An Assessment of the nutritional Status and its Predictors amongst women in a rural community of Dharwad Taluk, Karnataka, India

Abstract

The connection between food insecurity and health is becoming more widely acknowledged, as it plays a major role in the onset and advancement of non-communicable illnesses. The family's overall well-being and health are directly impacted by the health status of the female.Rural women play a dominant role in the country's economy and their nutritional status has direct bearing on the whole family. Hence the present study was conducted with the objective to assess nutritional status and to identify the predictors of poor nutrition among rural women of Dharwad taluk, Karnataka. The sample of the study included 500 rural women in the age group of 16-80 years. A self structured questionnaire, SES Agarwal 2005, Anthropometric measurements were used to assess BMI, Hb level, knowledge level and morbidity status. More than one third of the rural women were selected were in the age group of 40-80 years, were illiterates and involved in agriculture. Majority belong to social tribes and staying in nuclear families. Two third of the selected rural womenconsume non-vegetarian food. More than half of the families belonged to upper middle socio economic status. Majority of them had health related problems and were in mild to moderate anemia category. Low SES, low nutritional knowledge, non working status, morbidity condition, middle age group, anemia status and poor protein diet were found to be the risk factors of poor nutritional status among rural women. Low SES was found to be 2.6 times riskier; anemia condition was 4.68 times risk when compared to normal Hemoglobin level.

Key Words: Nutritional status, SES, Anemia, Morbidity, Knowledge

Introduction

India's economy greatly depends on agriculture, and women make up the majority of those working in the field from planting to harvesting. Based on data from the Agriculture Census (2010–11), women made up 30.3% of the estimated 118.7 million cultivators and 42.6% of the 144.3 million agricultural laborers. Of all female primary laborers, 24% were cultivators and 55% were agricultural laborers.Increased "casualization" of work, unprofitable crop production, and men's distress migration "for higher casual work in agriculture and non-agriculture sectors" have all contributed to the femininization of agriculture in India. Women are increasingly responsible for caring for the family land when men are not there. Job overload, feminization of poverty, job risks, and family burden are all consequences of feminization in agriculture, and these factors have led to severe physical and mental health issues (https://agcensus.nic.in/)..

An important factor in poor health is inadequate nutrition, which can also significantly shorten life expectancy and raise the risk of non-communicable diseases (NCDs), obesity, and obesity-related morbidity. The connection between food insecurity and health is becoming more widely acknowledged, as it plays a major role in the onset and advancement of non-communicable illnesses. The family's overall well-being and health are directly impacted by the health status of the female. The entire family is impacted by maternal mortality and morbidity, not just the mother. Most of the time, women manage the home and take care of the children in addition to actively participating in financially rewarding work outside the home or perhaps making a substantial contribution to the family business, whether it be in industry or agriculture. They are the main players in the rural economy. It suggests that their nutritional and physical well-being is critical to the growth of the country as well as to their own families. It health limits both their economic potential and their ability to care for family members (Aiyar,2021. Mckay,2017).

Some of the elements that operate against rural females are the patriarchal social structure, gender discrimination from birth, malnourishment, illiteracy, unskilled labor, hard physical work, early marriage, frequent and multiple pregnancies, and poverty. Female morbidity rates are higher even after they have an advantage over males biologically. Women are triple jeopardized by some of the elements that operate against rural females like the patriarchal social structure, gender discrimination from birth, malnourishment, illiteracy, unskilled labor, hard physical work, early marriage, frequent and multiple pregnancies, and poverty. One of the main reasons for the current state of health is low literacy and ignorance about nutrition and health. According to the 2001 census,

only 39.3% of Indian women are literate, making up 52.21 percent of the country's overall literate population.In particular, 30.6 percent of the females in rural areas are literates when compared to the overall 44.70 percent literates.

Anaemia is one of the most widely spread deficiency disease among women. Anaemia occurs due to deficiency of iron and folic acid. Iron is needed for the formation of haemoglobin that is the carrier of oxygen in our blood.According to the fifth round of the National Family Health Survey (NFHS-5), 57 percent of women are anaemic as per NFHS-5 in comparison to 53 percent reported by NFHS-4 in all the round-II states and union territories in India. In Karnataka 20 per cent of rural women have poor status and 37 per cent are obese. And the anemic rate among women in Karnataka is 59 per cent. And in Dharwad district 16.70 and 18.40 per cent of rural women had low BMI and obese respectively.And the anemic rate is 50.20 Per cent. (NFHS-5 Report). Hence under nutri smart village programme, five villages were adopted to improve the nutritional status of women. In view of this, the following study was conducted with an objective to study the nutritional status of the rural women in Dharwad taluk andits predicting factors.

Methodology

Population and Sample

The population of the sample was rural women from Dharwad taluk in the age group of 20-80 years. Among the 118 villages in Dharwad taluk five villages namely Belur, Dubbanamardi, Kalkeri, Kumbarkoppa and Kogelgeri were selected purposively as they were adopted under "**Nutri Smart Villages**" programme by ICAR- India Co-ordinated research Project-Women in Agriculture, UAS, Dharwad. The sample consisted of 500 women (100 from each village) in the age group of 20-80 years who were selected randomly.

Tools Used for the study

An in-depth detailed self-structured questionnaire was used to collect the demographic information, personal profile, clinical symptomsand morbid condition of rural women. Anthropometric measurements like height and weight of women was used to calculate Body Mass Index(BMI) to assess nutritional status of women. The BMI (Body Mass Index) of mothers was calculated using the formula weight in kg/ (height in meter)^2 and was classified according to WHO BMI classifications (WHO, 2006). To assess anemia, the women's hemoglobin (Hb) level was tested by drawing blood sample and testing with help of medical practitioners of local government hospital. Socio- economic status was measured using socio-economic status scaledeveloped by Aggarwal et al.

(2005). The nutritional knowledge, attitude and practices of rural women were studied using the standard checklist developed by ICAR- AICRP-WIA in the year 2022.

Research design

An exploratory design was used to assess the nutritional status, anemia levels and nutritional knowledge, attitude and practices, clinical symptoms and morbid condition of rural women. A correlational design was used to study the factors influencing the nutritional status of rural women.

Results and Discussion

It is clear from the table (table 1) that, 23.60 per cent were in the agegroup of 20-40 years, while 34.20, 36.00and 6.20 percent were in the age group of 41-60 years and 61-80 and 15-20 years respectively. Majority of the rural farm women (28.40%) were illiterate, followed by primary educated (26%), middle school educated (15.20%), high school educated (15%) and remaining 9 percent and 6 percent were having intermediate and graduation level of education respectively. Majority of the subjects were housewives (35%), followed by agriculture as a main occupation (34%). Wherein 16.6 percent, 11.4 percent were laborers and had services in Govt/private sectors. Only 3 percent women were involved in small sale business activities.

Table 2 Indicates family profile of rural women where majority were scheduled tribes (52.2%), followed by OBC (19.2%), scheduled caste (15.4%) and upper caste (13.2%) respectively. With respect to the marital status, 94.60 percent were married, 4 per cent were in widowhood stage, separated were 0.80 percent and 0.60 were single. About 59 per cent and 37.80 per cent rural women hailed from nuclear and joint family, while 3.20 per cent belonged to extended family type.

With respect to food pattern, majority were non vegetarian (61.20%) and 38.8 percent were vegetarian respectively. About 48.8 percent rural farm women reported that they were landless. Wherein 23.60 percent were small land holders, 13.80 percent were marginal land holders, 9.4 percent were semi-medium land holders, 4.20 percent were medium land holders and only 0.2 percent were large land holders respectively. Majority of the rural farm women belonged to lower middle socio economic status (51.80%),followed by upper middle SES (47.80%) and high SES (0.4%) respectively.

Table 3 describes on clinical symptoms observed among the farm women. With respect to the general appearance, majority were fair (52%), followed by good appearance (24.40%) and poor appearance (23.60%) respectively. About 80 percent informed about hair fall, wherein 30.80 percent found to have white hair and 14.40 percent with dry hair symptoms respectively. Symptoms associated with dark circle and burning eyes (12.20%),while blurred vision was observed among 5.60 percent rural women. Mouth ulcer was found among 26.80 percent rural women, about 29.20 percent had decayed tooth and 9.80 percent found to have decayed and broken tooth respectively. Muscular problems were found among 34.80 percent rural women.Results are in collaboration with the study conducted by (Nayak, J, et.al, 2013) who explained about the main hazards leading to Eye itching, irritation, breathing, water in eyes, blurred vision etc among farm women were Burning of cut-wood, forest wood, dung cake, agriculture waste and kerosene. Respondents faced back, shoulder, leg, chest pain, crushing finger, etc due to work load and type of work in farm activities. The shoulder pain was highest among respondents. Lack of safety measures in farm machine/ equipment were the source of hazard to farm women due to their loose clothes (saree). Occupational risk factors include static position, forward bending, heavy lifting and carrying, kneeling and vibration in agriculture. The lower the individual's socioeconomic position, the higher was their risk of poor health status. Social factors like education, employment status, income level, gender, and ethnicities have significant influence on women health disparities (Tarar M.A., 2016). The major health problems expressed by the respondents were back pain, joint pain, leg pain, head ache, dust allergy, swellings in joints, fever, cold and cough, general malaise, chest pain, pain in shoulders, eye problem, hearing problem, respiratory problem, throat infection, skin irritation, nervous problem, abdominal pain, constipation, urinal infection, mouth infection, cuts and wounds, musculo-sketal disorders Meenakshi J.R., et al (2020).

Table 4 indicates nutritional knowledge, attitude and practice among rural women. Majority of the rural farm women found to have low nutritional knowledge (62%), followed by medium nutritional knowledge (30%) and high nutritional knowledge (7.4%) respectively. The results are in line with the study conducted by Jyoti S.et al.,(2015) which indicated the overall knowledge, attitude and practices regarding utilization of underutilized green leafy vegetables in selected rural women that is 43.12 percent, 46.12 percent and 49 percent respectively. Another study by Hafiz A.R et al., (2020) showed that malnutrition affects mother and their infant's growth as both have a positive relationship among them and several factors, such as lack of knowledge of proper nutrition, lack of awareness of malnutrition, low income, cultural and socio-economic factors. Lack of education,

awareness and resources are the most common causes of malnutrition deficiency of adequate nutrients affects not only women but also their infants as it reduces their intelligence level. So there is need to create awareness regarding the nutritional status of women.The study by Geetha et al.(2022) assessed assess Knowledge, Attitude, and Practice (KAP) of rural farm women on nutrition along with personal, socio economic profile.More than one third (34.5 %) of the rural farm women had high knowledge, followed by low (33.5%) and medium (32.0%). Hence, intervention strategies like promotion of Nutri-gardens in Schools, Households and the rural Community, promotion of Nutri-sensitive crops or biofortified crops to address the malnutrition.

It is clear from the **table 5** that more than forty per cent of the rural women were under normal BMI category followed by over weight (28.10 %) and underweight (20.40 %). Only 6.20 per cent of the rural women were under obese BMI category. The trend indicated that overweight and obese together were more than undernourished. Similar results were observed by Prakash (2013) where 18.70 per cent of women were suffering with chronic energy deficiency, 42.30 per cent were normal, 27 per cent were overweight and 12 per cent were obese.Mesharam (2016) also observed that the prevalence of chronic energy deficiency has declined from 52 per cent during 1975–79 to 34 per cent during 2011–12, while that of overweight/obesity has increased from 7 to 24 per cent during the same period.

` It is clear from the table 6 that, morbidity status of farm women from last three months was found to be high in case of ailments viz., Fatigue/ weakness(68%), Backache (59%), Body pain (46%), Acidity (29.8%), Fever (27.2%), Giddiness (19%), Eye strain (17.2%), Joint pain (16.6%), Cold & Cough (16.2%), Headache (13.8%), Pain in shoulder (8.4%) and Asthma (4.8%) respectively. Results are in line with the study conducted by Pratibha J.(2018)Results revealed that prevalence of chronic energy deficiency (CED) was found to be higher among the farm women of Haryana and Uttar Pradesh.Morbidity pattern among women agricultural workers reveals that their ailments were more with poverty and occupation rather than lifestyle. Apart from poverty and deprivation, the insensitivity of the health-care system too adds to the ill health of agricultural women (Thresia CU., 2004). The study by Hemant Kumar(2022) revealed that the number of obese people was more that indicated unhealthy food intake and lack of physical activity. Prevalence of hypertension and diabetes as found to be on lower side.

Figure 1 indicates anemia status of rural farm women. Majority of the farm women had mild anemia(50.2%), followed by moderate anemia(38.40 %). While only 10.60 percent were found

to be normal (12 and above)and0.8 percent were found to be severely anemic.The study by Jethi R.,(2018) indicated In India nearly 70 percent of women are estimated to be iron deficient. Iron deficiency can exist without anemia. Iron deficiency Anemia (IDA) is very late manifestation of iron deficiency because iron deficiency is very well tolerated Anemia does not develop till storage iron is exhausted. Saha S (2022) conducted cross-sectional study on non-iron deficiency anemia in rural Indian women. Results revealed that two out of every three women are anemic; one out of four were anemic with depleted iron storage. Importantly, two out of five women had anemia but iron storage was sufficient.

The factors influencing the nutritional status of women depicts (table7) that the risk of poor nutritional status significantly increased with increase in age of rural women. When compared to the young women aged 15-20 years age group women, the risk of poor nutritional status was 2.86 times higher among 20-40 years old women, 1.59 times risk among 60-80 years women and 1.16 times risk for 40-60 year old women.Also, SES was found to significantly influence the BMI where the risk of poor nutritionl status was high among women belonging to lower middle SES (2.68 times more) when compared to high and upper middle SES groups. The occupational status indicated that the risk of poor nutritional status was more in home makers (1.1 times) when compared to working women. With respect to nutritional knowledge the women with low nutritional knowledge (6.11 times) and medium knowledge were at high risk of having poor nutritional (3.02 times) status. The Hb levels indicate a significant relationship where the rural women belonging to severe anemia category were 4.5 times high risk, women with mild anemia were 1.27 times and moderate anemia were 1.12 times risk of having poor status when compared to women having normal Hb level. The morbidity status as per the last three months prevalence among rural women was found to 4.27 times risk of poor BMI when compared to women who did not suffer from any morbid conditions. With respect to the eating pattern the risk was very high for vegetarian women where it was 9 times more than non-vegetarians. Age, SES, nutritional knowledge, anemia status, morbid condition and eating pattern were significantly associated with BMI. Whereas, educational was not found to significantly influence BMI of rural women.

Similar results were observed by Bhandari et.al.,2016 and Geeta et.al.,2022 where they observed that the risk was more among 20 to 35 years women. Prakash(2013) observed that Body mass index increased in women with increasing age with an increase waist-hip-ratio and foods low on protein, food frequency where the diets were cereal based with less of vegetables and fruits, low in

diversity, and over-dependence on locally grown produce. Biswas et.al., 2016 also observed the poor nutritional status was significantly associated with age, marital status, religion, place of residence, educational status, SES and wealth quintile being significant factors affecting nutritional status. Food and dietary habits also impact nutritional status, with milk or curd, pulses or beans, dark green leafy vegetables, eggs, and fish being associated with lower rates of underweight. Upadhyay et.al.,2011 also observed that rural women who had poor nutritional knowledge, anemia, low SES, increased age were the risk factors of poor nutritional status. Ferdoushi et.al.,2015 and Hasnainet.al.,2014 also observed that the illness and health related problems were the risk factors of poor nutritional status.

CONCLUSION

The present study clearly indicates the rural women had poor nutritional knowledge which was a risk factor for the poor nutritional status irrespective of their educational status. Low SES, non-working status, health related problems, anemia and poor diet pattern with low protein intake were found to be the risk factors of poor nutritional status. Majority of the rural women had mild to moderate anemia despite the action taken by the Government. However, a trend towards overweight and obesity was rise in the rural area was prevalent which is alarming and calls for more strong actions to take up the initiatives to combat poor nutritional status among rural women.

Future Scope: The article studies the present nutritional status and its predictor factors. There is further scope to conduct intervention studies and study its efficacy.

Ethical approval:

Ethical approval to conduct the study was obtained by the ethical committee of University of Agricultural Sciences, Dharwad.

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Table 1 : Personal Profile of the rural women

N=500

Variables	Categories	Number	Percentage
Age (Years)	20-40	149	29.80
	41-60	171	34.20
	61-80	180	36.00
	Total	500	500.0
Education	Illiterate	142	28.40
	Primary	130	26.00

	Middle school	76	15.20
	High school	75	15.00
	Intermediate	45	9.00
	Graduation & above	32	6.40
Occupation	Agriculture	170	34.00
	Labour	83	16.60
	Service (Govt/Private)	57	11.40
	Small business	86	17.20
	House wife	104	20.80

Table 2: Family Profile of Rural Women

N=500

Variables	Categories	Number	Percentage

Caste	Upper caste	66	13.20
	OBC	96	19.20
	SC	77	15.40
	ST	261	52.20
Marital status	Single	3	0.60
	Married	473	94.60
	Widow	20	4.00
	Divorcee	-	-
	Separated	04	0.80
Family type	Nuclear	295	59.00
	Joint	189	37.80
	Extended	16	3.20
Veg /Non vegetarian	Vegetarian	194	38.80
	Non vegetarian	306	61.20
SES	High	02	0.40
	Upper middle	259	51.80
	Lower middle	239	47.80

Table3: Clinical symptoms observed among the farm women (N=500)

Clinical symptoms *	No.	%
General appearance		
• Good	122	24.40
• Fair	260	52.00
• Poor	118	23.60
Hair*		
• Hair fall	402	80.40
• Dry hair	72	14.40
• White hair	154	30.80
Eye*		
• Dark circle	61	12.20
• Blurred vision	28	5.60
• Burning eyes	61	12.20
Tongue *		
• Mouth ulcers	134	26.80
Teeth*		
• Decayed tooth	146	29.20
• Decayed and broken tooth	49	9.80
Muscular problems *	174	34.80

*** Multiple responses**

Table 4. Nutritional Knowledge, Attitude and Practice among Rural women

N=500

Particulars	N	(%)
I. Nutritional knowledge of farm women		
Low	310	62.00
Medium	153	30.60
High	37	7.40
Total	**500**	**100.00**
Mean ±SD	**26.2±4.18**	

Table 5. BMI of Rural women

N=500

BMI in kg/ (height in meter)2	**N**	**%**
Underweight (<18.5)	102	20.40
Normal (18.50 – 24.90)	226	45.10
Over Weight (>24.90 -30)	141	28.10
Obese (>30)	31	6.20

Table 6: Morbidity status of farm women (last three months)

N=500

Ailments	**No.**	**Per cent ***
Body pain	230	46.00
Backache	295	59.00
Headache	69	13.80
Fatigue/ weakness	340	68.00
Giddiness	95	19.00
Eye strain	86	17.20
Fever	136	27.20
Cold & Cough	81	16.20
Acidity	149	29.80
Joint pain	83	16.60
Pain in shoulder	42	8.40
Asthma	24	4.80

*Multiple responses

Fig 1: Anemia Levels of Rural women

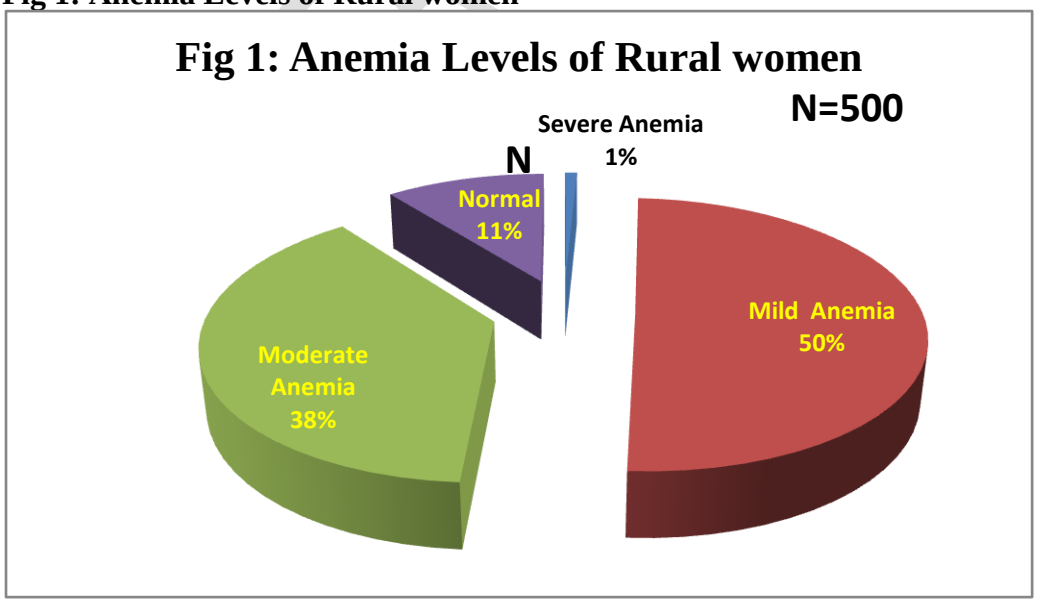

Table 7: Bivariate Analysis of factor influencing the nutritional status of Women based on BMI

N=500

Variables	Nutritional Status		OR(95 % CI)	P-Value
	Poor n (%)	Normal n(%)		
I. Age (Years)				
15-20	11(35.50)	20(64.50)	1	**0.024***
20-40	68 (57.60)	50(42.40)	2.857 (1.291-6.323)	
40-60	85(49.70)	86 (50.30)	1.155 (0.720-1.853)	
60-80	110(61.10)	70 (38.90)	1.590 (1.041-2.429)	
II. Socio economic status (SES)				
High	01(50.0)	01(50.0)	1	0.031*
Upper Middle	143(59.80)	96 (40.20%)	1.008 (0.062-16.284)	
Lower Middle	130(50.20)	129(49.80)	2.677(0.476-12.320)	
III. Education				
Post graduation	45(54.20)	38(45.80)	1	0.443^{NS}
Graduation	42(57.50)	31(42.50)	0.528(0.741-1.373)	
High School	130(57.50)	96(42.50)	0.710(0.413-1.621}	
Primary	52 (48.10)	56 (51.90)	1.275(0.719-2.263)	
IV. Occupation				
Working	219(55.30)	177 (44.70)	1	0.035*
Home maker	55(52.90)	49 (47.10)	1.102(0.715-1.700)	
V. Nutritional Knowledge				
High	11(29.72)	26(70.27)	1	0.003**
Medium	82(53.59)	71(46.41)	3.02(0.897-5.789)	
Low	181(58.39)	129(41.61)	6.11(1.273-18.135)	
VI. Anemia				
Normal	31(58.50)	22 (41.50)	1	0.001**
Mild	120(62.50)	72(37.50)	1.266(0.916-2.899)	
Moderate	119 (47.40)	132 (52.60)	1.12 (0.990-2.906)	
Severe	4 (100.00)	0	4.5 (2.012-5.990)	
VII. Morbidity Status				
No	42 (26.42)	117(73.58)	1	0.011**
Yes	232 (68.04)	109(31.96)	4.27(0.476-13.320)	
VIII. Vegetarian/Non-Vegetarian				
Non vegetarian	171(17.89)	135 (44.12)	1	0.000***
Vegetarian	103(53.09)	91(46.90)	9.01(1.273-18.135)	

*Significant at 5 % level ** Significant at 1 % level *** Significant at 0.001 % level