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Knowledge of the behavioral risk factors of the family members of the patients with non-communicable diseases in Bangladesh

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Abstract:
Non-communicable diseases (NCDs) are a major health issue in Bangladesh, accounting for 67% of all deaths. Despite the known influence of behavioral risk factors such as diet and exercise, little is known about awareness levels among family members of NCD patients, who are at higher risk due to shared genetic and environmental factors. This cross-sectional study investigated the knowledge and awareness of behavioral risk factors among 318 adult family members accompanying NCD patients in specialized hospitals in Dhaka City. Data were collected using semi-structured interviews in Bengali, with questions focusing on knowledge about physical exercise, balanced diet, cholesterol, obesity, and NCD prevention. The study showed a gender disparity, with 62.8% male and 37.2% female respondents. Education levels varied widely, and most were employed in the service sector. Knowledge about regular physical exercise was high (84.3%), but awareness about cholesterol and obesity was less prevalent. Regarding NCD prevention, a balanced diet and regular exercise were the most cited methods. Knowledge levels were categorized as poor (16.0%), satisfactory (38.4%), and good (45.6%), with significant associations found between knowledge levels and socio-demographic factors like sex, education, and occupation. The study provides critical insights into awareness levels among a high-risk population, which is vital for developing targeted public health interventions. It also emphasizes the need for health education programs to bridge knowledge gaps and promote healthier behaviors to mitigate NCD risk.

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Introduction

Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, and cancer, have emerged as a major public health concern in Bangladesh. Recent statistics indicate that NCDs are responsible for approximately 67% of all deaths in the country, far surpassing the mortality rate due to infectious diseases (WHO, 2018). NCDs are characterized by their long duration and slow progression, often causing considerable morbidity and mortality. While NCDs are influenced by a combination of genetic, environmental, and lifestyle factors, a growing body of evidence suggests that behavioral risk factors play a pivotal role in their development and progression (Boutayeb & Boutayeb, 2005). These behavioral risk factors encompass a range of modifiable lifestyle choices, including unhealthy diets, physical inactivity, tobacco use, and excessive alcohol consumption (WHO, 2021). Addressing these risk factors is crucial for preventing and managing NCDs, making it imperative to assess the knowledge and awareness of these factors among individuals at risk (Budreviciute et al., 2020). One key group of individuals at risk for NCDs are the family members of patients already diagnosed with these conditions. These individuals often share genetic and environmental factors with their affected relatives, which can increase their susceptibility to NCDs (Downing et al., 2020). Additionally, family members may be exposed to similar lifestyle habits, both positive and negative, which can significantly influence their own health outcomes (Downing et al., 2020). Understanding the level of knowledge and awareness of behavioral risk factors among the family members of NCDs patients is a critical aspect of public health research. It can provide insights into whether these individuals are equipped with the information needed to make informed choices about their health and reduce their risk of developing NCDs. Furthermore, such knowledge assessments can inform targeted health education and promotion interventions to enhance awareness and promote healthier behaviors among this at-risk population (Osborne et al., 2022). This article aims to explore the knowledge of behavioral risk factors among the family members of NCDs patients, shedding light on the importance of their awareness and the potential implications for public health. Through a comprehensive review of existing literature and research findings, we will delve into the current state of knowledge in this crucial area.

Literature review

Over the past few decades, there has been a notable shift in the disease burden in Bangladesh from communicable to non-communicable diseases (NCDs) (Islam et al., 2014). NCDs account for 67% of all deaths in Bangladesh, with cardiovascular diseases, diabetes, and cancers being the most prevalent (Mahmood et al., 2013). Bishwajit et al. (2014) argued that this epidemiological transition is influenced by changes in lifestyle and the adoption of more Westernized diets, which are high in sugars and fats. Behavioral risk factors like poor diet, lack of physical exercise, smoking, and alcohol consumption have been extensively linked to NCDs (Budreviciute et al., 2020). The family unit plays a critical role in the management and prevention of NCDs (Baig et al., 2015). Families often act as primary caregivers and have significant influence over dietary choices, exercise habits, and lifestyle modifications required for disease management (Baig et al., 2015). However, these family interventions are most effective when the family members are well-informed about the disease and its associated risk factors (Baig et al., 2015). Knowledge of behavioral risk factors helps family members take proactive steps to prevent NCDs in their own lives (Wekesah et al., 2019). They can adopt healthier lifestyles, reducing their own risk of developing NCDs (Wekesah et al., 2019). This is particularly relevant because NCDs often have genetic and lifestyle components, so family members may be at increased risk (Balwan & Kour, 2021). Family members who understand the warning signs and symptoms associated with NCDs are more likely to encourage patients to seek medical attention promptly (Saleem et al., 2022). Early diagnosis can improve treatment outcomes and reduce the progression of the disease (Creswell et al., 2011). Family

members who understand the behavioral risk factors and the impact of NCDs on mental health are better equipped to provide emotional support to patients (Greene-Cramer et al., 2020). They can help patients cope with stress, anxiety, and depression, which are common in NCD management (Borji et al., 2017). Several studies have investigated family knowledge of NCD risk factors in high-income countries, but research is comparatively sparse in low-income settings like Bangladesh (Palafox et al., 2016; Geldsetzer et al., 2019). Cultural beliefs, lack of education, and limited access to healthcare information often contribute to misconceptions and poor management practices among families (Agha & Rind, 2021).

Methodology

This study was a cross-sectional descriptive type, collecting data from respondents once. The study population included adult family members accompanying NCDs patients at four selected specialized hospitals in Dhaka City. Inclusion criteria required residence in Dhaka City, aged above 18, and willingness to participate. Exclusion criteria excluded seriously ill patients' family members who might need to move. The study was conducted during August-September 2022. Data collection used an interviewer-administered semi-structured questionnaire with 20 questions. The questionnaire was developed in Bengali to capture variables categorically. Purposive sampling was employed to select the sample size. The calculated sample size was 384, but due to time constraints, 318 participants were included. Data collection involved face-to-face interviews. Respondents were asked about five types of knowledge related questions. The questions were on knowledge about regular physical exercise, balanced diet, cholesterol, impact of obesity and prevention of NCDs. Participants' responses to knowledge questions were assessed and graded. For every accurate response to a knowledge question, they received one point, and the total number of correct responses was determined. Subsequently, participants' knowledge levels were categorized based on their scores. A knowledge level of "good" was assigned to those with scores above 4.5, which represents performance in the top 25% (above the 75th percentile). "Satisfactory" knowledge was attributed to participants scoring between 1.6 and 4.5, encompassing the 25th to 75th percentile range. Finally, a knowledge level of "poor" was designated for participants scoring below 1.5, placing them below the 25th percentile. This approach was employed to ensure clarity and consistency in evaluating participants' knowledge levels. Data was processed and analyzed using SPSS. Frequencies and percentages were used to express values, and non-parametric Pearson's Chi-square test explored the relationship between NCDs and socio-economic status of respondents.

Results

Table 01: Socio-demographic characteristics of the respondents (n=318)

Socio-demographic variables	No. of respondents	Percentage
Sex		
Male	200	62.8
Female	118	37.2
Level of education		
Illiterate	37	11.6
Primary (1-8 class)	53	16.7
Secondary & Higher Secondary ((9-12)	96	30.2
Graduate & Postgraduate	132	41.5
Occupation		
Service	168	52.8
Business	62	19.5
Housework	51	16.0
Students	31	9.8
No work	6	1.9

Table 01 shows that most of the respondents were male (62.8%) and only 37.2% of respondents were females. The most common occupation among the respondents was service (52.8%). The highest level of education achieved by the respondents was varied. The largest group of respondents (41.5%) had graduate or postgraduate education. However, there was also a significant number of respondents with primary education (16.7%) or less (11.6%). Most of the respondents were employed in the service sector (52.8%). However, there was also a significant number of respondents employed in the business sector (19.5%) and engaged in housework (16.0%). A smaller number of respondents were students (9.8%) or not working (1.9%).

Table 02: Respondents' knowledge about behavioral risk factors of NCD (n=318)

Knowledge related variables	No. of respondents	Percentage
Source of information about behavioral risk factors of NCDs		
Doctor & TV	50	15.7
Doctor/medical person	42	13.1
Book & Magazine	32	10.1
Doctor & Magazine	30	9.4
Radio & TV	29	9.1
Doctor & Relatives	15	4.7
Magazine & TV	12	3.8
Not known	108	34.0
Knowledge about regular physical exercise		
Known	268	84.3
Not well-known	33	10.4
Not known	17	5.3
Knowledge about balanced diet		
Known	226	71.2
Not well-known	83	26.2
Not known	8	2.6
Knowledge about cholesterol		
Known	142	44.7
Not well-known	148	46.5
Not known	28	8.8
Knowledge about the impact of obesity		
Known	149	47.0
Not well-known	123	38.7
Not known	45	14.3
Knowledge about the prevention of NCDs		
Balance diet	110	34.6
Regular physical exercise	78	24.5
Avoiding fatty foods	53	16.7
Regular intake of vegetable	32	10.1
Avoiding tobacco products	20	6.2
Avoiding anxiety & depression	13	4.1
Not known	12	3.8

Table 02 shows the knowledge-related variables of 318 respondents, including their source of information about behavioral risk factors of NCDs, knowledge about regular physical exercise, balanced diet, cholesterol, impact of obesity, and prevention of NCDs. The most common source of information about behavioral risk factors of NCDs was doctor and TV (15.7%), followed by doctor/medical person (13.1%), book and magazine (10.1%), doctor and magazine (9.4%), and radio and TV (9.1%). However, a significant number of respondents (34.0%) didn't know their source of information. Most of the respondents knew about regular physical exercise (84.3%). However, 10.4% of the respondents didn't know well about regular physical exercise, and 5.3% of the respondents didn't know about it at all. Most of the respondents knew about a balanced diet (71.2%). However, 26.2% of the respondents didn't know well about a balanced diet, and 2.6% of the respondents did not know about it at all. Almost half of the respondents knew about cholesterol (44.7%). However, 46.5% of the respondents didn't know well about cholesterol,

and 8.8% of the respondents didn't know about it at all. Almost half of the respondents knew about the impact of obesity (47.0%). However, 38.7% of the respondents didn't know well about the impact of obesity, and 14.3% of the respondents didn't know about it at all. The most common knowledge about the prevention of NCDs was a balanced diet (34.6%), followed by regular physical exercise (24.5%), avoiding fatty foods (16.7%), regular intake of vegetables (10.1%), and avoiding tobacco products (6.2%). However, a significant number of respondents (12.2%) didn't know about the prevention of NCDs.

Table 03: Respondents' level of knowledge about behavioral risk factors of NCDs based on scoring (n=318)

Level of knowledge	No. of respondents	Percentage
Poor	51	16.0
Satisfactory	122	38.4
Good	145	45.6

Table 03 presents data on the level of knowledge among a group of respondents. The level of knowledge was categorized into three levels: "Poor", "Satisfactory" and "Good" based on the scoring. There were 51 respondents in "poor" category, making up 16.0% of the total respondents. Moving to the "Satisfactory" knowledge level, the data shows a larger cohort of respondents, with 122 individuals falling into this category. This accounts for a significant portion, specifically 38.4%, of the total respondents. Finally, the "Good" knowledge level stands out as the most prevalent among the respondents, with 145 individuals falling into this category. This group comprises 45.6% of the total respondents, indicating that nearly half of the surveyed individuals had a solid grasp of the subject, which can be classified as "Good" knowledge.

Table 04: Association between respondents' level of knowledge about behavioral risk factors of NCDs and their socio-demographic characteristics

Socio-demographic variables	No. of respondents	Poor		Satisfactory		Good		P value
		Freq. (51)	Per. (16.0%)	Freq. (122)	Per. (38.4%)	Freq. (145)	Per. (45.6%)	
Sex								
Male	200	31	9.9	85	26.6	84	26.3	0.032
Female	118	19	6.1	38	11.8	61	19.3	
Level of education								
Illiterate	37	19	6.0	13	4.1	5	1.5	0.025
Primary (1-8 class)	53	18	5.8	17	5.4	17	5.5	
Secondary & Higher Secondary ((9-12)	96	7	2.2	36	11.4	53	16.6	
Graduate & Postgraduate	132	6	2.0	56	17.5	70	22.0	
Occupation								
Service	168	27	8.4	50	15.7	91	28.7	0.038
Business	62	2	0.6	35	11.1	25	7.8	
Housework	51	6	1.8	17	5.4	28	8.8	
Students	31	12	3.8	18	5.7	1	0.3	
No work	6	4	1.4	2	0.5	0	0.0	

Table 04 offers valuable insights into the distribution of knowledge levels among a group of respondents, categorized by three significant socio-demographic variables – sex, level of education and occupation. Among the 200 male respondents, 31 (9.9%) had poor level of knowledge, 85 (26.6%) had satisfactory and 84 (26.3%) had good level of knowledge of the behavioral risk factors. On the other hand, among the 118 female respondents, 19 (6.1%) had poor, 38 (11.8%) had satisfactory and rest 61 (19.3%) had good level of knowledge. The P value of 0.032 indicates that there is a statistically significant difference in knowledge distribution between males and females. In case of level of education, it ranged from illiterate to graduate & postgraduate. Here, as the level of education increases, the percentage of

respondents with "Poor" knowledge decreases while those with "Good" knowledge increases. The P value of 0.025 suggests a statistically significant association between education level and knowledge levels, emphasizing the role of education in knowledge acquisition. There are noticeable variations in knowledge distribution across different occupation categories. For instance, the "Service" and "Students" categories have a higher percentage of respondents with "Good" knowledge, while the "No work" category has the highest percentage of "Poor" knowledge. The P value of 0.038 indicates a statistically significant association between occupation and knowledge levels, highlighting the influence of one's occupation on their knowledge status.

Discussion

This study found that 62.8% of respondents were male, and 37.2% were female. This male-dominant ratio is congruent with findings from Story and Burgard (2012), who also noted that men were more likely to participate in health-related surveys in Bangladesh. Interestingly, the results indicated a statistically significant difference in the level of knowledge between males and females (P=0.032). This aligns with the study by Sherman et al. (2021), which reported that men often had better access to health information, but contrasts with Rahman et al. (2017), which suggested that gender had no significant impact on the knowledge of NCD risk factors in Bangladesh. Most of the respondents (52.8%) were employed in the service sector. The distribution of occupation significantly affected the knowledge level, with those in the service and student categories showing higher "Good" knowledge scores. This observation is supported by Dean et al. (2014), who found that people in professional occupations are generally more aware of NCD risk factors compared to those in other sectors. This study's P value of 0.038 aligns with these findings, demonstrating a significant association between occupation and knowledge level. The data revealed a varied educational background among respondents. As the level of education increased, the level of "Good" knowledge also increased, which was statistically significant (P=0.025). These findings are consistent with the research of Kanungo et al. (2015), who highlighted that educational level is a strong predictor of awareness and knowledge about NCDs. This study also delved into the sources of information for respondents. A majority sourced their information from doctors and TV (15.7%), which aligns with the findings of McIlfatrick et al. (2014), emphasizing the pivotal role of healthcare professionals and media in public awareness. However, it is crucial to note that a significant 34% of respondents did not know their source of information, an alarming figure that has not been adequately covered in existing literature and warrants further exploration. Most respondents had "Good" knowledge about regular physical exercise (84.3%) and a balanced diet (71.2%), but less so about cholesterol (44.7%) and the impact of obesity (47.0%). This is somewhat in line with the study by Yahia et al. (2014), which pointed out that while people are generally aware of the basics such as diet and exercise, there's a knowledge gap in understanding specific risk factors like cholesterol. While this study provides valuable insights, it is not without limitations. The sample size and geographic focus might not be fully representative of Bangladesh. Future research could aim for a larger and more diverse sample size, possibly focusing on rural settings, where the risk of NCDs and lack of awareness may be higher.

Conclusion

In conclusion, this study contributes to the growing body of evidence on the knowledge of behavioral risk factors of the family members of the patients with non-communicable diseases in Bangladesh. The results demonstrate significant associations between socio-demographic characteristics such as gender, occupation, and education level with varying levels of knowledge. These findings can guide targeted interventions for different demographic groups,

thereby enhancing the overall level of awareness and potentially contributing to the prevention and management of NCDs in Bangladesh. The cross-sectional design of this study provides a snapshot of knowledge, and self-reporting bias may affect result accuracy. Future research should consider longitudinal studies, qualitative insights, and effective health communication strategies to enhance NCD knowledge and behavior change interventions in Bangladesh.

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Conflict of interest
The authors declared no conflict of interest for this study.

Consent for publication
All authors have given their consent to publish this article.

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