



Gendered Differences in Nutritional status of Fish Consuming Households in Kerala, India

Pe. Jeyya Jeyanthi*, T.V. Sankar, R. Anandan, Suseela Mathew and Nikita Gopal
ICAR – Central Institute of Fisheries Technology, P. O. Matsyapuri, Cochin - 682 029, India

Abstract

Malnutrition, the deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients, covers two groups of conditions *viz.*, 'under nutrition' and 'over nutrition'. Malnutrition impacts globally across households, communities and countries with 0.46 and 1.90 billion adults being in under and over nutrition conditions, respectively. The level of malnutrition is generally higher among women and children. A cross-sectional study was undertaken to assess the nutritional status in Vadi and Kottarakkara villages, Kollam District, Kerala, India with emphasis on gender differences in the nutritional status of fish consuming households. The Body Mass Index (BMI) of children, adolescents and adults was calculated as per World Health Organisation (WHO) classification. In coastal village, 55% of boys and girls were of normal weight, and in non-coastal village 40.74% boys and 60.47% girls were normal weight. BMI of adolescents showed that 55.17% of boys and 63.64% girls were underweight. Majority of adults (64.71%) showed normal weight which included 56% women and 73% men. There is no prominent gender difference in nutritional status and demography, literacy and job were found to influence the nutritional status of fishers.

Keywords: Malnutrition, nutritional status, gendered differences, households

Introduction

'Good nutrition is our first defence against disease and our source of energy to live and be active'

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*E-mail: tvjeyanthi@gmail.com

proclaimed by United Nations General Assembly as UN Decade of Action on Nutrition (2016-2025) for mobilising action to eradicate malnutrition in all its forms in all countries.

Fish plays an important role in ensuring food and nutritional security and is one of the cheapest sources of protein (UNEP, 2005) providing almost 16% of animal protein (FAO, 1997). In developing countries, it is a major source of animal protein (www.fao.org) and an important dietary component in coastal households (HLPE, 2014; Jeyanthi, 2017). Consumption of fish is also proven to be beneficial for preventing various lifestyle diseases (Hosomi et al., 2012).

Kerala is one of the largest producer and consumer of fish. The per capita fish consumption is 26 kg which is higher than the national average per capita fish consumption of India (Shyam, 2012) and the preferred form is fresh fish (Jeyanthi & Gopal, 2015). This paper looks at the nutrition status of fish consuming households in Kerala. Basically, nutrition and health are closely linked (FAO, 2007). According to WHO (2018) nutritional status is the physiological state of an individual which results from the relationship between nutrient intake and requirements and the body's ability to digest, absorb and use these nutrients.

Nutritional status of a region is determined by consumption patterns and socio-economic conditions of households of that particular region. The assumption is that there will be variation in nutritional status of households with reference to geographical regions and in this case we are attempting to look at differences, if any, between coastal and non-coastal villages. Another aspect that the paper looks at is whether there is any gender difference within households as far as nutrition is concerned.

Materials and Methods

Kollam is coastal district and a leading producer of marine fishes in Kerala (Government of Kerala, 2016). Two villages *viz.*, Vadi which is a coastal village (CV) and Kottarakkara which is a non-coastal village (NCV) has been selected for the study.

The nutritional status of children (<10 years of age), adolescents (10-19 years of age) and adults (>19 years of age) of both genders were compared. A structured, pre-tested interview schedule was used and the data were collected purposively in the ratio of 2:1 coastal and non-coastal villages. The study group comprised 75 children, 85 adolescents and 1,152 adults (648 males and 504 females) in coastal villages (CV) and 37 children, 43 adolescents and 676 adults (382 males and 294 females) in non-coastal village (NCV). In all, 1968 respondents were covered from 300 households (HH). All the households consumed fish daily (Table 1).

The nutritional status was analyzed using World Health Organization (WHO) classification. The

classification is based on BMI, which is a standard indicator, calculated from body weight and height measurements.

The household profile *viz.*, age, gender, size of household, number of working members in a household, monthly income and infrastructure facilities possessed or accessed were studied. The factors determining the nutritional status of households were assessed using factor analysis. The parameters were selected by incorporating the socio-economic and health aspects of household. The demographic, literary, job, income, health and dietary status were the factors used in explaining the overall nutritional status. The details of factors and the parameters explaining each factors that were used in the factor analysis is mentioned in Table 3.

Results and Discussion

The profile of households in Kollam, Kerala revealed that the nuclear family (with family size four) was the most common family type in both coastal (73%) and non-coastal villages (62%). At

Table 1. Respondents by gender and age

Particulars	Gender	Coastal village	Non-coastal village	Pooled
Adult	Male	648 (49.39)	382 (58.23)	1030
	Female	504 (38.41)	294 (29.57)	698
Adolescent	Boy	56 (4.27)	21 (3.20)	77
	Girl	29 (2.21)	22 (3.35)	51
Children	Boy	42 (3.20)	27 (4.12)	69
	Girl	33 (2.52)	10 (1.52)	43
Total		1312 (100.00)	656 (100.00)	1968

* Numbers in brackets in each cell are row percentages.

Table 2. WHO classification of nutritional status

BMI values and nutritional status		Associated risks
	BMI between 18.5 and 25: Normal weight	Normal
	BMI between 25 and 30: Over weight	Average
	BMI between 30 and 40: Obesity	Important
	BMI above 40: Morbid obesity	Severe

Source: World Health Organization

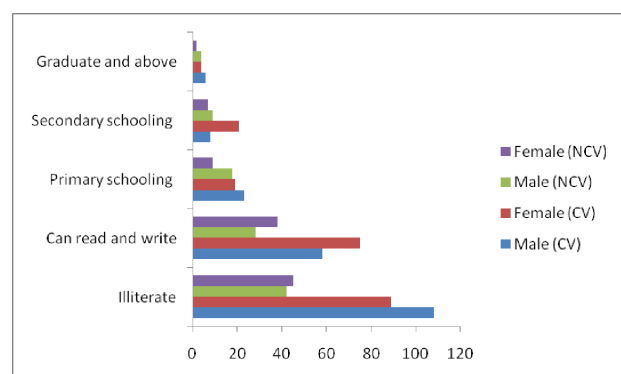
Table 3. Details of factors used in factor analysis

Factors	Parameters explaining the each factors
Demographic status	Age, Family size, Number of employed persons/ family, family income, Contribution of women to family income, Number of children
Literacy status	Education level and number of educated members in a family
Job status	Number of persons employed, nature of employment
Income status	Income earned by an individual, Income by male and income by female
Health status	Type of illness, incidence of baby with low birth weight, baby weight
Dietary status	Frequency of food consumption, expenditure on food

least, two family members in a household were employed. Garrett & Ruel (1999) argued that bigger household size had a negative impacts on calorie availability, which is greater in rural than in urban areas.

Only 42% of the respondents were literate. This is below the state average of 94% (Census, 2012). Primary schooling is the predominant educational qualification completed by the majority of households, followed by secondary schooling. Few individuals had completed graduation and post-graduation (Fig. 1). Among the literate respondents, 52 and 62% of men and 43% and 54% of women could read and write in the coastal and non-coastal villages, respectively.

Majority of men and women were engaged in unskilled employment, with more than 85% men and 20% women were engaged in unskilled employment in both the villages. Among the women, more than 75% were engaged in one or more fishing related activities.

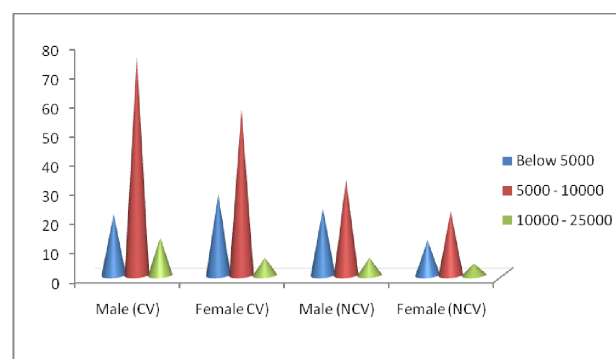


CV – Coastal village; NCV –Non-coastal village

Fig. 1. Educational status of respondents of household

The average monthly income of households ranged between Rs. 5000 – 10000 and it was higher in coastal village (Rs. 8686.84) than in non-coastal village (Rs. 7847.29). The monthly household income revealed that 55.50% of them earned Rs. 5000-10,000 in coastal village, while 76% earned below Rs.5000 in the non-coastal village. A considerable proportion of income was contributed by women in both the villages (Fig. 2). The support from other family members in the non-coastal village (41%) was considerably higher than the coastal village.

All the households consumed food thrice daily, with fish as an integral diet component. The highly preferred fishes were sardine and mackerel. The average fish consumption per week was 500 gm per head. The daily expenditure on fish accounted Rs. 125-150. From the study, it was revealed that diet is mainly cereal based with less vegetables and fruits. But, fish is the main daily diet in majority of households. The study results are contrast to the finding that consumption patterns are changing towards non-cereal food over time (Mashal et al., 2008).



* CV – Coastal village; NCV –Non-coastal village

Fig. 1. Income status of respondents

Table 4. Average Age details of rspondents

Particulars	Age (in years)	
	Coastal village (n=200)	Non-coastal village(n=100)
Children_ Boy	9.23	8.45
Children_Girl	9.01	8.29
Adolescent_Boy	16.54	17.42
Adolescent_Girl	15.94	16.67
Adult_Male	49.25	50.12
Adult_Female	46.47	47.75

The average age of children ranged between 8-9 years for boys and girls in both the villages. They were in the age group 45. Anthropometric measures are the outcome indicators, which reflect the end result (in a person) of all the factors that affect nutritional status. The results of descriptive statistics on anthropometric measures (body height and weight) of adults, adolescents and children of both the gender in the households are presented in Table 5.

Among children about 42.86% and 44.44% boys were found to be underweight in coastal and non-coastal villages, respectively. In total, 55% of both boys and girls in coastal village had normal weight. In non-coastal village, 40.74% boys and 60.47% girls had normal weight (Table 6). Around 9% girl children in CV and 15% boy children in NCV were over weight. There were no children in the obese or morbid obese category. Nutritional status during childhood determines the overall growth and development. Nutritional status of children is

relatively connected with education status of mother. The study on nutritional status of children in Maharastra found that children of illiterate mother are likely to fall in the underweight category than educated mothers (Unisa et al., 2016).

In the adolescent category, the BMI status revealed that more than 55 and 60% of girls were underweight. Only 43 and 33% of boys in coastal and non-coastal village showed normal weight while 38 and 32% of girls were normal weight. Around 9 and 15% adolescent boys were overweight in CV and NCV respectively while among girls it was only 7 and 5%. No obese or morbid obese cases were observed (Table 6). More adolescent girls than boys were underweight. Generally, nutritional status of adolescent girls contributes to the nutritional status of the community. Therefore, there is a need for measures to improve the nutritional status of adolescent girls. Awareness creation about nutrition and health is reported to have positive results (Teji et al., 2016). Malnutrition among the adolescent girls in the South East Asia is an extremely complex problem having long term impacts on health and well being (Alam et al., 2010; Madjdian & Bras, 2016).

Among the adults, around 35% of female in both coastal and non-coastal villages were underweight. According to Pawowska & Chalcarz (2017), the variation in nutritional intake influenced the gender differences in nutritional status. Majority of males had normal weights in coastal (68.36%) and non-coastal village (62.30%). Around 17.90 and 22.25% male in CV and NCV were overweight. About 6% female in coastal village and 5% male in NCV were obese. Apart from gender, intra-household allocation patterns also contributed considerably towards

Table 5. Anthropogenic characteristics of study group in Kollam, Kerala

Particulars	Coastal village			Non-coastal village		
	Height (cms)	Weight (kg)	BMI	Height (cms)	Weight (kg)	BMI
Children_boy	97.00	17.72	18.83	92.28	16.54	19.42
Children_girl	90.60	17.60	21.44	89.45	16.47	20.58
Adol_boy	122.27	34.50	23.08	120.56	34.25	23.56
Adol_girl	120.70	27.50	18.88	119.24	26.45	18.60
Adult_male_	166.82	60.28	21.66	164.75	59.15	21.79
Adult_female_	157.01	51.35	20.83	155.14	50.34	20.92

* BMI – Body Mass Inde

Table 6. Nutritional status of children, adolescents and adults in the responding households

BMI status	Coastal village						Non-coastal village					
	Children		Adolescent		Adult		Children		Adolescent		Adult	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Underweight	18 (42.86)	12 (36.36)	27 (48.21)	16 (55.17)	32 (4.94)	178 (35.32)	12 (44.44)	15 (34.88)	11 (52.38)	14 (63.64)	24 (6.28)	102 (34.69)
Normal weight	23 (54.76)	18 (54.55)	24 (42.86)	11 (37.93)	443 (68.36)	239 (47.42)	11 (40.74)	26 (60.47)	7 (33.33)	7 (31.82)	238 (62.30)	142 (48.30)
Over weight	2.38 (2.38)	3 (9.09)	5 (8.93)	2 (6.90)	116 (17.90)	36 (7.14)	4 (14.81)	2 (4.65)	3 (14.29)	1 (4.55)	85 (22.25)	23 (7.82)
Obese	-	-	-	-	36 (5.56)	32 (6.35)	-	-	-	-	19 (4.97)	14 (4.76)
Morbid Obese	-	-	-	-	21 (3.24)	19 (3.77)	-	-	-	-	16 (4.19)	13 (4.42)
Total	42 (100.00)	33 (100.00)	42 (100.00)	33 (100.00)	648 (100.00)	504 (100.00)	27 (100.00)	43 (100.00)	27 (100.00)	43 (100.00)	382 (100.00)	294 (100.00)

* - Numbers in brackets are percentages

determining the nutritional status of households. It was found that there was no significant difference between the household's nutritional status of all the three categories (children, adolescents and adults) in CV and NCV. From the previous studies, it was found that aging possesses number of challenges for the maintenance of good nutritional health in older adults (Leslie & Hankey, 2015). As per WHO, around 39% and 13% of adults aged above 18 years were overweight and obese in 2016 (WHO, 2020).

The results of determinants of nutritional status of fish dependent households using Kaiser-Meyer-Olkin and Bartlett's test showed the measure of sampling adequacy value as 0.54 and the chi-square test of sphericity was significant. It was found that the nutritional status of fish dependent households was mainly determined by demographic status, literacy status and job status. The income status,

Table 7. Factor Analysis for determining the factors of nutritional status (Rotated component matrix)

Parameters	Component 1	Component 2
Demographic status		0.56
Literacy status		0.75
Job status		0.49
Income status	0.56	
Health status	0.68	
Dietary pattern	0.73	

health status and dietary pattern were not a significant determinant of nutritional status of fish-dependent households in this study (Table 7). In fact, accessibility and availability of food are the factors that affect the nutrition (Verhart et al., 2015)

There was intra and inter household variation in nutritional status of fish consuming households (children, adolescents and adults). There was an apparent gender differences in the nutritional pattern of households especially in adolescents category. Nearly 35% of children are falling in underweight category. The proportion of underweight is more alarming among adolescent female. Women in underweight category are more (35%) compared to males in both the villages. Age and BMI relation showed that the BMI is increased over the age in male category. The gender specific differences in nutritional status were observed between groups and regions. Income status, dietary pattern and health status are the factors determining the nutritional status of household. Diet diversification needs to be stressed, particularly in the regions with high under-nutrition people. There is also the need to intensify education on health management and its associated health problems.

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