

A BRIEF REVIEW OF THE HEALTH AND NUTRITIONAL STATUS OF THE RURAL WOMEN OF UTTARAKHAND

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Abstract

Nutritional status is the health of an individual based on the nutrient's intake. The nutrients we receive via food we eat not only helps in our survival and day-to-day activities but also influences our health. Good nutrition is necessary to maintain good health. Nutrition plays a significant role in our growth and development. Good nutrition ensures a good and healthy life and also helps in fighting against many diseases. Women, especially rural women have always been on the poorer side of health and nutrition and there are various factors responsible for it, poor dietary intake, lifestyle and lack of knowledge are among these factors behind the poor nutrition status of rural women. There is also a lack of knowledge on health and nutrition. Furthermore, poor access to information, societal beliefs and myths, socio-economic factors also contribute to the poor nutrition status among the rural women. There are many studies that have reported the poor nutritional status of the rural women along with further suggestion to improve their nutritional status. Therefore, this is a brief review intended to assess the nutritional status of the rural women of state of Uttarakhand. The review also aims to suggest ways to improve the nutritional status of the rural women. For this purpose, 8 studies conducted between 2010 and 2020 among the rural women of Uttarakhand aged between 15-60 years have been taken under review.

Keywords: nutrition status, Uttarakhand, rural women, health

Introduction

“A healthy diet is a solution to many of our health-care problems. It is the most important solution” (John Mackey)

What we eat affects our health and wellbeing to a great extent, it plays a major role in determining and maintaining our health. Nutritional status is the condition of the body in those respects influenced and determined by the diet, nutrient intake and the ability of those nutrients to maintain normal physiology of the body. There are many factors that influence the nutritional status of an individual such as age, gender, disease, socio-economic factors, diet, nutrient intake, lifestyle etc. The rural women of India live in poorer condition and lack access to proper knowledge and information; therefore, it becomes important to assess their nutritional status and impart nutritional knowledge in them to create nutritional awareness among them. Rao et al., (2017) reported lower intake of all food groups among the rural women in India with prevalence of inadequate dietary intake, micronutrient deficiency and nutrition. Women, especially rural women have always been on the poorer side of dietary intake and nutritional

status. There are many factors responsible for this like, socio-demographic, environmental, cultural, economic etc. and also lack of awareness.

Nutritional status can be defined as condition of the body influenced by the diet of an individual. It is also an important parameter to assess the health of an individual or society. A good nutritional status not only determines our health but also has a great impact on our quality of life. A good nutrition status indicates a healthy body and a healthy lifestyle. Nutritional status is defined as the health condition of an individual as influenced by the intake and utilization of nutrients in body (**Todhunter, 1970**). There are various methods to determine the nutritional status of an individual which can be simply stated as ABCD of nutritional assessment. A means anthropometric measurement in which physical measurements like height, weight, waist circumference, hip circumference, BMI are calculated. B stands for biochemical assessment which involves doing laboratory tests to identify and nutritional deficiency. C is clinical assessment which is based on visible signs and symptoms of any nutritional deficiency and D stands for dietary assessment which studies the dietary intake of an individual.

Nutritional status of an individual gives an idea about the health of an individual by indicating any malnutrition or nutrient deficiency. Therefore, it becomes essential to study the health of an individual as determined and influenced by nutritional status. The nutritional status of rural community, particularly women is generally found to be poor with inadequate dietary intake and lack of diversity. Lack of awareness and scarcity of information is the major reason behind poor nutrition among rural women. There are various socio-economic and cultural factors also that influence the health and nutritional status of an individual. Educated and economically well-off women had better nutritional status and nutrition knowledge and followed healthier dietary practices (**Obong et al., 2001**). Due to lack of awareness, education and various cultural beliefs and customs, the rural women have poor nutritional status in comparison to urban women. The women living in urban areas have better facilities, awareness and nutrition knowledge and thus their nutrients intake is better than rural women. It has been observed that urban women are well nourished as compared to rural women (**Hossain et al., 2013**). Malnutrition has always been a concern among the rural population especially rural women. Higher rates of malnutrition, severe anemia and underweight were prevalent among the rural women (**Ackerson et al., 2008**). **Kashyap and Chhabra (2019)** reported poor nutritional knowledge among post-menopausal women.

Women are the bread-maker of a family and to a large extent determine the health and nutrition of the whole family, therefore, it is essential for women to have healthy nutritional status and nutritional knowledge so that they can create healthier individuals and society. But women, especially rural women lack the nutritional knowledge and follow inadequate dietary practices which lead to poor health and nutritional status. Therefore, guiding and helping women to develop healthy eating habits, nutritional knowledge and nutritional status is very critical.

There is an immediate need of nutrition counselling of the rural women to bridge the gap between knowledge and practices and help in improving the nutritional status of the rural women. There is lack of nutritional knowledge among rural women. Furthermore, poor access to information, prevailing myths and beliefs, purchasing capacity contribute to poor nutritional status and unhealthy eating habits of rural women. Many studies have reported poor nutritional status of rural women. Therefore, this brief review attempts to study the nutritional status of

the rural women and also intends to suggest some intervention to improve. For this purpose, eight studies conducted between 2010 and 2020 exclusively among the rural of Uttarakhand have been taken into consideration.

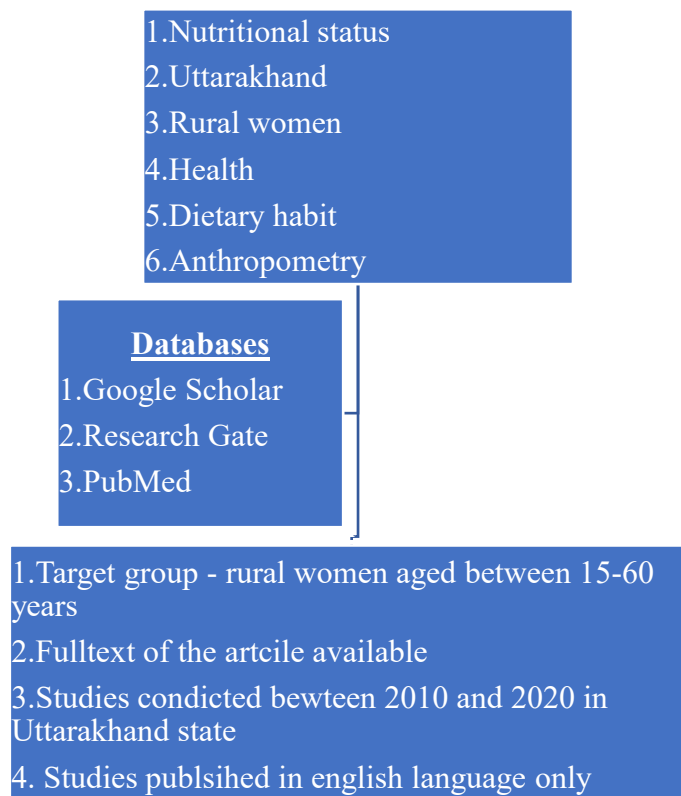
Materials and methods

For the proposed review, various electronic sources like Google Scholar, Research Gate, PubMed etc. were thoroughly explored by using the keywords like, nutritional status, health, rural women, anthropometric measurements, dietary habit, Uttarakhand etc. to reach relevant studies. Out of all the studies, eight studies meeting the inclusion criteria were selected for review. The inclusion criteria for the review included following points:

1. Target group was rural women aged between 15-60 years.
2. Full text of the article was available
3. Study was exclusively conducted in rural area of Uttarakhand between 2010 to 2020
4. Studies published in English language only
5. Anthropometric measurements and dietary survey were used for assessment of nutritional status

Studies involving pregnant women, lactating mothers, rural tribes and diseased persons were not included in the review.

The selected studies were then systematically reviewed on the basis of sample size, target group, study area, data collection and analysis tools, further recommendation and suggestions. The methodology for selection of articles is summarized below.



Results

Out of all the studies, a total of 8 studies that met the inclusive criteria were included in the review. The 8 studies selected for review included a total of 1787 participants. All the studies were aimed at rural women of Uttarakhand aged between 15-60 years. The 8 studies were taken from both Kumaon and Garhwal region out of which, 3 studies were conducted exclusively in the Kumaon region of Uttarakhand, 2 in Garhwal region and 3 studies were conducted in both Garhwal and Kumaon region of the state. All the studies involved anthropometric measurement and diet recall method. All the studies assessed the nutritional status of the women based on either anthropometry or dietary recall method.

Out of 8 studies, 5 used both anthropometry and dietary recall method, 5 studies were exclusively based on anthropometric measurements and only 1 study also used food frequency to assess the dietary status of the respondents. Only 1 study used food frequency to assess the nutritional status of the respondents. Only 1 study used pre-designed, pre-tested examination schedule to assess the dietary intake and eating habits of the respondents, 1 used pre-structured interview schedule and all other 8 studies used self-made questionnaire to collect the dietary intake and eating habits of the respondents. While taking anthropometric measurements, all the 10 studies calculated BMI, 3 studies measured skinfold thickness and WHR and only 1 study measured stunting among the respondents to assess the nutritional assessment. 7 studies recommended further action to improve the nutritional status and raise the nutritional knowledge respondents. The detailed results of all the studies are discussed below.

Table 1: research methodology of the studies

S.no.	Description	Data collection tool	Data analysis	References
1.	Region Dehradun Sample 378 (21-60 years)	1. Anthropometric measurement • Weight, height • Hip circumference, waist circumference	1. BMI according to WHO classification 2. Waist circumference as per South Asia Pacific guidelines 3. WHR cut off value 0.81 4. Percentage 5. Chi square 6. Binary logistic regression SPSS (22.0)	Shikha et al., 2019
2.	Region High, low and mid hill region of Uttarakhand Sample	1. Pre-structured interview schedule 2. 24-hour recall method	1. BMI index by James et al., 1988 2. $RFI = \frac{TRQ \times IT}{TCQ}$	Jethi et al., 2018

	120 farm women (18-45 years)	3. Anthropometric measurement • Height • Weight • Skin fold measurement 4. Blood pressure 5. Pulse rate	3. Food composition table (Gopalan et al., 1998) 4. Body density 5. Percent body fat 6. Fat free mass (Durnim and Womersley, 1974) 7. Siri percent Ft equation, 1961 8. Mean blood pressure $(DP + \frac{1}{3}(SP - DP))$ 9. $EER = 0.159 \times \text{average working hour} - 8.72$ 10. $VO_2 \text{ max} = 0.023 \times \text{body weight} - 0.034 \times \text{age} + 1.65$ 11. $TCCW = CCW + CCR$ 12. Standard deviation 13. Coefficient of correlation 14. T-test	
3	Region Udham Singh Nagar Sample 712 school going girls (12-18 years)	1. Anthropometric measurement • Weight • Height • Mid upper arm circumference • Waist circumference • Hip circumference	1. BMI- z score 2. WHR 3. Standard mean 4. Percentage	Singh et al., 2017
4	Region Rudrapur Sample 100 marginal and small farm women (21-40 years)	1. 24-hour recall method 2. Food frequency 3. Anthropometric measurements • Height • Weight • MUAC	1. BMI	Lata et al., 2016

5	Region Dehradun, Haldwani, Kashipur, Pithoragarh, Pauri Garhwal Sample 63 (22-55 years)	1. Self-made questionnaire 2. Anthropometric measurement • Height • Weight	1. BMI classification according to Subramaniam and Kawachi	Bisht & Kukreti, 2013
6	Region Almora Sample 35 women (31-45 years)	1. 24-hour recall method 2. Anthropometric measurement • Weight • Height	1. BMI 2. RDI	Jethi & Chandra, 2013
7	Region Pithoragarh, Pauri, Nainital, Dehradun, Udham Singh Nagar Sample 63 women (22-55 years)	1. Self-made questionnaire 2. Anthropometric measurement • Height • Weight 3. 3-day recall method	1. BMI 2. Food composition table for Indian foods 3. RDA for Indians	Kukreti & Bisht, 2013
8	Region Dehradun Sample 316 (20-60 years)	1. Anthropometric measurements • Weight • Height • Waist circumference • Hip circumference	1. BMI 2. WHR 3. Waist height ratio 4. Percentage 5. Chi square 6. Binary logistic regression analysis	Shikha et al., 2012

Abbreviation: BMI= body mass index, RFI = Raw amount of a food stuff consumed by the individual, TRQ = Total raw quantity of food stuff used in that preparation, II = Individual intake of the cooked amount of preparation, TCQ = Total cooked quantity of food prepared, DP= diastolic pressure, SP= systolic pressure, VO₂= maximal oxygen consumption, TCCW = total cardiac cost of work, CCW = cardiac cost of work, CCR= cardiac cost of recovery, MUAC= mid upper arm circumference, RDI= recommended dietary intake, RDA= recommended dietary allowance, WHR= waist to hip ratio

Table 2: results and suggestions

S. No	Results	Suggestions	References
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1	1. High prevalence of overweight and obesity 2. Prevalence of central obesity among 66.1% of women 3. Half of the females were overweight/obese 4. Obesity in rural areas was at 20.9% 5. High waist circumference 6. Shift in dietary habit and lifestyle 7. Consumption of high saturated fat and low fibre diet	1. Design a suitable health strategy 2. Intervention programme	Shikha et al., 2019
2	1. Consumption of energy was less than 75% of RDA 2. Protein consumption was lower than RDA 3. Calcium intake higher than RDA 4. Iron consumption more than RDA 5. Very lean body mass 6. Prevalence of malnourishment 7. Mean BMI= 18.96± 2.8 kg/m² 8. Normal BMI 30% 9. Low normal BMI 22.5% 10. Overweight 2.5%	1. Creating awareness 2. Making them self-sufficient 3. Intervention programme to modify food behavior and lifestyle pattern	Jethi et al., 2018
3	1. Mean BMI=17.98±2.40 kg/m² 2. 75.98% of girls had normal BMI 3. 15.87% girls were moderately undernutrition 4. 5.06% were severely undernutrition 5. 3.09% were overweight 6. Mean WHR= 0.81± 0.07, indicating risk of additional obesity	1. Nutrition education programme to improve eating habits and nutritional status	Singh et al., 2017
4	1. 55.7% of population were iron deficient 2. 74.2% of population were carotene deficient 3. Calcium, thiamine and vitamin C were at adequate levels 4. Protein adequacy among 62.85% 5. 43.24% had BMI 20-25 kg/m² 6. 22.52% had BMI 25-30 kg/m² 7. 10.81% had BMI 17-18.5 kg/m² 8. 7.21% had BMI >30 kg/m²	None	Lata et al., 2016

	9. Marginal farmers were under severe malnutrition 10. Small farmers were in risk of malnutrition 11. Small farm women had better nutritional status than marginal farm women		
5	1. Underweight – 20.6% 2. Normal BMI- 46% 3. Risk of overweight- 12.7% 4. Overweight- 17.5% 5. Obese- 3.2%	None	Bisht & Kukreti, 2013
6	1. Intake of pulses and cereals less than RDI 2. Milk consumption higher than RDI 3. Seasonal difference in the consumption of GLVs and other vegetables, more consumption during winter and less consumption in summers 4. Higher calcium consumption 5. Iron consumption was significantly lower than recommended 6. Prevalence of CED 7. Poor dietary intake 8. Poor nutritional status	None	Jethi & Chandra, 2013
7	1. Mean BMI= 21.5 kg/m ² 2. Lower consumption of iron and zinc 3. Less protein and energy intake than the recommended 4. Common health problems- diabetes, hypertension, hormonal imbalance, anemia, body ache	1. Nutrition education 2. Nutrition counselling	Kukreti & Bisht, 2013
8	1. Normal BMI- 49.4% 2. Prevalence of central obesity and overweight 3. Prevalence of high waist circumference (51.3%) 4. High risk WHR- 55.9%	1. Develop suitable health strategies 2. Intervention programme	Shikha et al., 2012

Abbreviation: RDA- recommended dietary allowance, BMI- body mass index, WHR- waist to hip ratio, RDI- recommended dietary index, GLVs- green leafy vegetables, CED- chronic energy deficiency

Discussion

This brief review is a compilation of studies that show the health and nutritional status of the rural women of Uttarakhand aged between 15-60 years. The study highlights the method, data collection instruments, data analysis, related outcome and necessary suggestions to improve the nutritional status of the rural women. Thus, the study can be effective in analyzing the nutritional status of the rural women and may help in designing effective nutrition intervention program to improve the nutritional status of the rural women. The rural women follow dietary practices influenced by their beliefs and traditions and lack nutritional knowledge and awareness and thus have poor health and nutritional status.

The study also provides a scope of improvement for future studies. The sample size in the studies under review was large enough to give a fair idea about the health and nutritional status of rural women of Uttarakhand. Only one study also measured blood pressure and pulse rate along with anthropometric measurements and dietary survey. Out of 8 studies, 5 suggested nutrition intervention programme and counselling and awareness to improve the nutritional status of the rural women while 3 studies did not provide any suggestions or feedback. These suggestions can be helpful in designing future researches and intervention programs.

This review also had some limitations that need special attention. In particular, the inclusion criteria for the articles allowed a limited time period of the researches and only studies conducted among the rural women of Uttarakhand aged between 15-60 years. So, there might be a biasness towards rural women of Uttarakhand. Studies in language other than English were also not included in the review.

Conclusion

Based on the results from the studies, it can be concluded that majority of the rural women had normal BMI with mean BMI ranging between 18-23 kg/m², prevalence of high WH4 (>0.86) was also reported indicating overweight and obesity. The diet of the rural women was reportedly deficient in iron, protein and energy, with low fibre and high saturated fat, indicating poor dietary intake. The study throws light on the role and importance of nutrition intervention programme in creating awareness and improving the dietary habit and nutritional status and overall health of the community.

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