International Journal of Community Medicine and Public Health
Uddin I et al. Int J Community Med Public Health. 2023 Mar;10(3):974-980
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20230609

Original Research Article

Knowledge and attitudes towards dietary patterns and lifestyle during COVID-19 pandemic in Bangladesh: an online based cross-sectional study

Ielias Uddin[1]*, M. Alshahria Rokon[1], Sabiha Sultana[2], Anika Jahin[3], Mursalin[2], Ibrahim Khan[2], Shraboni Sultana Setu[2], Mahnaz Rahman[4], M. Sahedul Hasan[1], Empa Yeasmin[2], Asraul Hasibin Rini[1]

[1]Department of Food Technology and Nutritional Science, Mawlana Bhashani Science and Technology University, Tangail, Bangladesh
[2]Department of Applied Nutrition and Food Technology, Islamic University, Kushtia, Bangladesh
[3]Department of Food and Nutrition, Government College of Applied Human Science, Dhaka, Bangladesh
[4]Department of Food and Nutrition Science, Mymensingh Home Economics College, Mymensingh, Bangladesh

Received: 11 January 2023
Accepted: 16 February 2023

***Correspondence:**
Ielias Uddin,
E-mail: ielias.ft18@gmail.com

ABSTRACT

Background: COVID-19 outbreak being the only pandemic of 21st century, that affected globally, has left us with some realization that elucidate the advancement in science and medicine is not enough to live a healthy life for the generation of modern era, if lifestyle and habitual factors are not controlled or maintained in proper way. In this study we aimed to find out people's knowledge and attitudes about dietary patterns and lifestyle during COVID-19.
Methods: An online based questionnaire was designed to collect the data based on the age limit of 15 to 60+ years. The survey was focused on both the affected and exposed individuals (n=853). The data was collected under three main sections containing questions about nutritional knowledge, preventive measures adapted by the respondents, lifestyle practices and their concerns.
Results: The outcome of the study reveals, significant association between gender of the study and their food consumption diversity ($p=0.026<0.05$), participants awareness about COVID-19 depends on their education level. Study also displayed the infection rate, acceptance of vaccination, change of food habit and weight gain tendency depends on the age of the individual, showing statistical significance.
Conclusions: The outcome of the study acquaints that proper balance between knowledge and practice, is the most important attitude, which can build prevention against any new public health threat like COVID-19 outbreak.

Keywords: Attitudes, Bangladesh, COVID-19, Dietary patterns, Lifestyle

INTRODUCTION

The SARS-CoV-2 virus is the main cause of the covid-19 pandemic, commonly referred to as the corona virus outbreak. The epidemic started in Wuhan, China, was first identified in December 2019, and it steadily spread over the world.[1] In order to spread throughout the body, it first targets the respiratory system, after which it harms the entire immune system. The virus's remarkable level of immune system adaptability is evidenced by the fact that its variety changed multiple times. Though the vaccines are the first priority to prevent the severity of COVID-19 infection, a healthy life style and adaptation to nutritious

food habit is now being considered as the basic shield to strengthen the immune system. According to WHO (world health organization), it is vital to eat healthy and stay hydrated in order to prevent COVID-19 infection and other chronic illnesses and ensuring good mental health is another essential factor that is required to maintain proper health in both who got affected and are at risk. Having a physically active life style is recommended as well to stay safe from any disease and to maintain proper health. It is widely acknowledged that people who are physically active tend to live longer and have fewer health problems as they age.[2] To support the formation of strong immunity in the body it is fundamental to ensure proper intake of foods enriched with vital nutrients. Due to the complexity of the immune system, which is made up of numerous distinct processes, adequate diet is necessary to maintain immune system function. Regular exercise of a moderate intensity is also believed to support immunological function and improve vaccine responses.[3] Although vaccination is a crucial preventive measure, there is a high likelihood that other antibiotic-resistant infections will proliferate in society. Additionally, nutritional status is crucial for maintaining a robust immune system against the virus, and a number of factors, including lifestyle, age, health status, sex, and medications, also have an impact on an individual's nutritional status.[4] The importance of balanced maintenance of healthy eating habit and life style are eventually has become the primitive factors to adapt to this new pandemic threat all over the world. In a brief investigation, age over 50, male gender, smoking, chronic kidney disease, diabetes, cardiovascular disease, chronic obstructive pulmonary disease, and cerebrovascular illness were found to be associated with a significant chance of developing severe COVID-19.[5] Research has demonstrated that three key factors; nutritional knowledge, attitude, and practices of individuals; play crucial roles in the prevention of COVID-19 and the recovery of patients.[6] In a developing country like Bangladesh, it is indispensable to raise the awareness about practicing robust life style and food habit in order to protect mass health in the community and decrease the pressure from government health service and economical stress. A study based on hospitalized patients indicated that the reason, behind not following doctors' guideline lack of nutritional knowledge, not attitudes or financial factors.[7] Making individuals understand the importance of nutritional practice is vital to make post-COVID situation better in case of regaining immunity. According to a survey done in China, inhabitants had a high awareness rate of most nutrition knowledge during the epidemic time, and a significant number of them adjusted their food safety and nutrition-related practices.[8]

Aim and objectives

Aim and objective of current study was to standardize more population and community specific health and life style guideline, scientific and quality study on the demographics is now requisite factor to build strong preventive defence against COVID-19 manifestation.

METHODS

Participation and procedure

An online population based cross-sectional survey was conducted among 853 individuals. The study was conducted in January and February 2022, immediately following the implementation of lockdown protocols by the Bangladeshi government. Using the Google survey tool (Google Forms), a semi-structured questionnaire was created, and the generated link was shared over social media (i.e., Facebook, WhatsApp). The researchers and research assistants on the contact list also received the URL directly. The investigators decided to gather the material through online techniques in order to maintain social distance among Bangladesh's strict lockdown. Initially, 900 online respondents provided their signed, informed consent. Of these, 853 participants completed the entire survey after verbally accepting the goal and scope of the study, representing a response rate of 94.78%. Being a resident of Bangladesh, having access to the internet, and voluntarily participating were requirements for inclusion in the study.

Sample calculation

We calculated the sample size needed to estimate prevalence with the required degree of precision and confidence. Since we aimed for a 2.5% precision in the prevalence estimate (i.e., a 95% confidence interval (CI) for an infinite sample), 853 people were included in the sample.

$$N = (Z2 * P(1 - P)) / e2$$

Above mentioned formula was used to compute the sample size, where Z is the value from the standard normal distribution that corresponds to the desired confidence level (Z=1.96 for 95% CI), P is the expected true proportion, and is the desired accuracy.

Measures

A self-reported, semi-structured survey asking about socio-demographics, knowledge, attitude, and practice, as well as informed consent. Data from the socio-demographics, including gender information, age, education, occupation, marital status, and monthly income and expenses for the household. The questionnaire asked for details about diet, eating habits, and knowledge and awareness of COVID-19.

Socio-demographic information

During the survey, some socio-demographic questions were asked, such as gender (male/female), age (15 years to >60 years), educational qualifications (primary level coded as 1, secondary level coded as 2, higher secondary coded as 3 and graduate coded as 4), occupation (student-'1', jobholder-'2', business-'3', teacher-'4', housewife-'5' and

others-'6'), and monthly family income; 10000-20000 Bangladeshi Taka (BDT), 21000-30000 BDT, 31000-40000 BDT, 41000-50000 BDT, 51000-60000 BDT and >60000 BDT.

Knowledge, attitudes and practices

The knowledge and awareness portion included 16-item 'yes/no' questions concerning affected and vaccination rate (4-item), nutritional knowledge and food habit (7-item) and awareness on safety measures (5-item). The life style practices and health concerns section included 5-item concerning 'yes/no' response of the participants. Additional questions were raised regarding the participants' personal safety practices, health conditions, and way of life decisions.

Data analysis

By using descriptive statistics and frequency checks, data explorations were carried out. Where applicable, a Pearson's r value was utilized to evaluate connections between two parameters. Evaluations were made of the relationships between participant characteristics and each of the knowledge and attitude outcomes that were specified. The p value cutoff for statistical significance was established at 0.05, or 5%.

RESULTS

The socio-demographic information about the participants is depicted in (Table 1). Among 853 participants in total, 388 were male respondents and 465 were female. The mean age of the respondents was 26.25±8.035.

It is visually noticed, according to the data collected, that their highest educational qualification was graduate and above and most of them were students and for that reason it is relevantly seen that the most of the respondents earned less than 20,000 BDT per month. The data of the respondents' knowledge and awareness according to their history of COVID-19 infection and vaccination rate is depicted in (Table 2). About 27.20% participants were affected by COVID-19 but 87% of 853 participants got vaccinated, 55.20% had other diseases or co-morbidity, while 50.20% of them believed vaccination as only prevention.

The information of food habit and nutritional knowledge of the participants according to their pandemic and lockdown experience is shown in (Table 3). It is surprisingly high in percentage that 80% (n= 682) of the sample population accepts nutritious food as prevention for COVID-19, 47.70% of them planned their daily diet according to nutritional value. Most of the participants (80.30%) gained weight during lockdown due to pandemic. As an important addition, majorities (81.80%) of the respondents consumed Vitamin-C daily, as a prevention for COVID-19 infection.

Table 1: Demographic information of the participants (n=853).

Variables	Value
Age (years)	26.25±8.035
Sex (N, %)	
Male	388, 45.5
Female	465, 54.5
Educational qualifications (N, %)	
Primary	14, 1.64
Secondary	51, 5.98
Higher secondary	285, 33.41
Graduate and above	503, 58.97
Occupation (N, %)	
Student	619, 72.57
Job Holder	113, 13.2
Business	31, 3.6
Teacher	18, 2.1
Housewife	58, 6.8
Others	14, 1.6
Monthly income (BDT) (N, %)	35992.26±1.711
10000-20000	226, 26.5
21000-30000	186, 21.8
31000-40000	153, 17.9
41000-50000	110, 12.9
51000-60000	61, 7.2
>60000	117, 13.3

The practices and health concerns, followed by the participants is depicted in (Table 4). About 80.30% (n=685) of the total respondents agreed that their mental health was affected during pandemic, 70.70% (n=603) of the participants maintained both exercise and nutritious food consumption as an extra preventive practice against COVID-19 and consumption of nutritious food was more frequent than exercise as a practice among the participants. Almost everyone from the participants (96.50%, n=823) believed physical exercise is an important factor to maintain good physical and mental health, where 41.70% respondents walked for 30-40 minutes per day, 15.10% walked at least for 10 minutes. 45.60% of the participants spent 3-4 hours on social media during lockdown due to COVID-19 pandemic and alarmingly, 19.70% respondents spent more than 8 hours on social media, a day.

It was observed from information about extra hygiene and sanitation practices adapted by the sample population of the survey and 47.80% (n=408) of the participants responded positively that they adapted to more hygienic life style during pandemic, 72.70% of the respondents used face mask regularly, 85.30% covered their face while sneezing or coughing, 57% sanitized their hand after exchanging money and majorities (92.40%) respondents cleaned their fruits and vegetable with extra caution as a preventive measure against COVID-19 (Table 5). The correlation between age and participants health factors related with COVID-19 infection is depicted in (Table 6). The study shows there are strong correlation between respondents age and susceptibility to be affected to

COVID-19 (p=0.000, at the level of 0.01 significance) and the acceptance rate of vaccines as prevention is highly correlated with the age ranges of the sample population of the study (p=0.004 at the level of 0.01 significance), while weight gain and change of food habit also show statistically significant (p=0.022 ; 0.018 at the level of 0.05 significance respectively) correlation with the age group variation of the respondents.

Table 3: Nutritional knowledge and food habit of the related to COVID-19.

Knowledge and food habit	Responses	N, %
Accepts nutritious food as prevention for COVID-19	Yes	682 (80.0)
	No	171 (20.0)
Gained weight during pandemic and lockdown period	Yes	685 (80.3)
	No	163 (19.1)
Change of food habit	Yes	627 (73.0)
	No	226 (26.5)
Intake of junk food	Yes	405 (47.5)
	No	448 (52.5)
Consumption of Vitamin-C in daily diet	Yes	698 (81.8)
	No	155 (18.2)
Increase of caffeine consumption	Yes	562 (65.9)
	No	291 (34.1)
Planning daily diet according to nutritional value	Yes	407 (47.7)
	No	446 (52.3)

Table 4: Life style practices and health concerns of the participants during COVID-19 pandemic.

Life style and health concerns	Responses	N (%)
Affected mental health during pandemic	Yes	685 (80.3)
	No	163 (19.1)
	No response	5 (0.6)
Two main life style factors maintained as preventive practice against COVID-19	Nutritious food consumption	193 (22.6)
	Exercise	20 (2.3)
	Both	603 (70.7)
Physical exercise is important factor to maintain both physical and mental health	Yes	823 (96.5)
	No	30 (3.5)
	No response	0 (0.0)
Duration of walking per day (minutes)	10	129 (15.1)
	20-30	368 (43.1)
	30-40	356 (41.7)
Duration of using social media per day (hours)	3-4	389 (45.6)
	7-8	296 (34.7)
	>8	168 (19.7)

The information about association between food consumption frequency and gender group of the sample population of the study is depicted in (Table 7). The food group discussed, according to the survey questionnaire shows strong statistical significance (p=0.026<0.05, level of significance). As the female respondents are more in number than the male respondents, it explains that female participants of the survey, consumed more from the diversified food groups. Important data set show-casing the outcome of the survey on the correlative association between educational qualification levels and their safety measures adapted against COVID-19 infection risk is shown in (Table 8). The study shows strong correlation between educational qualification of the sample population and their habit of using face mask (statistically significant at the level of 0.01 significance, p=0.000), the acceptance of vaccination as only prevention to COVID-19 does not depend on education level, showing no statistical significance. The practice of extra hygiene and consumption of vitamin C as a preventive food against COVID-19 shows strong correlative association with education level of the sample population of the study (p=0.005; 0.000 at the level of 0.01 significance respectively).

Table 5: Information about awareness and safety measures followed by the participants.

Safety measures followed	Responses	N (%)
Extra hygiene and sanitation practices followed during COVID-19 pandemic	Yes	408 (47.8)
	No	438 (51.3)
	No response	7 (0.8)
Used face mask during COVID-19 pandemic	Regular	620 (72.7)
	Occasional	59 (6.9)
	Never	174 (20.4)
Using napkin to cover up face while sneezing or coughing	Yes	728 (85.3)
	No	125 (14.7)
Sanitizing hand after money exchanging	Yes	484 (57.0)
	No	367 (43.0)
Cleaning fruits and vegetable with extra caution	Yes	788 (92.4)
	No	65 (7.6)

Table 6: Correlation between age of the participants and health factors concerning COVID-19.

Characteristic Variables		COVID-19 affected	Accepts vaccination as only prevention	Change of food habit	Weight gain
		N (%)	N (%)	N (%)	N (%)
Age (years) (15-60 years)	Yes	232 (27.2)	428 (50.2)	627 (73.0)	685 (80.3)
	No	624 (72.8)	425 (49.8)	226 (26.5)	163 (19.10)
Pearson's r value	-0.126 (two tailed)		-0.100 (two-tailed)	0.078 (two-tailed)	0.081 (two-tailed)
P value	0.000*		0.004*	0.022**	0.018**

*0.01 significance level, **0.05 significance level.

Table 7: Association between food consumption and gender group of the participants.

Types of food included in the diet	Responses	N	P value
Meat, fish and egg	Male	174	0.026
	Female	162	
Fruits and vegetables	Male	174	
	Female	248	
Rice, bread and cereals	Male	23	
	Female	29	
Oils and fat	Male	6	
	Female	9	
Milk and dairy food	Male	11	
	Female	17	
Total	Male	388	
	Female	465	
	Total	853	

Level of significance 0.05 (two-tailed).

Table 8: Association of educational qualification of the participants and their awareness of COVID-19.

Characteristic Variables		COVID-19 affected	Accepts vaccination as only prevention	Change of food habit	Weight gain
		N (%)	N (%)	N (%)	N (%)
Educational qualifications	Yes	679 (79.6)	428 (50.2)	408 (47.80)	698 (81.80)
	No	174 (20.40)	425 (49.8)	439 (51.30)	155 (18.20)
Pearson's r value	-0.223 (two tailed)		0.064 (two-tailed)	-0.095 (two-tailed)	-0.120 (two-tailed)
P value	0.000*		0.061*	0.005*	0.00*

*0.01 significance level.

DISCUSSION

COVID-19 being the most important public health concern recently, it is important to scrutinize every aspect related with discovering its' prevention and risk factors as well. As nutrition and food consumption is one of the major factors of human health and wellbeing, finding specific correlation and preventive solution by studying life style and dietary practices of COVID-19 affected population of different communities across the world, may bring out effective solution to the sudden threat. This study was aimed to examine the integrated relationship among the behavioral traits, food habit, knowledge on nutrition and hygiene practices due to prevent COVID-19 infection and the risk of getting affected.

The survey was done on total 853 individuals who were affected or exposed to COVID-19 outbreak during the pandemic. According to several studies on this issue, the importance of finding out solution from the aspect of nutrition was highly emphasized. According to a study on the Swedish population, poor changes in lifestyle habits and spending more time at home passively were linked to a higher risk of mental illness, including health anxiety about one's own and family members' health, generalized anxiety and depression symptoms, and worries about employment and the economy, where in this study shows that 80.30% of 853 individuals believes that COVID-19 pandemic affected their mental health.[9]

Another study done on a Italian community found out that decrease in physical activity, as well as worsening sleeping and dietary habits, were found in roughly 60% of participants and females were impacted greater by the life style changes, on the other hand, our study also shows a strong correlation ($p<0.05$) between gender of the sample population and their food consumption from various food groups, where the female ones consumed more diversified food than men.[10]

Most importantly an study from China also claimed that, the COVID-19 pandemic indeed improves Chinese residents' food safety knowledge and behavior, while focusing on food safety-related information is an important mechanism for improving food safety behavior and in this case, our study also shows statistically significant outcome that, the hygiene practice and sanitation, awareness on getting vaccinated, consumption of Vitamin-C, using face mask as a safety measure depends on the educational qualification of an individual.[11] As this study was conducted online, there are some field of concern which is left for further consideration.

CONCLUSION

Hopefully, the vaccination is available in the majority of the countries all over the world but the under developing and developing countries are still believed to be in danger zone, due to its' low maintenance and poor awareness in the vast communities. Nutritional awareness, maintaining social distancing, physical activity and their knowledge associated with these, expresses the balance of control in the community, in order to prevent pandemic like COVID-19 outbreak. We strongly expect studies similar to this issue should be done in more focused way, in order to build strong preventive knowledge before another outbreak takes over.

ACKNOWLEDGEMENTS

The authors would like to thank all participants for providing all the essential information via online during COVID-19 pandemic.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Sohrabi C, Alsafi Z, O'neill N. World health organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). Int J Surg. 2020;76:71-6.
2. Simpson RJ, Guy K. Coupling aging immunity with a sedentary lifestyle: has the damage already been done? a mini-review. Gerontol. 2010;56:449-58.
3. Lockyer S. Effects of diets, foods and nutrients on immunity: Implications for COVID-19? Nutr Bull. 2020;45:456-73.
4. Aman F, Masood S. EFSA panel on dietetic products, nutrition and allergies (NDA). Guidance on the scientific requirements for health claims related to the immune system, the gastrointestinal tract and defence against pathogenic microorganisms. Pakistan J Med Sci. 2020;36:121-3.
5. Akhtar S, Das JK, Ismail T, et al. Nutritional perspectives for the prevention and mitigation of COVID-19. Nutri Rev. 2021;79:289-300.
6. Marzban A, Yoshany N, Mozaffari-Khosravi H. Nutritional knowledge, attitude, and practices related to covid-19 in people of yazd, 2021. J Nutri Food Secur. 2022;7:22-9.
7. Ho DK, Nguyen HS, Irnandi DF. Adherence to COVID-19 nutritional guidelines and their impact on the clinical outcomes of hospitalized COVID-19 patients. Clin Nutr ESPEN. 2021;46:491-8.
8. Luo Y, Chen L, Xu F. Investigation on knowledge, attitudes and practices about food safety and nutrition in the China during the epidemic of corona virus disease 2019. Public Health Nutr. 2021;24:267-74.
9. Blom V, Lönn A, Ekblom B. Lifestyle habits and mental health in light of the two COVID-19 pandemic waves in Sweden, 2020. Int J Environ Res Public Health. 2021;18:3313.
10. Gallè F, Sabella EA, Roma P. Knowledge and lifestyle behaviors related to COVID-19 pandemic in people over 65 years old from southern Italy. Int J Environ Res Public Health. 2021;18:10872.

11. Shi MI, Xiang C, Zhang XH. Impacts of the COVID-19 pandemic on consumers' food safety knowledge and behavior in China. J Integr Agric. 2020;19:2926-36.

Cite this article as: Uddin I, Rokon MA, Sultana S, Jahin A, Mursalin, Khan I, et al. Knowledge and attitudes towards dietary patterns and lifestyle during COVID-19 pandemic in Bangladesh: an online based cross-sectional study. Int J Community Med Public Health 2023;10:974-80.