Original Article

Assessment of Socio-demographic Characteristics of the COVID-19 Patients with Diabetes Mellitus

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Abstract

Background:
COVID-19 is a highly infectious disease spreading all over the world since its appearance causing enormous sufferings and loss of human life specially among those who have suffered from Diabetes Mellitus along with it.

Objective:
The present study was aimed at to find out the socio-demographic characteristics among diabetic and non-diabetic COVID-19 patients 90 days after discharge from Combined Military Hospital, Dhaka.

Methods:
This retrospective cross sectional study was conducted among purposively selected 133 COVID-19 patients (39 diabetic and 94 non-diabetic) admitted in CMH, Dhaka from July 2020 to June 2021 with the objective to find out the association of socio-demographic characteristics of subjects with COVID-19 patients with Diabetes Mellitus. The data were collected through telephonic interview and medical records.

Results:
The study revealed that the mean age of the respondents were 48.0 years, 80.5% were male, 94.0% were Muslim, 96.2% were married, 30.8% had graduate and above level of education,78.2% had nuclear family, 88.0% reside in urban area. The mean family income was TK 32,250. Among the diabetic patients more than half (51.3%) were 60 and above age group, 48.7% were military retired personnel, 61.5% had family income TK<25,000. The association between exposure status with age (p=.000) and occupational status (p=.001), were found statistically highly significant. The risk exposure outcome among 60 years and above age group were higher among diabetic group (RR: 2.05, 95% CI 1.33-3.17).

Conclusion:
Health education measures to be taken to prevent and control the morbidity and mortality outcome among the diabetic group specially those who are aged, have poor level of education, low income group and retired personnel. However, to draw comprehensive inferences on this study, further research in this field is recommended.

Keywords: Covid-19, Diabetes mellitus, Socio-demographic characteristics

Introduction:

COVID-19 is an infectious disease caused by a newly discovered coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and first documented in Wuhan City, Hubei Province, China in December 2019 as an outbreak of pneumonia of unknown cause.[1] Like any other respiratory disease, COVID-19 is spread through air-droplets that are dispersed when an infected person talks, sneezes or coughs. It can be spread through close contact with an infected person or by contact with air droplets in the environment (on a surface for example) and then touching the mouth or nose.[1] So any crowded places and less air circulation with much people in a confined place like Shopping mall, Market, Cinema hall, Theatre, Restaurant, Gymnasium, School & Colleges where more people have the chance to come in close contact without health etiquette are more vulnerable to spread from man

to man. The spread of disease can be prevented by proper maintenance of hygiene and health etiquette. People of all ages can be infected. Older people (>60years), male and people with pre-existing medical conditions (such as diabetes) appear to be more vulnerable to becoming severely ill with the COVID-19 virus. When people with diabetes develop a viral infection, it can be harder to treat due to fluctuations in blood glucose levels and, possibly, the presence of diabetes complications. There appear to be two reasons for this. Firstly, the immune system is compromised, making it harder to fight the virus and likely leading to a longer recovery period. Secondly, the virus may thrive in an environment of elevated blood glucose. Psycho-social complains are also not less to the patients suffered from COVID-19. So, all these issues need to be addressed in a scientific way.

In a meta-analysis in Bangladesh between 1st January 1995 to August 2019 the pooled prevalence of diabetes in the general population was 7.8% (95% CI: 6.4–9.3). In a sample of 56452 individuals, the pooled prevalence of pre-diabetes was 10.1% (95% CI: 6.7–14.0; 17 studies).[2] The mortality and morbidity of the disease is very high in developed countries as well as Bangladesh faces significant challenges in combating COVID-19 as it is a densely populated country. Outcome patterns of COVID-19 are different in different parts of the world. Diverse risk factors influence the outcomes of COVID-19. Study on morbidity and mortality outcome of COVID-19 patients are very scarce in our country and as such the topic will be a baseline study for the future researcher on this subject. So, the present study was aimed at to find out the socio-demographic characteristics among diabetic and non-diabetic COVID-19 patients 90 days after discharge from Combined Military Hospital, Dhaka.

Methods:

This was a retrospective cohort study performed in the Combined Military Hospital (CMH), Dhaka, situated inside Dhaka Cantonment between the period of 01 January 2021 to 31 December 2021. The study populations were 133 RT-PCR laboratory confirmed positive COVID-19 patients (both gender) who admitted in the CMH and discharge from CMH, Dhaka within 90 days. This includes all Armed Forces COVID-19 patients (Army, Navy Air Force) incluiding their families and patients [Civilian Non-Entitled (CNE) patients and Relative Entitled (RE) patients] those who were attending Combined Military Hospital, Dhaka. Among the 133 COVID-19 patients, 39 were suffering from Diabetes Mellitus (DM) and 94 not suffering from DM. The subjects with psychological abnormality, severely ill patients and who did not respond to a phone call on three separate occasions were excluded from the study. An interview schedule was prepared and used for data collection and the data were collected by a semistructure questionnaire.After getting approval of the research proposal from the honourable Protocol approval Committee, AFMI formal permission was obtained from the Commandants CMH, Dhaka through proper channel for data collection. First necessary data were collected from Medical record office CMH, Dhaka.After explaining the purpose of the study to the respondents and obtaining verbal consent from them, data collection were carried out by the researcher through telephonic interview by asking question in Bangla. Data were collected from 1100 hours to 1300 hours everyday except Govt. holidays. Before asking sensitive question good rapport was made with the respondents by the researcher. For the present study, age, sex, marital status, occupational state, religion, family income, residence, type of family, size of the family and educational status of the patients were collected by face to face or telephonic interview.Then the data were analyzed with the help of software SPSS window program version 23. P-value <0.05 was considered as statistically significant,

Results:

Among 133 cases 39 were exposed (suffering from Diabetes Mellitus) and 94 were Non-exposed (Not suffering from Diabetes Mellitus) as shown in Figure-1.

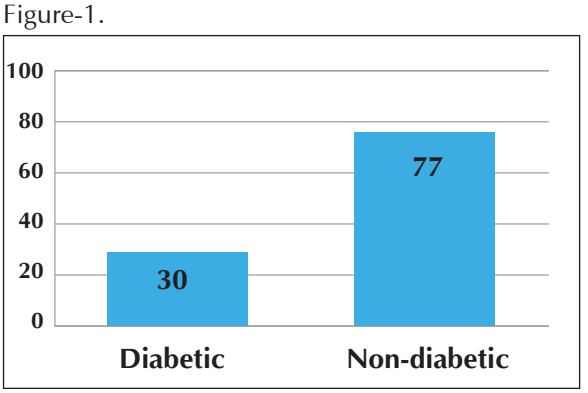


Figure-1: Distribution of type of participants by exposure to diabetes mellitus

Respondents were selected from different categories of people including officers, soldiers, families, civilians and retired personnel from Armed Forces to find out the representations of the populations of all classes of socio-economic and socio-demographic background. The representation of different categories of patients is shown in Figure-2.

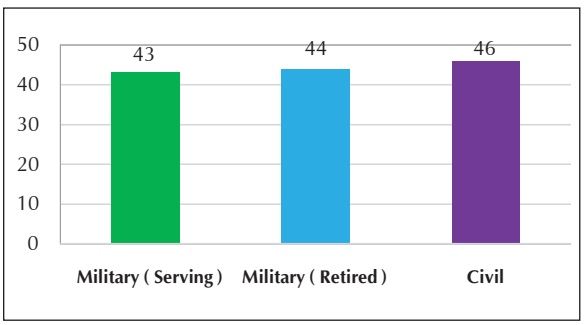


Figure-2: Distribution of type of patients by sources

Among the Diabetic group, Military serving 1(2.56%), Military Retired 19(48.72%) and Civil 19(48.72%) and among the non-diabetic respondents Military serving were 42(44.68%), Military Retired 25(26.60%) and Civil 27(28.72%). Totally, Military serving were 43(32.33%), Military Retired 44 (33.08%) and Civil were 46(34.59%).
Of all the respondents male were 107(80.5%) and female were 26(19.5%). Among diabetic patients male were 30(76.9%) and female were 9(23.1%). And in non-diabetic patients male were 77(81.9%)) and female were 17(18.1%) as shown in Figure-3.

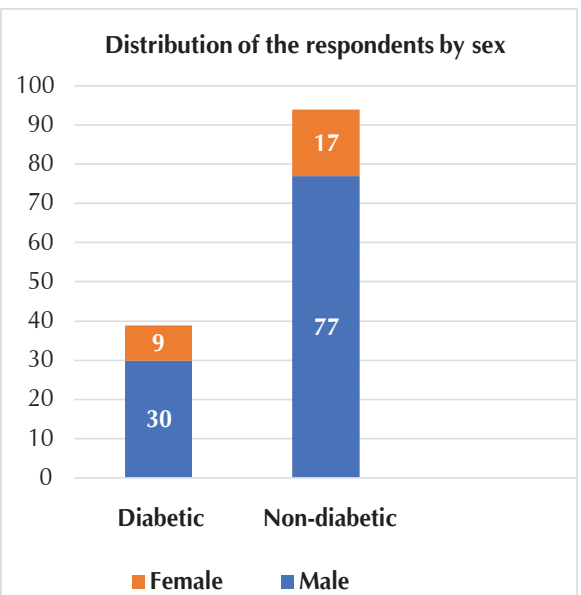


Figure-3: Distribution of the respondents by sex

Table-I showed the socio-demographic characteristics of both groups. Among the 133 respondents the age ranged from 22 to 81 years and maximum were 37 (27.8%) in 50-59 age group and minimum were 16 (12%) in 20-29 age group among the population. Mean ± SD was 48.01 ± 14.16 years. Among the exposed maximum were 20 (51.3%) in 60 and above age group and minimum were 2 (5.1%) in 30-39 age group. Mean ± SD was 58 ± 13.90 years. On the other hand, among non-exposed maximum were 25 (26.6%) in each 30-39 and 50-59 age group and minimum were 13 (13.8%) in the 60 and above age group. The Mean age of the respondents was 43.87 ± 13.90 years. The association between age and exposure status were statistically highly significant (RR: 2.05, 95% CI: 1.33-3.173, p=.000).

Among the respondents maximum 42 (31.6%) were HSC qualified and minimum 16 (12.0%) were Graduate. Among the exposed maximum were secondary and Masters level 10 (25.6%) each and minimum were Graduate 4(10.3%). On the other hand, among non-exposed maximum were H.S.C qualified 35 (37.2%) and minimum were SSC and Graduate12 (12.8%) each as shown in Table-I. Regarding occupation majority of the respondents was service holder 69(51.9%) and minimum were Business 1 (0.8%). Among the exposed maximum were retired 22 (56.4%) and none were in the business group 0(0.0%). Among non-exposed maximum were service holder 58 (61.7%) and minimum were business 1 (1.1%). The association between occupational status and exposure status were statistically highly significant (p=.001) as shown in Table-I.

Majority of the respondents were Muslim 125 (94.0%). Among diabetics maximum were Muslim 38 (97.43%) and 1 (2.6%) were Hinduism. Among non-exposed Muslim were 87 (92.6%) and minimum was from Buddhism 1(1.1%).Majority of the respondents (96.2%) were married. Among diabetic 39 (100%) were married and among non-diabetic 89 (94.7%) were married and 5 (3.8%) were unmarried. Regarding monthly family income of the respondent maximum 86(64.66%) had <25,000 Tk monthly family income and minimum were 1(0.8%) >50,000 Tk. Among exposed maximum 24 (61.53%) from <25,000 Tk income group whereas among non-exposed were 62 (65.96%) from <25,000 Tk income group and 1 (1.1%) from >50,000 Tk income group (Table-I).

Table-I: Socio-demographic characteristics of both groups (n=133)

Variables	Diabetic	Non-diabetic	Total	p-value
Age group (Years)				
20-29	0(0.0%)	16(17.0%)	16(12.0%)	
30-39	2(5.1%)	25(26.6%)	27(20.3%0	
40-49	5(12.8%)	15(16.0%0	20(15.0%)	0
50-59	12(30.8%0	25(26.6%0	37(27.8%)	
60 and above	20(51.3%)	13(13.8%)	33(24.8%)	
Total	39(100%)	94(100%)	133(100%)	
Educational Level				
Secondary	10(25.6%)	20(21.3%)	30(22.6%)	
S.S.C	8 (20.5%)	12(12.8%)	20(15.0%)	
H.S.C	7(17.9%)	35(37.2%)	42(31.6%)	0.192
Graduate	4(10.3%)	12(12.8%)	16(12.0%)	
Masters	10(25.6%)	15(16.0%)	25(18.8%)	
Total	39(100%)	94(100%)	133(100%)	
Marital status				
Married	39(100%)	89(94.7%)	128(96.2%)	
Unmarried	0(0.0%)	5(5.3%)	5(3.8%)	0.142
Total	39(100%)	94(100%)	133(100%)	
Religion				
Muslim	38(97.4%)	87(92.6%)	125(94.0%)	
Hinduism	1(2.6%)	6(6.4%)	7(5.3%)	
Buddism	0(0.0%)	1(1.1%)	1(0.8%)	0.5361
Total	39(100%)	94(100%)	133(100%)	
Occupation				
Service	11(28.2%)	58(61.7%)	69(51.9%)	
Retired	22(56.4%)	22(23.4%)	44(33.1%)	
Business	0(0.0%)	1(1.1%)	1(0.8%)	0.001
Housewife	6(15.4%)	13(13.8%)	19(14.3%)	
Total	39(100%)	94(100%)	133(100%)	
Monthly family income (Taka)				
<25,000	24(61.53%)	62(65.96%)	86(64.66%)	
25000-50000	15(38.5%)	31(33.0%0	46(34.6%)	0.162
>50,000	0(0.0%)	1(1.1%0	1(0.8%0	
Total	39(100%)	94(100%)	133(100%)	
Place of residence				
Urban	37(94.9%)	80(85.1%)	117(88.0%)	
Rural	2(5.1%)	13(13.8%)	15(11.3%)	0.386
Suburban	0(0.0%)	1(1.1%)	1(0.8%)	
Total	39(100%)	94(100%)	133(100%)	
Housing Condition				
Pacca	35(89.7%)	80(85.1%)	115(86.5%)	
Kancha	4(10.3%)	7(7.4%)	11(8.3%)	0.198
Semi pacca	0(0.0%)	7(7.4%)	7(5.3%)	
Total	39(100%)	94(100%)	133(100%)	

The study revealed that regarding types of family of the respondents 104 (78.20%) have nuclear type of family and 29(21.80%) are from joint family. Among exposed 32 (82.05%) were nuclear and 7(17.94%) were joint type of family. Among the non-exposed group 72(76.59%) were nuclear and 22 (23.40%) were in the joint family group. The result is shown in figure-4.

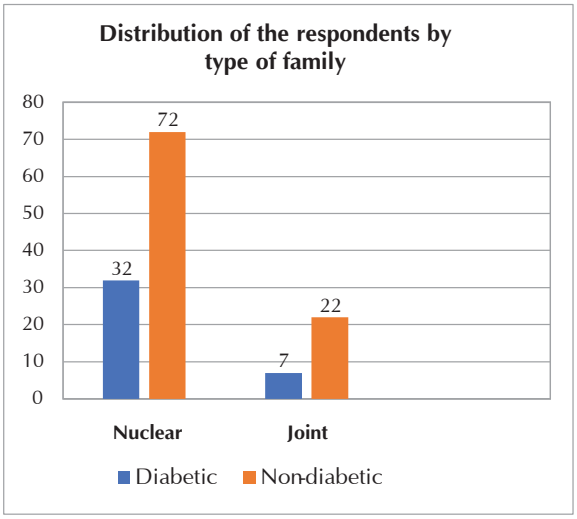


Figure-4: Distribution of the type of family of the respondents

According to the place of residence maximum 117(88.0%) were from urban area and minimum were from suburban area 1(0.8%). Among exposed maximum were in urban group 37(94.9%) and none were from suburban group 0(0.0%). Among non-exposed group maximum were from urban group 80(85.1%) and minimum were from suburban group 1(1.1%) (Table-I).

As regarding the housing condition of the respondent maximum have Pacca house 115(86.5%) and minimum have semi pacca house 7(5.3%). Among exposed maximum have Pacca house 35 (89.7%) and none have semi pacca house 0(0.0%) whereas among non-exposed it is 80 (86.5%) and 7(7.4%) respectively (Table-I).

Discussion:

In the present study it was found that the mean age of the respondents was 48.02 years (age ranges from 22-81 years). The mean age of the diabetic and non-diabetic respondents was 58 years and 43.87 years respectively. This study finding does not accord with the study finding conducted by Islam et al[3] on risk factors associated with morbidity and mortality outcomes of COVID-19 patients on the 28th day of the disease course: a retrospective cohort study in Bangladesh at NIPSOM, Bangladesh (2020) where they found the median age 37.0 years. Another study conducted by Mowla et al[4] on clinical profile of 100 confirmed COVID-19 patients admitted in Dhaka Medical College Hospital, Dhaka, Bangladesh and Ahsan et al[5] conducted a study on demographic and clinical profile with early outcome of critically ill COVID-19 patients admitted in an ICU of BIRDEM, Dhaka, Bangladesh in 2020 where they found that mean age of the respondents were 41.7 years and 63.6 years respectively. Another study conducted by Chowdhury et al[6] on knowledge, attitude and preventive practice towards COVID-19 among selected units of Dhaka Cantonment (2021) where the mean age of the respondents was 31.09 years. The cause of differences of age in the study may be due to differences in study population, sample size, research design and sociodemographic characteristics of the respondents.Among all respondents the most (80.5%) were male and 19.5% were female. This study finding was dissimilar with the study conducted by Ahmed et al[7] at CMH, Dhaka during March-April 2020 where male and female distribution among 201 cases were 90% and 10% respectively. Morshed et al[8] at KGH found among the respondents 71.8% male and female 28.2% respectively. The difference may be due to study population, sample size and sociodemographic characteristics of the respondents.Regarding educational qualification of the respondent 31.6% were HSC qualified, 22.6% were secondary level and 15% were SSC qualified. In the study of Chawdhury et al[6] conducted on soldiers in selected units of Dhaka cantonment and found 72.6% are HSC qualified as because their study was based on serving soldiers. The majority was HSC because the study was conducted at a tertiary level Military Hospital place where entitled patients were treated and most of the patients are soldiers of Bangladesh Armed Forces who are SSC qualified and after enrollment, they complete HSC within the organization.The study revealed that regarding occupation more than half (51.9%) were serving personnel i.e. 51.9%, retired persons were 33.1% and 14.3% were housewife. This is because Military Hospital treats serving personnel, their families and retired persons. Islam et al[3] found 32.5% service holders at NIPSOM where study was conducted in Bangladeshi general population. The association between occupation and exposure status were statistically highly significant (p=.001). This was because the study was conducted among the entitled patients of defense services, most of them were serving and retired personnel.It was evident from the study that among the respondent majority (94%) was Muslims. Among the exposed

(97.4%) and among non-exposed (92.6%) were also Muslims. However, the difference of religion between exposed and non-exposed was not statistically significant (p>0.05). As per Bangladesh Bureau of statistics (BBS) -2021, Muslims are 88.4% and 11.6% are other religion which have similarity with this finding.[9] Highest number of participants belongs to Islam because of predominance of Muslim population in Bangladesh.The study revealed that significant majority, 96.2% respondents are married and unmarried were only 3.8%. Among exposed (100%) and among non-exposed (94.7%) were married. Islam et al[8] found in their study in Bangladesh 72.6% married. The majority of the respondent are married in our study because of Military soldiers are eligible to get married after completion of 6 years of service or when attain 26 years of age. Similar findings were revealed by Chawdhury et al[6] where they found 80% respondents were married.Regarding monthly family income of the respondent 64.66% had <25,000 TK monthly family income. Among exposed 61.53% had TK <25,000 Tk monthly family income whereas among non-exposed it was 65.96%. The income between 2500-50000 taka was 34.6%. Islam et al[3] found that the majority 37.0% had monthly family income between TK.10 000 and 30 000, and their to less than TK 25000.The study revealed that regarding types of family of the respondents 78.20% had nuclear and 21.80% had joint type of family. Among exposed nuclear and joint family were 82.05% and 17.94% whereas among the non-exposed it was 76.59% and 23.40% respectively. The study commensurate with the study of Islam et al[8] conducted at NIPSOM, Dhaka, Bangladesh where they found nuclear family 72.75% and joint family 27.25% respectively.According to the place of residence (88.0%) were from urban area and 12% were from suburban and rural area. As regarding the housing condition of the respondent (86.5%) have pacca house at their residence and rest (5.3%) have semi-pacca or kancha house. According to BBS report 2021 national statistics of Bangladesh is households in pucca buildings constitute 23.9 percent of the total. Nearly 40 percent of the households in the urban area and only 10.6 percent of the households in the rural have pucca. Semi-pucca living structures are also found in about a quarter (26.7%) of the households. Among the reported structures, 22.7% of the households in the rural area and 31.6% in the urban area were semi-pucca.[9] The difference of more urban setting in our study may be due to increase of family accommodations by Bangladesh Armed Forces at different Cantonments of the country. On the other hand, due to economic development of the country and demographic transition, the number of kancha house is gradually decreasing in our country. However, this research was only based on a single-centered, Hospital- based study. Therefore, the study was restricted to the patients attending at a selected tertiary level Military Hospital, Dhaka only. Data collection was done in pandemic scenario of COVID-19 which hampers to collect data both the respondents and researcher so, sample size was small. Socio-demographic data were recorded from the Medical record system of CMH, Dhaka and thereby the study faces problem to get complete information on some variables. As patients were discharged from Hospital so face to face interview was not possible as such the requirement for written consent was waived because of the retrospective study design. The study was conducted through non-probability type of purposive sampling which may not qualify the validity of the finding.

Conclusion:

The reason for worse prognosis in people with diabetes is likely to be multifactorial, thus reflecting the syndromic nature of diabetes. Age, sex, ethnicity, comorbidities such as diabetes all probably contribute to the risk of worse outcomes. Based on the findings and discussion of the study, the following recommendations are put forwards for consideration by the policy makers, health administrators, public health specialist and future researchers for controlling DM in COVID-19 cases.Special attention should be taken for monitoring and surveillance of COVID-19 specially among the age group 60 and above, male, civil, military retired persons as much of this respondent were in this group.

1. Steps should be taken for the health of low-income group and urban populations.
2. So adequate preventive measures and more precautions should be taken who have DM in comparison to those who have not DM.
3. Further in-depth study on this aspect may be conducted on larger sample size to find out the associAation between Diabetes Mellitus with COVID-19.

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