International Journal of Applied Home Science
(An International Double Blind Peer Reviewed / Refereed Research Journal of Home Science)
Volume 11 (7 & 8), July & August (2024) : 309-313
Received : 01.06.2024; Revised : 15.06.2024; Accepted : 01.07.2024

RESEARCH PAPER
ISSN : 2394-1413 (Print)
DOI: 10.36537/IJAHS/11.7&8/309-313

Health and Nutrition Assessment of Adolescent Girls in Sadumar Village, Narsingpur District, Madhya Pradesh: An Empirical Study

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ABSTRACT

The present study assesses the health and nutrition status of adolescent girls in Sadumar village in Narsinghpur district of Madhya Pradesh on the basis of 2 factors *viz.,* anthropometric (BMI) and biochemical (Haemoglobin levels). The study employs an experimental research design followed by application of statistical methods on adolescent girls (N=150) in the age group of 10-49 years, who were assessed, then a related sample out of it (N=75) was counselled and then assessed again to find the difference in health and nutrition status. The data was collected by way of simple questionnaire. The findings reveal that though the health of the adolescent girlsis affected by various social, economic and cultural factors yet counselling them on healthy health practices keeping in mind their environmental background brings about a significant difference.

Keywords : Adolescent girls, Counselling, Health, Nutrition, Sadumar village

INTRODUCTION

The health of Indian women is deeply intertwined with their societal status, often overshadowed by perceptions of them as economic burdens, leading to their contributions being undervalued (Kamalapur and Reddy, 2013). The cultural preference for sons and the financial strain of dowries contribute to the mistreatment of daughters which restricts women's access to education and formal employment. This systemic inequality fosters poor health outcomes with far-reaching consequences for women's families and communities. These challenges not only affect women's well-being but also impact the health and economic stability of their children and households (Hariharan, 2016). By addressing the multifaceted determinants of malnutrition and poor health, this study aims to help create better public health plans to improve the lives of females in rural India (Ashworth *et al.,* 2004; Lorch, 2001).

As females in rural areas navigate the complex interplay of social, cultural and economic factors, their health outcomes reflect broader societal dynamics. Research has shown a nutrition transition in rural areas, where increased energy intake and reduced physical activity have led to higher rates of overweight and obesity among women (Prakruthi and Prakash, 2013). This transition is further exacerbated by lifestyle changes, such as increased sedentary behavior due to more television and electronic gadgets viewing. These changes in dietary intake and physical activity have significant effects on women's nutritional status, underscoring the need for targeted interventions.

This study aims to evaluate the health and nutrition of adolescent girls in Sadumar Village using an experimental research design. A sample of 150 adolescent girls was evaluated for their health and nutrition status through a simple survey questionnaire, followed by counseling through awareness camps, creation of What's app group, telephonic counselling and pamphlets for the related sample (N=75). This related sample was reassessed for health and nutrition status after 3 months of thorough counseling. Relevant statistical methods were

How to cite this Article: Varma, Nilima and Kourav, Mona (2024). Health and Nutrition Assessment of Adolescent Girls in Sadumar Village, Narsingpur District, Madhya Pradesh: An Empirical Study. *Internat. J. Appl. Home Sci.,* **11** (7 & 8) : 309-313.

applied to determine whether counseling brought a significant improvement in their health status. The significance of this study lies in its contribution to understanding the health dynamics of rural adolescent girls who are future mothers, providing insights that can inform more effective public health strategies and interventions.

Theory:

Health and nutrition in adolescent girls are crucial due to their unique physiological roles and life stages, such as menstruation, pregnancy and menopause. Proper nutrition supports reproductive health, foetal development and maternal well-being. Ensuring good health and nutrition enhances energy levels, mental health and overall quality of life, enabling adolescent girls to fulfill their personal and professional roles effectively. This study assesses the health and nutrition status of adolescent girls on the basis of 2 factors as guided by the literature. The sample of the study comprises of Adolescent girls (N=150).

Adolescent girls (N=150) have been assessed on 2 factors. Then a related sample (N=75) out of 150 adolescent girls was counselled about the importance of nutrition, certain practices for attaining and maintaining good health and were again assessed on these 2 factors after 3 months. The 2 factors utilized in the study to assess nutritional status are, First, "anthropometric assessment involves measuring height, weight, Body Mass Index (BMI), mid-upper arm circumference, and skinfold thickness to track changes in nutritional status"(Gibson, 2005); however, this study focuses only on BMI of adolescent girls. Second, biochemical assessment (Kondrup *et al.,* 2003) includes measuring proteins, vitamins and minerals in blood to gain insights into nutritional status, with a specific focus on hemoglobin levels and the awareness of its importance for female health.

Research Objective

The objectives of the research are :

1. To determine the effect of counselling on the BMI of adolescent girls in Sadumar village.
2. To determine the effect of Counselling on haemoglobin levels of adolescent girls in Sadumar village.

Hypothesis:

1. Counselling has brought a significant difference in the anthropometric assessment (BMI) of adolescent girls.
2. Counselling has brought a significant difference in the biochemical assessment (Haemoglobin levels) and prevalence of Anaemia and Anaemia awareness of adolescent girls.

METHODOLOGY

The data collection has been done from Sadumar village in Narsinghpur district of Madhya Pradesh. This study focuses on assessing the health and nutrition status of adolescent girls (N=150). The adolescent girls (N=150) were assessed on 2 factors mentioned above, then a related sample (N=75) was counselled and then again assessed on2 factors after 3 months

The data has been personally noted, from the participants. The questionnaire had questions regarding the demographic profile of participants (e.g.: Age, occupation etc., anthropometric assessment (e.g. height, weight) and Biochemical assessment (haemoglobin levels). The questions except demographic profile were all in binary format of YES/NO so that it was easy for the participants to respond. The demographic profile had 9 questions, anthropometric assessment had 2 questions, biochemical assessment and Anaemiaawareness had 4 questions.

Data Recording and Processing:

The responses thus obtained were recorded in a MS-Excel sheet.

Data recording for responses of Adolescent girls, Age 10-19 years

For each participant age, physiological status, occupation (working/non-working), category, educational status (primary/secondary/graduate/post graduate), total family income, family size, type of family (Nuclear/Joint) and water supply availability was noted as their demographic information. It is important to note demographic information because it helps to design tailored strategies for ideal nutritional counselling and at the same time enhances ethical research practices and enriches data interpretation.

After entering the demographic information, anthropometric assessment (BMI) was recorded. If the BMI of adolescent girls was in range with WHO guidelines we entered "1" otherwise "0"

Next, the responses of biochemical assessment (Haemoglobin levels) and Anaemia awareness were

recorded in excel sheet. Here also we have only recorded haemoglobin levels of females. To make the entry of haemoglobin levels (Hb) of the participant, it is known that the normal Hb level for females is 12 to 16 g/dl. So, if the Hb of the participant was within the normal range we coded it as "1" and if it was not in the range *i.e.* either high or low it was coded as "0". Besides, noting Hb levels we also assessed the awareness regarding Anaemia. Three questions were asked regarding this. If the participant was aware the response was recorded as "1" otherwise "0".

Observations:

The following Table 1 and Fig. 1 present the observations based on responses of adolescent girls

Table 1 : BMI of Adolescent girls

Anthropometric assessment	Pre counselling score in %	Post counselling score in %
Below 18.5	3.3	5.3
18.5 to 24.9	42	44
Above 24.9	54.7	50.7

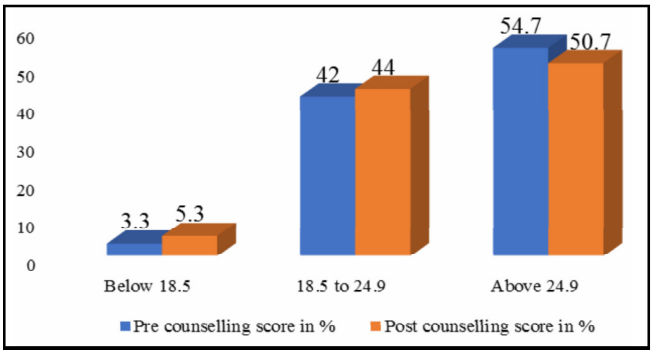

Fig. 1 : BMI of Adolescent girls

Table 1 and graph in Fig. 1 presents the anthropometric parameter (BMI) of adolescent girls in percentages before and after counselling. At first, 3.3% of participants were underweight, 42% had a normal weight, and 54.7% were overweight. After counseling, the percentage of underweight people went up slightly to 5.3%, and those with normal weight increased to 44%. Meanwhile, the percentage of overweight people went down to 50.7%. This suggests that the counseling helped, causing a slight drop in overweight individuals and an increase in those with a normal weight.

The following Table 2 and graph shows the scenario of Anaemia and awareness about Anaemia in adolescent girls

Table 2 : Anaemia and Anaemia awareness in adolescent girls

Biochemical Assessment	Pre-counselling Score in%	Post counselling score in %
No Anaemia	5.3	41.3
Mild Anaemia	70	54.6
Moderate Anaemia	24.7	4
Awareness of Anaemia		
What Is anaemia	80	85.3
Knowledge that anaemia can be prevented	42	52
Methods of anaemia prevention	28.7	42.6

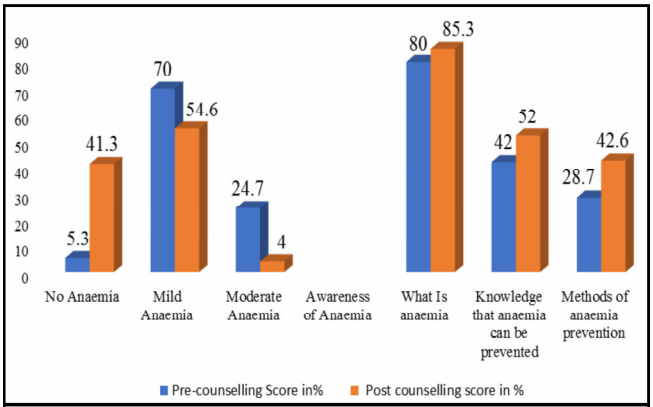

Fig. 2 : Anaemia and Anaemia awarness in adolescent girls

Table 2 and graph in Fig. 2 presents the biochemical assessment (presence of Anaemia based on haemoglobin levels) and awareness of Anaemia among participants before and after counselling. The percentage of participants with no Anaemia increased from 5.3% to 41.3%, while those with mild and moderate Anaemia decreased from 70% to 54.6% and 24.7% to 4%, respectively. Awareness of Anaemia rose from 80% to 85.3%, knowledge that Anaemia can be prevented increased from 42% to 52% and awareness of prevention methods improved from 28.7% to 42.6%.

RESULTS AND DISCUSSION

The Results of Hypothesis 1 has been given in Table 3

Table 3 shows the anthropometric assessment of adolescent girls.

In the Table 3 since the P-value (0.184552) is greater than the commonly used significance level (0.05), we fail to reject the null hypothesis, suggesting that there is

Table 3 : Anthropometric assessment of adolescent girls

Anova: Single Factor						
Summary						
Groups	Count	Sum	Average	Variance		
Anthropometric Assessment (Control Group)	150	148	0.986667	0.536734		
Anthropometric Assessment (Experimental group)	75	84	1.12	0.431351		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.88888	1	0.888889	1.771528	0.184552	3.883497
Within Groups	111.893	223	0.501764			
Total	112.782	224				

Table 4 : Biochemical assessment of adolescent girls

Anova: Single Factor						
Summary (Group A)						
Groups	Count	Sum	Average	Variance		
Biochemical Assessment and Anaemia awareness (Control Group)	150	348	2.32	0.527785		
Biochemical Assessment and Anaemia awareness (Experimental group)	75	203	2.706667	0.723604		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	7.475556	1	7.475556	12.61132	0.000468	3.883497
Within Groups	132.1867	223	0.592765			
Total	139.6622	224				

no statistically significant difference between the means of the control and experimental groups in their anthropometric assessments. Additionally, the F-value (1.771528) being less than the critical F-value (3.883497) further supports the conclusion that the differences between group means are not statistically significant (hypothesis testing 1 result).

Thus, the result in Table 3 does not show statistical significance which means that counselling has not improved the anthropometric assessment (BMI) of adolescent girls in Sadumar village. Thus, our hypothesis 1 that Counselling has brought a significant difference in the anthropometric assessment (BMI) of adolescent girls is rejected.

The results of Hypothesis 2 are given in Table 4

Table 4 shows the Biochemical assessment of adolescent girls

Since in the Table 4 the P-value (0.000468) is much less than the commonly used significance level (0.05), we reject the null hypothesis, suggesting that there is a statistically significant difference between the means of the control and experimental groups in their biochemical assessment and anemia awareness. Additionally, the F-value (12.61132) being greater than the critical F-value (3.883497) further supports the conclusion that the differences between group means are statistically significant

Thus, the results in Table 4 shows statistical significance which means that counselling has improved the biochemical assessment *i.e.* haemoglobin levels of adolescent girls in Sadumar village. Thus, our hypothesis 2, Counselling has brought a significant difference in the biochemical assessment (Anaemia and Anaemia awareness) of adolescent girls is accepted.

Conclusion:

This study underscores the transformative potential of targeted health interventions in form of education and counselling in improving the well-being adolescent girls (10-19 years). While the efforts made good progress in reducing severe anemia, improving eating habits, and raising health awareness, they also show the need for more personalized, thorough, and ongoing methods to address the different needs of these communities (Barker *et al.*, 2018). Future research should focus on improving interventions to make sure they fit well with the local culture and context, while also including overall lifestyle

changes that support long-term health benefits.By perpetuating the advancement of efficacious health strategies, we can achieve significant progress in augmenting the overall health and quality of life for adolescent girls throughout various stages of their lives.

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