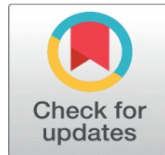


PREVALENCE AND ASSOCIATED FACTORS OF MALNUTRITION AMONG EARLY ADOLESCENT GIRLS IN SELECTED URBAN AND RURAL SCHOOLS OF WEST BENGAL

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ABSTRACT

Introduction Adolescence is a period of rapid growth and development, acquisition of health-related behaviours such as food preferences and physical activity and these behaviours track throughout the life course and may contribute to the nutrition related to non-communicable diseases in adulthood.

Aim: The aim of the study is to assess prevalence and associated factors of malnutrition among early adolescent girls.

Method: the investigator conducted a descriptive comparative study on prevalence and associated factors of malnutrition among early adolescent girls in urban and rural schools of West Bengal with the objective to assess the prevalence of malnutrition and associated factors of malnutrition among early adolescent girls, to compare the prevalence of malnutrition between early adolescent girls in urban and rural schools and to find out the association between prevalence of malnutrition with selected associated factors of malnutrition among early adolescent girls in selected urban and rural schools of West Bengal. This study was based on “Nursing Process Model” developed by Ida Jean Orlando in 1958. Non-probability purposive sampling technique was adopted to select 140 participants. The tools used for the study were semi structured interview schedule to collect socio – demographic data, anthropometric measurement Proforma to assess the prevalence of malnutrition through the WHO z-score (BMI-For-age Girls 5 to 19 years) and structured interview schedule to assess the associated factors of malnutrition among early adolescent girls.

Result: the study findings revealed that the prevalence of under nutrition was higher in rural area (40%) compared to urban (8.57%) whereas the prevalence of over nutrition was higher in urban (51.42%) compared to rural area (12.85%). There was significant association between prevalence of malnutrition with selected associated factors of malnutrition such as frequency of eating fast food, any past history of illness, engagement in physical activity. The study has several implications in Nursing practice, education, administration, research. The studies concluded with recommendations for future intervention and improve policy intervention regarding prevention of malnutrition.

Keywords: Malnutrition, Adolescent Girl

1. INTRODUCTION

Adolescent population are the most important segment of the society; particularly in developing countries. They are the future leaders and promise for the better life of the community. In this phase of life an individual gets a second chance to improve the health and well-being. Adolescence phase is the healthy phase. The

health status of the adolescents reflects the health of the future generation. [Kadri \(2021\)](#)

Adolescence is a period of rapid growth and development, acquisition of health-related behaviours such as food preferences and physical activity and these behaviours track throughout the life course and may contribute to the nutrition related to non-communicable diseases in adulthood. [Maehara et al. \(2019\)](#)

The period of adolescence is the transition from childhood to adulthood and comprises individuals aged between 10 to 19 years. Adolescents comprises of large percentage of population, i.e., 1.2 billion adolescents globally, comprising one-sixth of the total global population. About 87% of adolescents reside in developing countries. In India, about 253 million populations are adolescents' age group. [Ahmad et al. \(2018\)](#)

The coexistence of under nutrition and over nutrition in the same population is called double burden of malnutrition (DBM), is becoming a worldwide concern. Recently in India, the double burden of malnutrition is increasing rapidly in addition to the increasing burden of non-communicable diseases. A significant proportion of Indian children residing in urban areas are affected by over nutrition whereas, the prevalence of under nutrition has still remained a significant public health issue among the underprivileged and undernourishment segments of India. [Nitish \(2015\)](#)

Due to the nutritional, demographic and epidemiological transitions, developing countries have faced significant changes in child and adolescent nutrition that led to the changes in the lifestyle patterns and food habits. In India, there is a rapid socio-economic change, changes in the dietary habits, and a more sedentary lifestyle in Indian population which is the main possible causes of nutritional changes. Now-a-days, a decline in prevalence of under nutrition with an increase in over nutrition is giving rise to double burden of malnutrition among Indian population. [S Debnath et al. \(2019\)](#)

Despite of the economic status, reduction in the under nutrition is slow whereas, obesity is caused due to changes in dietary intake and physical activity levels associated with globalization, industrialization and urbanization. Key drivers of these changes include the easy and convenient availability of packaged food products and increasing consumption of these foods alongside increasingly sedentary lifestyle and occupation. [Maehara et al. \(2019\)](#)

The double burden of malnutrition among adolescents is a recognizable urgent health challenge. Adolescence is the critical phase of development, increased nutritional needs, greater opportunity for intervening to prevent the immediate, long-term and intergenerational consequences of under nutrition and obesity. Positive health behaviours such as diet, physical activity shaped in this adolescence period. Changes in food consumption and physical activity patterns in this period have created conditions that promote excess energy intake while deficient energy and nutrient intake remain common. So that, the adolescents are vulnerable for dual burden of malnutrition. [Darling et al. \(2020\)](#)

Assessment of nutritional status of adolescent girls require special attention because they contribute for the future generation. Girls are more vulnerable among adolescents particularly in developing countries including India. But due to various adverse socio-cultural and socio- economic reasons, adolescent girls are neglected. Country's social and economic future depends on children and adolescents that's why a well-balanced diet is required during this preparatory stage of life-cycle for complete physical-mental growth and development. [Maiti et al. \(2011\)](#)

Prevalence of undernutrition among adolescents causing delay in growth and development. Optimal health is not reached by the undernourished adolescents causing long term health problems, increased risk for infectious diseases in adulthood. Several studies have shown that undernutrition is greater among lower socio-economic groups rather than higher socio-economic groups. Adolescent girls are the brink of women hood, so low body mass index (BMI) can increase adverse pregnancy outcomes such as low birth-weight baby, preterm baby, still birth, gestational anaemia etc. [Darling et al. \(2020\)](#)

On the other hand, the rate of over nutrition is also increasing day by day among children and adolescent age group. Over nutrition also has many immediate and long-term effect on health such as increased risk of type-II diabetes mellitus, high blood pressure, high cholesterol and triacylglycerols levels etc. Like under nutrition, over nutrition also has adverse effect on pregnancy outcome. [Darling et al. \(2020\)](#)

As per WHO (World Health Organization) data in the year of 2022, approximately, 390 million were overweight, 160 million were obese, 190 million were thinness among the age group of 5 -19 years. Mainly women, adolescent, children and infant are at the risk of malnutrition. Poor people are suffering by different forms of malnutrition. On the other hand, health care costs are increasing due to malnutrition, reduces the productivity and economic growth that leads to poverty. [WHO Malnutrition \(2025\)](#)

Indian adolescents were suffering from double burden of malnutrition. Poor and inadequate nutrition in infant, children and adolescent affect the health and development of children and adolescent. The double burden of malnutrition offers an important opportunity for integrated action on malnutrition in all its forms (under nutrition, overweight-obesity as well as diet related non-communicable diseases). Addressing this double burden of malnutrition is the key to achieving the Sustainable Development Goals; Goal 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture) and [Target 3, 4](#) (reduce mortality from non-communicable diseases and promote mental health). [WHO \(2025\)](#)

Government of India has recognized the importance of health seeking behaviour of adolescents. India's overall health and also mortality, morbidity and population growth are determined by adolescent health. Therefore, adolescent reproductive and sexual health is focusing on the provision of emergency contraceptives, delaying age at marriage, reducing incidence of teenage pregnancy, meeting unmet contraception need, reducing the maternal mortality, reducing STI incidence and reducing HIV prevalence, information and counselling about reproductive and sexual health Treatment of RTI/STI, ICTC service, treatment of menstrual cycle disturbances, periodic health check up, periodic health education, co- curricular activities. [National Health Mission \(2025\)](#)

An estimated 1.1 million adolescent die each year. The leading causes of death are road traffic accidents, suicide and interpersonal violence. They also experience illness and injury. The causes of mortality and morbidity is different by age, sex and geographical area. For early adolescents (10-14 years) the leading risk for health are related to water, hygiene and sanitation. Though adolescent problem is preventable and treatable, but they face barriers in accessing health information and services. Limited knowledge, cost, distance, parental or partner control and provider bias restricts adolescents from getting the care they need to grow and develop good health. [WHO \(2025\)](#)

National adolescent health responses by WHO are evidence-based and consider the values and preferences of adolescents. WHO support countries to improve

measurement and strengthen data, conduct research and shares best practices. WHO issues evidence-based recommendations that are relevant for adolescents across the full range of health areas including positive development, communicable and non-communicable diseases, sexual and reproductive health including HIV, addiction, suicide, injury, mental health, accident, violence, and self-harm. Different policy and programmes are launched by WHO. At the heart is the Global Accelerated Action for the Health of Adolescents (AA-HA), guides national-level policy makers and programme managers on how to plan, implement, monitor and evaluate adolescent health programmes. [WHO \(2025\)](#)

2. STATEMENT OF THE PROBLEM

Prevalence and associated factors of malnutrition among early adolescent girls in selected urban and rural schools of West Bengal

3. OBJECTIVES OF THE STUDY

- 1) To assess the prevalence of malnutrition among early adolescent girls in urban schools of West Bengal.
- 2) To assess the prevalence of malnutrition among early adolescent girls in rural schools of West Bengal
- 3) To assess the associated factors of malnutrition among early adolescent girls in urban schools of West Bengal.
- 4) To assess the associated factors of malnutrition among early adolescent girls in rural schools of West Bengal.
- 5) To compare the prevalence of malnutrition between early adolescent girls in urban and rural schools of West Bengal.
- 6) To find out the association between prevalence of malnutrition with selected associated factors of malnutrition among early adolescent girls in selected urban and rural schools of West Bengal.

4. METHODOLOGY

This study was carried out using a descriptive comparative research design that included purposive sample of early adolescent girls. It was conducted in two Government school of urban and rural area West Bengal. The early adolescent girls who were studying in class VI and who can speak and understand Bengali language residing in both study areas were included as sample. Students who were absent on the day of data collection and mentally and physically ill were excluded from this study. This study was based on “Nursing Process Model” developed by Ida Jean Orlando in 1958. Content validity of tools was established by 7 experts (3 were medical personnel in the field of community and 4 were nursing experts from the field of community health nursing and child health nursing). The reliability of the tool II was computed by inter rater method ($r = 1$) and for tool – III, Cronbach’s alpha method was used ($r = 0.82$). Ethical approvals were obtained from the Headmistress of each school.

Informed consent was taken from every participant and guardian. Data analysis was planned on the basis of the objective of the study. Both descriptive statistics (frequency and percentage distribution) and inferential statistics (unpaired t-test and chi square test) were used to analysis the data.

5. RESULTS

A sample size consisted of 70 early adolescent girls each from urban and rural school was included in this study. Participants from urban area, 88.57% were 12 years of age and 54.28% from rural area were 13 years of age. Participants from urban area belonged to the better socioeconomic status, as 55.71% of participants were in Class I based on the revised B.G. Prasad socio-economic status classification Jan 2022 whereas 57.14% of participants from rural area were in class III. Prevalence of over nutrition among early adolescent girls was 51.42% and 12.85% in urban and rural area respectively. Prevalence of under nutrition in urban area was 8.57% and in rural area it was 40%.

Table 1 depicted that in urban area, 88.57% girls belonged to the 12 years of age and 11.42% girls belonged to the age group 13. All (100%) girls were Hindu in religion. 60% girls' family members were ≤ 4 . 58.57% girls belonged to the nuclear and 41.42% girls belonged to the joint family. In rural area, 45.71% girls belonged to the 12 years of age and 54.28% girls belonged to the age group 13 years. Majority (57.14%) of the girls belonged to Hindu religion. 64.28% had >4 no. of family members and 67.14% belonged to the joint family.

Table 2 revealed that, in urban area, 44.28% fathers were Higher Secondary passed and 30% were graduate and above. Regarding mother's education, 37.14% were Higher Secondary passed and 25.71% had secondary level of education. Whereas, in rural area, 8.57% fathers were illiterate and 41.42% had secondary level of education. 17.14% mothers were illiterate and 32.85% had primary level of education. **Table 3** depicted that in urban area, 38.57% fathers were engaged in service and 34.28% were businessman. In rural area, 31.42% fathers were labor and 24.28% fathers were businessman. Regarding mother's occupation, in urban area, 55.71% mothers were homemaker, 18.57% were service-holder and in rural area, 74.28% mothers were homemaker and 12.85% mothers occupied with others job. **Table 4** showed that, based on the revised B.G. Prasad socio-economic status classification Jan 2022, in urban area, 55.71% and 34.28% adolescent's family belonged to upper class and upper middle-class family respectively and in rural area, 27.14% and 57.14% belonged to upper middle class and middle-class family respectively. Data presented in **Table 5** showed that in urban area, all (100%) girls' source of drinking water was municipality supply and all 100% girls' source of drinking water supply was tubewell in rural area. In urban area, 54.28% girls took mid-day meal from school, whereas in rural area, 55.71% girls took mid-day meal from school.

Table 1

Table 1 n1 (urban school) + n2(rural school) = 70 + 70		
Characteristics	Urban Frequency (%)	Rural Frequency (%)
Age (years)		
12	62 (88.57)	32 (45.71)
13	8 (11.42)	38 (54.28)
Religion		
Hindu	70 (100)	40 (57.14)
Muslim	-	30 (42.85)
No. of family members		

≤4	42 (60)	25 (35.71)
>4	28 (40)	45 (64.28)
Type of family		
Nuclear	41 (58.57)	23 (32.85)
Joint	29 (41.42)	47 (67.14)

Table 2

Table 2 n1 + n2= 70 + 70		
Characteristics	Urban	Rural
	Frequency (%)	Frequency (%)
Fathers' education		
Illiterate	-	6 (8.57)
Primary	4 (5.71)	23 (32.85)
Secondary	14 (20)	29 (41.42)
Higher Secondary	31 (44.28)	10 (14.28)
Graduation and above	21 (30)	2 (2.85)
Mothers' education		
Illiterate	-	12 (17.14)
Primary	10 (14.28)	23 (32.85)
Secondary	18 (25.71)	17 (24.28)
Higher Secondary	26 (37.14)	14 (20)
Graduation and above	16 (22.85)	4 (5.71)

Table 3

Table 3 n1 + n2= 70 + 70		
Characteristics	Urban	Rural
	Frequency (%)	Frequency (%)
Fathers' occupation		
Service	27 (38.57)	15 (21.42)
Business	24 (34.28)	17 (24.28)
Labor	12 (17.14)	22 (31.42)
Others	7 (10)	16 (22.85)
Mothers' occupation		
Homemaker	39 (55.71)	52 (74.28)
Business	11 (15.71)	5 (7.14)
Service	13 (18.57)	4 (5.71)
Others	7 (10)	9 (12.85)

Table 4

Table 4 n1 + n2= 70 + 70		
Characteristics	Urban	Rural
	Frequency (%)	Frequency (%)

Per capita family income per month and socio-economic status		
I (Upper class) (Rs. 8220 and above)	39 (55.71)	11(15.71)
II (Upper middle class) (Rs. 4110-8219)	24 (34.28)	19 (27.14)
III (Middle class) (Rs. 2465-4109)	7 (10)	40 (57.14)

Table 5

Table 5 n1 + n2= 70 + 70		
Characteristics	Urban	Rural
	Frequency (%)	Frequency (%)
Source of drinking water supply		
Municipality	70 (100)	-
Tubewell	-	70 (100)
Taking mid-day meal from school		
Yes	38 (54.28)	39 (55.71)
No	32 (45.71)	31 (44.28)

Figure 1

n1 = 70

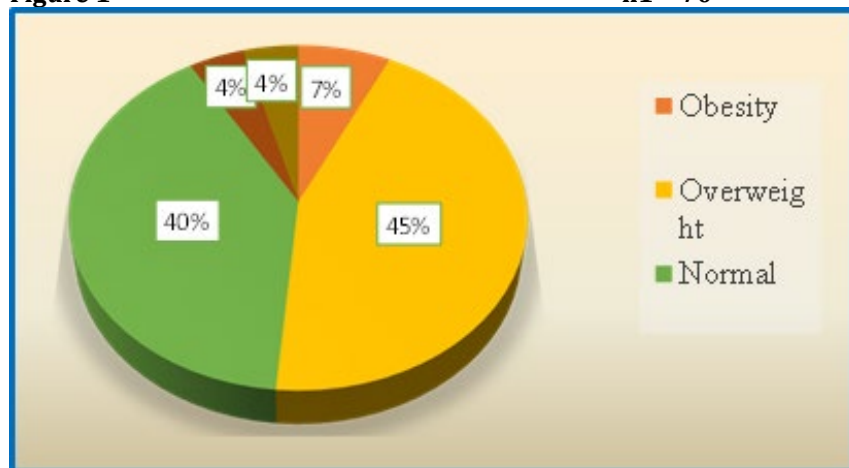


Figure 1 Pie Diagram Showing Percentage Distribution of Adolescent Girls in Urban School Based on Prevalence of Malnutrition.

Section – II: Findings related to the description and comparison of prevalence of malnutrition among early adolescent girls in urban and rural schools. Data present in [Figure 1](#) shows that in urban area, 7% girls were having obesity, 45% girls were having overweight, 40% were normal, 4% girls were having thinness and 4% girls were having severe thinness. Figure 2 depicted that in rural area, 3% and 10% girls were having obesity and overweight respectively, 47% girls were normal, 34% girls were having thinness and 6% girls were having severe thinness. [Figure 3](#) depicted that, prevalence of under nutrition in urban area was 8.57% and in rural area it was 40%. 40% and 47.14% girls were normal in urban area and rural area

respectively. The prevalence of over nutrition in urban area was 51.42% and in rural area it was 12.85%. The data presented in table 6 showed that mean BMI of early adolescent girls in urban schools (20.27 ± 3.62) was higher than the mean BMI of adolescent girls in rural schools (17.24 ± 2.99). The difference was statistically significant as the computed t-value (5.39) was found greater than table value (1.96) at df (138) at <0.05 level of significance.

Figure 2 **n2 = 70**

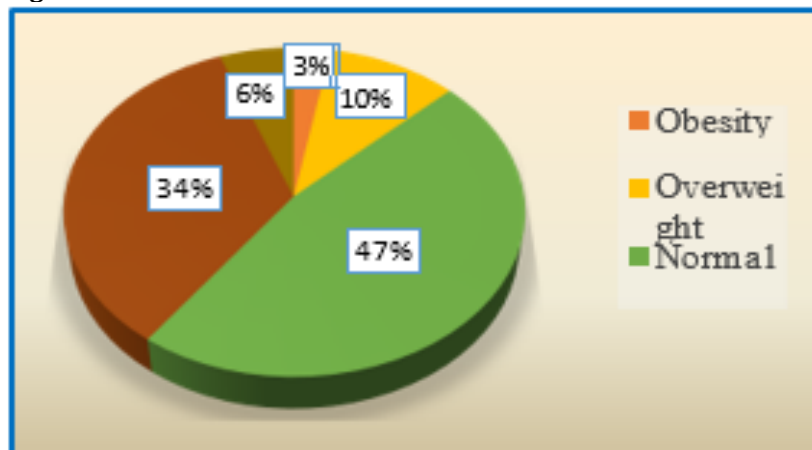


Figure 2 Pie Diagram Showing Percentage Distribution of Adolescent Girls in Rural School Based on Prevalence of Malnutrition.

Figure 3 **n1 + n2 = 70 + 70**

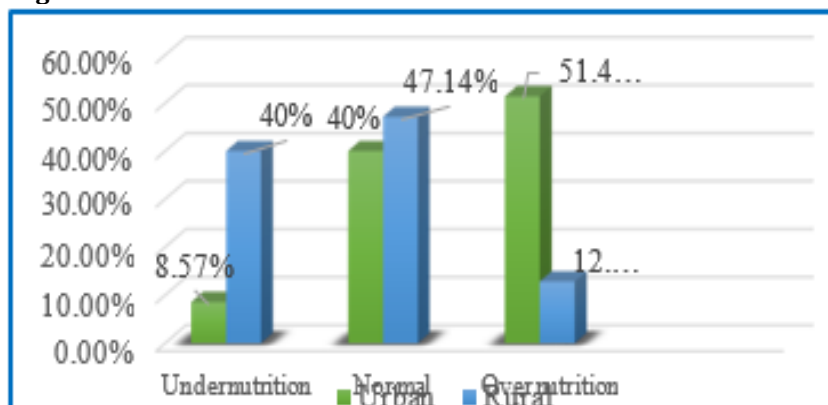


Figure 3 Multiple Bar Diagram Showing Comparison of Prevalence of Malnutrition Among Early Adolescent Girls in Urban and Rural Schools.

Table 6

Table 6 n1 + n2 = 70 + 70

Group	Variables	Mean \pm SD	Mean difference	t -value (unpaired 't' test)	df	p-value
Urban		20.27 \pm 3.62				
	BMI		3.03	5.39	138	0.0001
Rural		17.24 \pm 2.99				

t (138) = 1.96, $p < 0.05$

Section - III: Findings related to the description and comparison of the associated factors of malnutrition among early adolescent girls in urban and rural schools. Data presented in Table 7 showed that 100% adolescent girls in urban school always wash hands with soap-water before eating, in rural school it was 85.71%. 100% adolescent girls in urban never walk barefooted outside but in rural 42.85% girls sometimes walk barefooted outside. In urban, 55.71% ate fruit daily whereas, 48.57% adolescent girls ate fruit 1-3 times in a week in rural.

Table 7

Table 7 n1 + n2= 70 + 70		
Associated factors	Urban	Rural
	Frequency (%)	Frequency (%)
1) Wash hands before eating		
Always	70 (100)	60 (85.71)
Sometimes	-	10 (14.28)
2) Walking on barefooted outside		
Sometimes	-	30 (42.85)
Never	70 (100)	40 (57.14)
3) Times of eating fruit in a week		
Daily	39 (55.71)	13 (18.57)
4-6 times	19 (27.14)	18 (25.71)
1-3 times	11 (15.71)	34 (48.57)
Not at all	1 (1.42)	5 (7.14)

Table 8 revealed that, 62.85% adolescent girls were drank milk or any health drink daily urban and in rural, 37.14% were drank 4-6 times in a week. 75.71% and 37.14% ate egg/fish/meat daily in urban and rural school respectively.

Table 8

Table 8 n1 + n2= 70 + 70		
Associated factors	Urban	Rural
	Frequency (%)	Frequency (%)
4) Times of drinking milk or any other health drink in a week		
Daily	44 (62.85)	16 (22.85)
4-6 times	15 (21.42)	26 (37.14)
1-3 times	4 (5.71)	21 (30)
Not at all	7 (10)	7 (10)
5) Times of eating egg/fish/meat in a week		
Daily	53 (75.71)	26 (37.14)
4-6 times	16 (22.85)	22 (31.42)
1-3 times	1 (1.42)	22 (31.42)
6) Times of eating vegetables in a week		
Daily	59 (84.28)	49 (70)
4-6 times	7 (10)	13 (18.57)
1-3 times	4 (5.71)	8 (11.42)

Table 9 shows that, in urban, 41.42% had taken salad with food daily in a week whereas, in rural, 32.85% took salad with food 1-3 times in a week. Data also revealed that 24.28% urban adolescent girls ate fast food daily and 11.42% rural adolescent girls ate fast food daily.

48.57% and 38.57% adolescent girls had taken carbonated soft drinks 1-3 times in a week in urban and rural area respectively.

Table 9

Table 9 n1 + n2= 70 + 70		
Associated factors	Urban	Rural
	Frequency (%)	Frequency (%)
1) Times of taking salad with food in a week		
Daily	29 (41.42)	8 (11.42)
4-6 times	25 (35.71)	15 (21.42)
1-3 times	9 (12.85)	23 (32.85)
Not at all	7 (10)	24 (34.38)
8) Frequency of eating fast food in a week		
Very rare	11 (15.71)	18 (25.71)
1-3 times	22 (31.42)	27 (38.57)
4-6 times	20 (28.57)	17 (24.28)
Daily	17 (24.28)	8 (11.42)
9) Frequency of drinking carbonated soft drink in a week		
Very rare	8 (11.42)	14 (20)
1-3 times	34 (48.57)	27 (38.57)
4-6 times	17 (24.28)	25 (35.71)
Daily	11 (15.71)	4 (5.71)

Table 10 depicted that, majority of adolescent girls (90%) in rural area had taken breakfast every day and all (100%) adolescent girls had taken breakfast every-day in a week in urban area. 77.14% and 81.42% received vaccine as per age in urban and rural area respectively. The table shows that, 15.71% urban adolescent girls and 27.14% rural adolescent girls had past history of illness. In urban 41.42% and in rural 14.28% engaged in exercise or outdoor physical activity very rarely.

Table 10

Table 10 n1 + n2= 70 + 70		
Associated factors	Urban	Rural
	frequency (%)	Frequency (%)
10) Times of taking breakfast in the morning in a week		
Everyday	70 (100)	63 (90)
3-4 days	-	7 (10)
11) Received vaccines as per age		
Yes	54 (77.14)	57 (81.42)
All vaccines received but some were delayed	6 (8.57)	2 (2.85)

All vaccines are not received	10 (14.28)	11 (15.71)
12) Any past history of illness		
Yes	11 (15.71)	19 (27.14)
No	59 (84.28)	51 (72.85)
13) Engage in exercise or outdoor physical activity in a week		
Very rare	29 (41.42)	10 (14.28)
1-2 days	16 (22.85)	22 (31.42)
3-4 days	14 (20)	17 (24.28)
Daily	11 (15.71)	21 (30)

Section – IV: Findings related to the association between prevalence of malnutrition with selected associated factors of malnutrition among early adolescent girls in selected urban and rural schools of West Bengal. Data presented in [table 11](#) showed that there was significant association between malnutrition with frequency of eating fast food in a week and engage in exercise or outdoor physical activity in a week as the calculated chi square value was more than the table value (3.841) at df (1) at 0.05 level of significance. There was no significant association between malnutrition with received vaccines as per age and past history of illness.

Data presented in [table 12](#) showed that there was significant association between malnutrition with frequency of eating fast food in a week, past history of illness and engage in exercise or outdoor physical activity in a week as the calculated chi square value was more than the table value (3.841) at df (1) at 0.05 level of significance. There was no significant association between malnutrition with received vaccines as per age because the calculated chi-square value was less than the table value (3.841) at df (1) at 0.05 level of significance.

Table 11

Table 11		n1= 70					
SL. No.	Variables	Malnutrition		Total	Value of χ^2	df	p-value
		Yes	No				
1.	Frequency of eating fast food in a week						
	≤3 days in a week	14	19	33	8.03	1	0.004
	>3 days in a week	28	9	37			
2.	Received vaccines as per age						
	Yes	33	21	54	0.12	1	0.72
	No	9	7	16			
3.	Any past history of illness						
	yes	6	5	11	0.16	1	0.68
	no	36	23	59			
4.	Engage in exercise or outdoor physical activity in a week						
	<4 days	32	13	45	6.48	1	0.01
	≥4 days	10	15	25			
χ^2 df (1) = 3.84, p<0.05							

Table 12

Table 12		n2= 70					
Sl. No.	Variables	Malnutrition		Total	Value of χ^2	df	p-value
		Yes	No				
1.	Frequency of eating fast food in a week						
	≤3 days in a week	19	26	45	5.71	1	0.016
	>3 days in a week	18	7	25			
2.	Received vaccines as per age						
	Yes	32	24	56	2.06	1	0.15
	No	5	9	14			
3.	Any past history of illness						
	yes	14	5	19	4.53	1	0.03
	no	23	28	51			
4.	Engage in exercise or outdoor physical activity in a week						
	<4 days	22	10	32	5.97	1	0.014
	≥4 days	15	23	38			

χ^2 df(1) = 3.84, p<0.05

6. DISCUSSION RELATED TO OTHER STUDY FINDINGS

Discussion related to other study with regards to background information of early adolescent girls in urban and rural schools.

The present study showed that all (100%) adolescent girls were Hindu in urban area school and in rural, majority (40%) of the adolescent girls were Hindu and 30% were Muslim by religion. In urban area school maximum (58.57%) adolescent girls belonged to nuclear family whereas in rural area school maximum (67.14%) adolescent girls belonged to joint family. Based on the revised B.G. Prasad socio-economic status classification Jan 2022, in urban area, 55.71% and 34.28% adolescent's family belonged to upper class and upper middle-class family respectively and in rural area, 27.14% and 57.14% belonged to upper middle class and middle-class family respectively.

Goyal A, Gadi NA, Kumar R, conducted a study among urban and rural adolescent on prevalence of overweight and obesity. In this study majority (71.62%) were Hindu and 7.14% were Muslim. In rural area, maximum (70.33%) were joint families compared to urban area (17.80%) whereas in urban area maximum (82.20%) were nuclear families compared to rural area (29.66%). This study supported the present study. [Anand and Sharma \(2023\)](#)

Anand A., Sharma P. (2023), conducted a study among urban-rural adolescents on prevalence and determinants of malnutrition. The majority of the adolescent in urban areas (56.2%) and in rural area (91.9%) were Hindu by religion and others were Muslims. In rural area joint families were more (63%) and nuclear families were 14%. On the other hand, in urban area, 40% were joint families and 39% were nuclear families. As per modified BG Prasad Scale, most of participants (67.1%) from urban area had a higher socio-economic status rather than the rural area (36.6%). This study supported the present study. [Ahmad et al. \(2018\)](#)

Discussion related to other study with regards to prevalence of malnutrition

The present study revealed that in urban area, the overall prevalence of under nutrition was 8.57% and over nutrition was 51.42%. Of the underweight early

adolescent girls, 4% were thin and 4% severely thin whereas 45% were overweight and 7% were obese. In rural area, the overall prevalence of under nutrition was 40% and over nutrition was 12.85%. Of the underweight early adolescent girls, 34% were thin and 6% severely thin whereas 10% were overweight and 3% were obese. The prevalence of under nutrition was higher in rural area compared to urban whereas the prevalence of over nutrition was higher in urban compared to rural area.

Anand A., Sharma P. (2023), conducted a study among urban-rural adolescents on prevalence and determinants of malnutrition. The overall prevalence of under nutrition was 18% whereas overweight was 28%. Of the underweight adolescents, almost 13% were thin and 5% severely thin whereas 21% of participants were overweight and about 7% were found to be obese. Under nutrition was three times more prevalent in rural (27.6%) area as compared to urban areas (8.6%). Being overweight was more rampant in urban areas (42.4%) compared to rural areas (13.3%). In urban areas, 25.1% females were under-weight and 36% were overweight. In rural scenario, 44.6% females were under-weight and 12.3% were overweight. This study supported the present study. [Ahmad et al. \(2018\)](#)

Ahmad, Siraj et al conducted a study on double burden of malnutrition among adolescent girls in North India. The study result showed that the prevalence of overweight and obesity in urban area was 59.6% and 67.2% respectively while 68.4% underweight adolescent girls belong to the rural area. The prevalence of overweight and obesity were 3 times and 10 times higher in urban area as compared to rural area among the adolescent girls. This study supported the present study. [Anand and Sharma \(2023\)](#)

Maiti S., et al conducted a study on nutritional status of urban and rural early adolescent girls. The prevalence of under nutrition was much higher in rural area than urban area. The prevalence of underweight, stunting and thinness in rural area were 35.4%, 35.7% and 26.3% while in urban area they were 19.6%, 29% and 13.6% respectively. This study supported the present study. [Maiti et al. \(2011\)](#)

Discussion related to other study with regards to the associated factors of malnutrition and its association with malnutrition.

In the present study there was significant association between prevalence of malnutrition with selected associated factors of malnutrition such as frequency of eating fast food, any past history of illness, engagement in physical activity.

Getacher L. et al., conducted a study on double burden of malnutrition and its associated factors among adolescents in Ethiopia. The result showed that the dietary diversity, frequency of meals and history of illness were significantly associated with either under nutrition or over nutrition. This study supported the present study. [Getacher et al. \(2023\)](#).

7. CONCLUSION

The findings of the present study revealed that the prevalence of over nutrition was more in urban area as compared to rural area. On the other hand, the prevalence of under nutrition was more in rural area rather than the urban area. There was significant association between prevalence of malnutrition with selected associated factors of malnutrition such as frequency of eating fast food, any past history of illness, engagement in physical activity.

8. LIMITATIONS

Conclusion of the study cannot be generalized to a large population, as the study was conducted to one urban and one rural school, and non-probability sampling technique was used for selecting sample.

CONFLICT OF INTERESTS

None.

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