Original Article

Preventive Dietary Knowledge to Combat Non-Communicable Diseases: A Descriptive Study Contextualized Bangladeshi Female University Students

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How to cite this article: Saima Alam, SharminRahman Muna, Dipita Das Gupta et. al. Preventive Dietary Knowledge to Combat Non-Communicable Diseases: A Descriptive Study Contextualized Bangladeshi Female University Students. Indian Journal of Public Health Research and Development / Vol. 16 No. 2, April-June 2025.

Abstract

Non-communicable diseases (NCDs) represent one of the most pressing and intricate public health issues. This study aimed to verify the dietary knowledge of female university students regarding NCDs. This was a descriptive type of cross-sectional study with 385 female university students of Dhaka, Bangladesh. Data were gathered by pre-tested and semi-structured questionnaires. Analysis was performed by using multivariate techniques followed by regression modeling. This study reflected that the majority of the female students belonged to the age group <22 years. The study found that 77% of the respondents had poor knowledge of preventive diets to combat NCDs. It was observed that the highest level of poor knowledge was about the dietary policies that cause NCDs (85.7%) and benefits of fruits & vegetables intake to combat NCDs (83.4%) among female university students. Also, the highest level of poor knowledge is significantly ($p<0.05$) related to the students who did not have any family history of NCDs (AOR=2.57) and also 3rd year group (AOR=2.34). This study showed that few female university students had overall good knowledge, and the state of information regarding preventative diet to combat NCDs was unsatisfactory. This study discovered that several relevant predictors under socio-demographic repercussions were highly significant in relation to inadequate knowledge.

Keywords: Non-communicable diseases, NCDs, Preventive Dietary Knowledge

Introduction

Non-communicable diseases (NCDs) represent Bangladesh's critical and multifaceted public health dilemma. These conditions are chronic, enduring for prolonged durations, and typically progressing slowly[1]. In 2019, NCDs were responsible for 1.62 billion Disability Adjusted Life Years (DALYs), constituting 63.8% of the overall DALYs, indicating a global rise in their prevalence[2]. Globally, NCDs constituted 74% of total mortality, emerging as the

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Submission date: June 2, 2024 **Acceptance date**: September 30, 2024 **Published date: March 11,2025**

predominant contributor to premature death[3]. In 2012, the World Health Organization (WHO) issued a cautionary report highlighting that NCDs account for 68% of global mortality. Within this context, approximately 75% of all NCD-related fatalities were concentrated in low-and middle-income countries (LMICs)[4].

Bangladesh and many other LMICs are undergoing an epidemiological transition marked by a shift from infectious diseases to NCDs[5]. NCDs impose significant health and economic burdens, particularly affecting the productivity of younger populations. By 2030, these diseases will result in a global economic loss of $47 trillion. Failure to mitigate NCDs could lead LMICs to incur an economic deficit exceeding $7 trillion from 2011 to 2025, averaging around $500 billion annually[6].

Numerous elements shape consumers' eating habits, genetic predispositions, personal factors[1] like culture, expertise, preferences, and time for meal preparation, and economic and political aspects such as food cost and accessibility. Additionally, the dissemination of food-related information, whether through education or marketing, plays a significant role in influencing dietary choices[7]. Furthermore, people in Bangladesh lack awareness about integrating healthy habits into their daily lives, primarily due to insufficient knowledge, infrastructure, and resources, and a failure to acknowledge its significance[8]. Research indicates that understanding nutrition can empower individuals to promote good health and decrease the chances of developing chronic diseases by impacting dietary habits[9]. Younger adults, including college students, face unique challenges as they navigate independent dietary choices for the first time, often constrained by limited knowledge, experience, time, and financial resources, potentially resulting in unhealthy dietary patterns and adverse health consequences[10] . Insufficient nutrition knowledge among some young people contributes to poor mental and physical health. In the past, parents, usually mothers, were the primary source of nutritional education at home, shaping their children's eating habits[11]. Studies have consistently found a significant connection between maternal education and children's health. Educated mothers tend to have children with lower rates of malnutrition, including underweight, wasting, and stunting[12].

This study examines dietary knowledge among female university students in Bangladesh to prevent NCDs. Focusing on women is strategic as they often manage household nutrition, impacting broader societal health. The research aimed to identify knowledge gaps on dietary awareness related to NCDs. Findings will inform future interventions and policies to enhance dietary practices among young Bangladeshi women, reducing the NCD burden.

Methods

Study design

A quantitative cross-sectional study was carried out using analytical approach from June to December 2023. Semi-structured data were collected in this study to obtain information on socio-demographic characteristics, clinical characteristics and knowledge on preventive diets to combat NCDs among female university students of Bangladesh.

Study participants, sample size, and sampling technique

This study considered a total of 385 undergrad female students studying in the Akij College of Home Economics of Dhaka, Bangladesh. Quantitative information for this study was collected from the respondents identified as students of the Akij College of Home Economics, and provided their consent to participate in this study.

Initially a potential standard sample size was assumed as 367 calculated by using the formula "n= 'Z^2pq/d^2" where Z (standard normal deviate) considered as 1.96; p (reasonable estimate of prevalence rate 60.5%) was considered as 0.60[13] and margin of error was considered as 0.05. With a minimum calculated sample 367, an additional 5% was added as cushion to take into account non-response and the final samples were 385.

A total number of 500 students of Akij College of Home Economics of Dhaka district were considered as study. Akij College of Home Economics was selected through random sampling as study place. A total of 385 students were selected followed systematic random sampling from the pool of 500

students listed by the college and were considered as the participants of this study.

Data collection

Quantitative data was collected by using a pre-tested and semi-structured questionnaire through the interviewer-administered method. Respondents were interviewed according to their convenience on August 2023 and onwards. All authors had access to the collection and preserving participants' information during or after data collection.

Ethical considerations

This study was approved by the Ethical Review Committee of the Department of Public Health of Northern University Bangladesh (NUB/ DPH/ EC/ 2022/ 20) and conformed to the Declaration of Helsinki.

Questionnaire design

The questionnaire was pre-validated by two independent reviewers and pre-tested among 10 respondents. The quality of the questionnaire addressed the responses of the pre-test. The pivotal components of the questionnaire were: (i) Socio-demographic characteristics: age, education, religion, marital status, number of children, residence type, Parental education, parental occupation, monthly family income, family size, and family type; (ii) Clinical characteristics: nutritional status measurement through calculating body mass index (BMI), had any of NCDs, family history of NCDs; (iii) Knowledge on preventive diets to combat NCDs: dietary policies to cause NCDs, selected ideal dietary guidelines to combat NCDs, food causes of NCDs, benefits of food & vegetables intake to combat NCDs, patterns of obesogenic food consumption, adverse effects of tobacco use and risk factors of passive smoking.

Data analysis

Collected data was checked and analyzed employing the Statistical Package for the Social Sciences (SPSS) software. Study characteristics were subjected to descriptive statistics (frequency and proportions) to summarize the obtained data.

Relevant continuous data were categorized followed by mid-values of the percentage scores as cut points[14]. A multinomial logistic regression analysis was performed followed by a modeling procedure considering a backward elimination process, including pre-specified confounders i.e., age, education, religion, marital status, number of children, residence type, Parental education, parental occupation, monthly family income, family size, family type, nutritional status, had any of NCDs, Family history of NCDs. Odds Ratios with 95% confidence intervals concerning Knowledge on preventive diets to combat NCDs (poor and good) were calculated for the specified exposures.

Results

Participant's characteristics

A total of 385 female college students were enrolled in this study. The majority of the respondents belonged to the age group <22 years (68.8%) and had a positive family history of NCDs (55.3%), as depicted in (Table-1).

Table 1: Demographic characteristics of the respondents according to the total knowledge on preventive diets to combat NCDs (n=385)

Characteristics	Number of participants, n (%)	Knowledge on preventive diets to combat NCDs		p-value
		Good n (%)	Poor n (%)	
Age (in years)				
<22	265(68.8%)	60(15.6%)	205(53.2%)	0.35
>22	120(31.2%)	30(7.8%)	90(23.4%)	
Education				
1st Year	55(14.3%)	10(2.6%)	45(11.7%)	0.05*
2nd Year	143(37.1%)	32(8.3%)	111(28.8%)	
3rd Year	117(30.4%)	23(6.0%)	94(11.7%)	
4th Year	70(18.2%)	25(6.5%)	45(11.7%)	

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Number of children				
No children	381(99.0%)	90(23.4%)	291(75.6%)	0.34
≥1	4(1.0%)	0(0.0%)	4(1.0%)	
Residence type				
Hostel	63(16.4%)	18(4.7%)	45(11.7%)	0.53
Mess	23(6.0)%)	4(1.0%)	19(4.9%)	
Sublet	9(2.3%)	1(.3%)	8(2.1%)	
Home	290(75.3%)	67(17.4%)	223(57.9%)	
Father's education				
<HSC	167(43.4%)	34(8.8%)	133(34.5%)	0.13
>HSC	218(56.6%)	56(14.5%)	162(42.1%)	
Mother's education				
<HSC	259(67.3%)	60(15.6%)	199(51.7%)	0.49
>HSC	126(32.7%)	30(7.8%)	96(24.9%)	
Father's occupation				
Service	119(30.9%)	24(6.2%)	95(24.7%)	0.45
Day laborer	1(0.3%)	1(0.3%)	0(0.0%)	
Self-employed/Business	179(46.5%)	43(11.2%)	136(35.3%)	
Farmer	6(1.6%)	2(0.5%)	4(1.0%)	
Unemployed / Retired person	61(15.8%)	16(4.2%)	45(11.7%)	
Other's	19(4.9%)	4(1.0%)	15(3.9%)	
Mother's occupation				
Service	49(12.7%)	8(2.1%)	41(10.6%)	0.27
Housewife	308(80.0%)	73(19.0%)	235(61.0%)	
Other's	28(7.3%)	9(2.3%)	19(4.9%)	
Monthly family income (in USD)				
<273	139(36.1%)	34(8.8%)	105(27.3%)	0.39
>273	246(63.9%)	56(14.5%)	190(49.4%)	
Family size (in numbers)				
<4	178(46.2%)	39(10.1%)	139(36.1%)	0.30
>4	207(53.8%)	51(13.2%)	156(40.5%)	
Family type				
Living alone	92(23.9%)	23(6.0%)	69(17.9%)	0.63
Nuclear	268(69.6%)	63(16.4%)	205(53.2%)	
Combined	25(6.5%)	4(1.0%)	21(5.5%)	
Nutritional status (measured by BMI)				
Under weight (<18.5)	40(10.4%)	9(2.3%)	31(8.1%)	0.92
Normal weight (18.5-23.5)	271(70.4%)	65(16.9%)	206(53.5%)	
Over weight (25.0-30.0)	59(15.3%)	12(3.1%)	47(12.2%)	
Obese (<30)	15(3.9%)	4(1.0%)	11(2.9%)	
Had any of NCDs				
Yes	8(2.1%)	2(0.5%)	6(1.6%)	0.59
No	377(97.9%)	88(22.9%)	289(75.1%)	
Family history of NCDs				
Yes	213(55.3%)	65(16.9%)	148(38.4%)	0.01*
No	172(44.7%)	25(6.5%)	147(38.2%)	

Along with that, approximately two-third (63.9%) of study respondents belonged to families having monthly income >273 USD. Moving towards parents' educational and occupational background majority of the respondent's mothers had not completed their education up to higher secondary (HSC) level and were housewives (67.3% and 80.0% respectively) and the majority of respondent's fathers (56.6%) had educational qualification from higher secondary and above, and were businessman (46.5%).

Respondent's characteristics associated with knowledge on preventive diets to combat NCDs

Table 1, also showed multivariate (cross-table) analysis, which reveals that respondent's age group <22 years (53.2%) and 2nd year students (28.8%) were significantly associated with poor knowledge on preventive diets to combat NCDs. It also showed that the rate of poor knowledge is highest among unmarried students (67.3%) and among Muslim students (70.6%). On the other hand, monthly family income of >273 USD (49.4%) and nuclear family (53.2%) were significantly associated with poor knowledge. Among the respondents, those who had normal weight (53.5%) and those who had no NCD experience (75.1%) were significantly associated with poor knowledge. But interestingly, respondents who had and who didn't have a family history of NCDs, had poor knowledge on preventive diets (38.4% and 38.2% respectively).

Table 2: Insights of preventive dietary knowledge to combat NCDs (multiple responses)

Preventive dietary knowledge on individual components	Total knowledge on preventive diets			
	Good		Poor	
	n	%	n	%
1.Dietary policies to cause NCDs	55	14.3	330	85.7
2. Ideal dietary guidelines to combat NCDs	132	34.3	253	65.7
3. Food causes of NCDs	81	21	304	79
4. Benefits of fruits& vegetables intake to combat NCDs	64	16.6	321	83.4
5. Patterns of obesogenic food consumption	98	25.5	287	74.5
6. Adverse effects of tobacco use	153	39.7	232	60.3
7. Risk factors of passive smoking	116	30.1	269	69.9

Insights of preventive dietary knowledge to combats NCDs

Table 2 reflected that, the majority of respondents (85.7%) had poor knowledge about the dietary policies that cause NCDs. Moreover, 83.4% of the respondents had poor knowledge about the benefits of fruit and vegetable intake to combat NCDs.

Several individual components that had an impact on poor knowledge by more than 50% of total knowledge. These were ideal dietary guidelines to combat NCDs (65.7%), patterns of obesogenic food consumption (74.5%), adverse effects of tobacco use (60.3%), and risk factors of passive smoking (69.9%).

Total knowledge on preventive diets to combat NCDs

Total knowledge on preventive diets to combat NCDs was observed as poor knowledge (77%) among more than three-fourth of female university students and very few had overall good knowledge (33%) (Figure 1).

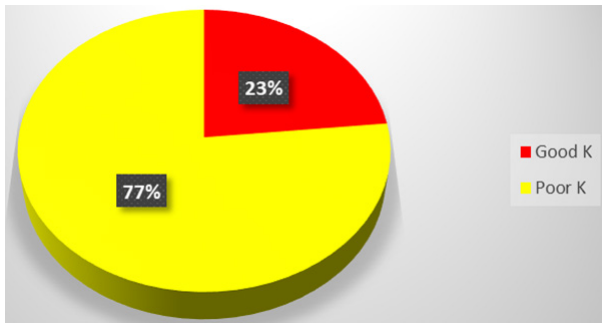

Figure 1: Total knowledge on preventive diets to combat NCDs (n=385)

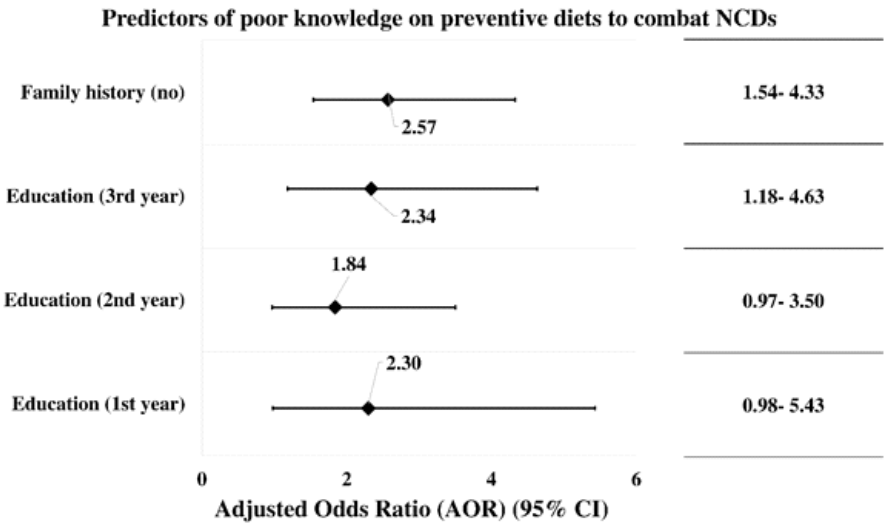

Figure 2: Predictors associated with the poor knowledge on preventive diets to combat NCDs (n= 385)

Figure 2 footnote: Regression Analysis was performed to analyze. Statistically significant predictor was considered at p≤0.05. The reference category for education was'4th year', for family history of NCDs was'Yes', and knowledge on preventive diets to combat NCDs was'Good'.

Predictors associated with the poor knowledge on preventive diets to combat NCDs

This study revealed significant predictors associated with poor knowledge of preventive diets to combat NCDs among the respondents. Significant variables from cross-tabulation were enrolled in the regression analysis procedure. The outcome of the initial regression analysis and the adjusted modeling were similar. For this reason, the result of adjusted modeling is mentioned in this study.

The study significantly revealed that respondents with no family history of NCDs had 2.57 times more (AOR/p=2.57/0.01; 95% CI: 1.54-4.33) poor knowledge about the preventive diet of NCDs compared to the other group. In addition, the study also reflected that the odds of poor knowledge were 2.34 times higher (AOR/p=2.34/0.02: 95% CI: 1.18-4.63) among the 3rd year group of the respondents compared to another groups.

Discussion

This study aimed to determine the preventive dietary knowledge on NCDs among the undergrad female students of Dhaka city. It was revealed that more than three-fourths of female university students (77%) have poor knowledge on preventive diets. Similarly, in the northeast part of Bangladesh, 61% of university students have no adequate healthy dietary habits[15]. More participants (85.7%) did not know about the nutritional policies that cause NCDs. Respondent's parents, especially mothers are not well educated (67.3% of mother's education is under HSC, and most of them are housewives (80%). The lack of adequate planning, implementation, and monitoring could be attributed to the discouraging output observed[16].Following selected nutritional guideline was found poor (65.7%) among the students. Research in China, shows that university students also do not abide by Chinese Dietary Guidelines as well[17].

Highlighting the status of preventive dietary knowledge on NCD, it was found that the knowledge about the benefits of fruit and vegetable intake was severely low (83.45%). In another study of Bangladesh, for the age of 26 years that means post-graduate students, this percentage was nearly similar (89.7%) [18]. On the other hand, the Tanta University survey in Egypt found that as regards the consumption of fast food, chips, spicy food, and soft drinks, the highest proportion of the studied subjects reported that they took them once or less than 82 once / day[19].

Knowledge on fatty food consumption was intensely poor (74.5%). The National Youth and Adolescent Survey in Iraq reported that 47% of

Iraqis consumed fast food, which was lower than our study'spercentage[20].69.9% of female students were unaware of risk factors of passive smoking in this study. Low prevalence had also been observed in other studies conducted on female college students of different universities in Saudi Arabia[21].

Comparatively, 4th year university students (6.5%) had a better understanding of preventive dietary knowledge than others. The study significantly found that the odds of poor knowledge were 2.34 times higher among the 3rd year respondents compared to another group. A robust outcome revealed in other intellectual outcomes focused on young adults who usually have poor knowledge on dietary choices to combat NCDs[8-10]. The study indicates that respondents without any family history of NCDs were likely to have limited knowledge about preventive diets for NCDs, serving as a significant predictor. As a unique outcome, this portion was not similarly portrayed in other studies where they mentioned the education and occupation of mothers triggered the nutrition of their child, which is significantly associated with the status of NCDs among them[11, 12].

The study highlights a critical situation concerning dietary knowledge and practices for preventing NCDs. Research on preventive dietary knowledge in Bangladesh is currently insufficient and still in its early stages. Therefore, additional surveys are necessary to draw efficient conclusions in this issue. Despite several limitations, the study's outcomes provide robust support for policy makers in establishing effective intervention models. Besides, the findings of this study could aid in addressing knowledge gap, particularly among female population.

Conclusions and Recommendations

This study disclosed several significant predictors of poor preventive dietary knowledge to combat NCDs. Among them, dietary policies to cause NCDs; benefits of fruit & vegetable intake in combating NCDs, and patterns of obesogenic food consumption found as significant predictors for poor preventive dietary knowledge to combat NCDs among female university students. It was also found that the highest level of poor knowledge is strongly related to the respondents who did not have any family history of NCDs and also the 3rd year group. Knowledge regarding preventive strategies need to be improved from both the personal and the family level through several effective educational and behavioral interventions. Effectively utilizing the identified barriers will enhance existing policies for preventing NCDs and improving preventive dietary knowledge among Bangladeshis.

Source of funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest: None declared.

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