



RESEARCH ARTICLE

IMPACT OF HEALTH EDUCATION ON REGULAR HEALTH BEHAVIOR IN IMPROVING HEALTH OUTCOMES AMONG THE FDMN COMMUNITY IN ROHINGYA REFUGEE SETTLEMENT, COX'S BAZAR, BANGLADESH

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ABSTRACT

Background: The Rohingya population encounters a multitude of health-related obstacles while residing in densely populated refugee camps that are constrained in terms of resources. These challenges encompass both communicable and non-communicable diseases, malnutrition, and restricted availability of healthcare services. Health education programs have been implemented in order to enhance the health behavior and health status of the Rohingya refugees, as a means of addressing the aforementioned health concerns. **Aim of the study:** The aim of this study is to find out the impact of health education on regular health behavior in improving health status among the FDMN community in Rohingya refugee settlement, Cox's Bazar, Bangladesh. **Materials and Methods:** A cross-sectional survey on Rohingya refugee people (N=510) living in refugee camps in Cox's Bazar, Bangladesh was conducted to assess the impact of health education on the health behavior. Data was collected via face-to-face interviews after having voluntary consent from the participants using a pre-tested, structured and language validated questionnaire on knowledge, attitude and behavioral practices on different health outcomes. Randomized, Non probability and purposive sampling methods were followed. **Results:** A total of 510 refugee people were enrolled in this study where maximum participants' age was between 21-30 years (n=224, 43.9%). Male and female respondents' participation was nearly equal (male: n=264, 51.8%; female: n=246, 48.2%). About half of the respondents (n=277, 54.3%) were illiterate or did not have any institutional education. Socio-demographic variables showed significant association with different diseases-based knowledge and attitudes. Impact of health education was found noticeable as The impact of health education might be regarded as satisfactory as 71% respondents are currently using anti-mosquito nets/coils/spray where it was 57% during 6 months back. Here 68% respondents found practicing hand wash properly before meal and after toilet with soap compared to 51% during 6 months back. It was seen that 61% respondents knew about essential nutrients where it was 47% during 6 months back. Again 73% respondents thought that fruits & vegetables are good sources of vitamins & minerals which was recorded 68% in 6 months back. 78% respondents used to wash fruits, vegetables and other raw foods before consumption which was 61% before 6 months. Also seen that 66% respondents believed that healthy lifestyle and healthy food habit can prevent diseases (both communicable and non-communicable) where 52% thought similar in 6 months earlier. **Discussion and Conclusion:** According to this study, we found that Rohingya refugees in Cox's Bazar, Bangladesh got many opportunities, benefits and cooperation in many ways like shelter, food-nutrition support, healthcare facilities, safety, safe drinking water access, health education through many health communication approaches from Bangladesh Government, local authority, local NGOs and different global NGOs. We observed that socio-demographic characteristics, health education related knowledge and attitudes were correlated. The findings showed that age and education shape health knowledge and attitudes. Health education's impact on Rohingya refugees is consistent with other refugee studies, indicating its value in improving health outcomes. Beside these, there was a satisfactory impact of health education in improving the knowledge, attitude and practices regarding different health issues.

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INTRODUCTION

The Rohingya refugee crisis has emerged as a prominent humanitarian issue in recent years, as a substantial number of Rohingya individuals have sought asylum in neighboring nations, primarily Bangladesh, in order to evade persecution and violence within Myanmar. The Rohingya population encounters a multitude of health-related obstacles while residing in densely populated refugee camps that are constrained in terms of resources. These challenges encompass both communicable and non-communicable diseases, malnutrition, and restricted availability of healthcare services. Health education programs have been implemented in order to enhance the health behavior and health status of the Rohingya refugees, as a means of addressing the aforementioned health concerns. This manuscript provides an extensive literature review that examines the effects of health education on various health concerns within the Rohingya refugee community in Bangladesh, specifically emphasizing their health knowledge, health behavior and health outcomes. The prevalence of diarrheal diseases in refugee camps is a significant health concern, primarily attributed to inadequate sanitation and hygiene practices. According to Ahmed *et al.* (2017), health education initiatives targeting the promotion of hand hygiene, appropriate food handling, and the adoption of safe water practices have demonstrated encouraging outcomes in mitigating the prevalence of diarrheal illnesses within the Rohingya refugee population. Tuberculosis (TB) is an infectious disease that poses a significant public health concern within refugee populations. Health education programs have been implemented in Rohingya refugee camps with the aim of enhancing awareness about tuberculosis (TB), promoting early recognition of symptoms, and improving adherence to treatment. According to a study conducted by Islam *et al.* (2019), educational interventions have been found to result in enhancements in the detection of tuberculosis cases and adherence to treatment. Non-communicable diseases, such as diabetes, are increasingly being recognized as substantial health concerns within the Rohingya refugee population.

Health education programs have been introduced to address the effects of diabetes by promoting healthy lifestyle behaviors, including maintaining a balanced diet and engaging in regular physical activity. The primary objective of these interventions is to provide refugees with the necessary knowledge and skills to effectively manage their health (Riaz *et al.*, 2020). The Rohingya refugee population exhibits a heightened vulnerability to mental health disorders as a result of their exposure to traumatic events and forced displacement. Health education initiatives with a specific emphasis on psychosocial support and mental health awareness have been formulated in order to cater to the psychological well-being of individuals seeking refuge. The aforementioned initiatives have the objective of diminishing social stigma and encouraging individuals to seek assistance, as stated by Mollica *et al.* (2019). Health education initiatives aimed at enhancing maternal and child health have been deployed with the objective of enhancing reproductive health and family planning behaviors within the Rohingya community.

The primary objective of these interventions is to enhance knowledge regarding contraceptive methods and encourage the adoption of safe practices during motherhood (Jesmin *et al.*, 2021). Malnutrition poses a significant health concern within the Rohingya refugee population, with a particular emphasis on its impact on women and children. Refugees have been the target of nutrition education programs that aim to impart knowledge regarding healthy dietary practices and the use of micro-nutrient supplementation as a means to address the issue of malnutrition (Shommu *et al.*, 2020). Multiple studies have documented that health education interventions have resulted in enhanced health knowledge within the Rohingya refugee population. According to Roy and Sarkar (2017), these programs have effectively enhanced public knowledge regarding prevalent health concerns, strategies for disease prevention, and the accessibility of healthcare services. Health education programs have been instrumental in fostering healthier behaviors within the refugee population.

The acquisition of enhanced understanding regarding hygiene practices, disease prevention, and the adoption of healthy lifestyle choices has yielded favorable transformations in health behavior. Consequently, there has been a decline in the occurrence of communicable diseases and an improvement in the management of chronic conditions (Ahmed *et al.*, 2017; Islam *et al.*, 2019; Riaz *et al.*, 2020). Health education programs have additionally played a role in the heightened utilization of healthcare services among the Rohingya refugees. With advancements in health knowledge, there is an increased tendency among individuals to promptly seek medical care when they encounter health problems, resulting in improved health outcomes (Jesmin *et al.*, 2021). Health education initiatives have facilitated the empowerment of the Rohingya community, enabling them to assume an active role in managing their health and overall well-being. According to Mollica *et al.* (2019), these initiatives have effectively fostered community engagement by facilitating the active involvement of refugees in discussions, planning, and decision-making processes related to health. Efforts in health education that have specifically targeted mental health have played a crucial role in diminishing the social stigma associated with mental health concerns. Consequently, an increased number of Rohingya refugees have exhibited a greater inclination to access mental health assistance and psychosocial services (Mollica *et al.*, 2019). The main aim of this study is to assess impact of health education on regular health behavior in improving health outcomes among the FDMN community in Rohingya refugee settlement, Cox's Bazar, Bangladesh.

METHODOLOGY

Study design, accessible population & area of the study: A cross-sectional survey on the Rohingya Refugee population in Cox's Bazar, Bangladesh was carried out for the purpose of this study.

Study population & sample size: The survey was administered on the Rohingya Refugee people of different ages (excluding children <18 years) and genders who were residing in refugee camps. Data collection was done from December, 2022 till June, 2023. The participants in the study who declined the opportunity to participate in the survey were disqualified. Data was collected two times (with 6 months interval) for comparing the knowledge, attitude and practices of the respondents regarding different health issues and health behaviors. The sample size was calculated by using this formula ($n = z^2pq/d^2$). The poll received responses from a total of 510 different individuals.

Data collection tool: (Questionnaire): In order to achieve the goals of the study, the questionnaire was first developed, then validated, then translated, and last personalized. The socio-demographic questions that were asked were tailored to the group of refugees. There were categorical responses to questions on knowledge and practices around communicable diseases and non-communicable diseases. For the purpose of linguistic validation, the questionnaire was translated into English and Rohingya using forwarding and backward translation respectively. The respondents were intended to depict the status of refugees in Bangladesh.

Variable: The questionnaire was developed on socio-demography, knowledge, attitude and practice based variables. The questions were designed on that particular variable/s with suitable options rationally.

Sampling method: The non-probability and purposive sampling methods have been used in this study to recruit the study population.

Statistical data management plan and analysis: The collected data was primarily analyzed by using Microsoft excel. The demography of the participants were presented in frequencies, percentage, graphs and tables. Chi-square tests were used to determine the degree of association between continuous and categorical exposure variables with the outcome. Descriptive statistics (frequency and percent) were used to describe the variables. The Statistical Package for the Social Sciences (SPSS) version 20.0 was utilized in order to carry out the

data analysis. $P < .05$ were chosen as the cutoffs for the alpha level of significance.

Inclusion criteria: People with given consent and willingly joined the study were included into this study. Both male and female of different age groups (excluding children <18 years) were selected as participants.

Exclusion criteria: People who were unwilling to participate and were not able to provide information due to physical or mental illness or handicapped.

Ethical approval : The ethical approval had been issued and the recommendations had been followed accordingly.

Conflict of Interest: There is no conflict of interest among the authors.

RESULTS

Descriptive statistics of socio-demographic factors: A total of 510 refugee people were enrolled in this study where maximum participants' age group was 21-30 years ($n=224$, 43.9%). Male and female respondents' participation was nearly equal (male: $n=264$, 51.8%; female: $n=246$, 48.2%). About half of the respondents ($n=277$, 54.3%) were illiterate or did not have any institutional education. About the occupational status, majority of the respondents were housewife ($n=200$, 39.2%). Among all the respondents 290 (56.9%) mentioned about joint family they are living in. In this study majority ($n=307$, 60.2%) of the respondents were married. It was found that majority ($n=279$, 54.7%) of the respondents' monthly family income was 3.5K - 7K. Majority ($n=331$, 64.9%) of the respondents had 5 - 8 family members [Table 1].

Association between the socio-demographic variables with the health education system: Age group had significant association with the response to whether the health education system teach about different health issues ($p < .001$), whether the system guide them about practicing sanitation & hygiene ($p < .001$), whether the system educate them about communicable diseases ($p < .001$), whether they educated about diarrhea, cholera, typhoid & hepatitis ($p < .001$), and also whether they provide charts, leaflets and brochure about different health issues ($p < .001$). Educational status was found significantly associated with whether health camps are arranged near them ($p < .05$), whether they teach them about different health issues ($p < .001$), whether they guide them about practicing sanitation & hygiene ($p < .001$), whether they educate them about communicable diseases ($p < .001$), whether they educate them about diarrhea, cholera, typhoid & hepatitis ($p < .001$), and also whether they provide them charts, leaflets and brochure about different health issues ($p < .001$) [Table 2a - 2f].

Association between the socio-demographic variables with attitude towards health education: Table 3 shows the association between the socio-demographic variable with attitude towards health education. Age group and educational status both traits have been found significantly associated with change in their attitude about sanitation & hygiene practice ($p < .001$), think that health education helped them to prevent some communicable diseases ($p < .001$), think that health education increased their knowledge and awareness about sanitation, hygiene, some diseases and about good health behavior ($p < .001$), and think that health education helped them to prevent some non-communicable diseases ($p < .001$) [Table 3a - 3f].

Impact of Health Education on health related behavior: It was observed that 71% respondents are currently using anti-mosquito nets/coils/spray where it was 57% during 6 months back. Here 68% respondents found practicing hand wash properly before meal and after toilet with soap compared to 51% during 6 months back. It was seen that 61% respondents knew about essential nutrients where it was 47% during 6 months back. Again 73% respondents thought that fruits & vegetables are good sources of vitamins & minerals which was recorded 68% in 6 months back.

Table 1. Socio-Demographic information of the respondents

Traits	N= 510	
	n	n%
Age		
< 20 Year	160	31.4
21-30 Years	224	43.9
31-40 Years	72	14.1
41-50 Years	34	6.7
51- 60 Years	20	3.9
Gender		
Male	264	51.8
Female	246	48.2
Educational status		
Illiterate	277	54.3
Primary Level	205	40.2
Middle Level	24	4.7
Graduate	4	0.8
Occupational status		
Housewife	200	39.2
Daily Worker	145	28.4
Unemployed	37	7.3
Shopkeeper	31	6.1
Student	82	16.1
Temporary Job	15	2.9
Type of family		
Nuclear	220	43.1
Joint	290	56.9
Marital status		
Married	307	60.2
Single	203	39.8
Monthly family income		
Less than 3500 BDT	157	30.8
3500 to 7000 BDT	279	54.7
More than 7000 BDT	74	14.5
Number of family members		
1 to 4 persons	136	26.7
5 to 8 persons	331	64.9
More than 8 persons	43	8.4

78% respondents used to wash fruits, vegetables and other raw foods before consumption which was 61% before 6 months. Also seen that 66% respondents believed that healthy lifestyle and healthy food habit can prevent diseases (both communicable and non-communicable) where 52% thought similar in 6 months earlier. Currently 71% respondents believed that antibiotics are important in all cases of respiratory tract infection but 57% before 6 months believed the same. We found that 75% respondents know about different communicable diseases but in 6 months back 64% knew about it. 57% respondents knew about how some communicable diseases can be transmitted where it was 48% during 6 months back. 59% respondents believed that healthy foods are expensive where it was 65% during 6 months back. Again 49% respondents believed that HIV-TB-Cancer are result of great sin where it was 67% during 6 months back. 74% respondents told that health workers motivated them to practice sanitation and hygiene properly where it was 64% before 6 months. 63% respondents said that health workers show them videos, posters, banners and leaflets during health education where it was 58% during 6 months back [Figures 1 - 5].

DISCUSSION

The manuscript explores the effect of health education on various health concerns, health-related behaviors, and overall health conditions within the Rohingya refugee community residing in refugee camps located in Bangladesh. We conducted a survey to gather socio-demographic data from a sample of 510 participants. The study specifically examined variables such as age distribution, gender composition, educational attainment and occupational status. Furthermore, we investigated the correlations between socio-demographic factors and participants' perceptions regarding health education system, attitudes and practices towards different health issues.

Table 2a - Association between the socio-demographic variables with the health education system

Questions ►	Do you know the health Workers?		Do they arrange Health Camp near you?		Do they teach you about Different Health Issues?		Do they guide you about practicing Sanitation & Hygiene?		Do they educate you about Communicable diseases?		Do you know about Diarrhea, Cholera, Typhoid & Hepatitis?		Do you know about HIV & other sexually transmitted diseases?		Do they provide you with charts, leaflets and brochure about different health issues?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Age																
< 20 Year	160	0	148	12	134	26	130	30	127	33	122	38	119	41	115	45
21-30 Years	224	0	219	5	209	15	210	14	210	14	190	34	192	32	202	22
31-40 Years	72	0	70	2	69	3	67	5	68	4	53	19	58	14	60	12
41-50 Years	34	0	33	1	33	1	32	2	33	1	16	18	26	8	31	3
51- 60 Years	20	0	20	0	20	0	20	0	19	1	12	8	15	5	18	2
P value	-		.082		.001*		.001*		.001*		.001*		.078		.001*	

Table 2b - Association between the socio-demographic variables with the health education system

Questions ►	Do you know the health Workers?		Do they arrange Health Camp near you?		Do they teach you about Different Health Issues?		Do they guide you about practicing Sanitation & Hygiene?		Do they educate you about Communicable diseases?		Do you know about Diarrhea, Cholera, Typhoid & Hepatitis?		Do you know about HIV & other sexually transmitted diseases?		Do they provide you with charts, leaflets and brochure about different health issues?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Gender																
Male	264	0	254	10	242	22	238	26	239	25	207	57	215	49	227	37
Female	246	0	236	10	223	23	221	25	218	28	186	60	195	51	199	47
P value	-		.872		.686		.906		.479		.452		.537		.121	

Table 2c. Association between the socio-demographic variables with the health education system

Questions ►	Do you know the health Workers?		Do they arrange Health Camp near you?		Do they teach you about Different Health Issues?		Do they guide you about practicing Sanitation & Hygiene?		Do they educate you about Communicable diseases?		Do you know about Diarrhea, Cholera, Typhoid & Hepatitis?		Do you know about HIV & other sexually transmitted diseases?		Do they provide you with charts, leaflets and brochure about different health issues?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Education																
Illiterate	277	0	273	4	277	0	276	1	274	3	237	40	254	23	270	7
Primary Level	205	0	190	15	167	38	163	42	162	43	142	63	140	65	142	63
Middle Level	24	0	23	1	18	6	17	7	18	6	11	13	13	11	11	13
Graduate	4	0	4	0	3	1	3	1	3	1	3	1	3	1	3	1
P value	-		.012*		.001*		.001*		.001*		.001*		.872		.001*	

Table 2d - Association between the socio-demographic variables with the health education system

Questions ►	Do you know the health Workers?		Do they arrange Health Camp near you?		Do they teach you about Different Health Issues?		Do they guide you about practicing Sanitation & Hygiene?		Do they educate you about Communicable diseases?		Do you know about Diarrhea, Cholera, Typhoid & Hepatitis?		Do you know about HIV & other sexually transmitted diseases?		Do they provide you with charts, leaflets and brochure about different health issues?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Type of Family																
Nuclear	220	0	213	7	217	3	216	4	215	5	172	48	191	29	209	11
Joint	290	0	277	13	248	42	243	47	242	48	221	69	219	71	217	73
P value	-		.453		.001***		.001***		.001***		.599		.001***		.036*	

Table 2e. Association between the socio-demographic variables with the health education system

Questions ►	Do you know the health Workers?		Do they arrange Health Camp near you?		Do they teach you about Different Health Issues?		Do they guide you about practicing Sanitation & Hygiene?		Do they educate you about Communicable diseases?		Do you know about Diarrhea, Cholera, Typhoid & Hepatitis?		Do you know about HIV & other sexually transmitted diseases?		Do they provide you with charts, leaflets and brochure about different health issues?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Occupation																
Housewife	200	0	193	7	186	14	185	15	183	17	161	39	166	34	170	30
Daily Worker	145	0	137	8	133	12	132	13	132	13	122	23	125	20	130	15
Unemployed	37	0	37	0	35	2	34	3	35	2	23	14	28	9	30	7
Shopkeeper	31	0	30	1	29	2	27	4	28	3	24	7	26	5	28	3
Student	82	0	79	3	67	15	66	16	64	18	55	27	56	26	55	27
Job	15	0	14	1	15	0	15	0	15	0	8	7	9	6	13	2
P value	-		.709		.032*		.872		.008		.002		.006		.001***	

Table 2f. Association between the socio-demographic variables with the health education system

Questions ►	Do you know the health Workers?		Do they arrange Health Camp near you?		Do they teach you about Different Health Issues?		Do they guide you about practicing Sanitation & Hygiene?		Do they educate you about Communicable diseases?		Do you know about Diarrhea, Cholera, Typhoid & Hepatitis?		Do you know about HIV & other sexually transmitted diseases?		Do they provide you with charts, leaflets and brochure about different health issues?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Marital status																
Married	307	0	293	14	283	24	280	27	279	28	229	78	244	63	262	45
Single	203	0	197	6	182	21	179	24	178	25	164	39	166	37	164	39
P value	-		.361		.325		.265		.247		.103		.523		.175	

Table 3a - Association between the socio-demographic variables with attitudes towards health education system:

Questions ►	Do you think Health Education made change your attitude about Sanitation & Hygiene practices?		Do you think Health Education helped you to prevent some communicable diseases?		Do you think Health Education increased your knowledge and awareness about Sanitation, Hygiene, some diseases and about good health behavior?		Do you think Health Education helped you to prevent some non-communicable diseases?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Age								
< 20 Year	123	33	127	32	131	28	129	26
21-30 Years	206	17	209	13	212	12	185	39
31-40 Years	67	5	66	6	68	4	51	21
41-50 Years	33	1	33	1	31	3	15	19
51- 60 Years	20	0	19	1	19	1	11	9
P value	.001***		.001***		.001***		.001***	

Table 3b. Association between the socio-demographic variables with attitudes towards health education system

Questions ►	Do you think Health Education made change your attitude about Sanitation & Hygiene practices?		Do you think Health Education helped you to prevent some communicable diseases?		Do you think Health Education increased your knowledge and awareness about Sanitation, Hygiene, some diseases and about good health behavior?		Do you think Health Education helped you to prevent some non-communicable diseases?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Gender								
Male	233	28	238	24	241	22	214	46
Female	216	28	216	29	220	26	177	68
P value	.789		.325		.395		.007	

Table 3c. Association between the socio-demographic variables with attitudes towards health education system

Questions ►	Do you think Health Education made change your attitude about Sanitation & Hygiene practices?		Do you think Health Education helped you to prevent some communicable diseases?		Do you think Health Education increased your knowledge and awareness about Sanitation, Hygiene, some diseases and about good health behavior?		Do you think Health Education helped you to prevent some non-communicable diseases?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Educational Status								
Illiterate	275	0	273	4	273	4	230	46
Primary Level	152	50	158	44	166	38	144	58
Middle Level	20	4	19	5	18	6	13	10
Graduate	2	2	4	0	4	0	4	0
P value	.001***		.001***		.001***		.001***	

Table 3d. Association between the socio-demographic variables with attitudes towards health education system

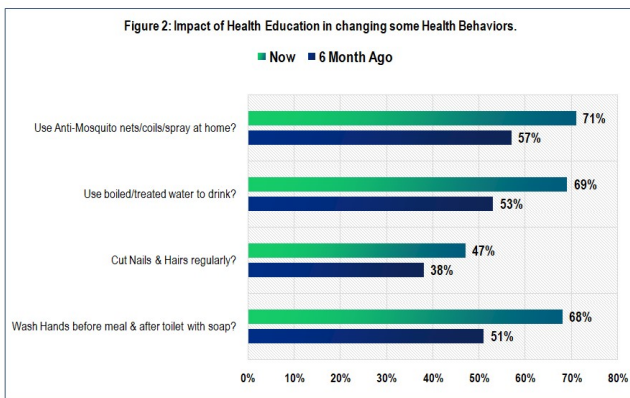
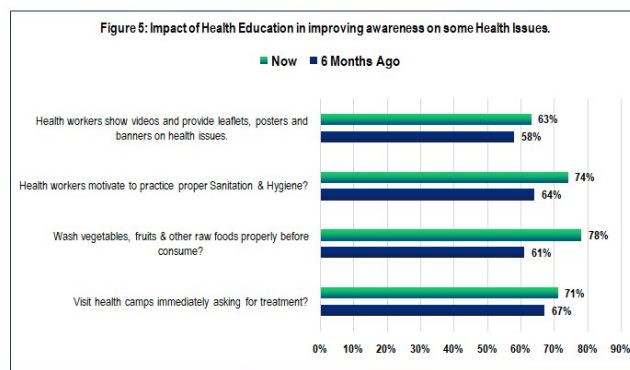
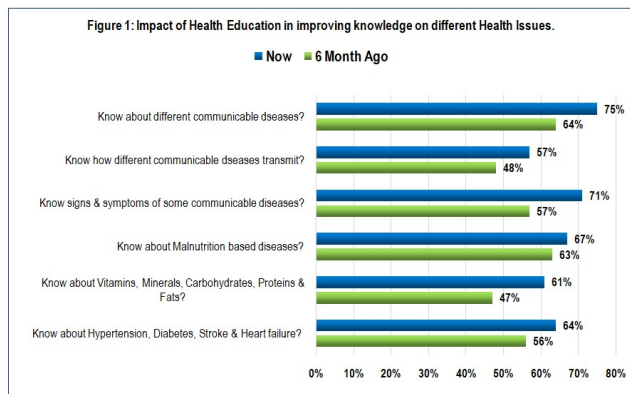
Questions ►	Do you think Health Education made change your attitude about Sanitation & Hygiene practices?		Do you think Health Education helped you to prevent some communicable diseases?		Do you think Health Education increased your knowledge and awareness about Sanitation, Hygiene, some diseases and about good health behavior?		Do you think Health Education helped you to prevent some non-communicable diseases?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Occupational Status								
Housewife	178	20	179	21	178	22	149	50
Daily Worker	127	17	132	12	131	13	122	22
Unemployed	34	3	33	4	34	3	25	12
Shopkeeper	27	4	27	3	30	1	28	3
Student	69	11	68	13	73	9	63	17
Job	14	1	15	0	15	0	4	10
P value	.904		.396		.569		.001***	

Table 3e. Association between the socio-demographic variables with attitudes towards health education system

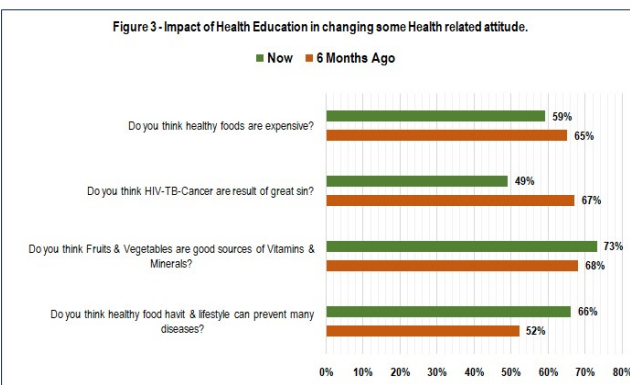
Questions ►	Do you think Health Education made change your attitude about Sanitation & Hygiene practices?		Do you think Health Education helped you to prevent some communicable diseases?		Do you think Health Education increased your knowledge and awareness about Sanitation, Hygiene, some diseases and about good health behavior?		Do you think Health Education helped you to prevent some non-communicable diseases?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Type of family								
Nuclear	212	4	211	6	215	4	159	58
Joint	237	52	243	47	246	44	232	56
P value	.001***		.001***		.001***		.053	

Table 3f - Association between the socio-demographic variables with attitudes towards health education system

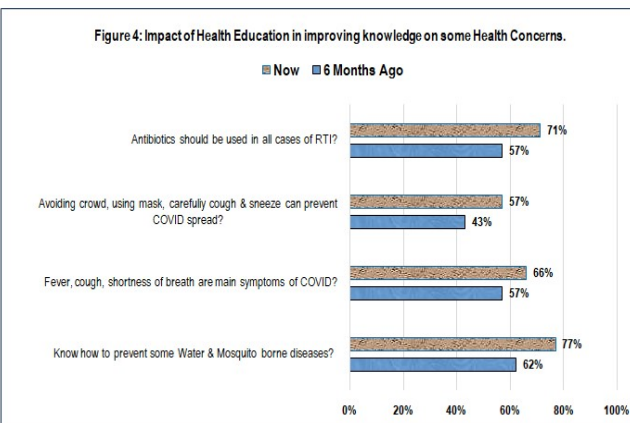
Questions ►	Do you think Health Education made change your attitude about Sanitation & Hygiene practices?		Do you think Health Education helped you to prevent some communicable diseases?		Do you think Health Education increased your knowledge and awareness about Sanitation, Hygiene, some diseases and about good health behavior?		Do you think Health Education helped you to prevent some non-communicable diseases?	
	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)	Yes (n)	No (n)
Marital Status								
Married	272	33	276	29	274	32	220	86
Single	177	23	178	24	187	16	171	28
P value	.812		.393		.330		.001***	



Moreover, a significant proportion of the participants exhibited limited or nonexistent formal education, with 54.3% being either illiterate or lacking access to institutionalized educational opportunities. In relation to occupational status, the largest percentage of participants consisted of individuals who identified as housewives, accounting for 39.2% of the total sample. The age distribution of the participants aligns with previous research conducted in refugee settings, which observed a greater proportion of younger individuals as a result of the demographic composition of refugee populations (Tay *et al.*, 2020). The gender distribution in this study is relatively balanced, which is consistent with findings from previous research. These results underscore the significance of implementing interventions in refugee healthcare that are sensitive to gender-related considerations (Doocy *et al.*, 2018). The prevalence of individuals with limited literacy or minimal education is a frequently observed trend in refugee environments, which underscores the difficulties encountered by displaced communities in obtaining educational opportunities (Chynoweth and Stites, 2014). The prevalence of housewives as the primary occupational status can be attributed to the restricted employment opportunities within refugee camps and the cultural expectations placed on women in certain communities (Kabir and Khan, 2014). The research revealed noteworthy correlations between socio-demographic factors and the level of health education awareness among the Rohingya refugees. Various age groups were found to be linked with multiple facets of health education, encompassing the provision of instruction on diverse health concerns, guidance on sanitation and hygiene practices, and education on communicable and non-communicable diseases. There was a significant correlation observed between educational attainment and participation in health camps, receipt of health education, and knowledge acquisition pertaining to different diseases.



The relationship between age groups and health education proficiency is substantiated by the findings of Ahmed *et al.* (2017) and Islam *et al.* (2019). These studies revealed that younger individuals residing in refugee camps exhibited enhanced accessibility to health education initiatives and displayed greater responsiveness towards health-related information. The correlation between educational attainment and health education is consistent with the results of research conducted by Mahmud and Leppard (2018) as well as Roy and Sarkar (2017). These studies emphasize the beneficial influence of education on health literacy within refugee environments. The investigation additionally examined the correlation between socio-demographic factors and attitudes towards health education within the Rohingya refugee population. There were notable correlations between age groups and educational status in relation to attitudes towards health education. These associations encompassed various aspects such as the adoption of improved sanitation and hygiene practices, heightened awareness of both communicable and non-communicable diseases, and the perceived efficacy of health education in preventing diseases. The findings regarding the relationship between age groups and attitudes towards health education align with the research conducted by Islam *et al.* (2019) and Mollica *et al.* (2019). These studies revealed that younger individuals residing in refugee camps exhibited a greater propensity to respond positively to health education interventions and embrace healthier behaviors.



The present discourse aims to critically examine the research outcomes and juxtapose them with analogous investigations conducted within refugee settings. The sociodemographic profile of the respondents in the study reveals that a significant proportion of the Rohingya refugees fell within the age range of 21-30 years, constituting 43.9% of the sample. The gender distribution exhibited a relatively equitable balance, as male respondents accounted for 51.8% of the sample, while female respondents constituted 48.2%.

The correlation between educational attainment and perspectives on health education is consistent with the research conducted by Jesmin *et al.* (2021) and Riaz *et al.* (2020), suggesting that education significantly influences individuals' attitudes towards health education and preventive behaviors within refugee populations. The results presented in this manuscript indicate that health education programs exert a beneficial influence on health behavior and health status within the Rohingya refugee community. The successful execution of health education programs has resulted in enhanced understanding of various health concerns, heightened consciousness regarding both communicable and non-communicable diseases, and favorable modifications in sanitation, hygiene practices, and disease prevention behaviors. The provision of health education to the Rohingya community has led to enhanced healthcare utilization and a positive shift in attitudes towards health education and preventive measures. There is substantial evidence from various contexts that health education has a favorable influence on health behavior and health status among refugee populations. Ahmed *et al.* (2017) documented that health education interventions were associated with a decrease in the occurrence of diarrheal diseases among populations that have been displaced. In a similar vein, Riaz *et al.* (2020) and Mollica *et al.* (2019) conducted studies that demonstrated the positive impact of health education on diabetes management and mental health outcomes within refugee populations, respectively. The impact of health education might be regarded as satisfactory as 71% respondents are currently using anti-mosquito nets/coils/spray where it was 57% during 6 months back. Here 68% respondents found practicing hand wash properly before meal and after toilet with soap compared to 51% during 6 months back. It was seen that 61% respondents knew about essential nutrients where it was 47% during 6 months back. Again 73% respondents thought that fruits & vegetables are good sources of vitamins & minerals which was recorded 68% in 6 months back. 78% respondents used to wash fruits, vegetables and other raw foods before consumption which was 61% before 6 months. Also seen that 66% respondents believed that healthy lifestyle and healthy food habit can prevent diseases (both communicable and non-communicable) where 52% thought similar in 6 months earlier. Currently 71% respondents believed that antibiotics are important in all cases of respiratory tract infection but 57% before 6 months believed the same. We found that 75% respondents know about different communicable diseases but in 6 months back 64% knew about it. 57% respondents knew about how some communicable diseases can be transmitted where it was 48% during 6 months back. 59% respondents believed that healthy foods are expensive where it was 65% during 6 months back. Again 49% respondents believed that HIV-TB-Cancer are result of great sin where it was 67% during 6 months back. 74% respondents told that health workers motivated them to practice sanitation and hygiene properly where it was 64% before 6 months. 63% respondents said that health workers show them videos, posters, banners and leaflets during health education where it was 58% during 6 months back. So it might not be exaggerated to conclude that health education impacted positively and improved their knowledge, attitude and practices on different health issues and health behaviors.

Limitations of the study: Notwithstanding its valuable contributions, it is imperative to acknowledge the limitations inherent in the manuscript that necessitate careful consideration. The utilization of a cross-sectional design poses a constraint on the ability to establish a causal relationship between socio-demographic factors and disease outcomes. Longitudinal studies have the potential to offer a more comprehensive comprehension of the dynamic nature of disease prevalence and health behaviors among refugee populations over an extended period. Furthermore, the study's utilization of self-reported data may introduce response biases, potentially compromising the accuracy and reliability of the obtained results. The inclusion of clinical assessments or objective measures to validate self-reported information would contribute to the overall strength and reliability of the study. Moreover, it is important to note that the research was carried out within a particular refugee camp setting in Bangladesh. Therefore, caution should be exercised when attempting to apply the findings to other refugee populations or different settings. The socio-

demographic characteristics and disease patterns are subject to variation across diverse refugee camps and regions.

CONCLUSION

The findings of the manuscript indicate that health education has a significant impact on enhancing health behavior and health status within the Rohingya refugee population residing in refugee camps located in Bangladesh. The research conducted in this study has revealed noteworthy correlations between socio-demographic variables, knowledge pertaining to health education, and individuals' attitudes towards health education. The findings highlight the significance of age and educational attainment in influencing individuals' knowledge and attitudes towards health-related matters. The significance of health education in the Rohingya refugee community corresponds with findings from comparable studies conducted in other refugee settings, thereby affirming the crucial role of health education in enhancing health outcomes among displaced populations. Although the study offers valuable insights, it is imperative to acknowledge certain limitations. The utilization of a cross-sectional design poses limitations in establishing a causal relationship between socio-demographic factors and outcomes in health education. Moreover, it is important to consider the potential influence of self-reporting bias on the respondents' answers, as this could have implications for the accuracy and reliability of the collected data. In its entirety, the manuscript makes a valuable contribution to the expanding corpus of literature pertaining to health education within refugee contexts. Additional investigation and assessment are required to delve into the enduring viability and efficacy of health education endeavors, as well as the possibility of expanding these interventions to yield advantages for a greater number of refugee populations on a global scale.

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