

Original Research

Sources of nutrition information and nutritional knowledge among school-going adolescents in Bangladesh



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ABSTRACT

Objectives: The increasing prevalence of malnutrition among school-going adolescents is a major public health threat in Bangladesh. School studying adolescents are a crucial group suffering from malnutrition. Proper nutrition information can enrich their knowledge, promote their health and also minimize the burden of malnutrition. The study aimed to identify the sources of information and corresponding knowledge level on nutrition among school-going adolescents in Bangladesh.

Study design: A school-based cross-sectional survey was carried out from January to August 2019.

Methods: A pre-structured questionnaire having 13 validated questions regarding facts panel of packaged food and daily dietary habits was used to assess the knowledge. Scores on nutritional knowledge were calculated by summing up the answer values (Yes = 1, No = 0) and, scores below the overall mean were considered low. Logistic regression was employed to identify whether any source was related to respondents' nutritional knowledge.

Results: Family members were the most popular (52.4%) source of nutrition information. Majority students (43.2%) trusted professionals as an accurate source. Approximately half (49.1%) of the participants scored low (<9.34) in basic nutrition knowledge assessment. Participants seeking information from family members (AOR: 0.693; 95% CI: 0.555–0.866, $p < 0.05$) and online resources (AOR: 0.826, 95% CI: 0.710–0.962, $p < 0.05$) were less likely to obtain low scores than those not favored the sources.

Conclusion: Knowledge about essential nutrition among school-going adolescents was quite low. The findings of this study are useful to the policymakers to develop and design interventions to improve adolescents' knowledge of nutrition. A school-based nutrition awareness program can be introduced to reduce malnutrition among adolescents in Bangladesh.

1. Introduction

School-going adolescents intake increased fast food and low-quality food [1–4] and follow irregular meal patterns particularly skip breakfast [2,5,6] which are associated with increased weight gain in adolescence and adulthood [2]. Adolescents' overweight and obesity (13–19 years) have emerged as a major public health threat in Bangladesh [7]. School-going adolescents constitute an important group of adolescents in Bangladesh in nutrition planning [8–10]. Proper nutritional knowledge

and its reliable sources can minimize adolescent malnutrition. Unfortunately, there is a serious paucity of credible data on these issues that can be used for policy and programmatic development [7].

Adolescents' nutrition knowledge depends on the awareness of and practices on nutrition and its source [11,12]. As a source, school-going adolescents favor mainly family members, friends, internet, television, health workers and textbooks [13–15]. Several studies have identified that online resources are popular, although, there is otherness for their usage and reliability among adolescents [13,14,16–18]. A study in Ghana

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reported that online resources were the most common source of nutrition information, but healthcare professionals were perceived to be the most reliable source (86.5%) [12].

Good nutrition knowledge results in identifying nutritional facts, better dietary behaviors and practices [11,19,20]. In addition, reliable nutrition information, facts panel, for example, accelerate proper nutritional practices [12,19]. A very recent study which is conducted in rural communities in Rangpur District, Bangladesh has identified that school-going adolescents in Bangladesh have substantial knowledge about good health and nutrition practices and they acquire nutrition information from many sources including teachers, family members (usually mothers), textbooks as well as indirectly from traditional media and online resources, of which family members are the primary sources [8].

Community specific interventions based on nutrition information-seeking behaviors among adolescents can promote good nutritional habits and health [12,13]. But, no study was conducted in Bangladesh regarding the specific relation between these sources of nutrition information and their effect on nutrition knowledge among school-going adolescents. Thus, the results of this research are needed to fame the proper prevention of adolescent malnutrition. Therefore, this study aimed to know the sources of nutrition information and the level of nutritional knowledge among school-going adolescents in an urban setting in Bangladesh.

2. Methods

2.1. Study settings

The study was conducted among secondary school students of three urban cities (Meherpur, Madaripur and Patuakhali) in Bangladesh from January to August 2019. These areas were selected due to the representativeness of all urban cities of the country. These three districts were selected from three Divisions in Bangladesh like Meherpur (283 km away from the capital city) from Khulna Division, Madaripur (63 km away from the capital city) from Dhaka Division, and Patuakhali (335 km away from the capital city) from Barishal Division. We collected data from four different schools (Both Government and Non-Government) from each district.

2.2. Study design and procedure

First, three divisions were randomly selected from eight of Bangladesh. One district from each division was selected conveniently based on transport facilities and resident opportunities and homogeneity of other maximum districts of the respective division. Four schools of each district headquarters were chosen purposively based on student numbers and composition (male vs. female; science vs. non-science) of students. We selected both Government and non-Government schools to make more reliability of research output. We invited all students to participate in the study. Investigators explained the objectives of the research and assured that not to disclose the data. We only considered class nine and ten, because most of the students bellow class nine in Bangladesh don't use the internet and also have no trend in online health and nutrition information-seeking behavior. All invited students were interested in taking part in this research. The sample size of 855 was calculated using total population examinee (1700102) sit for Secondary School Certificate (SSC) examination under eight general education boards of Bangladesh in 2019 [21,22], with a 95% confidence level, 3.35% confidence interval and 50% precision. For more accurate data, 872 participants were enrolled to collect data. Voluntary participation of all respondents was sought through verbal consent and the filling of an informed written consent form. All the participants were informed about the purpose of the study and the matter that the study had no personal implications. The participants only who were willing to participate and filled written consent were given copies of the questionnaire. The final participation rate was 100% (n = 872).

2.3. Study variables

The questionnaire was pretested at another school located at Patuakhali district among 50 adolescents who were studying in class nine and ten. The pretested questionnaire included the demographic information like age, sex, religion, study group, class of study, occupation and educational qualification of parents, besides, an open-ended question on the sources of nutrition information of all the respondents and some basic questions regarding nutrition to assess the basic nutritional knowledge. Based on the findings from the pretest, and a previous study [12], some modifications were carried out to the questionnaire. The responses of the respondents on sources of nutrition information were family members, friends, health workers, traditional media (TV, radio and newspaper) and online resources. Therefore, with these five sources, a close citing table was made for making the questionnaire more comfortable to complete. A Likert scale with options: 'never', 'rarely', 'often' and 'always' was set for the participants to identify how often they get nutrition information from these sources. Perceived reliability of those sources was also assessed by using another Likert scale with options: 'not reliable', 'moderately reliable', 'very reliable' and 'absolutely right'. The assessment of basic nutritional knowledge was conducted through 13 questions posed to participants covered knowledge on nutrition facts panels and knowledge on daily dietary habits and lifestyle. The highest score a participant could obtain was 13, and the lowest was 0 points.

2.4. Statistical analysis

The quantitative data were analyzed at a 95% confidence interval using SPSS for Windows Version 23.0. Descriptive statistics, such as frequency counts, percentages, mean, and standard deviation were used to analyze the demographic details of the respondents. The mean score for nutrition knowledge of the participants was calculated, and this was used in creating a categorical variable for basic nutrition knowledge: scores below the mean were considered low whereas those scores equal to or above the mean were considered high. The possible differences between high and low scores of basic nutritional knowledge and their information seeking behaviors were calculated using the Pearson chi-square test. A logistic regression model was used to identify whether any of the source/sources was/were related to the nutritional knowledge level. P values of less than 0.05 were considered as statistically significant.

3. Results

Over half (51.5%) of participants were female. The mean age of the participants was 14.9 (SD = 0.807). The majority (58%) studied in non-government schools. Nearly half (50.3%) of the students studied in class IX and maximum (68.3%) respondents belonged to the science group (Table 1). Almost one-third (30.2%) of fathers had higher education, and 32.6% of mothers completed their secondary education. Most of the mothers (89.2%) of participants were housewives, and maximum (39.9%) fathers were engaged in small businesses.

Fig. 1 shows the sources and the degree to which these sources were used by the participants when searching for nutrition facts. Over half (52.4%) always collected information from their own family members. In contrast, only 3.9% always got the message about nutrition from their friends. Just over half of respondents often pursued nutrition information from health workers and traditional media (TV, Radio, and Newspaper) and it was around forty percent for family members (40%) and friends (40.6%). Over one-third of respondents (35.9%) often considered online media to get nutrition information.

The level of reliability of nutrition sources between participants has been shown in Fig. 2. A majority (48.9%) of the participants perceived nutrition information from family to be absolutely right. Additionally, health workers including nutritionists and dietitians were also perceived by most participants (43.2%) as accurate (absolutely right). Only 12.4%

Table 1
Demographic characteristics of the study participants (n = 872).

Variables	Categories	N (%)
Age, mean (SD)		14.9 (0.807)
Sex	Male	423 (48.5)
	Female	449 (51.5)
District (study area)	Meherpur	290 (33.3)
	Madaripur	294 (33.7)
	Patuakhali	288 (33.0)
Study Class	Class IX	439 (50.3)
	Class X	433 (49.7)
Study group	Science	593 (68.0)
	Non-science	279 (32.0)
Status of the schools	Government	369 (42.3)
	Non-Government	503 (57.7)
Religion	Muslim	806 (92.4)
	Non-Muslim	66 (7.6)
Educational level of fathers	Under Primary	108 (12.4)
	Primary	131 (15.0)
	Secondary	207 (23.7)
	Higher secondary	153 (17.5)
	Tertiary education	263 (30.2)
Educational level of mothers	Under Primary	125 (14.3)
	Primary	145 (16.6)
	Secondary	284 (32.6)
	Higher secondary	149 (17.1)
	Tertiary education	169 (19.4)
Occupation of fathers	Government Job	152 (17.4)
	Private Job	121 (13.9)
	Business	348 (39.9)
	Farmer	139 (15.9)
	Others ^a	102 (11.7)
	No more ^b	10 (1.1)
Occupation of mothers	Housewife	778 (89.2)
	Job	94 (10.8)

^a Others occupation included expat, driver, workers and elementary occupations.

^b Indicates the respondent's fathers who were died.

reported that online resources were correct for nutrition information. Maximum (36.1%) respondents believed that health professionals were very reliable. Contrary, maximum (26.6%) students informed that online resources were the most unreliable sources of nutrition information.

Among study participants, the majority (85.6%) knew about the nutrition facts panel on food packets. But 73.7% of the participants did

not read the nutrition facts panel. The mean knowledge score for the entire study population was 9.34 (SD, 2.13) out of 13.0 points. About half of the study participants (51.9%) scored high on the basic nutrition knowledge assessment, whereas almost half (48.1%) of the participants scored low.

The bivariate analysis stated that all sources were significantly associated with the level of nutritional knowledge of participants (Table 2).

A logistic regression model was employed to identify whether any of the source/sources was/were related to the nutritional knowledge level of the participants. After adjusting the district, age, gender, study group, educational qualification and occupation of fathers and mothers of the participants, those who perceived nutrition information from family members (Adjusted Odd Ratio [AOR]: 0.693; 95% CI: 0.555–0.866) and online resources (AOR: 0.826, 95% CI: 0.710–0.962) were less likely to obtain low scores on the nutrition knowledge assessment compared to those who did not get information from these two sources. None of the other sources of nutrition information identified was associated with the level of basic nutrition knowledge (Table 3).

4. Discussion

This study was to explore the sources of nutrition information and its association with the level of basic nutritional knowledge among school-going adolescents in Bangladesh. Family members were the most used source by the respondents of this study, whereas a Ghanaian study [12] reported that online resources were the most favorable source for nutrition information, followed by traditional media, family members, friends/peers, and health care professionals. One the other hand, an Iranian study found that television programs to be the first go-to for health and information, followed by family members, friends, books, and public libraries [13]. Family members may have been the most patronized source of nutrition information due to the complete dependency of the adolescents on their families. The majority of the participants of this study also considered family members as the accurate source of nutrition information which is consistent with the findings of Worsley [23].

On the contrary, several studies found online resources as the most used and very reliable sources for nutrition information [12,16]. But online resources were the least used and most unreliable sources of nutrition information in this study, which also supports the findings by Zhang [18]. According to Zhang [18], young adult Americans don't

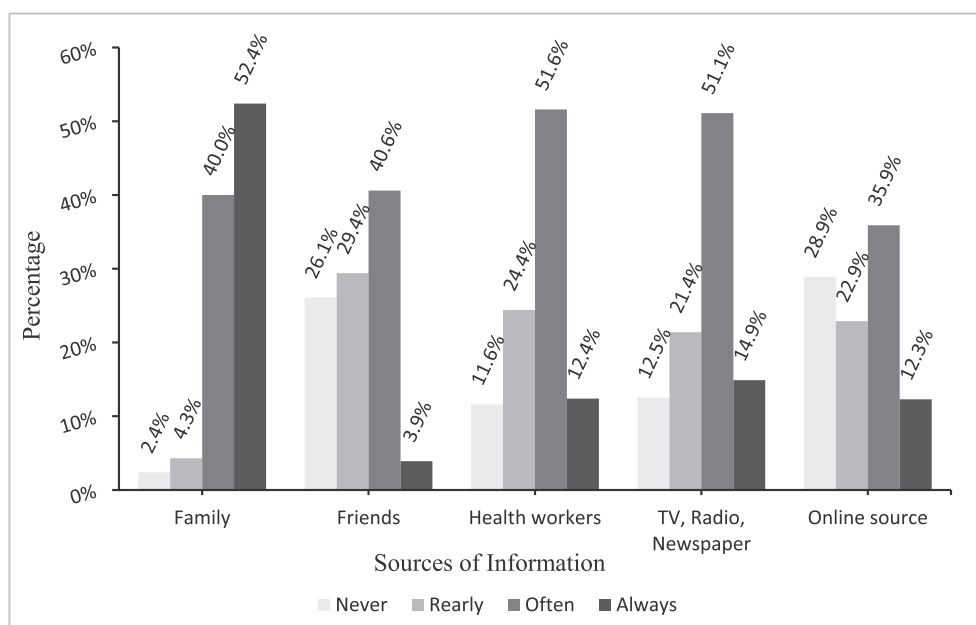


Fig. 1. Sources of nutrition information and frequency of use among the participants.

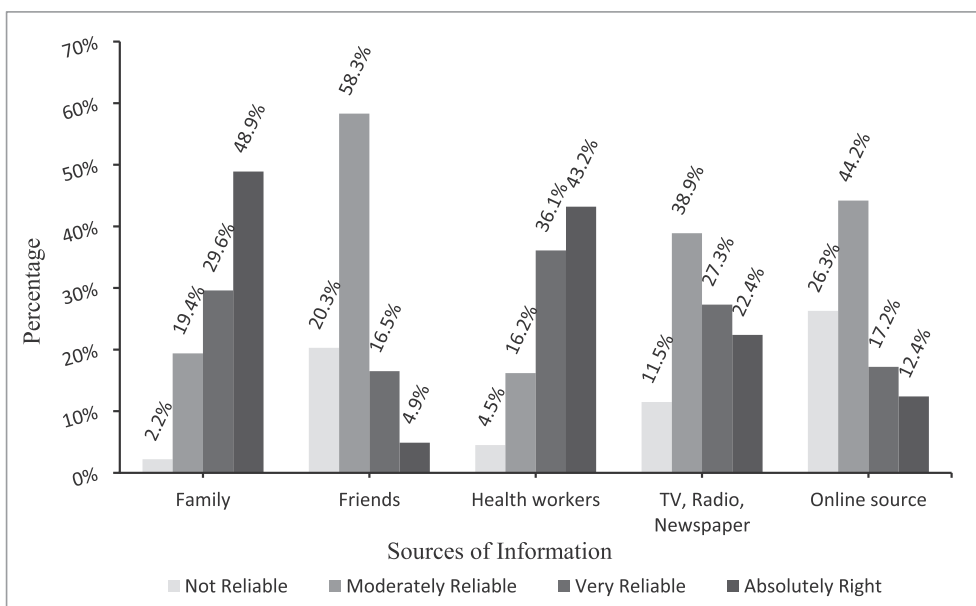


Fig. 2. Level of reliability of nutrition information sources among the participants.

Table 2

Bivariate analysis of sources of nutrition information and basic nutrition knowledge (n = 872).

Sources of nutrition information	Basic nutrition knowledge ^a		Chi-square	P value
	High score (%)	Low score (%)		
Family				
Yes	451 (99.96)	400 (95.46)	15.516	<0.001**
No	2 (00.44)	19 (4.54)		
Friends				
Yes	365 (80.57)	279 (66.59)	22.052	<0.001**
No	88 (19.43)	140 (33.41)		
Health workers				
Yes	414 (91.39)	357 (85.20)	8.138	0.004*
No	39 (8.61)	62 (14.80)		
Traditional media^b				
Yes	418 (92.27)	345 (82.34)	19.643	<0.001**
No	35 (7.73)	74 (17.66)		
Online resources				
Yes	357 (78.80)	263 (62.77)	27.253	<0.001**
No	96 (21.20)	156 (37.23)		

**P value < 0.001, *P value < 0.01.

^a The mean score for nutrition knowledge of the participants was calculated and this was used in creating categorical variable for basic nutrition knowledge: scores below the mean were considered low whereas that scores equal to or above the mean were considered high.

^b This included newspapers, television and radio programmes.

perceive online resources as very reliable even though they used online resources regularly when they were looking for nutritional and health-related matters and also the participants of his study felt that it was not advisable to take health information from online platforms such as social networking sites.

Health workers and traditional media were the second most used sources of nutrition information in this study. Health workers were also the second highest sources of nutrition information and were considered accurate by many participants which are compatible with the findings by several studies [23–25]. Besides, According to Worsley [23], health workers especially provide ‘expert’ or ‘special’ information. Another study [25] stated as adolescents thought that seeking information from health workers was a good idea to find out whether anything was wrong with them and ask questions about their health. Thus, these may be the

Table 3

Association between sources of nutrition information and basic nutrition knowledge, based on logistic regression model (n = 872).

Sources of nutrition information	Low nutrition knowledge ^a	
	Odds Ratio	95% CI
Family members (yes vs no)	0.693*	0.555–0.866
Friends (yes vs no)	0.889	0.747–1.057
Health workers (yes vs no)	0.889	0.747–1.059
Traditional media ^b (yes vs no)	0.888	0.743–1.061
Online resources (yes vs no)	0.826*	0.710–0.962

CI implies Confidence Interval.

*P value < 0.05.

^a Low score means below the mean of the sample.

^b This included newspapers, television and radio programmes.

reasons why many adolescents in this study perceived nutrition information from these sources as accurate.

Though, over half of the study participants had scored high on the basic nutrition knowledge assessment and mostly knew about the nutrition facts panel, over half of the participants didn’t accustom to read that nutrition facts panel on packaged foods. The usage of the nutrition facts panel is strongly associated with making healthy food choices [26]. Nutrition facts panels specially offer information on the nutritional content of packaged foods, and it is important to understand the provided information [27,28]. The usage of nutrition facts panel was low among the study participants, indicating the need for usage of nutrition facts panel and understanding of that information.

The results revealed that family members are the most common source to get nutrition information. And students were less likely to get a low score on the nutrition knowledge assessment when used family member and online resources as media of getting information.

4.1. Limitations

This study has several limitations. First, the study was cross-sectional, thus causal conclusions cannot be drawn. Second, this study stated self-reporting information that may bias the result. Third, other external possible influential factors could affect the nutrition information seeking behavior of the students. Moreover, the inclusion of a larger sample size may increase the generalization of the results.

5. Conclusion

The findings of this study suggest that nutrition information sources of school-going adolescents are complement, not replace, each other. This study explores that school-going adolescents get nutrition information from family members mostly. These adolescents have limited access and low use of internet to get nutrition information. They trust the information mostly they get from the family members. A majority part of the respondents seeks nutrition information from the health workers who can help them find and use nutrition facts panel. Before entering young adulthood, school-going adolescents should be introduced to nutrition education such as nutrition facts panel reading and understanding, daily dietary and lifestyle habits, where they get more freedom in making their own choices. However, several external possible influential factors like socio-demographic factors could affect the nutrition information seeking behavior of the students and their nutritional knowledge level. Thus, further study could be conducted to identify them, to find out the causality more exactly and also to generalize the findings to the whole country.

Authors contribution

Satyajit Kundu: Conceptualization, Writing- Original draft preparation; Md Shafiqul Islam Khan: Supervision, Reviewing and Editing; Jhantu Bakchi: Conceptualization, Data collection; Abu Sayeed: Methodology development & draft preparation; Md. Hasan Al Banna: Data Entry & draft preparation; Musammet Rasheda Begum: Data Analysis; Md. Nazmul Hassan: Conceptualization & draft preparation.

Ethical approval

The protocol of this study was approved by the Research Ethical Committee (REC) of the Department of Food Microbiology, Patuakhali Science and Technology University (PSTU) (Approval No. FMB: 03/01/2019:04). Ethical clearance also obtained from the Research and Training Center (RTC) of PSTU (No: NFS-01/2018-2019). Permission to collect data from the schools was obtained from the respective Head Teachers. The participants only who filled the written consent were given copies of the questionnaire. Adequate time was also taken to explain to the respondents about their right to withdraw from the study at any time.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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