

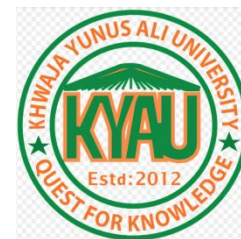
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Research Article

Nutritional Status, Dietary Patterns and Physical Status among Rural Resident Qawmi Madrasa Students in Bangladesh: A Cross-sectional Study

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Abstract

The students of Bangladesh Qawmi Madrasa, especially the residential students, are in a deplorable condition in terms of their nutritional intake. The aim of this study was to determine the nutritional status, dietary patterns and physical status among rural resident madrasa students in several districts of Bangladesh. This was a cross-sectional study with close-ended questionnaire. Random sampling technique was followed in data collection. Total 711 data were analyzed by SPSS 16.0 version. 91 % students were male and most of them were Alim or higher secondary level. The student's BMI was normal in 46% of the cases. Most of the students consumed green leafy vegetables almost every day per week.

63.6% and 54.7% students never took milk and fruits in a single day per week. Knowledge level of students on nutritious food was not good. The main reason of not taking nutritious food was they had not enough knowledge about nutritious food and they had no clear concept about the benefit of nutritious food. 54.4% students felt sick in last month and 18.3% had an aversion to food. All students washed their hands before taking food and after using toilet though only 4.5% students had took physical exercise. The madrasa authority should ensure their daily nutritious meal. Government should increase their budget on this sector. Policy makers may reorganize their policy on madrasa students.

Keywords: Nutrition, Malnutrition, Dietary patterns, Stunting, Physical health, Madrasa students.

1. Introduction:

Maintaining a healthy diet throughout childhood and adolescence is essential to ensure a child's physical and mental health, as well as their growth and intellectual development. This also helps to forestall more pressing health problems, such as impaired cognitive function and occupational performance (Evans *et al.*, 1996). In addition, it can help prevent long-term health problems like cardiovascular disease, cancer, iron-deficiency anemia, obesity, anorexia, tooth decay, and stroke. Moreover, there is evidence that adolescence is vital for establishing lifelong healthy behaviors and routines, including optimal eating patterns (Ferrara *et al.*, 2022).

Adolescent nutritional deficits and unhealthy eating habits can have long-term effects, such as delayed sexual development and shorter adult height (Gabhainn *et al.*, 2002). In the United States, nutritional studies have revealed that the most significant frequency of nutritional inadequacies occurs throughout adolescence (Aiga *et al.*, 2019). More than 90% of teenagers report eating snacks between meals, often processed and high-fat foods (Aiga *et al.*, 2019). These snacks may provide up to one-third of the recommended daily allowance of nutrients.

High rates of childhood undernutrition in South Asia remain throughout adolescence, but this issue has received little attention, partly because of the misconception that teenagers are a low-risk demographic (Alam *et al.*, 2010). Madrasa students are one of the largest parts of students in Bangladesh (Ahmed, 2015). Madrasa is the Arabic term for any kind of educational institution, secular or religious (of any religion). In the West, the term refers to a specific religious school or college for studying the Islamic faith. However, this is not always the only topic studied (Islam and Tithi, 2015).

Here, the madrasah is one of the largest aspects of the low-income population where young kids are educated,

yet, students do not receive adequate nourishment. And these situations are almost the same in urban, suburban, and rural Bangladesh. As Madrasa students come from all parts of the country and live away from home for the first time, they have difficulty adjusting to the new atmosphere. The majority of them have difficulty adjusting to new eating habits, sleeping hours, sanitary facilities, entertainment, and games. Sometimes students in Madrasa encounter some mental difficulties also.

At the present time, the relevant data regarding the nutritional status, associated factors, and eating habits among resident madrasa (Islamic religious schools) students in rural Bangladesh are either insufficient or missing. As a result, the purpose of this study was to attempt to fill in this gap. We utilized multivariate statistical approaches in order to uncover dietary trends through the consumption of several food groups that are associated to one another. In doing so, we were able to capture the intricacy and multidimensional character of diet. This method also made it possible to have a deeper understanding of the many patterns of food intake that naturally exist within a community, and it made it easier to identify the subgroups of individuals who may have the greatest requirement for health promotion initiatives (Sprake *et al.*, 2018). Due to the lack of previous research and reports on the dietary patterns among madrasa students in Bangladesh, this research project aimed to investigate the nutritional status, associated factors, and dietary patterns among resident madrasa students in rural areas of Bangladesh. This was done because there is currently a shortage of such research and reports. When taken together, the current study's results should be significant for future nutritional interventions at the madrasa-level setting. These interventions are intended to enhance food quality and minimize the risk of lifelong chronic illness in the generations to come.

2. Materials and Methods

2.1 Study design

This research followed cross-sectional study method. All questionnaire was close ended questions and those are in English language. The questionnaire had five part including demographic characteristics, dietary patterns, knowledge on nutrition, factors influencing for not

consuming nutritious food, Physical status of students. All questions were adopted from some published research articles (Ahmed *et al.*, 2016; Yemaneh *et al.*, 2017; Kabir *et al.*, 2010).

2.2 Study population, sampling and data collection:

Sample size was calculated by the following equation:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

According to this equation, random sampling technique was used with 711 (CI: 95%, Margin of error: 5%) Qawmimadrassa resident students included in this survey to explore the study objectives (Jamil *et al.*, 2022). This research had been conducted in several district of Bangladesh including Sirajganj (59), Kushtia (200), Madaripur (55), Pabna (160), Chittagong (160), Dhaka (99). The students who were from madrasa background and who lived in madrasa hostel or private hostel/mess

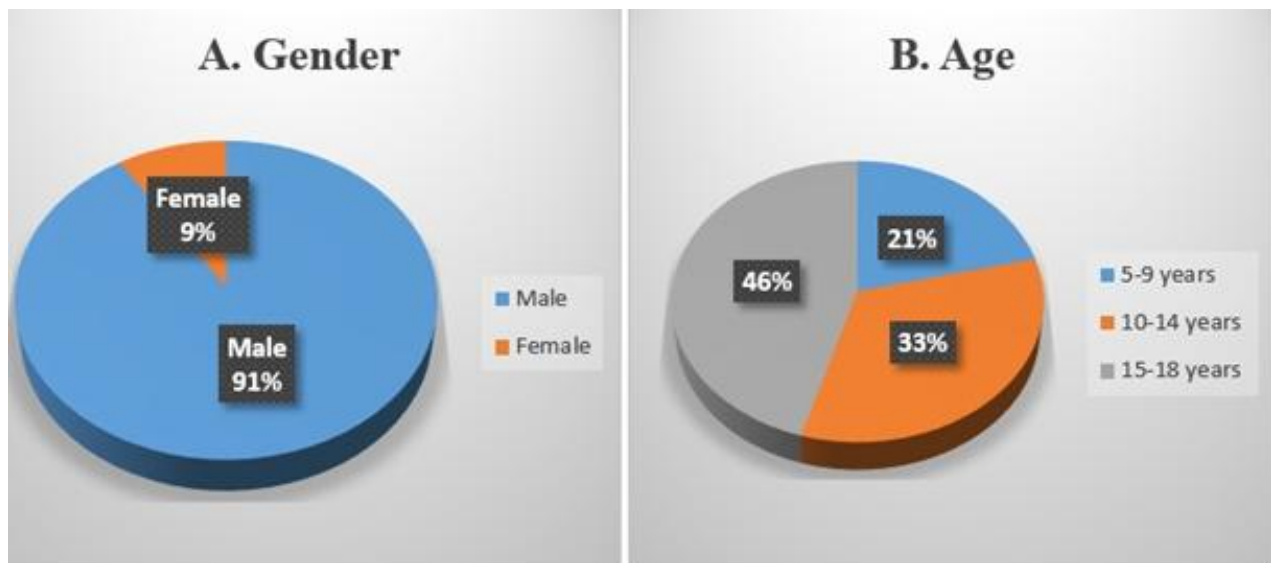
included in this study. Students who did not live in hostel and who lived in their own house were excluded in this study. All participants were interviewed face to face by a paper based questionnaire (Akhter *et al.*, 2022). After the goal of the study had been explained by the person collecting the data, respondents were selected from among those who were willing to complete the questionnaire. The responders were given the assurance that any personal information they provided would be kept confidential. During the research, all of the rules and procedures set out in the World Medical Declaration of Helsinki were followed (Hossain *et al.*, 2022). All data were collected from 2nd September to 11th October.

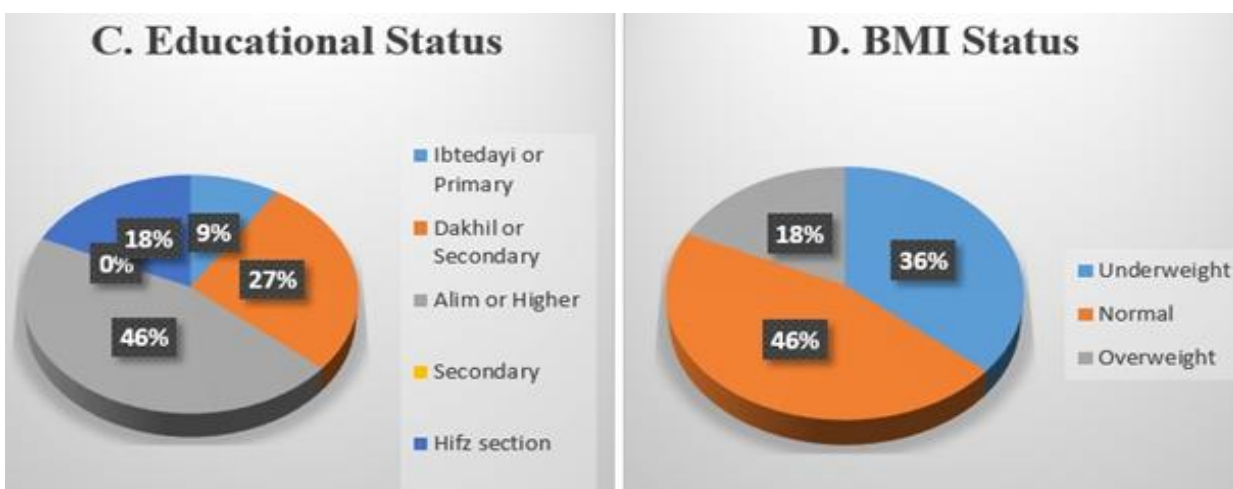
2.3 Data analysis:

SPSS 16.0 version was used for data analysis.

3. Result:

Figure 1: Demographic characteristics of respondents(n=711)





The study participants' demographic characteristics are presented in **Figure 1**. The majority respondents were male than female (91% vs 9%). 21% and 33% respondents were respectively 5-9 and 10-14 years old. 46% respondents were 15-18 years old. Total 9% students were in Ibtedayior primary education level,

27% students were in Dakhil or secondary education level, 18% students were in hifz section and lastly 46% students were in Alim or higher education level. Maximum students were normal weighted (46%). 36% and 18% students were underweighted and over weighted respectively.

Table 01: Dietary Patterns of respondents (n=711)

Variables	N	%
Egg (Days per week)		
0	65	9.10
1 to 3 days	582	81.90
4 to 5 days	64	9.00
6 to 7 days	0	0.00
Milk (Days per week)		
0	452	63.60
1 to 3 days	259	36.40
4 to 5 days	0	0.00
6 to 7 days	0	0.00
Meat (Days per week)		
0	194	27.30
1 to 3 days	517	72.70
4 to 5 days	0	0.00
6 to 7 days	0	0.00
Fish (Days per week)		
0	266	31.79
1 to 3 days	485	68.21
4 to 5 days	0	0.00
6 to 7 days	0	0.00
Green Leafy vegetables (Days per week)		
0	0	0.00
1 to 3 days	0	0.00
4 to 5 days	324	45.60
6 to 7 days	387	54.40

Fruits (Days per week)		
0	389	54.70
1 to 3 days	322	45.30
4 to 5 days	0	0.00
6 to 7 days	0	0.00
Do you take nut in your meal regularly?		
Yes	97	13.64
No	614	86.36
Do you take iodized salt regularly?		
Yes	129	18.10
No	387	54.40
May be	195	27.40

The dietary patterns of respondents are presented in **Table 1**. According to this study 9.1% respondents never ate egg for a single day in a week. Maximum 81.9% respondents ate egg at least 1-3 days in a week. There was a shocking result that 63.6% respondents never took milk for a single day in a week. 72.7% respondents ate meat 1-3 days in a week and 27.3%

respondents never ate meat for a single day in a week. 68.21% respondents took fish in their meal for 1-3 days in a week. Surprisingly green leafy vegetables were taken by 54.4% respondents for 6-7 days in a week. But 54.7% never ate fruits in a week. 86.36% respondents didn't take nut in their regular meal. 54.4% respondents didn't take iodized salt regularly.

Table 02: Knowledge on Nutrition of respondents (n=711)

Variables	N	%
<i>If you eat a diet high in fat, you can prevent its harmful effects by eating apples.</i>		
Yes	194	27.30
No	65	9.10
Not sure	452	63.60
<i>A healthy diet should consist of half meat, one-fourth vegetables, and one-fourth other foods.</i>		
Yes	65	9.10
No	516	72.60
Not sure	0	0.00
<i>Fat is always harmful to the body, so it should be avoided as much as possible.</i>		
Yes	517	72.70
No	65	9.10
Not sure	129	18.10
<i>If you want to eat healthy food, you should eat low fat food.</i>		
Yes	193	27.10
No	65	9.10
Not sure	453	63.70

The knowledge on nutrition of respondents are presented in **Table 2**. 27.3% respondents knew the following statement "If they eat a diet high in fat, they

can prevent its harmful effects by eating apples". 63.6% respondents were not sure about that statement. Surprisingly 72.6% respondents didn't know that a

healthy diet should consist of half meat, one-fourth vegetables, and one-fourth other foods. Besides 72.7% respondents knew that fat is always harmful to the body, so it should be avoided as much as possible.

27.1% respondents knew that “if they want to eat healthy food, they should eat low fat food.” But 63.7% respondents did not sure about that.

Table 03: Factors influencing for not consuming nutritious food of respondents (n=711)

Variables	N	%
<i>What is responsible for not eating nutritious food?</i>		
Reluctance to eat	65	9.10
Lack of money so I cannot buy food	64	9.00
Not having a good idea about nutritious food	389	54.70
Little is known about the benefits of nutritious food	93	27.10

Table 3 presents the factors which influence for not consuming nutritious food of study's respondents. As per this study, 54.7% respondents reported that they had not good idea about nutritious food. And 27.1%

respondents had little knowledge about the benefits of nutritious food. So according to the study lacking of knowledge is the main barrier for not consuming nutritious food.

Table 04: Physical status of respondents (n=711)

Variables	N	%
<i>Have you feel sick within one month?</i>		
Yes	387	54.40
No	324	45.60
<i>Do you have any chronic disease or disability?</i>		
Yes	129	18.10
No	582	81.90
<i>Do you have an aversion to food?</i>		
Yes	130	18.30
No	581	81.70
<i>Do you feel weakness all time?</i>		
Yes	64	9.00
No	647	91.00
<i>Do you wash your hands before eating?</i>		
Yes	707	99.40
No	4	0.60
<i>Do your wash your hands after using toilet?</i>		
Yes	711	100.00
No	0	0.00
<i>Do you take physical exercise regularly?</i>		
Yes	32	4.50
No	679	95.50

Table 4 represents the physical status of respondents. Maximum 54.4% respondents reported that they felt sick within one month. Only 18.1% respondents had any chronic disease or disability. Similarly only 18.3% respondents had an aversion to food. 9% participants felt weakness all time as per our study. A great positive

4. Discussion

This study was to investigate the dietary pattern, knowledge of nutrition, factors of not consuming nutritious food and physical status of madrasa students. As per this study, half of the respondents did not take fruits for a single day (54.7%) and 63.6% respondents did not take milk for a single day. On the other hand Kabir *et al.*, 2010 revealed in their research that 67.2% students took fruits in 7 days in a week and 46.1% students did not take milk for a single day in a week (Kabir *et al.*, 2010). In our study 46.6% and 54.4% students took green leafy vegetables respectively 4-5 days and 6-7 days in a week. Green leafy vegetables were more accessible and very cheap for them. In our study nobody took egg for 6-7 single days but 81.9% students took at least 1-3 days per week. Besides Kabir *et al.*, exposed that 10.2% students took egg in everyday in a week (Kabir *et al.*, 2010). Moreover Ahmed *et al.*, 2016 conducted a study on school going adolescent girls and they reported that 11.2% girls did not take egg for a single day and 33.6% girls did not take milk any days in a week (Ahmed *et al.*, 2016). So their dietary patterns are a concern issue.

According to this study knowledge level of students on nutrition was not satisfactory. Maximum respondents did not have proper education and knowledge about it. They did not know which food can make them unhealthy and not. 63.7% students did not know that low fat containing food is good for health. They had many misconceptions. Students were not so much concern about their health (Aiga *et al.*, 2019). As per this study, the main reason for not consuming nutritious food was lack of knowledge. 54.7% students did not have minimum idea about nutritious food. And 27.1% student had known a little bit about benefits of nutritious food.

result were found from this study that almost all participant did wash their hands before eating and 100% participants did wash their hands after using toilet. But a worst result is 95.5% respondents did not take physical exercise.

Individuals' nutritional status can be influenced, in part, by their attitudes toward the foods they choose to eat, which in turn can be affected by their level of nutrition-related knowledge. Individuals may experience health difficulties as a result of their lack of understanding (Lestari and Octavia, 2021). Hasibuan, 2020 reported that both people and their families might be responsible for the factors that impact their dietary patterns. These things can be broken down into three separate predictors: personal characteristics, diet, and the environment (Hasibuan, 2020).

Khanam and Haque reported in their research that 45% girls and 36% boys were underweighted and they became malnourished (Khanam and Haque, 2021). In our study, 54.4% students felt sick within one month. According to the findings of yet another study carried out in Assam by Dey *et al.*, nearly one-fourth (24.5%) of school-aged children suffered from stunting, with 6.5% of them being severely stunted. Furthermore, nearly two-thirds (63.3%) of the children were underweight (Dey and Nath, 2017). In addition, Mondal *et al.*, discovered in 2012 that the prevalence of underweight (44.4%) and stunting (37.2%) was significantly higher among Bengali schoolchildren aged 6–16 years old in the Chapra block (Mondal *et al.*, 2012). The researchers, Shivaprakash *et al.*, looked at pupils aged 6–12 who attended a public school in the Mandya district of Karnataka (Bhattacharyya *et al.*, 2021). They found that the frequency of underweight children was 30.3%, while the prevalence of stunted children was 27.9%. A study that was carried out in Punjab in 2018 by Verma *et al.*, 2020 discovered that 37.5% of school-going children were underweight, while 87.7% of them were stunted (Verma *et al.*, 2020).

5. Conclusion:

This study found that a large percentage of rural resident madrasa students in Bangladesh suffer from undernourishment, poor dietary habits, and a lack of physical fitness. This is an emergency situation from the standpoint of adolescent health. Therefore, the madrasa managing committee should take proper steps to overcome this problem. Besides, the government may take some initiative and increase their budget. Hostel supervisors need to implement some rules and committee members should go to the hostel for inspection one day per month. We hope this research conclusion will also assist policymakers and planners in formulating a new plan and strategy to tackle undernutrition among madrasa students.

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7. Authors Contribution:

Research concept- Mohammad Zakerin Abedin & Md. Emdadul Hasan Mukul, Research design- Safayet Jamil, Supervision- Md. Emdadul Hasan Mukul, Data collection: Md. Rifat Hasan Shemul, Safayet Jamil, Asma Akhter & Husain Rakib Swadhin, Data analysis & interpretation- Safayet Jamil & Asma Akhter, Article writing- Safayet Jamil, Quazi Istiaque Bari, Husain Rakib Swadhin & Tasnim Musharrat, Article editing and reviewing- Safayet Jamil, Shahidur Rahman & Quazi Istiaque Bari, Final approval: All authors.

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9. Conflict of Interest

The authors declare no conflicts of interests.

10. Ethical statement

Institutional ethical clearance was taken from the ethical committee of KYAU.

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