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KNOWLEDGE, ATTITUDES, AND PRACTICES ON COVID-19 PREVENTION AMONG VEHICLE MECHANICS IN DHAKA CITY

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ABSTRACT

The coronavirus 2019 (COVID-19) pandemic has posed substantial public health challenges worldwide, particularly among occupational groups with high exposure risk and limited access to health information. Adequate knowledge, appropriate attitudes, and proper preventive practices are critical to reducing the transmission of infectious diseases such as COVID-19. This study examines the levels of knowledge, attitudes, and preventive practices regarding COVID-19 among vehicle mechanics in Dhaka City, Bangladesh. A cross-sectional offline survey was conducted between January and December 2021 among 423 vehicle mechanics selected from two thanas of Dhaka City using simple random sampling for respondents and cluster sampling for garages. Data were gathered through direct, in-person interviews with participants using a structured questionnaire, and the results were analyzed using descriptive statistics and chi-square tests. The findings indicate that 62% of participants demonstrated poor knowledge of COVID-19. Knowledge of COVID-19 differed significantly by educational status ($\chi^2 = 242.82$, $df = 15$, $p < 0.01$), as well as by age, marital status, and financial contribution to the family. Nearly 90% of respondents reported that COVID-19 negatively affected their mental health and socioeconomic conditions. Preventive practices were notably low: only 2.6% maintained physical distancing, 3.8% wore masks at the workplace, and 7.1% wore masks outside the workplace. Furthermore, only 1.7% of respondents consistently followed safety measures when dealing with customers. The findings indicate that preventive practices related to COVID-19 were significantly associated with respondents' level of knowledge, with the majority demonstrating inadequate knowledge and suboptimal preventive behaviors.

INTRODUCTION

The COVID-19 outbreak has emerged as a major global public health challenge (Pal et al., 2020). It was initially identified in late December 2019 in Wuhan, Hubei Province, China, where clusters of pneumonia cases of unknown origin were reported (Zhu et al., 2020). The disease rapidly spread across China and beyond international borders, leading the World Health Organization (WHO) to declare COVID-19 a pandemic on March 11, 2020, officially (Cucinotta & Vanelli, 2020). Countries around the world have taken urgent steps to control the disease, such as Turkey, which has restricted travel and transportation, shut down border gates, halted international flights, and suspended travel to or from 31 provinces (Aytekin, 2020). The preventive measures posed significant challenges in low- and lower-middle-income countries. As of January 8, 2026, the pandemic affected 240 countries worldwide, resulting in more than 779 million confirmed cases and over 7.1 million deaths. Deaths have been reported from 231 countries, according to the most recent data submission dated December 7, 2025 (WHO, 2026). On March 8, 2020, Bangladesh announced its first COVID-19 case (Ferdous et al., 2020). As of December 30, 2026, the government has recorded 2,052,221 confirmed COVID-19 cases and 29,531 deaths domestically (DGHS, 2026). Vehicle mechanics repair and maintain automobiles (Thorburn, 2025). Generally, they inspect, maintain, and repair cars and light trucks by examining belts, hoses, plugs, brakes, fuel systems, and other components. In Bangladesh, most of them work in garages situated along roadsides. In low-income nations, the number of temporary, unauthorized

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garages is high, and most workers are illiterate and work without safety measures (Ataro et al., 2018). Vehicle mechanics constitute a vulnerable occupational group due to their roadside working conditions, limited safety practices, and frequent contact with diverse populations. They are exposed to multiple occupational hazards, including dermatological, respiratory, and carcinogenic risks (Moen et al., 1995). Given the high transmissibility of COVID-19 through close contact and respiratory droplets (Mizumoto et al., 2020), vehicle mechanics face an elevated risk of infection. Despite this, evidence on their knowledge, attitudes, and practices regarding COVID-19 prevention remains scarce in Bangladesh. Therefore, this study aims to assess the levels of knowledge, attitudes, and practices regarding COVID-19 prevention among vehicle mechanics in Dhaka city.

LITERATURE REVIEW

A study conducted among Bangladeshi populations reported low levels of COVID-19 knowledge, with a mean knowledge score of 6.1 ± 2.6 out of 17, reflecting an overall correct response rate of 35.9%. Mass media was identified as the primary source of information (95.6%), followed by relatives (48.8%), friends and neighbors (45.8%), the internet (2.7%), and social media (1.5%). In contrast, preventive practices and attitudes were relatively strong, with mean practice and attitude scores of 9.8 ± 1.6 out of 12 (81.7%) and 12.3 ± 1.7 out of 14 (87.9%), respectively (Islam et al., 2021). Analysis of responses to KAP questions showed that 54.8% of participants had correct knowledge about COVID-19, recognizing it as a serious but treatable disease with a low fatality rate. However, nearly half of the respondents were poorly informed, and 36.2% perceived COVID-19 as a fatal disease with inevitable death. Moreover, 82.8% of participants were unaware of the origin of COVID-19 (Paul et al., 2020). Despite knowledge gaps, participants generally demonstrated positive attitudes toward preventive behaviors, including wearing face masks, maintaining social distancing, and practicing personal hygiene. Similar positive attitudes toward mask use, frequent handwashing, and reporting suspected cases were also observed among the general Bangladeshi population in earlier KAP studies (Lau et al., 2020). However, only 63.1% of slum dwellers were aware that COVID-19 is preventable, which contrasts with findings among the general population in Bangladesh, where 90% demonstrated this knowledge (Ferdous et al., 2020). Additionally, Bangladeshi young adults expressed optimism regarding effective control of COVID-19 and confidence in government measures. High levels of positive attitudes toward COVID-19 prevention were also reported in studies conducted in Malaysia, China, and Saudi Arabia (Al-Hanawi et al., 2020; Azlan et al., 2020; Zhong et al., 2020). Using an 80% cutoff point, overall knowledge was categorized as poor, with a mean score of 9.60 ± 1.45 out of 13. No statistically significant difference in knowledge scores was observed between males (9.65 ± 1.49) and females (9.52 ± 1.38), suggesting improved educational access for females in Bangladesh (Paul et al., 2020). Overall, only 33% of participants demonstrated good knowledge of COVID-19. Older respondents, particularly retired individuals, were more knowledgeable than younger participants, especially students. Studies from countries with similar sociodemographic contexts reported higher levels of knowledge; for example, 84.25% of respondents in Nepal demonstrated adequate knowledge, compared with 80.64% in India, 85% in Iran, and 64.8% in Pakistan (Paudel et al., 2020). Consistent with these findings, studies from Malaysia and Saudi Arabia reported higher levels of knowledge among older populations (Al-Hanawi et al., 2020; Azlan et al., 2020). The mean attitude scores reflected an overall positive attitude toward COVID-19 prevention, with females demonstrating more favorable attitudes than males. Similar findings were reported in studies conducted in Saudi Arabia, India, and Sudan. However, attitude scores were lower among government employees and students than among homemakers (Al-Hanawi et al., 2020; Paul et al., 2020). In a study involving 1,231 healthcare professionals, the majority were young adults: 67% were aged 20-30 years, and 61.6% were male. The mean age was 29.29 ± 6.75 years, and most respondents held a bachelor's degree or higher. Despite their educational backgrounds, many relied on social networks and news media for COVID-19 information, and 60.0% had not participated in formal lectures or discussions on COVID-19 (Alrubaiee et al., 2020).

MATERIALS AND METHODS

Study Design and Area

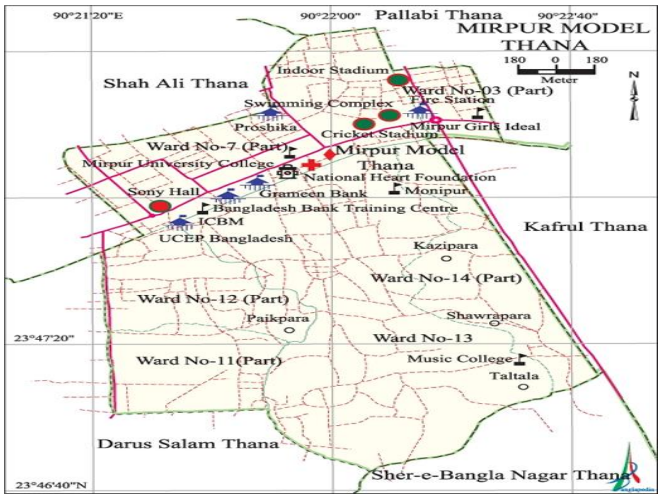

Figure 1. Mirpur Thana

The current study followed a cross-sectional study design. The study examined the mechanics of various vehicle garages in the Mirpur and Dhanmondi Thana areas of Dhaka city. The list of Thanas (n=49) in Dhaka City was obtained from the Bangladesh Police website. Then, Dhanmondi from Dhaka South City Corporation (23) and Mirpur from Dhaka North City Corporation (26) were randomly selected. The vehicle garages situated in the Mirpur (Figure 1) and Dhanmondi (Figure 2) Thana areas were selected using cluster sampling. All vehicle mechanics working in those garages who met the selection criteria were eligible for the study.

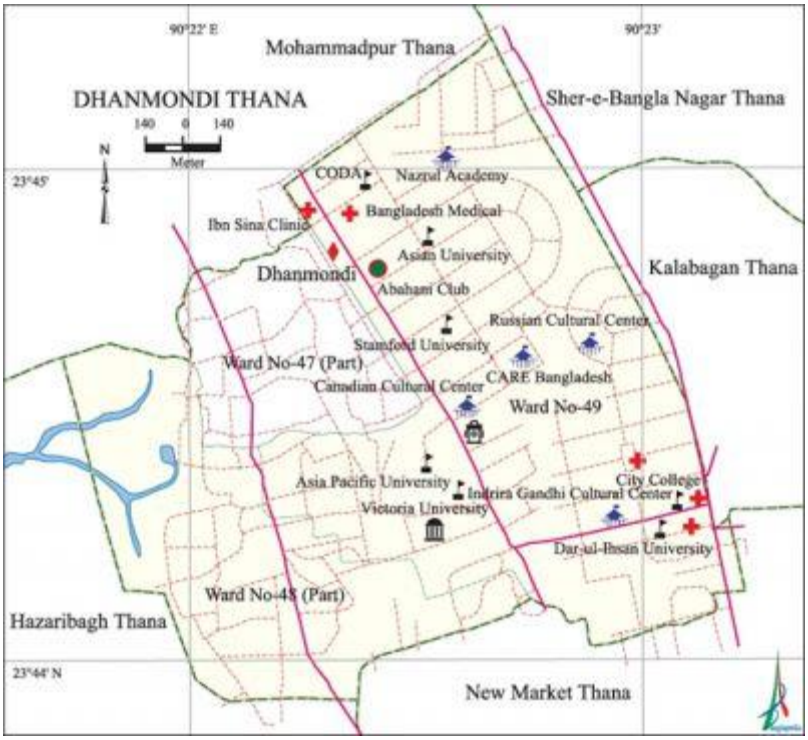

Figure 2. Dhanmondi Thana

Study Population

The study population consisted of vehicle mechanics employed in garages located in the Mirpur and Dhanmondi Thana areas of Dhaka city. Eligible participants were mechanics with at least 6 months of work experience in garages in these areas. Individuals younger than 18 years of age were excluded from the study.

Sample Size

The formula of one sample population was used to calculate the sample size:

$$n = \frac{z^2 pq}{d^2}$$

Considering a 95% confidence interval with a 5% margin of error and p=0.5, 384 was the desired sample size. Furthermore, given the 10% non-response rate, the final sample size was 423.

Procedure

The questionnaire was developed in English and then translated into Bangla. The questionnaire was pre-tested among 10 vehicle mechanics similar to the study population, other than the study area (from vehicle garages in the Mohammadpur area), to identify the potential errors of the questionnaire; after necessary corrections from pre-testing, the study tool was finalized. After taking informed verbal consent from the respondents, data were collected via face-to-face interviews. The study was conducted from January 1 to December 31, 2021.

Measures

A semi-structured questionnaire was prepared to collect sociodemographic, work-related, knowledge, attitude, and practice data on COVID-19, based on the study's objectives and a literature review.

Sociodemographic Characteristics

To assess sociodemographic characteristics, questions included age, sex, marital status, educational attainment, and family income.

Knowledge Regarding COVID-19

There were seven questions to assess knowledge of COVID-19 transmission modes, COVID-19 symptoms, at-risk people for COVID-19, COVID-19 prevention, telehealth services, vaccine availability, and COVID-19 vaccine doses. Respondents were given "yes" and "no" response options to these items. A correct response to an item would be assigned 1 point, while an incorrect response would be assigned 0 points. The person who answered with an accuracy of less than 40% on the questions was considered to have poor knowledge; 41-60% satisfactory knowledge; 61-80% good knowledge; and above 80% excellent knowledge (Almohammed et al., 2021).

Attitude Regarding COVID-19

To measure attitudes towards COVID-19, surveyed respondents were asked whether they agreed, disagreed, or were neutral. The Three-Point Likert Scale was used in this study to assess attitudes towards COVID-19. There were 12 questions using a 3-Point Likert scale, ranging from disagree to agree. They were asked whether COVID-19 is preventable, whether maintaining home quarantine and lockdowns is important for preventing COVID-19-related socioeconomic damage, and whether they agreed, disagreed, or were neutral.

Practice Regarding COVID-19

To find out the practice regarding COVID-19, they were asked about maintaining social distance, wearing masks, and other measures. There were 14 questions with three responses: Never, Occasionally and Always.

Data Analysis

All raw data were checked for correctness and completeness to exclude missing or inconsistent data. The data were entered into IBM SPSS (Statistical Package for the Social Sciences) version 26 for analysis. Descriptive analysis was performed to obtain frequencies for the variables. Then, a chi-square test was performed to examine the independence between the level of knowledge and sociodemographic variables, as well as COVID-19 practice. P-value < 0.05 was considered for statistical significance. Results of the analysis were presented in both tabular and graphical form.

Ethical Considerations

Approval from the ethical review committee of the State University of Bangladesh was obtained. Verbal permission was obtained from the garage owners prior to obtaining informed consent from the respondents. Privacy, confidentiality, and anonymity were maintained strictly. Respondents had the right to refuse to participate or withdraw from the study at any stage. The study is limited by its focus on selected garages in Dhanmondi and Mirpur, restricting generalizability.

RESULTS

The majority of respondents aged 18-25 (36.4%) had no educational qualifications (51.1%) and were married (61.9%). They mostly belonged to joint families (53%) and always contributed to their family (70%). The test of independence showed that knowledge of COVID-19 differed significantly by educational status ($\chi 2 = 242.82$; df = 15; $p < 0.01$). Moreover, knowledge of COVID-19 significantly differed by respondents' age, marital status, and financial contributions to their families (Table 1).

Table 1. Sociodemographic determinants of COVID-19 knowledge

Variables	N (%)	Level of knowledge				χ^2 (df)	p-value
		Poor	Satisfactory	Good	Excellent		
Respondents' Age in Groups							
18-25 Years	154 (36.4%)	77 (29.4%)	35 (41.7%)	16 (44.4%)	26 (63.4%)	29.94* (6)	0.000
26-33 Years	131 (31%)	78 (29.8%)	29 (34.5%)	13 (36.1%)	11 (26.8%)		
≥ 34 Years	138 (32.6%)	107 (40.8%)	20 (23.8%)	7 (19.4%)	4 (9.8%)		
Educational Status							
None	216 (51.1%)	179 (68.3%)	31 (36.9%)	4 (11.1%)	2 (4.9%)		
Can only sign	58 (13.7%)	42 (16%)	12 (14.3%)	3 (8.3%)	1 (2.4%)		
Up to primary	94 (22.2%)	32 (12.2%)	30 (35.7%)	18 (50%)	14 (34.1%)		
Up to SSC	23 (5.4%)	1 (0.4%)	4 (4.8%)	6 (16.7%)	12 (29.3%)		
Up to HSC	9 (2.1%)	0 (0%)	0 (0%)	0 (0%)	9 (22%)	*242.82* (15)*	0.000
Up to High School	23 (5.4%)	8 (3.1%)	7 (8.3%)	5 (13.9%)	3 (7.3%)		
Religion of the Respondents							
Islam	373 (88.2%)	236 (90.1%)	70 (83.3%)	32 (88.9%)	35 (85.4%)	*7.34 (6)*	0.287
Hindu	47 (11.1%)	24 (9.2%)	14 (16.7%)	3 (8.3%)	6 (14.6%)		

Christian	3 (0.7%)	2 (0.8%)	0 (0%)	1 (2.8%)	0 (0%)		
Marital Status of the Respondents							
Single	156 (36.9%)	73 (27.9%)	38 (45.2%)	16 (44.4%)	29 (70.7%)	33.27* (6)	0.000
Married	262 (61.9%)	185 (70.6%)	45 (53.6%)	20 (55.6%)	12 (29.3%)		
Widowed	5 (1.2%)	4 (1.5%)	1 (1.2%)	0 (0%)	0 (0%)		
Family Types of the Respondents							
Nuclear family	199 (47%)	120 (45.8%)	37 (44%)	21 (58.3%)	21 (51.2%)	2.59 (3)	0.459
Joint family	224 (53%)	142 (54.2%)	47 (56%)	15 (41.7%)	20 (48.8%)		

*** p-value<0.05**
χ^2 = Chi-square
df = degree of freedom

About 69% of the respondents agreed that COVID-19 is preventable and can be treated at home. In addition, more than 70% of respondents agreed that it is crucial to wear a face mask in crowded places and that spatial distancing is mandatory. Although about 62% to 63% respondents believed that health education and safety measures can play an important role in COVID-19 prevention, almost 90% of the respondents reported that COVID-19 has damaged their mental health and socioeconomic condition (Table 2).

Table 2. Knowledge of COVID-19 among vehicle mechanics

Variables	**Response**		
	Agree	**Neutral**	**Disagree**
COVID-19 is preventable	291 (68.8%)	123 (29.1%)	9 (2.1%)
It can be treated at home	289 (68.3%)	110 (26%)	24 (5.7%)
It is crucial to wear a face mask in crowded places	323 (76.4%)	83 (19.6%)	17 (4%)
Spatial distancing is mandatory to prevent COVID-19	266 (62.9%)	137 (32.4%)	20 (4.7%)
Health education can protect against Covid-19	268 (63.4%)	131 (31%)	24 (5.7%)
Safety measures can play an important role in COVID-19 prevention	264 (62.4%)	138 (32.6%)	21 (5%)
The lockdown for Covid-19 has caused socioeconomic damage	383 (90.5%)	34 (8%)	6 (1.4%)
The lockdown for Covid-19 has damaged mental health	378 (89.4%)	36 (8.5%)	9 (2.1%)

Very few respondents maintained spatial distancing (2.6%) and wore masks at the workplace (3.8%) and outside (7.1%). In addition, only 1.7% of respondents always took safety measures for their customers. Furthermore, the majority of respondents (79.2%) never wash their hands with soap, and 41% stay at home during lockdown as a precaution. About 66% of respondents never visit a doctor when they feel sick. Moreover, about 87% of garages lacked COVID-19 safety signs. All these practices are significantly dependent upon their level of knowledge regarding COVID-19 (Table 3).

Table 3. Responses of knowledge, attitudes, and practices

Variables	**N (%)**	**Level of knowledge**				**χ^2 (df)**	**p-value**
		Poor	**Satisfactory**	**Good**	**Excellent**		
Do you maintain spatial distancing?							
Never	351 (83%)	233 (88.9%)	70 (83.3%)	25 (69.4%)	23 (56.1%)	37.70* (6)	0.000
Occasionally	61 (14.4%)	22 (8.4%)	13 (15.5%)	11 (30.6%)	15 (36.6%)		
Always	11 (2.6%)	7 (2.7%)	1 (1.2%)	0 (0%)	3 (7.3%)		
Do you wear a face mask when working?							
Never	345 (81.6%)	237 (90.5%)	62 (73.8%)	22 (61.1%)	24 (58.5%)	62.18* (6)	0.000
Occasionally	62 (14.7%)	18 (6.9%)	20 (23.8%)	14 (38.9%)	10 (24.4%)		
Always	16 (3.8%)	7 (2.7%)	2 (2.4%)	0 (0%)	7 (17.1%)		
Do you wear a face mask when going outside?							
Never	246 (58.2%)	191 (72.9%)	35 (41.7%)	12 (33.3%)	8 (19.5%)	80.57* (6)	0.000
Occasionally	147 (34.8%)	63 (24%)	42 (50%)	20 (55.6%)	22 (53.7%)		
Always	30 (7.1%)	8 (3.1%)	7 (8.3%)	4 (11.1%)	11 (26.8%)		
Do you wash your hands frequently with soap and water?							
Never	335 (79.2%)	233 (88.9%)	65 (77.4%)	21 (58.3%)	16 (39%)	68.29* (6)	0.000
Occasionally	77 (18.2%)	28 (10.7%)	15 (17.9%)	13 (36.1%)	21 (51.2%)		
Always	11 (2.6%)	1 (0.4%)	4 (4.8%)	2 (5.6%)	4 (9.8%)		

Do you encourage customers to wear face masks?							
Never	386 (91.3%)	255 (97.3%)	78 (92.9%)	28 (77.8%)	25 (61%)	69.47* (6)	0.000
Occasionally	33 (7.8%)	6 (2.3%)	5 (6%)	7 (19.4%)	15 (36.6%)		
Always	4 (0.9%)	1 (0.4%)	1 (1.2%)	1 (2.8%)	1 (2.4%)		

*** p-value<0.05**

$\chi 2$ = Chi-square

df = degree of freedom

Moreover, about 62% of respondents had limited knowledge of COVID-19 (Figure 3).

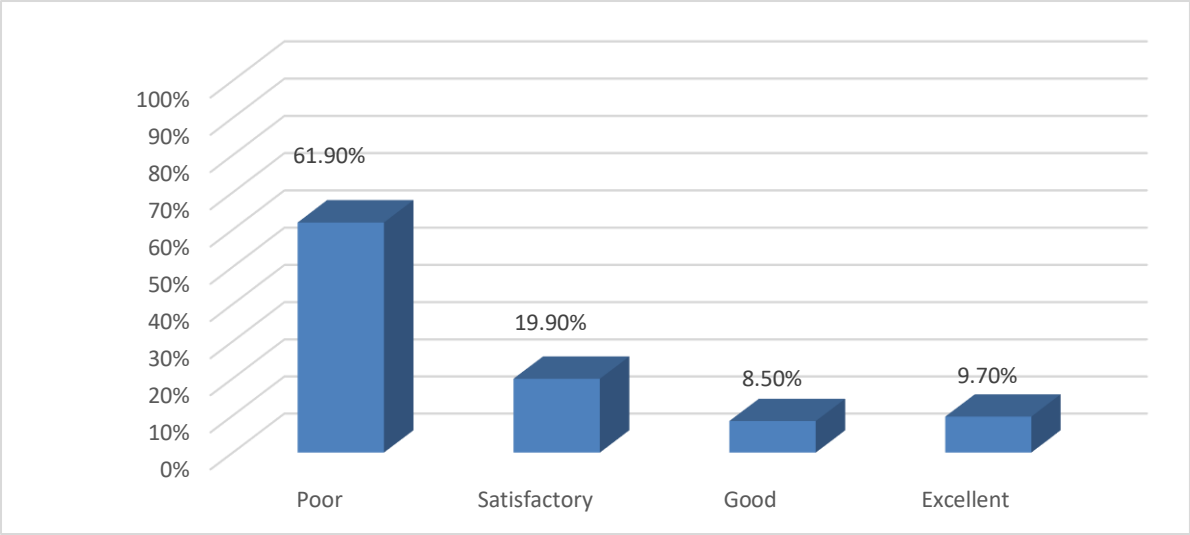

Figure 3. Distribution of the respondents by level of knowledge

DISCUSSIONS

COVID-19 has continued to spread rapidly in Bangladesh, with widespread community transmission (Islam et al., 2021). Amid this severe public health crisis, approximately 24.5 million people, representing 14.7% of the national population, fell into the "new poor" category by March 2021, largely due to the pandemic's socioeconomic consequences (BRAC Institute of Governance and Development, 2021). A significant proportion of vehicle mechanics reside in slum settlements, where low-income and extremely poor populations are particularly vulnerable during such crises (Banik et al., 2020). These slum areas are characterized by high population density, with around 75% of households living in single-room conditions (Bangladesh Bureau of Statistics and UNICEF Bangladesh, 2015). This study found that most vehicle mechanics (61.9%) had poor knowledge of COVID-19. This finding was not surprising as the majority of vehicle mechanics had little educational qualification and low economic status. This research showed that mass media (e.g., Radio, Television, etc.) was the primary source of knowledge about COVID-19, followed by social media. This study is similar to recent KAP findings among Bangladeshi slum dwellers (Islam et al., 2021). Moreover, being associated with having accurate knowledge is significantly associated with a higher education level. Similar findings were reported in previous studies on COVID-19 in Bangladesh (BRAC Institute of Governance and Development, 2021). It is obvious because educated people are generally more aware of COVID-19's potential, given their greater knowledge. The current study found that a large majority of participants reported that infected individuals (83.7%) and Sneezing Cough (91.8%) were ways COVID-19 spreads. An earlier KAP study found similar results: 82.8% among Bangladeshi slum dwellers (Islam et al., 2021) and 69.1% in a web-based survey in India (Shukla & Deotale, 2020). In this study, most respondents reported fever as a COVID-19 symptom. The present study revealed that most respondents identified mask use (96.2%) and regular handwashing (88.5%) as effective measures for preventing COVID-19, findings that align with KAP studies conducted among the Chinese population regarding coronavirus disease (Gao et al., 2020). Furthermore, a large proportion of participants (87.7%) demonstrated a positive attitude toward COVID-19 prevention, with a mean attitude score of 31.6 ± 4.4. Positive attitudes were evident in practices such as wearing face masks, maintaining physical distance, adopting safety measures, and recognizing the pandemic's socioeconomic impact. Similarly, earlier KAP studies reported favorable attitudes among Bangladeshi slum dwellers toward mask use, social distancing, and personal protection (Alrubaiee et al., 2020). However, only 68.8% of vehicle mechanics were aware that COVID-19 is preventable, which is notably lower than the proportion reported among the general Bangladeshi population in recent KAP studies (90%) (Ferdous et al., 2020). A large majority of respondents show a positive attitude toward the view that the COVID-19 lockdown has caused socioeconomic damage, consistent with an earlier study in Bangladesh (Bodrud-Doza et al., 2020). Also, the respondent believes that the lockdown for COVID-19 has damaged mental health and is consistent with the earlier study in Bangladesh (Shammi et al., 2020). A high level of positive attitude toward COVID-19 has also been reported in studies conducted among slum dwellers in Bangladesh. (BRAC Institute of Governance and Development, 2021). The favorable attitudes toward COVID-19 among participants

may be attributed to the Bangladesh government's unprecedented preventive measures, including lockdowns, suspending all flights, and temporarily closing offices and educational institutions to protect the population from the virus (WHO, 2020). Though Knowledge regarding COVID-19 was limited, the present research shows that 44.1% of the mechanics in Dhaka, Bangladesh, had good preventive practices against COVID-19, with a mean score of 19.9 (SD=4.2). That means more than half of the vehicle's mechanics had poor preventive practices against COVID-19. This research shows that 58.2% of respondents do not wear a face mask when going outside, and a large majority (81.6%) do not wear one when working. This is consistent with a study among Malaysian individuals, which reported that 51.2% of participants wore face masks when going outdoors (Olum et al., 2020). Also, 79.2% do not wash their hands frequently with soap and water, which is consistent with research in Thailand that found that more than half of respondents (54.8%) reported not using soap regularly when washing their hands (Srichan et al., 2020). About half (50.8%) of the participants maintain the etiquette during sneezing and coughing. This finding was remarkably similar to previous studies (Olum et al., 2020). This study finds that younger respondents, compared with middle-aged individuals, knew that the COVID-19 vaccine was available in Bangladesh; there is a significant association between age and knowledge, consistent with a study in Iran (Erfani et al., 2023). Therefore, tailoring the messages from health officials and other media outlets about the disease requires addressing the multifactorial causes of reduced knowledge.

CONCLUSIONS

This study found that most vehicle mechanics in Dhaka city had limited knowledge of COVID-19 despite generally favorable attitudes toward its prevention. Despite many respondents acknowledging COVID-19 as preventable and agreeing with major preventive principles, these positive attitudes did not readily translate into proper preventive practices. Mask use, hand hygiene, physical distancing, and workplace safety were observed to be exceptionally poor, resulting in a significant gap between knowledge and practice. These findings also suggest that low levels of education and disadvantaged socioeconomic status played important roles in low levels of knowledge, which in turn contributed to unsafe practices. The reliance on mass media as the main source of information, combined with limited access to more structured health education, led to fragmented, sometimes inconsistent knowledge about COVID-19. Given their roadside working environment and frequent interaction with heterogeneous populations, vehicle mechanics constitute a vulnerable occupational group at high risk of infection. Overall, the study emphasizes the need to develop grassroots health education and risk communication interventions for vehicle mechanics to raise awareness of practical, cost-effective measures to reduce the spread of the disease. Strengthening workplace awareness programs is important for bridging the gap between knowledge, attitude, and practice, thereby helping reduce the spread of infections at the occupational/community levels.

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