

## A Cross-Sectional Study of Prevalence of Depression, Anxiety and Stress among Professional Cab Drivers in New Delhi

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### Abstract

**Background:** The profession of drivers is one of the occupational groups exposed to very poor working conditions. This study aimed to establish the prevalence of depression, anxiety and stress among cab drivers. **Materials and Methods:** This cross-sectional study included 134 cab drivers. Their mental health status was assessed with the help of a screening tool – Depression Anxiety Stress Scale (DASS-21). Their demographic details, working conditions, lifestyle factors and use of habit-forming substances were also assessed with the help of a semi-structured questionnaire. **Results:** It was revealed that all cab drivers were male and between 20 to 64 years of age. Eighty two (62%) drivers said they are sometimes irritated at work. 29 (21.5%) said they feel irritated daily and rest 23 (17.2%) said that they were never irritated at work. When screened for depression, anxiety and stress, it was found out that 81 (60.5%) were suffering from depression, 63 (47%) from anxiety and 49 (36.5%) had variable degree of stress. **Conclusion:** Cab drivers are at high risk of acquiring mental health diseases, yet the mental health of this large workforce is ignored.

**Keywords:** Cab drivers, DASS-21, mental health, occupational health, substance abuse

### INTRODUCTION

Last few years has seen many changes in terms of how a common man commutes in the populated capital city of India. Many years ago, there was a monopoly of public buses and auto rickshaws over the commute of the majority. Then came the majestic Delhi metro, having a daily ridership of over 3 million, boasting of being the most cost effective and punctual solution to travel within the city often crippled by traffic jams. Taxis have been in the business for years, but they fell within the reach of a common man since 2013, with the advent of application-based cab aggregators (ABCA) in Delhi, owing to the ease of online booking, minimum waiting time, doorstep pick up and drop, luxury, comfort and relatively cheap fares.

Cab drivers are at high risk of occupational morbidities and mortalities like cardiovascular diseases, physical assaults, musculoskeletal disorders like back pain and high stress.<sup>[1-3]</sup> Drivers are in a profession that exposes them to physical illness, mental illness and addictions of habit-forming substances, specially tobacco. Their profession is also unique because they are bestowed upon responsibility of other people's lives, either the ones they are carrying in their vehicles or the ones

on the road. New Delhi has 78,686 registered taxis (2013–14) and each day, 71 Indians die in road mishaps involving cars, jeeps and taxis.<sup>[6]</sup> Many studies have reported that accidents and their severity are associated with age, sleepiness, drug use and smoking.<sup>[7-10]</sup>

In India, the taxi driver's mental health, which is a reflection of that of general population, is poor. The National Mental Health Survey (NMHS) estimated that about 150 million Indians need care for mental disorders, and about 10% suffer from common mental disorders (CMD) such as depression, anxiety, emotional stress and suicide risk, as well as alcohol and drug use.<sup>[11]</sup> However, relatively few studies have used standardised tools to assess the burden of CMD in the population.<sup>[12]</sup> Such studies are literally inexistent in context of occupational groups like taxi drivers in India. A study done on truck drivers reported that 30% of the truck drivers were having mental health

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hours was  $12 \pm 2.64$  h. A large number of drivers (111, 83%) did not report being subjected to or being involved in any road rage incident in the last 1 year. One half of the drivers (66, 49.5%) were reportedly booked for a traffic law violation and almost one-fourth (36, 27%) have been involved in accidents in the last 1 year. When asked about the frequency of being irritated during driving, 82 (62%) said they are sometimes irritated, 29 (21.5%) said they feel irritated daily and rest (23, 17.2%) said that they were never irritated at work. The most common causes of irritation were (in decreasing order): rude/demanding behaviour of passengers, traffic congestion, not getting enough booking, personal issues like hunger, lack of sleep, tiredness and less time for family and narrow roads or difficult to reach locations [Table 2]. The factors significantly associated with irritation of drivers were long hours of working ( $P$  value  $< 0.001$ ), not taking a day off during the week ( $P$  value = 0.02) and presence of a self-reported medical condition ( $P$  value = 0.04).

**Table 2: Occupational details of the drivers**

Characteristics		n	Percentage
Length of association with the cab company	$\leq 1$ year	57	42.54
	1 year or more	77	57.46
Average drive per day (km)	upto 200	69	51.49
	$>200$	65	48.51
Working days in a week	5 or less	13	9.70
	6	80	59.70
	7	41	30.60
Average duration of working hours per day (h)	8-12	34	25.37
	12-15	65	48.51
	15-18	27	20.15
	18 or more	8	5.97
Being subjected to/involvement in road rage incident in last 1 year	Yes	23	17.16
	No	111	82.84
Booked for traffic violation in last 1 year	Yes	66	49.25
	No	68	50.75
Involvement in accident in last 1 year	Yes, minor	33	24.63
	Yes, major	3	2.24
	No	98	73.13
Feeling of irritation during driving	Daily/mostly	29	21.64
	Sometimes	82	61.19
	Never	23	17.16
Most common cause of irritation*	Not getting enough booking	30	27.05
	Traffic congestion	32	28.83
	Rude/demanding behaviour of passengers	39	35.14
	Narrow roads:difficult locations	6	5.41
	Personal issues like hunger, lack of sleep, tiredness and less time for family	14	12.61

Source: Original \*The responses were given by 111 drivers who felt irritated at work

#### Lifestyle behaviours of cab drivers

Majority (90, 67.2%) of drivers were sleeping for 5–7 h in a day, few (40, 28.2%) were sleeping for 8 h and a fewer (4, 3%) for  $<5$  h, with an average of  $6.7 \pm 1.2$  h of sleep during the day. Sixty (45%) drivers said they were having their meals on time, 57 (42.5%) never consumed junk food in place of a major meal and only 22 (16.4%) said they exercised at least on few days during a week [Table 3]. The risk of having junk food increased with younger age and unmarried status ( $P$  value  $< 0.001$ ).

#### Usage of habit-forming substances among cab drivers

Forty four (32.8%) drivers reported smoking tobacco, 37 (27.6%) said they used chewable tobacco and 42 (31.3%) consumed alcohol at least 2 days in a week [Table 4]. The average pack years were 4.59 and the average expenditure on smoking was 18 INR.

#### Self-reported medical conditions among cab drivers

Thirty four (25.3%) drivers reported suffering from gastrointestinal (GI) problems like acidity and indigestion, 52 (38.8%) reported to be suffering from musculoskeletal morbidity like back pain and knee pain, 2 (1.5%) had diabetes and 3 (2.3%) had hypertension.

#### Mental health status of cab drivers

When screened for depression, anxiety and stress, it was found out that 81 (60.5%) were suffering from some degree of depression, 63 (47%) had some degree of anxiety and 49 (36.5%) had variable degree of stress [Table 5]. The significant risk factors leading to stress were lack of sleep ( $P$  value = 0.009) and being irritated ( $P$  value = 0.004). Duration of sleep of  $<8$  h was also significantly associated with an unfavourable score on the DASS-21 scale (suggesting depression, anxiety or stress) ( $P$  value = 0.02).

**Table 3: Lifestyle details of drivers**

Characteristics		n	Percentage
Average hours of sleep per day	$<5$ h	4	2.99
	5-7 h	90	67.16
	8 h or more	40	29.85
Average cups of caffeinated drinks per day	2 or less	93	69.40
	3-4	28	20.90
	5 or more	13	9.70
Having meals on time	Daily/mostly	60	44.78
	Sometimes	63	47.01
	Never	11	8.21
Consumption of junk food	Daily/mostly	25	18.66
	Sometimes	52	38.81
	Never	57	42.54
Getting 8 h of sleep per day	Daily/mostly	53	39.55
	Sometimes	58	43.28
	Never	23	17.16
How often do you exercise in a week	Never	112	83.58
	Occasionally	5	3.73
	2 days or more	5	3.73
	5 days or more	12	8.96

Source: Original

In the present study, one-fourth of the drivers were suffering from GI disorders and 38% were suffering from musculoskeletal disorders like back pain and knee pain. Similar proportion of drivers (24%) have reported having GI problems in another study.<sup>[33]</sup> The drivers suffering from lower back pain were much higher in other studies (60% or more).<sup>[22,34]</sup> While, another study reported much lesser proportion of taxi drivers with lower back pain.<sup>[3]</sup> The main reasons of higher physical morbidity is driving for long hours, resting in the car in uncomfortable positions, frequent use of clutch during traffic situations, little physical activity and unhealthy eating.

In the current study, more than half of the drivers screened positive for depression, however, none of the independent variable was found to be significantly associated with the same. In a study done on truck drivers of Brazil, the prevalence of depression among truck drivers was 13.6% and depression was associated with younger age, low educational, use of stimulants and wage earning.<sup>[35]</sup> In another study done on truck drivers of USA, 26.9% were suffering from depression, 20.6% from chronic sleep disturbance and 13% from other emotional problems.<sup>[36]</sup>

In the current study, almost one-third are suffering from anxiety. The findings are different from a study done on truck drivers of USA, where 14.5% suffer from anxiety.<sup>[36]</sup> In the current study, 36% drivers had variable degrees of stress. The findings are congruent with a study done by Davidson *et al.* in Australia on taxi drivers which reported that one-third (33%) of drivers had very high (K10  $\geq$ 30) levels of distress and 28% had high (K10 = 22–29) levels of distress.<sup>[4]</sup> The levels of stress, however, were reported to be very high among drivers of public transport in Belgium where 70.2% drivers revealed their job to be stressful.<sup>[37]</sup> Los Angeles and New York city taxi driver data also highlight poor working conditions, high stress, safety fears and unstable income.<sup>[38,39]</sup> The lesser levels of stress reported in the current study is due to the use of a tool, which used proxy statements to measure stress rather than asking about stress itself. The results of the current study have shed light on the emotional and occupational health of cab drivers which is a highly underserved occupational group. Mental health should become a focal point of health interventions among the drivers and emphasis should be laid on promotion and prevention of mental health. Mental diseases should be assessed and treatment should be provided.

Health seeking among drivers in the current study is poor. More than two-third of the drivers never had a health check up in the last 1 year. When asked about self-reported diabetes and hypertension, only one driver had been diagnosed with diabetes and three with hypertension. The proportion is much lower than that reported in another study, where 28% of drivers had hypertension and 14% had diabetes.<sup>[29]</sup> Very few cases of chronic disease in the current study does not suggest absence of hypertension or diabetes among the drivers but mere non-diagnosis.

In the current study, none of the drivers had any health insurance provided by the company. In other studies the proportion of drivers with health insurance was higher (46–50%).<sup>[27,29]</sup> Health insurance cover in general population is low in India, the findings of current study reinforces the same. Moreover, drivers are generally considered independent contractors and thus not 'employees.' The vast majority are therefore not entitled to employer-sponsored health insurance options through taxi companies.<sup>[29]</sup>

The study may have certain limitations. The sample size is small and due to time constraints, the interview had to be kept short, which may have led to neglect some important independent variables that affect mental and physical health. A very important factor that may affect mental health status is personality trait – which was not assessed due to time constraints. The tool used to assess mental health was a mere screening tool and actual prevalence of depression, anxiety or stress could not be assessed. Owing to safety issues, the interview was only conducted during the day and this may have led to a bias due to non-inclusion of night shift drivers. Despite this, the study has good generalisability to other cab drivers of the city or other major cities of the country. Available data still provides valuable information on an understudied occupational group.

## CONCLUSION

The extent of mental and physical morbidities found in this study is profound and underscores the need to address driver's health through multiple levels of intervention. Unique characteristics of this job and demographic profile of drivers mandate highly specialised interventions. Their mental health problems should be addressed through screening, counselling and promotion of relaxation techniques like yoga. There is also an urgent need to promote healthy eating habits, taking walking breaks, cessation of use of habit-forming substances and frequent health check-ups. The cab companies need to implement measures to improve job satisfaction, particularly among the wage-earning drivers – as this is likely to improve their mental health. Improving health insurance coverage for this group of workers is recommended. Larger cohort studies should be done to study various aspects of driver's health and collaboration with hospitals should be done so that they can conveniently seek care.

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## Competing interests

The authors declare no competing interests.

## Author's contribution

Akanksha Rathi has conceptualised the study, collected the data and written the manuscript. Vikas Kumar has done data analysis and has revised the manuscript. Amrita Singh has done data collection and analysis and Panna Lal has revised and finalised the manuscript.



and health-promoting practices.<sup>[6-11]</sup> As with many community health problems, the knowledge, attitude, and practices (KAPs) of the population play a major role in implementation of control measures of VBDs.

To combat common diseases, the World Health Organization has proposed the use of lay persons as health educators.<sup>[12]</sup> Schools provide a critical opportunity to children to learn about common health problems and endemic disease and ways to prevent them. Teachers can act as excellent educators by playing a key role of delivering important health education messages to children and targeting an important health determinant – the health behavior.<sup>[13,14]</sup>

Despite their importance, little attention has been paid to the role of school teachers as health educators. There is not much research available regarding which areas of prevention could be improved at the population level by promoting health education in schools by teachers.<sup>[15]</sup> Few studies have shed light on their role as health educators to combat diseases such as AIDS and oral diseases.<sup>[16,17]</sup> Therefore, there is a need to explore areas of prevention and health promotion that can be converted into successful prevention programs at the school levels with the help of teachers.<sup>[18,19]</sup>

There is little information on the KAP components of the community in relation to the mosquitoes and their control in India.<sup>[20]</sup> In addition, the literature available on teacher's health behaviors is scarce and inconsistent.<sup>[15]</sup>

Since teachers have a key role in society as educators, this study was carried out to know school teacher's KAP related to dengue and malaria and the effect of 1-day workshop on their knowledge.

## Materials and Methods

### Study design and participants

This is a cross-sectional study conducted on 3<sup>rd</sup>, 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> April 2017. All participants were Municipal Corporation of Delhi (MCD) schoolteachers, which were nodal in-charge of their schools for VBD control activities. The purpose of the study was explained to them and they were asked for their willingness to participate. After clarifications were made, the participants were asked to sign the informed consent form to indicate their understanding and agreement to participate. The study protocol was approved by institutional ethical committee before its use in the study.

### Study instrument and data collection

Data were collected with a pretested self-administered questionnaire. The questionnaire covered the following areas: sociodemographic characteristics (sex, age, marital status, education, income, and number of members in household), knowledge, personal experience, attitude, and practices regarding VBDs.

### Intervention workshop

After collecting the pretest questionnaire, the participants attended 1-day workshop on prevention and control of VBDs, organized by the public health department of MCD, north division. In a duration of 4 days, 212 teachers of 212 schools in north division of MCD attended this. The workshop consisted of lectures and interactive sessions with the help of audio-visual aids. There were demonstrations of models of different mosquitoes, insecticides, and larvae. The session was followed by a discussion and question-answer round. Once the workshop was over, a posttest questionnaire was handed over to the participants to fill.

### Data analysis

The characteristics of the study population are presented as means, standard deviations, ranges, and frequency tabulations. Each participant was assigned a knowledge score based on the number of correct or appropriate responses. The scores were further divided arbitrarily in low, medium, and high scores. Those participants who correctly answered 75% or more of questions were termed as high scorers, those who correctly answered between 50%–74% of the questions were medium scorers, and rest were low scorers. It was done for both, pre- and post-intervention scores. The answers have been depicted in the forms of tables and frequencies. The association between KAP and associated factors was calculated using Chi-square (or Fisher's exact test) and a *P*-value of <0.05 was deemed as significant. The knowledge scores of pre- and posttest were converted into discrete data by categorizing in high, medium, and low scores and were compared using chi-square test.

## Results

A total of 212 school teachers participated in the study. The mean age of the participants was  $38.57 \pm 8.25$  years. Almost 60% of the teachers were between 20 and 39 years of age and the remaining were of 40 or more years. The range of age was 20–63 years. The majority were females (57.5%), followed by males (42.5%). Half of the respondents (50%) were graduates, followed by postgraduates (41.5%) and intermediates (8.5%). The socioeconomic status (SES) was calculated according to Modified BG Prasad scale, which takes into consideration the monthly per capita income. According to the same, a very high percentage of teachers (94.3%) fell into the socioeconomic scale category I and the remaining were in categories II–IV [Table 1].

Regarding knowledge of respondents, almost all respondents (99.1%) knew that mosquito bite is responsible for malaria and around three-fourth of them knew that female anopheles mosquito transmits malaria and chloroquin is commonly used in the treatment of malaria. More than 90% of respondents knew that dengue causing mosquito breeds in clean water and bites usually during daytime, 73.6% knew that the vector for dengue is *Aedes*, and 71.7% knew that aspirin should be avoided in a suspected case of dengue. Three-fourths of the respondents were aware of common symptoms of

**Table 3: Attitude of the study participants regarding malaria and dengue**

Beliefs	Responses	Frequency (%)
Belief about fatality of malaria	Ordinary disease	32 (15.1)
	Serious disease	26 (12.3)
	If not treated in time, patient may die	128 (60.4)
	No idea	26 (12.3)
Belief about possibility of prevention of dengue	Yes	186 (87.7)
	No idea	26 (12.3)
Belief about dengue being a problem in Delhi	Yes	182 (85.8)
	No	12 (5.7)
	No idea	18 (8.5)
Belief about responsibility of malaria/dengue prevention and control	Government agencies only	6 (2.8)
	Collective responsibility of government and community	204 (96.2)
	No idea	2 (0.9)

**Table 4: Practice of the study participants regarding malaria and dengue**

Practices	Responses	Frequency (%)
Whether suffered from dengue or malaria ever	Yes	50 (23.6)
	No	150 (70.8)
	No response	12 (5.7)
Preferred health facility for consultation during last episode of dengue or malaria	Government hospital	24 (48.0)
	Qualified doctors in private clinic	24 (48.0)
	Self-medication	2 (4.0)
Type of medicines taken during last episode of dengue or malaria*	Allopathic	44 (88.0)
	Ayurvedic	4 (8.0)
	Homeopathic	2 (4.0)
	Home remedies	8 (16.0)
Personal protective methods used against mosquito bites†	Mosquito net	90 (42.5)
	Mats, coil, agarbatti	64 (30.2)
	Hit, All Out, Good Night	118 (55.7)
	Fast moving fan	48 (22.6)
	No response	10 (4.7)
Regularly empty water container or stagnant water in the house	Yes	180 (84.9)
	No	20 (9.4)
	No response	12 (5.7)

\*Multiple responses

such as obesity.<sup>[21-23]</sup> Because teachers have a generally higher social status in a community and a high degree of contact with students and parents, they can be effective stakeholders in the fight against VBDs. In a semiliterate society, the school child may well be the first in the family to be educated. The information he carries home may be seen as modern, reliable, and believable. This study was aimed to assess school teacher's KAPs related to dengue and malaria. It was also aimed to assess the effect of 1-day workshop on the knowledge of participants.

The mean age of the participants in this study was similar to that reported by other studies.<sup>[2,8,24,25]</sup> In this study, the majority of

teachers were females. Similar observations have been reported in other studies.<sup>[2,24-27]</sup> In this study, it has been reported that a large number of teachers were graduates and postgraduates, which is much more than that reported in a study done by Metuh and Ikpeze<sup>[29]</sup> in school teachers in Nigeria. The possible explanation may be that in India education begins early and majority of professionals opt for postgraduation. The ownership of house reported in this study is also similar to that reported by a study done by Alobuia *et al.*<sup>[2]</sup> in Jamaica.

The study participants had a fairly good knowledge about transmission and symptoms of malaria. In this study, almost all respondents (99.1%) knew that mosquitoes transmit malaria. Similar observations (70%–90%) have been made in other studies.<sup>[8,24,25,27]</sup> On the contrary, the study done by Alobuia *et al.*<sup>[2]</sup> in Jamaica reported a much smaller figure (39%). The authors have reported that the reason for such poor knowledge is that Jamaica is not a country where malaria is endemic, and only a small portion of individuals knew anyone who had been diagnosed with dengue or malaria. Another reason might be that study participants in our study were teachers while they were patients and their relatives in the Jamaica study.

Three-fourth of the respondents in this study knew that fever with chills and rigor is characteristic of malaria. The observation is congruent to those reported in other studies.<sup>[6,27,28]</sup> However, De *et al.*<sup>[25]</sup> from Siliguri, India, reported that 97% had good knowledge regarding clinical features of malaria such as fever, shivering, headache, and vomiting. The reason is that Siliguri is highly endemic for malaria and the awareness level of people is good.

In this study, the study participants were mostly aware about the biting time and breeding sites of mosquito vector of dengue. About 95% of participants knew that biting time of *Aedes* is during the day. Contrarily, Alobuia *et al.*<sup>[2]</sup> in Jamaica reported that only 2.5% of the study participants knew that biting time of *Aedes* was daytime. The reason may be that participants of our study are teachers and mostly are from good socioeconomic background.

About 92% of respondents knew that dengue vector breeds in clean stagnant water in this study. The figure is much higher than that reported by a study done by Boratne *et al.*<sup>[29]</sup> in Puducherry (60.69%). The reason for this observation is that the Puducherry study was carried out in periurban areas and the study population mainly consisted of housewives and daily wagers, whose awareness level might be lower than that of the participants in this study.

The attitude of respondents in this study was observed to be majorly favorable as 60% of them thought of malaria as a serious disease and 85.8% thought dengue to be a serious problem in Delhi. Similar observations have been made (47%–96%) in other studies where community people from different geographical areas have perceived mosquito-borne diseases as a serious problem.<sup>[2,29,30]</sup> Another positive observation seen

might be the high level of awareness of the study participants. The second reason might also be the fear of dengue during transmission season as the frequent outbreaks of dengue in the city, which leaves many dead, creates panic among the community.

A sizeable proportion of the respondents were using personal prophylaxis measures against mosquitoes, which is again reflective of the high awareness level. One-third of the participants reported using mosquito coils and mats, which is similar to the observation reported by another study.<sup>[24]</sup> The maximum number of respondents (more than half) used liquid repellent vaporizers. Similar findings have been reported in other studies.<sup>[6,24,27]</sup> A large number of respondents (42.5%) also used mosquito nets for personal protection. The findings are not congruent with other studies, which reported a much lesser prevalent use of nets (14.4%–35%).<sup>[25,28]</sup> Mosquito nets are frequently used in Delhi due to the high density of mosquito population that remains stable almost throughout the year.

An encouraging practice reported in this study is that a large number of respondents reported emptying the water containers in their house regularly, which is more than that reported by other studies.<sup>[2,25,27]</sup> The education and awareness campaigns conducted in the city seem to be responsible for spreading the message of source reduction.

In this study, it is seen that the knowledge score or attitude did not differ significantly with sociodemographic factors such as age, gender, education, SES, or ownership of residence. Few studies have reported similar observations.<sup>[2,24]</sup>

However, personal experience and few practices were found significantly associated with few demographic factors. In this study, it was found that older respondents were more likely to be affected by dengue or malaria in their lifetime. The reason for the same is that they had been exposed for a longer time to acquiring these diseases due to their age. More number of younger respondents empty the containers in and around their house as they are more active and probably are more health conscious. Another interesting finding reported in this study is that participants living in rented houses were more likely to use mosquito bed nets (75%) when compared with those living in self-owned houses (38.3%). The reason being that home-owner may have better housing conditions like permanent net or screening on windows and live in better conditions thus are less concerned about the mosquito problem.

An important finding reported in the study is the significant improvement in knowledge score of the participants following health education workshop. In view of the foregoing conclusions, health education workshops and campaigns may deem helpful in improving the awareness among particular groups like teachers. Evidence from prior researches also supports this fact as effective reduction of vector breeding sites was observed to be achieved by community education alone rather than use of chemical methods.<sup>[33]</sup>

This study emphasizes on the use of school teachers as health educators. This will greatly reduce the burden on primary care physicians – who are the first point of contact for continuing healthcare of members of the community. The primary care physicians have to have a wide knowledge on all subjects and are expected to provide treatments, preventive care, and health education. Their work will become easier with the intersectoral collaboration of health and education sectors.

This study has certain limitations, which must be taken into consideration when interpreting the results. First, our assessments of attitudes and practices toward VBDs and vector control have relied on self-reported data collected through self-administered questionnaires and could be affected by bias. Second, we have included in the study a particular cohort of professionals (teachers), whose awareness level is expected to be high. In addition, they are well-educated and thus there is a significant improvement in the already high knowledge scores. The interpretation cannot be extrapolated on general population as the education level and awareness might not be at par. However, despite these limitations, our findings contribute to our understanding of KAP regarding VBDs in school teachers in Delhi and can be used to develop interventions designed to improve vector control and reduce transmission of these diseases in the region and possibly the country.

## Conclusion

Despite so many efforts to control malaria, dengue, and chikunguniya, these diseases are still having a huge impact on health, well-being, and economy of the people. Key success for mosquito-borne diseases control depends not only on services provided by health authority but also on knowledge, awareness, and practices for prevention and early care-seeking behavior of the community. There is a need to know and improve existing knowledge and practice regarding mosquito-borne diseases and its control in community. In addition, innovative interventions like actively involving school teachers to spread health education messages must be explored to improve the KAPs of the community, which in turn will affect the burden of diseases.

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## Conflicts of interest

There are no conflicts of interest.

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# Assessment of knowledge, attitude, and practices toward prevention of hepatitis B infection among medical students in a high-risk setting of a newly established medical institution

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## Abstract:

**BACKGROUND:** India is in the intermediate hepatitis B virus endemicity zone with hepatitis B surface antigen prevalence among the general population ranges from 2% to 8%. Among health-care workers, seroprevalence is two to four times higher than that of the general population.

**AIM:** The aim of the study was done to assess the knowledge, attitude, and practices (KAPs) of medical students regarding hepatitis B.

**MATERIALS AND METHODS:** This is a cross-sectional study that was conducted from March to April 2018. Students were invited to the department on specified dates for awareness and immunization against hepatitis B. Their KAP was assessed with the help of a self-administered questionnaire.

**RESULTS:** With a response rate of 81.3%, a total of 161 students participated in the study out of 198. Out of the 161 study participants, only 13 (8%) students had received a completed course of hepatitis B vaccination in the past, 30 (18.7%) students had a history of inability to complete the three doses of hepatitis B vaccination, and the rest 118 (73.3%) students were never immunized against hepatitis B. The knowledge about the risk of acquiring the disease at the hospital or high-risk setting was present in less than half of the students. The average knowledge score was 10.63 out of 16 and average healthy practice score was 2.94 out of 4. On applying Pearson correlation test, it was found that there was a positive correlation of knowledge and practices of the students ( $P = 0.012$ ), implying that better knowledge of the disease has a positive effect on the practices exercised by an individual.

**CONCLUSION:** Newly enrolled students and other individuals attached to a high-risk setting such as a medical institution should be screened for immunization status during initial medical examination as the number of unimmunized persons, especially against hepatitis B is high.

## Key words:

Hepatitis screening, hepatitis B, high risk, knowledge, attitude, and practices, medical students

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## Introduction

Hepatitis B infection is an ancient disease from the times of Bronze Age<sup>[1]</sup> which had been suspected as an agent of infection in the 50s which was later reported first as Australian antigen in the 60s,<sup>[2]</sup> and subsequently discovered under the electron

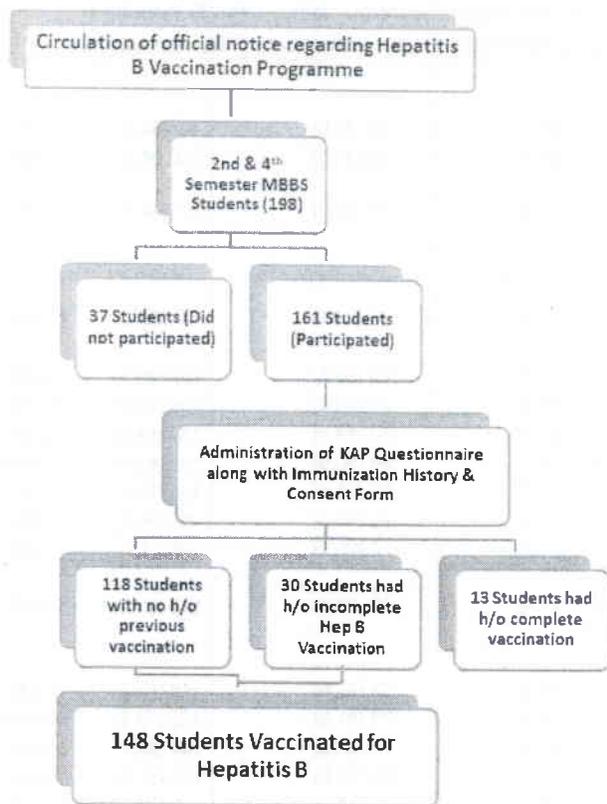
microscope in the 70s.<sup>[3]</sup> Vaccination for hepatitis B was introduced in the 80s.<sup>[4]</sup>

Hepatitis B is a major public health problem as one-third of the world population is infected with hepatitis B virus (HBV).<sup>[5,6]</sup> Based on the prevalence of hepatitis B surface antigen (HBsAg), different areas of the world are classified as

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**Figure 1:** The flow chart of data collection and immunization activity. An official notice was circulated among the 2<sup>nd</sup>- and 4<sup>th</sup>-semester medical students, whose total number was 198. Out of them, 37 students did not participate in the study and 161 students did. The students who appeared were explained about the study and a knowledge, attitude, and practice questionnaire and consent form was distributed to them. Out of them, 13 students reported that they have received all three doses of hepatitis B vaccine. Rest of the 148 students was vaccinated

## Results

### Characteristics of the study participants

From the combined strength of 198 of the second and fourth semester (1<sup>st</sup> and 2<sup>nd</sup> year) students, 161 (81.3%) students turned up for immunization on the specified dates. The students were between the ages of 17 and 25 years. About 37 (18.7%) students did not attend the sessions even after repeated announcements (at least three times) and their status could be ascertained. Majority of the students were male (112, 70%) as compared to females (49, 30%) [Table 1].

### Knowledge of students regarding risk, mode of transmission, and prevention of hepatitis B

The knowledge about their risk of acquiring the disease at the hospital was present in less than half of the students. Only 50.3% were aware that it can be transmitted through percutaneous injury, 39.8% knew about the transmission through contact of mucous membrane with potentially infectious material, and 44.1% knew that it can be transmitted if breached

**Table 1:** Descriptive characteristics of students involved in the study (n=161)

Characteristics	n (%)
Age (years)	
17-18	27 (16.8)
19-20	95 (59.0)
21-22	37 (22.9)
23-25	2 (1.2)
Sex	
Female	49 (30.4)
Male	112 (69.6)
Semester of MBBS	
Fourth	73 (45.3)
Second	88 (54.7)

skin comes in contact with infectious material. Only 47 (29.2%) students knew that there is a 10%–30% risk of transmission of HBV infection in case of a needlestick injury. The mode of transmission or source of infection was correctly answered by 24%–94% of the students where maximum students (94.5%) knew about the blood or blood products and very few students (24.2%) knew about the breast milk as being the source of infection for hepatitis B. A large number of students knew about the ways of prevention of hepatitis B like 95.2% knew about use of sterile instruments, 92.5% about safe sex, 98% about hepatitis B vaccination, and 81.6% about use of gloves while handling infectious material. The mean knowledge score of 2<sup>nd</sup>-year students was 11.3 and that of 1<sup>st</sup>-year students was 10.6 out of 16. There was statistically significant difference between the knowledge of 1<sup>st</sup>- and 2<sup>nd</sup>-year students ( $P = 0.008$ ) [Table 2]. When the students were asked whether they have been exposed to potentially infectious material, everyone stated that they have not. Similarly, none of the students reported being hepatitis B status positive.

### Attitude of students toward vaccination against hepatitis B

The attitude of the students has been given in Table 3. Out of the four attitude questions, two were positive and two were negative. The attitude of the students was positive as 155 (96.3%) opined that everyone should get hepatitis B vaccination and 145 (90.1%) thought that the vaccine is certainly helpful. Only six (3.7%) students said that they are either not at risk or do not need the vaccine.

### Preventive practices of students toward hepatitis B

Out of the 161 study participants, only 13 (8%) students had received a completed course of hepatitis B vaccination in the past, 30 (18.7%) students had a history of inability to complete the three doses of hepatitis B vaccination and the rest 118 (73.3%) students were never immunized against hepatitis B. Majority of the students stated that they ask for a new syringe whenever they get injections, they ask the barber to change the blade

**Table 4: Preventive practices of students toward Hepatitis B**

Questions pertaining to practices of students	Fourth semester (n=73), n (%)	Second semester (n=88), n (%)	Total (n=161), n (%)	P
1. Have you received hepatitis B vaccine previously				
Yes	15 (20.5)	28 (31.8)	43 (26.7)	0.108
No	58 (79.5)	60 (68.2)	118 (73.3)	
2. If you needed injection, did you ask for a new syringe before use?				
Yes	67 (91.8)	77 (87.5)	144 (89.4)	0.379
No	6 (8.2)	11 (12.5)	17 (10.6)	
3. Do you ask your barber to use new blade for shaving/hair cutting?				
Yes	64 (87.7)	80 (90.9)	144 (89.4)	0.506
No	9 (12.3)	8 (9.1)	17 (10.6)	
4. Do you ask for sterilized equipment for ear and nose piercing?				
Yes	67 (91.8)	76 (86.4)	143 (88.8)	0.278
No	6 (8.2)	12 (13.6)	18 (11.2)	
Total healthy practice score (mean)	2.93	2.97	2.94	0.738

**Table 5: Correlation between knowledge score and healthy practice score**

Scores	Mean	SD	n	Correlation coefficient	P
Total knowledge score	10.73	2.502	161	0.198	0.012
Total practice score	2.94	0.903	161		

SD = Standard deviation

regard to beneficial health procedures and program, evidence from literature suggests otherwise.<sup>[33-35]</sup> The vaccination of HCWs become even more important as most of the HBV infections in HCWs are attributable to accidental percutaneous exposure which are deemed trivial to be recalled by HCWs for executing preventive measures.<sup>[36]</sup>

The WHO seeks to achieve the goal of viral hepatitis elimination by 2030 and lack of general knowledge about viral hepatitis seems to be a barrier to reaching this goal.<sup>[37]</sup> This study showed that medical students have poor knowledge and lack of awareness about hepatitis B, its routes of transmission, risk factors, and modes of prevention; however, the attitude is largely positive. The findings are congruent with that of other studies.<sup>[24,38,39]</sup> According to a study on medical students by Al-Ghamdi, anti-HBs levels were significantly low in many students after their primary immunization. Therefore, the testing medical students for anti-HBs levels may be warranted as they represent a high-risk population.<sup>[40]</sup> A few studies, however, reports good knowledge (>80%) among the medical students.<sup>[25,29]</sup>

The study facilitated to immunize the future budding health-care professionals against hepatitis B infection. The study was planned and executed within the mandate of WHO hepatitis B guidelines in a low- and

middle-income country such that maximum gains are attained by existing available resources. The immunization activity served as a good platform for the students for gaining awareness on related subtopics such as standard/universal precautions, biomedical waste management, and postexposure prophylaxis.

### Conclusion

Newly enrolled students and other individuals attached to a high-risk setting such as a medical institution should be screened for immunization status during initial medical examination as the number of unimmunized persons, especially against hepatitis B, are high. The study served to screen and enroll individuals with incomplete or no immunization against hepatitis B and immunize them in the catch-up vaccination program. Such screening and catch-up vaccination program can enable policy-makers to achieve elimination levels of hepatitis B.

### Acknowledgments

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### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

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5 messages

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Thanking you,

Yours sincerely,

Peush Sahní

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Thu, Jun 28, 2018 at 10:59 AM

Thank you so much.

Regards

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