

Original Research Article

Insights of literacy on preventive behaviors of non-communicable diseases in Bangladesh: descriptive types of cross-sectional study among female university students

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ABSTRACT

Background: Non-communicable diseases were the leading global causes of mortality, causing more deaths compare to all other causes combined, which strike hardest at world's low and middle-income countries. The aim of the study was to ascertain the health literacy and its practical application among the young generation to prevent major non communicable diseases.

Methods: This was a descriptive type of cross-sectional study with 400 participants drawn from female university students of Dhaka, Bangladesh. Data were gathered by pre-tested, self-administered, structured and anonymous online questionnaires. Analysis was performed by using multivariate techniques followed by regression modelling and the margin of error was considered as 0.05.

Results: Socio-demographic characteristics of the respondents showed that, majority of the female students belonged to age group <25 years. Study found that 63.5% of all university students had poor literacy on prevention of NCDs with female propensity. It was observed that highest level of poor literacy was about cancer (73.20%) and hypertension (75.20%) among all other NCDs. Statistically significant analysis observed that monthly lower family income <468 USD (AOR/p=1.73/0.01), respondents of businessman father (AOR=1.68/0.06) and residing in a family with >4 members (AOR/p=0.67/0.00) were the predictors for poor literacy about preventive health behavior on NCDs.

Conclusions: This study revealed that the status of literacy on preventive health behaviors of NCDs among female university students was not satisfactory and very few had overall good literacy. This study found several important predictors under socio-demographic consequence played a significant role regarding poor literacy.

Keywords: NCD, Female university students, Diabetics, Cancer

INTRODUCTION

Non-communicable diseases (NCDs) are the most foremost reason for morbidity and mortality worldwide.¹ Major NCDs include cardiovascular diseases, diabetes, chronic respiratory diseases, cancer, and mental state disorders. According to the world health organization's (WHO) estimation in the year 2020, 80% of the global

burdens of disease will be NCDs and causing seven out of every ten deaths in developing countries, about half of them are premature deaths under the age of 70.² In Bangladesh the proportion of deaths from NCDs were 43.4% in 2000, which were increased to 66.9% in 2015.³

According to WHO, over two-third (67%) or predicted 550 000 people died every year in Bangladesh owed to

NCDs and associated conditions including CVD, diabetes, COPD, cancer, and mental health problems.⁴ NCD risk factors were found to exist in clusters that become further high up with the growing age of that individual in the Bangladeshi adult population.⁵ Impact and disease burden are influenced by socio-demographic, cultural, and environmental factors, so, it is important to inspect any disease in diverse settings to improve and empower people for control over their health and environments. Primary prevention can be attained by health promotion interventions by literacy on its etiology, prevention, and control.¹

Health literacy stands for cognitive and social skills. Such competencies help to develop the motivation and ability of individuals regarding access enhancement, understand and utilize effective information which promotes and maintain good health.⁶ It (HL) is a concept, based on the idea that both health and literacy are important for daily life.⁷ Health literacy is important not only for health but also for socio-economic development because limited health literacy increases health care costs.⁸ Health literacy is necessary for effectual control of NCDs through effective disease prevention systems, and for the management of NCDs as people have to access, become conscious, and keep in enduring disease management courses.

In Bangladesh over the last few years, health professionals have begun to analyze the relationship between health, knowledge, and environmental support to achieve a more sophisticated understanding of how to change lifestyles. These levels distinguish between compliance with expert prescribed behavior (functional health literacy), self-management of problems in partnership with health professionals (interactive health literacy), and empowerment (critical health literacy).⁶ Health literacy on preventive health behavior about NCD for healthy living is time demanding issue now in 21st century as low- and middle-income countries are facing double burden with their limited health resources and poor health literacy level among community.

Study showed that improving health literacy in the younger population about cardiovascular diseases (CVDs) and promoting their healthy lifestyle behavior is crucial preventive approaches. They found that the level of knowledge of the participants regarding CVDs was 58.3% during the pre-intervention phase.⁹ However, all these studies were conducted including both gender but this study is focused on only female students as Female University students are future mothers and heads of the family. They play a crucial role in the food habits and behavior of family members. So, if their literacy on preventive health behavior is better, they can manage it well and which will prevent many non-communicable diseases among herself and her family members in the future. But we found very few studies regarding these issues especially on female university students, for these reasons. This study was intended to measure the literacy

on preventive health behavior of NCD among female university students that may guide to a broader study and also lead to building up healthy nations.

METHODS

Study design

This cross-sectional study was carried out based on descriptive approach. Structured data were collected on January to June 2021 to depict the literacy status of preventive health behaviors of non-communicable diseases among female university students of Bangladesh. Considering the variations of students, the study was conducted in Dhaka city of Dhaka district.

Study participants, sample size and sampling

A total 400 respondents were randomly enrolled in this study who were female students from the selected public university i.e.; University of Dhaka (DU) and the private university i.e.; Northern University Bangladesh (NUB). All enrolled female students in summer-2021 semester (May to August 2021) of both the DU and NUB were considered as participants in this study. Initially it was assumed that a potential standard sample size 384 would be taken by using the formula

$$N = \frac{Z^2 pq}{d^2}$$

where Z (standard normal deviate) considered as 1.96; p (the prevalence of health literacy on preventive health behaviors related to NCDs) was unknown and was considered as 0.50 and margin of error was considered as 0.05. With a minimum calculated sample, an additional 4% was added as cushion to take into account non-response and questionnaire error factors and the final samples were 400. Similar number i.e., 200 samples were selected from the DU and 200 were from the NUB. Study subjects were selected by systematic random sampling from the selected female students list of both the universities followed inclusion criteria.

Data collection

Data were gathered by pre-tested, self-administered, structured and anonymous online questionnaire. Due to the spread of the COVID-19 pandemic and the lockdown policy enforced within the country, a physical and paper-based questionnaire was not feasible. Thus, respondents were accessed through emails and social media platforms i.e., WhatsApp, and Face book Messenger concurrently. The web link of online survey was 'https://docs.google.com/forms/d/e' which took only 10 to 15 minutes by the respondents to complete. The online web-based survey was administered in English language with the utmost support of the university authority. Participation of the respondents was anonymous and voluntary. Informed consent was sought from the

respondents at the beginning of the survey and participants could withdraw from the survey at any time.

Questionnaire design

A Google form was used to develop the online questionnaire. The questionnaire was pre-validated by two independent reviewers and pre-tested among 10 respondents. The responses from the pre-test were used to improve upon the quality of the questionnaire. The questionnaire comprised of several segments: literacy related to NCDs (cancer, diabetes, heart disease, hypertension, stroke); literacy related to preventive health behaviors (diet, physical activities and tobacco use); demography of the female students: age, religion, parental education, parental occupation, monthly family income, family size and family history related to NCDs).

Data analysis

Quality of 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. To categorize the data of age and monthly income, the cut off value was decided according to previous relevant published articles. A scoring system was developed to categorize the participant's knowledge level of COVID-19. All the components related to literacy were included in the score calculation. Only the correct answers to each literacy question were listed. Each correct response was assigned a score of 1, each incorrect response was assigned a score of 0. For multiple answers; the score of 1 was divided by total numbers of answers. Afterwards, total score was converted into percentage and classified into two categories. Poor literacy corresponded to a score of (<60%) and good literacy corresponded to a score of (>60%).¹⁰

A multivariable logistic regression analysis was performed followed by modeling procedure considering backward elimination process, including pre-specified confounders i.e., age, religion, parental education, parental occupation, monthly family income, family size and family history related to NCDs. Odds ratios with 95% confidence intervals with respect to literacy on preventive health behaviors of NCDs were calculated for the specified exposures.

RESULTS

Participant's characteristics

A total of 400 female university students were enrolled in this study. Socio-demographic characteristics of the respondents, here majority of respondent belongs to age group <25 and had positive family history of NCD (76.2% and 54% respectively) as depicted in (Table 1).

Table 1: Demographic information of the respondents (n=400).

Characteristics	N (%)	P value (≤0.05)
Age group (years)		
<25	305 (76.2)	0.08
>25	95 (23.8)	
Religion		
Muslim	357 (89.3)	0.47
Non-muslim	43 (10.7)	
Father's education		
Non-formal	39 (9.8)	0.16
Up to secondary	149 (44.8)	
Higher secondary and above	182 (45.5)	
Mother's education		
Non-formal	66 (16.5)	0.05*
Up to secondary	234 (58.5)	
Higher secondary and above	100 (25)	
Father's occupation		
Service holder	130 (32.5)	0.12
Business	106 (26.5)	
Others	164 (41)	
Mother's occupation		
Housewife	357 (89.2)	0.17
Others	43 (10.8)	
Monthly family income (BDT)		
<40000	280 (70)	0.00*
>40000	120 (30)	
Number of family member		
<4	200 (50)	0.03*
>4	200 (50)	
History of NCD in family		
Yes	216 (54)	0.00*
No	184 (46)	

*Statistical significance at p value ≤ 0.25

Along with that two third (70%) of study respondents belongs to family having monthly income <470.58 USD. Moving towards parents' educational and occupational background greater part of respondent's mother completed their education up to secondary level and were housewife (58.5% & 89.2% respectively) and majority of respondents father (45.5%) got education qualification higher secondary and above, and very few found to have business (106%) background as occupation.

Respondent's characteristics associated with poor knowledge on NCD

Table 1, also showed multivariate (cross table) analysis, where it reveals that respondent's mothers low educational background (p=0.05) and monthly family income of <470.58 USD (p=0.00) are significantly associated with poor literacy about preventive health behavior on NCD. On the other hand, respondent those who have no experience of NCD in their family are significantly associated with poor literacy level.

Literacy on preventive health behavior about NCD

Total level of literacy on preventive health behavior about NCD was observed poor (258, 63.5%) among more than half of female university students and very few had overall good literacy (146, 36.50%) on preventive health behavior about NCD (Figure 1).

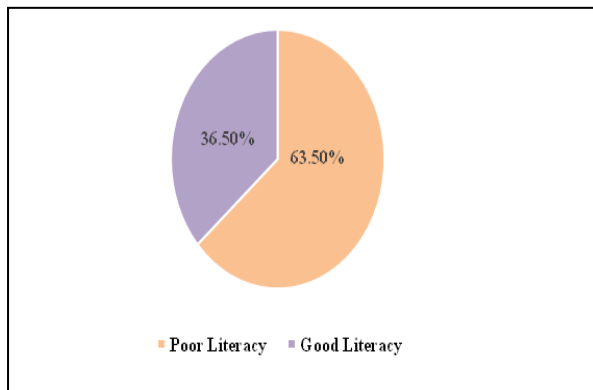


Figure 1: Literacy on preventive health behavior about NCD.

Health literacy level/status on different component about NCD among female university student

Highlighting upon the status of literacy level on different component on NCD it was found that highest level of poor literacy was about cancer (73.20%) and hypertension (75.20%) among all other NCD's in this study. In addition, second highest poor literacy was found about stroke (61.20%). Surprisingly other NCD's like diabetics (57.50%) and heart disease (56.80%) got relatively less percentage of poor literacy level compare to other NCD's. Regarding risk factor of NCD's it was observed that tobacco (69%) related health literacy was poor among female university student. Moving on behavior, diet (57%) as preventive health behavior for NCD it was observed that students have poor literacy level. It was interesting to observe that student got good literacy level on physical activity (51.20%) as one of the preventive sites for NCD (Figure 2).

Identified predictors of poor literacy on preventive health behavior about NCD among respondents

Multivariable logistic regression analysis was done to identify predictors for poor literacy as mentioned in (Figure 3-4).

A backward step-by-step binary logistic regression (simple and multiple) was performed and all significantly significant predictors ($p < 0.05$) were kept in final model.

Initial binary regression analysis found that mothers with non-formal education ($COR/p=2.26/0.01$) as educational background plays role as predictors of poor literacy of female university students.

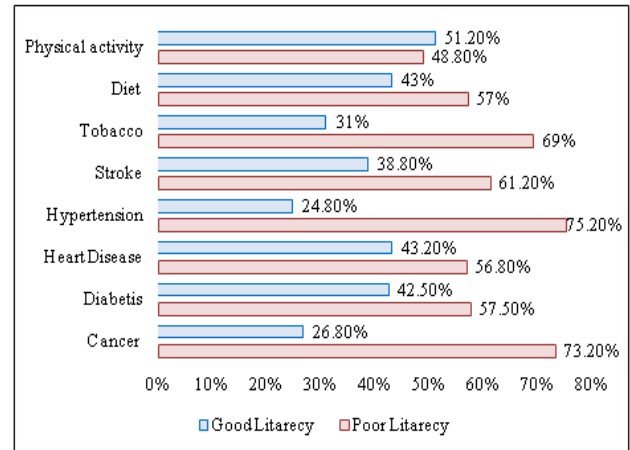


Figure 2: Health literacy level on different component about NCD among female university student.

Once modelling was done along with backward elimination process study reveals that female university students from monthly family income <470.58 USD ($AOR/p=1.73/0.01$) are more likely to have poor literacy about preventive health behavior on NCD compare to others. Additionally female students of a businessman ($AOR/p=1.68/0.06$) and service holder ($AOR/p=1.21/0.06$) found to have influence on poor knowledge on NCD. Furthermore, students having negative family history of NCD ($p=0.06$) and residing in a family with >4 members ($p=0.00$) are nearly to be identified as predictor for poor literacy about preventive health behavior on NCD.

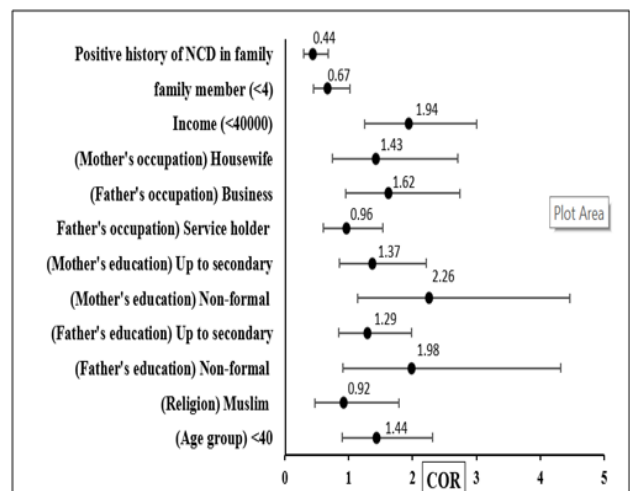


Figure 3: Predictors (COR) influencing poor literacy on preventive health behavior about NCD among respondents (statistically significant predictor is considered at $p \leq 0.05$. Reference category for father's and mother's education is graduation/above, for father's and mother's occupation government and non-government employ, for monthly family income is 40000 BDT or more, for family member >4 member and for family history negative family history is consider).

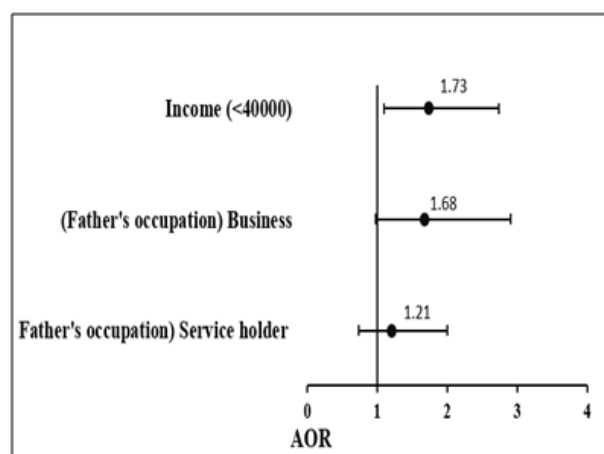


Figure 4: Predictors (AOR) influencing poor literacy on preventive health behavior about NCD among respondents.

DISCUSSION

This study was aimed to attain the level of health literacy on NCDs among the undergraduate students Dhaka city. It was revealed that 63.5% of all university students had limited literacy on prevention of NCDs with female predilection. This finding is consistent with other university-based studies in Ghana and Nepal.^{11,12} Likewise, in Europe such population-based study showed 47% limited (insufficient or problematic) literacy on NCDs among the citizens of eight European countries.¹³ On the other hand, university-based studies in USA and Canada reported better levels of health literacy (about 7%-15% limited health literacy). The reason behind the reflection of such reverse scenario might be the difference in study settings as the countries are rich enough in order to the economic development levels, health resource allocations, and access to health information compared to Bangladesh (majority of the respondents had monthly family income less than 40000 BDT), Ghana and Nepal.^{11,12} However, the contrast observation reported in the similar studies conducted among the Dutch adults and the Turkish university students, where females were found to have better literacy rather than male.^{14,15} As Bangladeshi citizens belong the patriarchal culture where males tend to have all the fundamental opportunities dominantly rather than female, that's why such disproportions might be attributed in this study.

Highlighting upon the status of literacy level on different component on NCD it was found that highest level of poor literacy was about cancer (73.20%) and hypertension (75.20%) among all other NCD's in this study. In addition, second highest poor literacy was found about stroke (61.20%). Regarding risk factor of NCD's it was observed that tobacco (69%) related health literacy was poor among female university student. Another study in China revealed that less than half (40%) were not aware of the risk factors of the condition such as hypertension, hyperlipidemia, diabetes, and smoking; and

over 20% had no idea that they need long-term medication and strict control of blood pressure, blood lipids, and blood sugar. In comparison with that study the literacy level on hypertension in Bangladesh is much poor. The reason might be the different study setting and the health service availability in China.¹⁶ Health literacy usually influenced by a number of personal, societal, and environmental determinants like age, gender, socioeconomic status, education, culture. Moving on behavior, diet (57%) as preventive health behavior for NCD it was observed that students have poor literacy level. It was interesting to observe that student got good literacy level on physical activity (51.20%) as one of the preventive sites for NCD.

Elevated odds of having poor knowledge on NCDs were found among such respondents who had monthly family income less than 470.58 USD and low educational background of their mother. The finding regarding lower monthly income as predictor of low literacy is consistent with the results of some studies conducted among university students (Zhang et al, Evans et al, Svendsen et al, Bhusal et al).^{11,12,14,17}

In the contrary, health literacy was not associated with parent's highest level of education as reported in previous studies.^{11,14,18-20} This contrast observation is not well understood and needs to be explored prospectively in future research. Moreover, who did not have any family history of NCDs found to have less literacy on NCDs prevention. The reason might be the frequent attachment with the health care facilities due to having NCDs history in family. Which enhanced the literacy level of the respondent as family member. The finding coincides with the Palestinian university-based study which revealed that more frequent use of health services is associated with higher health literacy.²⁰ Likewise, study in Taiwan showed a positive association between e-health literacy and health service utilization among college students.²¹ As solutions, proper establishment of health insurance as well as frequent medical checkups, either from illness or as screening, could lead to more exposure to health professionals, which might contribute to higher health literacy among university students. Palestinian study also suggested the possible wat outs.²⁰

Although many NCD-related policies or programs has initiated by the government a little success in effectively addressing the growing burden of non-communicable diseases has been found over the year. Inadequate planning, implementation and monitoring might be the trigger factor for such depressive outcome.²² Due to having poor literacy on prevention of NCDs, the practice regarding the preventive behaviors found poor too. Study on Thailand stated that health literacy had highest direct influence on health behavior.²³ Thus, positive behavior depends upon the knowledge level of a population. From such perspective, an Indian study wanted to intervein the youth population to measure their literacy level and skill on end line survey. On that study, the intervention group

showed 20.6% higher health literacy score at end line versus control group. In addition, they showed a significant increase of skill compared to the comparison group after the application of the intervention.²⁴

The study indicates a miserable scenario regarding health literacy as well as behavior on prevention of NCDs. Thus, further surveys are required for an efficient conclusion regarding such issue. Research on health literacy is not adequate in Bangladesh and is still in its infancy. Current research mainly focuses on the description of health literacy and behavior status and analysis of influencing factors from a public health perspective. The outcome of this study might help to address the barriers regarding poor literacy especially among female population. Adequate utilization of the identified barriers will enrich the existing policy for the prevention of NCDs and an increase of health literacy in Bangladeshi population. Though, the study had several limitations as it was conducted during COVID lockdown period and collected data through online, the outcome has good strength to support the policy makers to establish a good model for further intervention approach.

CONCLUSION

Our study disclosed several important predictors related to poor literacy level. Mothers with non-formal education; respondents of a businessman father with more than four family members; negative family history of NCDs found to significant predictors for poor literacy on NCD among female university students. It was also found that, highest level of poor literacy was about cancer and hypertension.

Recommendations

In a nutshell, we recommend that according to priority, effective and comprehensive health promotion programs are needed to pilot and generalize, which are aimed at improving health literacy among the young generation.

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