kerala, India.

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