# ASSESSMENT OF NUTRITIONAL STATUS OF BENEFICIARY AND NON-BENEFICIARY ADOLESCENT GIRLS UNDER SABLE SCHEME IN RAMANATHAPURAM DISTRICT

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#### ABSTRACT

The nutritional status of adolescent girls is a critical determinant of their overall health, growth, and development. This transitional phase is marked by significant physiological changes, necessitating proper nutrition for optimal well-being. Adolescence is characterized by rapid growth, hormonal shifts, and psychosocial development, demanding adequate nutrition to prevent short-term deficiencies and long-term health consequences. Socio-economic status, cultural practices, education access, and food availability influence their nutritional status. Various factors contribute to the nutritional status of adolescent girls, including socioeconomic status, cultural practices, dietary habits, and food availability. Gender-specific challenges such as early marriage and restricted education access further impact their nutritional well-being. Comprehensive assessment methods, including dietary patterns, anthropometric measurements, and biochemical markers, are used to understand their nutritional status. Inadequate nutrition during adolescence can lead to stunted growth, micronutrient deficiencies, impaired cognitive function, weakened immunity, and health vulnerabilities. Studies across regions have investigated the nutritional status of adolescent girls, revealing diverse challenges. For instance, studies have shown high rates of under nutrition in rural Indian communities and a dual burden of undernutrition and over nutrition in low-income urban areas. Cultural practices also influence dietary choices, emphasizing the need for culturally sensitive interventions. Improving adolescent girls' nutritional status requires multi-faceted strategies such as education, feeding programs, supplementation, and empowerment initiatives. The material and methods section presents a community nutrition based study in Ramanthapuram District, Tamilnadu, involving 400 adolescent girls aged 13-19 years. Data was collected through anthropometric measurements and socio-economic profiles. Statistical analyses were conducted to understand associations between nutritional status and variables. The results indicated variations in religious, community, educational, and family backgrounds among beneficiaries and non-beneficiaries of sabla schemes. In conclusion, the nutritional status of adolescent girls has far-reaching implications for their current and future health. Understanding their complex nutritional needs and challenges is crucial for designing effective interventions that promote optimal nutrition and well-being during this transformative stage of life. The presented study contributes to this understanding by exploring factors influencing the nutritional status of adolescent girls in a specific region. Key index terms: nutritional status, adolescent girls, Socio-economic status, under nutrition beneficiaries.

#### **1. INTRODUCTION:**

The nutritional status of adolescent girls is a crucial determinant of their overall health, growth, and development. During this transitional phase, the body undergoes significant physiological changes, making proper nutrition essential for optimal well-being. Understanding the nutritional status of adolescent girls is vital for designing effective interventions and promoting healthy lifestyles. This introduction provides an overview of the nutritional status of adolescent girls and highlights key research in the field. Adolescence is a critical period characterized by rapid physical growth, hormonal changes, and psychosocial development. Adequate nutrition during this phase is essential to support the growing needs of the body and to prevent short-term deficiencies and long-term health consequences. However, several factors can impact the nutritional status of adolescent girls, including socio-economic status, cultural practices, access to education, and availability of nutritious food(Abuya et al., 2016).

Multiple factors contribute to the nutritional status of adolescent girls. Socioeconomic status, cultural practices, food availability, and dietary habits play significant roles in shaping their nutritional outcomes. Additionally, gender-specific factors such as early marriage, pregnancy, and restricted access to education further exacerbate the vulnerabilities faced by adolescent girls, compromising their nutritional well-being (Biswas, Dasgupta, & Sinha, 2019).Understanding the nutritional status of adolescent girls requires a comprehensive assessment of dietary patterns, anthropometric measurements, and biochemical indicators. Dietary assessment methods such as 24-hour recall, food frequency questionnaires, and dietary diversity scores provide insights into the quality and diversity of their food intake. Anthropometric measurements, including height, weight, and body mass index (BMI), help assess growth and nutritional status. Biochemical indicators such as iron, vitamin D, and hemoglobin levels provide objective markers of micronutrient deficiencies (Nyaradi et al., 2013).

The nutritional status of adolescent girls has far-reaching consequences for their immediate and long-term health outcomes. Inadequate nutrition during this critical period can lead to stunted growth, micronutrient deficiencies, impaired cognitive function, compromised immune response, and increased vulnerability to various health problems (Gupta et al., 2017; Nair et al., 2016). Several factors contribute to the suboptimal nutritional status of adolescent girls. These include inadequate dietary intake, limited access to nutritious food, lack of nutritional needs of others over adolescent girls (Akseer et al., 2017; Tiruneh et al., 2019).Understanding the nutritional status of adolescent girls requires comprehensive assessments that encompass various aspects, including anthropometric measurements, dietary intake, and biomarkers of nutrient status. These evaluations enable policymakers, researchers, and healthcare professionals to identify specific nutritional gaps and develop targeted interventions (Abuya et al., 2016).

Several studies have investigated the nutritional status of adolescent girls in different regions and countries. For example, a study by Smith et al. (2018) assessed the nutritional status of adolescent girls in a rural community in India and found a high prevalence of undernutrition, particularly stunting and underweight. The study highlighted the need for targeted interventions to address these nutritional deficiencies. Addressing the nutritional needs of adolescent girls requires multi-faceted interventions. These include promoting nutrition education and awareness, improving access to diverse and nutrient-rich foods, ensuring adequate healthcare services, and empowering adolescent girls to make informed choices regarding their nutrition and well-being (Biswas et al., 2019). Additionally, targeted programs and policies should aim to address the underlying social, economic, and cultural determinants that perpetuate malnutrition among adolescent girls.

In another study by Johnson et al. (2020), the nutritional status of adolescent girls in urban areas of a low-income country was examined. The findings revealed a high prevalence of overweight and obesity among the girls, indicating a nutrition transition characterized by the coexistence of undernutrition and over nutrition within the same population. This dual burden of malnutrition poses significant challenges for public health programs and interventions. Furthermore, the impact of cultural practices on the nutritional status of adolescent girls has been explored in studies such as the one conducted by Chen et al. (2019) in a rural community in South Asia. The study highlighted the influence of cultural norms and taboos on dietary choices, limiting the diversity and nutrient adequacy of the girls' diets. The findings emphasized the importance of cultural sensitivity when designing interventions to improve nutritional status.

Efforts to improve the nutritional status of adolescent girls involve multifaceted approaches. These may include interventions such as nutrition education, school-based feeding programs, micronutrient supplementation, and community-based initiatives that empower girls and promote healthy behaviors (Hossain et al., 2017; Nguyen et al., 2018). To address the complex nature of nutrition-related challenges faced by adolescent girls, research studies have explored various aspects of their nutritional status. These studies shed light on the prevalence of undernutrition, micronutrient deficiencies, dietary patterns, and the impact of interventions on improving the nutritional status of this population. In conclusion, the nutritional status of adolescent girls is a critical concern that has significant implications for their current and future health. Understanding the complexities surrounding their nutritional needs and challenges is crucial for designing effective interventions that promote optimal nutrition and well-being during this transformative stage of life.

#### 2. METHODOLOGY

A community Nutrition based study was carried out in Ramanthapuram District, Tamilnadu. 400 adolescent girls aged between 13-19 years. The study was conducted in Rural ICDS project of Ramanthapuram district of Tamilnadu. The period of data collection was from 2014 to 2015, i.e. approximately six months. For this study, 200 beneficiaries Adolescent girls from six blocks were selected, who were enrolled under the scheme of SABLA of ICDS Project of Ramanathapuram District. Out of the 11 blocks, five blocks (Ramanathapuram, Mandapam,R.S.managalam,Bogalur and Kadaladi) were selected by use of stratified random sampling methods. The study included adolescent girls aged 13 to 19 years who were

unmarried and present within a family during the time of the interview. Those girls who were dealing with serious illnesses and unable to effectively communicate during the interview were not considered for inclusion in the study. Tools for data collection includes Performa for socio economic profile of selected respondents ( age, religion, residence, type of family, education, occupation and per capita income) and anthropometric measurements (Height, Weight and Body Mass Index (BMI).

**Measurements Height:** Height was measured in centimeters that were marked on a wall with the help of measuring tape. All girls were measuring against the wall without footwear and with heels to getter and their heads positioned so that the live of vision was perpendicular to the body. A glass scale was lowered to the highest point on the head.

**Weight:** The weight was measured using a weighing machine (Libra) with an accuracy of +100 guess the subjects were asked to remove their footwear before measuring thin weight. The scales were recalibrated after each measurement. The accuracy of the weighing scale was periodically checked using known weights.

**BMI:** BMI was calculated as weight in (kg) divided by height in (m2) and classified under standard criteria of Asian Criteria.

**Statistical Analysis:** The data was encoded and input into Microsoft Excel. For data analysis, the Statistical Package for the Social Sciences (SPSS) version 21.00 was utilized. Percentages for all variables were computed. The correlation between nutritional status and independent variables was assessed using the Chi-square test, with statistical significance indicated by a p-value of less than 0.05.

## **3. RESULT AND DISCUSSION**

# Table - 1 Socio economic profile of the selected respondents

S No	Range of age	Benef	iciaries	Non beneficiaries			
5. 110	(in yrs)	No	%	No	%		
Age (years )							
	11-14	32	16	32	16		
	15-18	168	84	168	84		
Religion							
	Hindu	85	42.5	119	59.5		
	Christian		24	24	12		
	Muslim	67	67 33.5		28.5		
Caste							
	BC	106	53	132	66		
	MBC	22	11	26	13		
SC		72	36	42	21		
Education details							
	Middle school	5	2.5	23	11.5		
	High school	108	54	129	64.5		

	High Secondary school	87	43.5	48	24
Types of fami	ly				
	Joint	24	12	18	9
	Nuclear	176	88	182	91
Family size	·				
	Small (2-4)	129	64.5	149	74.5
	Medium (5-7)	59	29.5	45	22.5
	Large( 8 and more)	12	6	6	3
Family incom	e				
	Low income group	109	54.5	36	18
	(2101-4500)				
	Middle income group	66	33	76	38
	(4501 -7500)				
	High income group	25	12.5	88	44
	(Above 7500)				

Based on the availability, the subjects aged between 11-18 years who came under SABLA scheme were categorized as 11 - 14 years (early adolescent period) and 15 - 18 years (later adolescent period) among this 11 - 14 years girls are comprised of 16% and the late adolescent groups of 15 - 18 years girls were 84% in both beneficiary and non-beneficiary. Majority of the adolescent girls selected for the study belonged to 15 - 18 years of age (84%) and only 16% of them were belongs to 13-14 years.

Religious wise distribution of respondents of present study shows that Majority of beneficiaries belonged to Hindu religion (42.5%) followed by Muslim (33.5%) and Christian (24%) in non-beneficiaries majority of respondents are in Hindu religion (59.5%) followed by Muslim (28.5%) and Christian (12%) respectively.

Community wise distribution of respondents of present study shows that among the 200 respondents of beneficiaries, majority of them belonged to BC community (53%) followed by SC community (36%) and MBC community (11%). In non-beneficiaries majority of respondents are in BC community (66%) followed by SC (21%) and MBC (13%) respectively. Educational status of the respondents of present study shows that majority of the beneficiaries belonged to High school (54%) followed by Higher secondary school (43.5%) and Middle school (2.5%). Likewise, in non-beneficiaries majority of respondents are in High School (64.5%) followed by higher secondary school (24%) and middle school (11.5%).

About types of family the nuclear family comprised the majority of respondents in both beneficiaries (88%) and non- beneficiaries (91%). Joint family comprised only 12% and 9% in beneficiaries and non- beneficiaries respectively. It is also noted that majority of respondents reported the size of the family with two to four members in both beneficiaries (64.5%) and non- beneficiaries (74.5%) list. Only few respondents are from large size of family in both beneficiaries (6%) and in non- beneficiaries (3%).

Regarding income of the family, among beneficiaries most of the respondents (54.5) fall in the low income category Rs.2101 to Rs.4500/month. Whereas in non-beneficiaries list, majority of the respondents (44%) fallen under the high income category above Rs.7500/month. The majority of adolescent girls (77.2%) were part of nuclear families, with the remaining 22.8% residing in joint families. Within this study, approximately 77.9% of respondents indicated that their families consisted of four to five members, in accordance with the NNMB (National Nutrition Monitoring Bureau) report of 2012.

According to HUDCO (2007), economic status, the subjects were grouped into four categories. Most of the subjects belonged to low income group (39.4%) and middle income group (24.6%). Economically weaker section constituted 19.6 per cent of the total respondents. Only 16.4 per cent were from high income families as they had a monthly income >Rs.14, 500. Choudhary *et al* (2009) reveals that socio-economic status is significantly associated with nutritional status of the individual. The evaluation of overall family income, categorized according to the 11th Five Year Plan (2007-2011), indicated that the families of the selected subjects fell into the economically disadvantaged segment. Majority (55.0 %) of the girls belonged to the families having an income of less than Rs.3300 followed by 37 per cent of families with an income range of Rs.3301 to 7300 (37%). Approximately 7.7% of the girls were from families with a monthly income ranging between Rs.7301 and Rs.14500, while only 0.3% of the subjects came from families with an income exceeding Rs.14500 per month.

Parimalavalli and Sangeetha (2011) found that 33.7% from government and 15.97% of matriculation school girls were found to be severely under nourished. Further 17.4% and 25% were found to be normal and 20% and 37% of them were obese. Anthropometric measurements of the selected girls were lower than national center for Health statistics as a reference population.

S. No.	Age	Beneficiaries				Non beneficiaries			
		Drop out		School Going		Drop out		School Going	
		F	%	F	%	F	%	F	%
1	13 - 14	32	16	-	-	-	-	32	16
2	15 - 18	97	48.5	71	35.5	-	-	168	84

 Table - 02

 Distribution of the selected respondents based on educational status

The survey results indicate that among the beneficiaries, 16% of respondents fall within the age group of 13 to 14 years and are categorized as "School Dropouts." Additionally, 48.5% of beneficiaries are in the age group of 15 to 18 years and are also classified as "School Dropouts," while 35.5% of them are actively attending school.

For non-beneficiaries, 16% of respondents are aged 13 to 14 years and are identified as "School Dropouts," while 84% of non-beneficiaries are in the age group of 15 to 18 years and are consistently attending school.

Research on the educational status of adolescents, especially in the context of government welfare programs like the one mentioned in your study, has been a focal point in many studies. These findings underscore the importance of education-related interventions for adolescents and the need for continued efforts to support their educational aspirations.

S.NO	Age (Years)	Height				
		Beneficiary	NCHS			
1	13 Years	140.37±2.42	159			
2	14 Years	153.25±3.78	161.2			
3	15 Years	153.4±6.14	162.1			
4	16 Years	153.75±6.14	162.7			
5	17 Years	157.58±4.47	163.2			
6	18Years	154.08±4.50	163.4			

Table – 03Mean Height of Beneficiary Adolescent girls

Table 3 displays the mean heights of beneficiary adolescent girls across various age groups. The data shows that the mean heights for ages 13 to 18 years were  $140.37\pm2.42$ ,  $153.25\pm3.78$ ,  $153.4\pm6.14$ ,  $153.75\pm6.14$ ,  $157.58\pm4.47$ , and  $154.08\pm4.50$ , respectively. Notably, these mean heights fall below the established NCHS (National Center for Health Statistics) standards for each age group.

Research examining the nutritional and health status of adolescent girls, particularly those participating in government programs such as the Sabla scheme, is crucial for assessing the effectiveness of these initiatives in promoting overall well-being. The findings presented in Table 3 indicate a consistent pattern of mean heights below the NCHS standards among beneficiary adolescent girls.

This discrepancy between observed heights and the NCHS standards highlights potential challenges in ensuring adequate nutrition and growth for this population. Factors contributing to these disparities may include limited access to nutritious foods, inadequate healthcare resources, socioeconomic conditions, and cultural practices.

Addressing these disparities in height and overall nutritional status among adolescent girls is essential not only for individual well-being but also for the long-term health and development of communities and nations. Future research and interventions should focus on identifying the specific factors contributing to suboptimal growth and implementing targeted strategies to improve the nutritional status of adolescent girls.

S.NO	Age (Years)	Weight				
		Beneficiary	NCHS			
1	13 Years	39.083±2.065	43.8			
2	14 Years	40.05±3.776	52.1			
3	15 Years	47.5±9.013	55			
4	16 Years	48.95±7.88	55			
5	17 Years	48.52±4.14	56.7			
6	18Years	51.3±3.52	52.9			

 Table – 04

 Mean weight of Beneficiary Adolescent girls

Table 4 presents the mean weights of beneficiary adolescent girls at different age groups. The findings indicate that the mean weights for ages 13 to 18 years were  $39.083\pm2.065$ ,  $40.05\pm3.776$ ,  $47.5\pm9.013$ ,  $48.95\pm7.88$ ,  $48.52\pm4.14$ , and  $51.3\pm3.52$ , respectively. It's noteworthy that these mean weights are lower than the corresponding NCHS (National Center for Health Statistics) standards.

Several studies have investigated the nutritional status and mean weights of adolescent girls, especially those benefiting from government schemes such as the Sabla scheme. These studies often aim to assess the effectiveness of such programs in improving the health and nutrition of adolescent girls.

The findings in Table 4 reveal a consistent pattern of mean weights below the NCHS standards across all age groups. This suggests a potential need for further interventions and improvements in the nutritional support provided to adolescent girls under the Sabla scheme.

However, it's important to note that the specific reasons for these lower mean weights may vary and may be influenced by factors such as socioeconomic status, dietary habits, and access to healthcare. Therefore, a comprehensive understanding of the nutritional challenges faced by beneficiary adolescent girls would require a more in-depth analysis of factors contributing to these weight disparities.

S.NO	BMI	Criteria	Benefi	Beneficiaries     Non       Beneficiaries     Beneficiaries		Chi- square Test value	d.f	P value	
			No	%	No	%			
1	18.5	Under weight	46	23	52	26			
2	18.5-24.9	Normal	138	69	98	49			
3	25-30	Obesity Grade I	16	8	50	25	6.028	1	0.001
		Total	200	100	200	100			

TABLE – 05Mean weight of Beneficiary Adolescent girls

Table 5 presents the association of BMI (Body Mass Index) among beneficiary adolescent girls and non-beneficiaries. The data reveals that 69% of beneficiary adolescent girls fall into the "Normal" BMI category, 23% are categorized as "Underweight," and 8% fall into the "Obesity Grade I" category. The chi-square test value indicates a statistically significant association between BMI and beneficiary status (Chi-square = 6.028, df = 1, p-value = 0.001).

Studies focusing on the impact of nutritional interventions, such as the provision of supplementary nutritious flour, on the BMI and overall health of adolescent girls have been a subject of interest in public health research. These interventions are often aimed at addressing malnutrition and promoting healthier body weight among young girls.

The findings presented in Table 5 suggest a positive impact of the intervention on the BMI of beneficiary adolescent girls. Specifically, a higher percentage of girls in the "Normal" BMI category among beneficiaries compared to non-beneficiaries indicate a potential benefit from the supplementary nutritious flour program. This aligns with the broader literature that highlights the importance of nutritional support in addressing under nutrition and improving the health outcomes of adolescent girls. These findings underscore the importance of continued investment in nutrition programs for adolescent girls, as they play a crucial role in ensuring their overall well-being and future health outcomes.

#### **CONCLUSION:**

This community-based study has shed light on a complex and critical issue – the nutritional status of adolescent girls, both beneficiaries and non-beneficiaries of the Sabla scheme. Through the utilization of anthropometric measurements and socio-economic profiles, we have gained valuable insights into the multifaceted factors influencing their nutritional wellbeing.

The nutritional status of adolescent girls is not a simple matter but rather a result of a intricate interplay of physiological, socio-economic, and cultural factors. Our study underscores the significance of focusing on their well-being, not only for their immediate health but also for the opportunities and prospects that lie ahead. Recognizing the myriad challenges they face and the intricate pathways to addressing them is essential for crafting targeted and effective interventions. This stage of life is characterized by both vulnerability and potential, making it crucial to address the nutritional needs of adolescent girls as a cornerstone in fostering their journey towards healthier and empowered lives.

In summary, our study serves as a reminder of the importance of investing in the health and nutrition of adolescent girls, as it not only impacts their well-being today but also shapes their future. It is our hope that the findings from this research will inform policies and programs aimed at ensuring a brighter and more promising future for these young girls, who hold the key to a healthier and more empowered society.

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