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Psychological impacts on the travel behaviour post COVID-19

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ABSTRACT

The present study investigates the behavioural impact of COVID-19 on commuter’s mobility. For this purpose, an online questionnaire survey was prepared, which was circulated in Delhi, India. More than 200 respondents participated in the survey. The information regarding travel patterns, working, mental health, and psychological stress are obtained for pre, during and post-COVID-19 periods. The results highlight that a significant number of commuters stated to shift their choice of commuting from shared modes to private modes of transport in the post-COVID-19 period. About 28.7% of persons who change their modes are likely to use it for a more extended period. Due to lockdown, 65% of people who are working/studying from home expressed to resume offline mode after COVID-19. About 80% of the persons will have anxiety and tension, which is likely to affect their driving behaviour (e.g., rash driving, distraction, insecurity).

1. Introduction

1.1. Background

Presently, Severe Acute Respiratory Syndrome associated Coronavirus (commonly known as SARS CoV-2, nCoV-19, or COVID-19) has achieved pandemic status worldwide. Today, most persons are occupied by assessing the impact of the ongoing pandemic on physical health, livelihood, the economy of the family, and the nation. In 2003, a similar disease (SARS-CoV or SARS-CoV-1) was identified and first reported. The SARS-CoV-1 infected more than 8000 persons, of which more than 750 lives were lost (Chan-Yeung and Xu, 2003). Though many researchers are attempting to study the propagation of the virus, epidemic modelling with respect to transport (Müller et al., 2020), physical distancing in public transport (Suman et al., 2020), contact duration (Qian et al., 2020), future transport policy after-COVID-19 (Thombre and Agarwal, 2021), etc., the psychological impact of the pandemic situation is understudied. Therefore, this paper attempts to analyze the psychological impacts of COVID-19 on travel and driver behaviour.

1.2. Psychological burden

Today, most countries are battling a psychological crisis that is not yet fully explored and well researched. Globally, living in a state of constant fear due to the chances of getting infections accompanied with no assurance of safety, etc., is resulting in the life of the people in mental trauma and anxiety, which are likely to have an adverse impact on the mental health of the people and their well-being. The outbreak of Coronavirus has affected different groups of persons differently; for instance, (a) COVID-19 infected persons face issues like loneliness, anxiety, panic, post-traumatic stress (PTSD) disorder, panic, depression, and (b) health care providers might have issues like guilt, burnouts, depression, guilt, uncertainty, PTSD, etc., (Dubey et al., 2020). To curb the transmission of the virus, a major part of the world population is restricted to their homes due to a nationwide lockdown that can put a psychological burden on human mental health (Rubin and Wessely, 2020; Pulla, 2020). Keeping this thing in view, the World Health Organization has provided several guidelines to the general public, healthcare workers, people in isolation, children, older people, and people with an underlying health condition to support mental and psychological well-being (WHO, 2020).

Looking at the impact of COVID-19 on the world population, there are various ways in which this pandemic will affect people’s mental health (Zandifar and Badrfam, 2020). Person et al. (2004) and Siu (2008) show that the persons infected from the SARS outbreak found it difficult to follow their typical day-to-day routine years after virus exposure, and healthcare workers are more prone to such issues. Similar to many countries, a nationwide lockdown was imposed in India to

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control the spread of the COVID-19 virus, and travel restrictions have been imposed for an extended period (Kumar and Nataraj, 2020). Residents of containment zones are left without any social life, leisure, or sports activities. In addition to that, most of them are required to work or study from home. At the same time, a significant number of persons are also sent for quarantine due to a variety of reasons (e.g., coming from containment zones, close contact with an infected person, showing symptoms, etc.), and that results in a variety of psychological problems such as high levels of anxiety, anger, depression, panic disorder, emotional disturbance, and post-traumatic stress (Brooks et al., 2020; Hawryluck et al., 2004). These mental problems get elevated post quarantine due to many reasons like financial loss, an insufficient supply of essentials, the progression of the virus, and misleading information (Brooks et al., 2020; Hawryluck et al., 2004).

1.3. Impact of COVID-19

Many previous studies have discussed and shown many types of psychosocial effects that can affect the common people. There is mass fear among people due to the uncertainty of the character of COVID-19, which has led to adverse psychological reactions. It has been reported that the perceived risk of infection can generate ill-adapted behaviours, emotional distress, and avoidance reactions among common people (Taha et al., 2019). A Chinese study conducted in January and February 2020 showed that 54% of respondents had mild to extreme symptoms, 29% had mild to severe anxiety symptoms, and 17% had moderate to severe symptoms of depression (Wang et al., 2020). Another survey based on 53,000 respondents showed that 35% of people had psychological distress, 29% had mild to moderate symptoms, and 5% had severe symptoms (Qi et al., 2020).

Some studies in India show how Indian people are coping with the psychological stress of COVID-19. An online study was conducted with 1000 respondents in 64 cities in India during the initial phase of the pandemic, focusing primarily on the psychological effects of COVID-19. The results reveal that almost one-third of respondents are affected by the psychological impact. Younger age people and the female gender with some diseases are most affected (Varshney et al., 2020). A similar online survey was conducted in West Bengal at the end of March 2020, and the results showed that about 72% of respondents were worried, and about 25% were depressed by the prevailing situation over the last two weeks. Approximately 70% of respondents were concerned about their financial condition and loss during the lockdown period, and 65% admitted that COVID-19 had affected their mental health (Chakraborty and Chatterjee, 2020). Nearly 35% of respondents were found to have started avoiding media exposure to keep their anxiety levels stable (Balkhi et al., 2020). Besides, there have been studies that involve college students in China and show that the level of anxiety among students is comparatively higher and has been positively associated with the delay in academic activities and a shift in daily lifestyles (Gao et al., 2020). Like Females, young persons, students, and persons with higher educational status had symptoms like dizziness, myalgias, and coryza (Wang et al., 2020).

1.4. Impact on children and older persons

Apart from healthcare workers, the most affected group of people are children and older people, which is probably the most crucial and overlooked issue (Ghosh et al., 2020). Closure of various facilities, such as schools, parks, playgrounds, etc., has a severe impact on children’s routines, potentially leading to distress and confusion. Moreover, several other factors, such as the frustration of the physical distancing with friends, loss of personal space at home, and financial losses of family incurred during the lockdown, may influence children emotionally and increase their mental stress (Ghosh et al., 2020). Unlike children, older people with certain critical illnesses are more vulnerable to COVID-19 as it raises their risk of death, thereby causing fear among them (Munis and Field, 2010). Additionally, other psychological effects, such as irritability, anxiety, and excessive stress or frustration, can also affect the elderly (Siu, 2008).

1.5. Impact on working persons

To control the spread of the Coronavirus, not only public spaces but industries and workplaces were also closed. The employees were asked to work from home if it is possible remotely. To compare the working persons’ behaviour before and during the COVID-19, a study was conducted during the lockdown in the Netherlands (de Haas et al., 2020). Based on 2800 samples between March 27 to April 4, 2020, the authors find that the working routine of more than half of the workers had changed; for instance, (a) 24% of the respondents changed their working times, (b) 16% reduced their working hours, (c) about 10% temporarily stopped working, (d) about 65% reported home as a comfortable place to work, etc. Similarly, a study from the US exhibits that more than 35% of the people worked from home in May 2020, up from 8.2% in Feb. 2020 (Bick et al., 2020). About 44% of the working 43 persons who commuted in Feb. 2020 continued to do so in May 2020. Another study reveals that about 37% of the workers continued to commute amidst the pandemic (Brynjolfsson et al., 2020). Further, 15% of the people were working remotely before-COVID-19. About 12% of persons working about a month before-COVID-19 outbreak reduced their working hours or were not working. A European study focuses on living and working during COVID-19 (Eurofound, 2020). Data collected from 27 European countries shows that 5% of respondents lost their jobs permanently, while 23% temporarily lost their jobs. Apart from this, 16% of workers are likely to lose their jobs in the near future in terms of job security. The workers’ working time had been decreased, and results indicate that 50% of the working population had reduced their working time and, contrary to this, 7% of workers reported that their working time had been increased. The countries where the largest proportions of workers were working from home are Finland (close to 60%), Luxembourg, Belgium, Netherlands and Denmark (above 50%) and more than 40% in Austria, Italy, and Sweden. For India, Thombre and Agarwal (2021) find that about 66% of the persons from mega-cities and 57% of persons from other cities were working/studying remotely during the lockdown. Surprisingly, 88% of persons experienced stress/anxiety/fear while teleworking. Interestingly, in the post-COVID-19 situation, only 12% of the persons from mega-cities and 19% of persons from other cities reported working/studying from home.

1.6. Impact on travel

As discussed above, the COVID-19 and lockdown have affected people of all ages and classes and brought lives to a standstill. People’s mental health has been affected due to the fear of getting infected, and this psychological stress has been elevated during the lockdown. Consequently, this psychological stress will affect travel behaviour, as people may feel anxiety and fear in their minds when travelling on public transport (PT). Due to high psychological stress and responsibility to maintain the physical-distancing can affect people’s choice of mode, and people might avoid PT (Troko et al., 2020). Because of (a) high psychological stress, many people may not travel at all (b) many persons may start working/studying from home, and this is likely to bring down the overall travel demand (Thombre and Agarwal, 2021). Public transport usage is likely to see a sharp fall, while concurrent use of private vehicles is expected to surge as people will like to travel alone or with their family members and friends (TERI, 2020). Those who do not have alternatives other than PT may try to avoid peak hours and start travelling off-peak hours (De Vos, 2020). Those who are working from home if it is possible remotely may start working/studying from home, and this is likely to bring down the overall travel demand (Thombre and Agarwal, 2021).
sales during COVID 19 (Interreg Europe, 2020). Several online surveys and studies have determined the short-term and long-term effects of COVID-19 on people's travel behaviour. In April 2020, an online study in China revealed that most travellers are expected to make their first leisure trip between September and October.

Further, it was found the travellers that were willing to make the first trip were young, single, and middle-class people (Chen et al., 2020). Another study from China assesses the change in people's behaviour during peak periods and after recovering from the COVID-19 pandemic (Wu et al., 2020). The study shows that most people stopped working during peak periods, except for medical staff, and by the end of April 2020, 78% of people started going to the office, and 22% were working from home. In terms of PT's use prior to the pandemic outbreak, 59% of people used PT, and this number was reduced to 13% during the peak, and 49% were using PT at the end of April 2020. Similarly, an online study was conducted in Spain to assess the situation of Spanish citizens and their perceptions of the COVID-19 pandemic (Oliver et al., 2020). Over 1,56,000 respondents participated in the study, and it was found that respondents mainly come out of the house to buy daily needs, and about 10% did not leave their house. The private mode of transportation sees a surge as high as 84.5%. The US travel association survey and MMGY travel intelligence team conduct an online tracking survey to know the impact of COVID-19 on US citizens' travel behaviour in various phases (MMGY, 2020). In its second report, released in the second week of April 2020, 60% of the leisure trips have already been cancelled, and 33% of people have rescheduled their plans. The report published on June 10, 2020, reported that people are most optimistic about travel compared to the previous survey. For instance, the number of persons who would like to make a leisure trip increased from 36% to 66% from the 4th to 5th reports (published in May and June 2020, respectively). People feel safer while making overnight leisure trips, and about 33% still feel unsafe while taking overnight trips. This survey shows how people are becoming more optimistic despite no reduction in the number of new cases in the United States, indicating that travellers are becoming habitual due to the prolonged period of the pandemic.

There have been similar trends in India, but as expected, a huge drop in all types of trips is reported during the lockdown period. One of the early studies was released by the Institute of Energy and Resources in the middle of the first lockdown (TERI, 2020). They carried out an online survey in April 2020, and it was reported that 35% of respondents are most likely to change their mode of travel to work after COVID-19. Post COVID-19, there will be a sharp decrease in PT and shared mobility usage. People may shift towards private transportation, intermediate PT, and non-motorized transport (NMT) will increase for short-distance trips. Similar results were found in an online study carried out between May 20 to June 31, 2020, which showed that people are likely to use a personal vehicle for work trips instead of PT (Aaditya and Rahul, 2021a). Between February 15 and April 30, 2020, retail and recreation were decreased by 73%, grocery and pharmacy by 51%, visit parks by 46%, transit stations by 66%, and workplaces mobility were decreased by 57% (Saha et al., 2020; Google, 2020). In addition to the immediate impact on the travel demand, it is likely to have a psychological impact on driver behaviour due to COVID-19. For instance, a study shows that depression and anxiety are likely to increase the likelihood of crashes (Alavi et al., 2017).

1.7. Problem statement

Although there have been many pandemics and epidemics such as SARS, MERS, and Ebola in the past few decades, the world has faced no such pandemic which has had such an enormous impact on people worldwide. Therefore, it becomes imperative to assess people’s psychology which plays an important role in human decision-making and, thereby, in their activities and actions. The literature review described above has been presented in two parts. The first part is about the psychological impact of COVID-19 on people of all ages and groups. The second part is about the effect of COVID-19 on travel behaviour. The literature lacks studies showing how adverse psychological impacts can lead to a change in travel behaviour. To address this research gap, the present study has the following objectives: (a) to investigate the behavioural impacts of COVID-19 on mobility in Delhi, India, (b) to investigate the psychological impact of COVID-19 and (c) to analyze the impacts of the psychological factors on the travel and driving behaviour.

2. Data collection

2.1. Survey questionnaire design

A cross-sectional and observational study was conducted in Delhi, the capital city of India, during the second week of June 2020 to capture the psychological impacts of the ongoing Coronavirus pandemic and associated changes in travel behaviour. The study was designed for primary (work/study) activities. An online structured questionnaire was developed using Google Forms and then floated through (a) e-mails to public and private organizations in Delhi and (b) personal messages to persons working/studying and residing in the Delhi NCR (National Capital Region). Organizations were encouraged to float this questionnaire to their employees, family members, and friends working/studying and residing in Delhi, NCR. A bilingual survey was created to capture responses from lower-income employees who are not comfortable in English (English and Hindi). The survey was designed in the second week of June 2020. A total of 63 questions were asked in the questionnaire, clustered into five parts; they are (a) basic information, (b) pre-COVID-19, (c) during COVID-19 (lockdown), (d) Post-COVID-19 (c) behavioural parameters. The questionnaire comprises questions on basic information, mental health, and psychological stress before COVID-19 & during the lockdown, travel activity before COVID-19 & during the lockdown, and after COVID-19. The questionnaire comprises three sections. The first section comprises basic information in which questions related to the demographics of the respondents were asked. The demographic information collected from the questionnaire was gender, age, marital status, education qualification, profession, and personal monthly income. The second section comprises three parts where respondents were asked about the parameters while choosing the transport mode before COVID-19, during the lockdown, and after COVID-19, and about the change in transport mode due to COVID-19. Then respondents were also asked about their travel plan post-lockdown. The predominant mode of transport for commuting to primary and secondary activities was asked and in addition to the trip length of primary activities.

The questionnaire also comprised working/studying efficiency during the lockdown, willingness to work/study from home/university/workplace after lockdown, and staggering working hours. Regarding psychological changes, the respondents were asked about their mental health and how the existing situation of COVID-19 is affecting it and what are the things they are doing to cope with it, and how it will affect their travel behaviour. At last, questions comprised the future expectations of people and how it will affect their travel behaviour. At last, questions comprised the future expectations of people and how it will affect their travel behaviour post-COVID-19. The whole questionnaire was structured in such a way that the information regarding travel patterns, working, mental health, and psychological stress was obtained. Behavioural changes in terms of psychological impact on travel behaviour are measured by comparing the people’s behaviour pre, during, and post COVID-19. Therefore, the questionnaire was comprised of prevailing, retrospective, and forward-looking questions.

2.2. Responses

Given the ongoing pandemic situation, convenience sampling is used, resulting in 210 cleaned responses, which are used for further analysis. The typical time to complete the survey is 6–8 min. Section-based branching (i.e., questions displayed based on the answer to a
previous question) is used to reduce the respondents’ efforts. No private information is asked or recorded.

3. Results

3.1. Demographic attributes

About 54% of males and 45% of females responded to the survey. A good mix of population is recorded i.e., 23% belongs to [18, 24) year, 35% belongs to [24, 35), 15% belongs to [35,45) and 23% belongs to [45, 60) age categories. About 42% of respondents are single, and 56% of respondents are married. Approximately 26% of the respondents are government employees, 38% work in private companies, 6% are in business, and 18.6% are students. About 4.8% of total respondents are getting stipends (e.g., MHRD or any other fellowship). The respondents are categorized into three categories, namely, lower (up to 30,000), middle (30,000 to 80,000), and high-income groups (80,000 and above). Total responses recorded in these three categories are 44.76%, 30.95%, and 24.29%, respectively. Table 1 shows the percentage sample of the demographic details of all respondents.

3.2. Impact on travel behavior

During the survey, the lockdown was relaxed via ‘Unlock 1.0’ in which, travel within the district, travel during the daytime is permitted except for containment zones. During ‘Unlock 1.0’, PT services were not in operation. The after-COVID-19 situation is referred to as when the risk of getting the infection is negligible, and there is no travel restriction.

Table 1 Overview of the survey sample.

| Variable               | Levels                        | Sample (%) |
|------------------------|-------------------------------|------------|
| Gender                 | Male                          | 54.29      |
|                        | Female                        | 45.24      |
|                        | Prefer not to mention         | 0.47       |
| Age (years)            | <18 years                     | 0.47       |
|                        | 18-24 years                   | 23.33      |
|                        | 25-35 years                   | 35.24      |
|                        | 36-45 years                   | 15.24      |
|                        | 46-60 years                   | 22.86      |
|                        | >60 years                     | 2.86       |
| Marital Status         | Single                        | 41.90      |
|                        | Married                       | 56.67      |
|                        | Divorced/Widowed              | 0.48       |
|                        | Prefer not to mention         | 0.95       |
|                        | Other                         | 0.00       |
| Education Qualification| Up to secondary (10th)        | 0.00       |
|                        | Up to senior secondary (10+2) | 4.76       |
|                        | Diploma/ITI                   | 9.06       |
|                        | Graduation                    | 31.43      |
|                        | Master and higher             | 41.43      |
|                        | Professional courses (CA, MBA, ...)| 9.05   |
|                        | Other                         | 4.29       |
| Profession             | Student                       | 13.81      |
|                        | Student with scholarship/stipend| 4.76   |
|                        | Business/self-employed/Consultant| 6.66  |
|                        | Govt. Employee (central/state) | 26.19      |
|                        | Private employee/Salaried worker| 38.10 |
|                        | NGO/Volunteer                 | 0.48       |
|                        | Housewife                     | 2.38       |
|                        | Retired                       | 2.86       |
|                        | Job-Seeker                    | 4.76       |
|                        | Driver (auto-rickshaw/taxi/goods vehicle) | 0.00 |
| Personal Monthly Income| Nil                           | 19.52      |
|                        | Up to 10,000                  | 2.38       |
|                        | 10,000 to 30,000              | 22.86      |
|                        | 30,000 to 50,000              | 18.58      |
|                        | 50,000 to 80,000              | 12.38      |
|                        | 80,000 to 1,00,000            | 8.57       |
|                        | More than 1,00,000            | 15.71      |

The study reveals that before the COVID-19, the preferred mode of travel in Delhi was PT and private mode of transport. Fig. 1 shows that the modal share of modes where space is shared has decreased substantially (e.g., metro, bus, carpool, etc.). This may be due to the risk of getting the infection in shared transport. On the other hand, the use of cars (e.g., private vehicles, dropped by a family member/friend, taxis, etc.) has increased remarkably. The chance of getting infected is very low in a personal vehicle, which may be the reason for the increase in the taxi share. This points to the increase in the severity of congestion in Delhi for a longer period. In terms of NMT, the walk share is likely to increase, whereas the share of the bicycle is likely to drop. The negative perception of using a bicycle among people in India and during COVID, people may use private transport for their primary trips. Furthermore, people may use bicycles for sports/recreational trips rather than for primary transportation. Moreover, it is found that among the persons using PT, more women are likely to have psychological constraints than men. To understand the mode choice behaviour, the respondents’ priorities are recorded on a Likert scale (1–5 in the increasing order of preference).

The responses of the travellers who switch from a vehicle with shared space (e.g., bus, metro, carpool) to a private vehicle (e.g., car, walk, bicycle, motorcycle, taxi) are filtered and used for the analysis. The results are shown in Fig. 2. It can be observed that after COVID-19, respondents give higher weight to the risk of getting the infection, physical distancing, passengers with masks, prepaid fare system, etc. As expected, cost, travel time savings, and comfort have priority almost similar to the situation before COVID-19. About 28.7% of the persons who reported changing their mode are likely to use it for an extended period, whereas 43% are unsure of it. This suggests that the former desires to be safe from COVID-19 and may use private modes of transport for a longer period, while the latter shows an inability to take the decision due to the uncertainty of COVID-19. This behavioural shift may have long-term consequences on people’s movement, putting an additional load on road infrastructure (Das et al., 2021). Further, this also means that there is a need for sustainable transport policies to attract more PT and NMT trips to decrease the severity of congestion.

3.3. Impact on work/study

During the COVID-19 situation, about 67% of persons started working/studying at home, which was much lesser before COVID-19. Of those employed before COVID-19, 2.7% lost their job, and 35% did not go to the office/university. Surprisingly, 25% reported that nothing changed, and they are working as before. This category includes working from home before COVID-19 (8%) or persons who are working in essential services (17%). The rest of the persons are going a few times or on a requirement basis. Of people who were working/studying from home during COVID-19 and comparing their working productivity before and during COVID-19, 9.2% had an efficiency higher than 100%, 16.8% had an efficiency between 80 and 100%, and the rest of the persons had an efficiency less than 80% (Table 2). Higher efficiency could be attributed to more flexible working hours, more working time during the lockdown, and fewer outside activities. Inadequate efficiency may be caused by an unsuitable working environment, a lack of personal space, lack of quick communication (face-to-face interactions) and insufficient internet access. However, the work-from-home culture may provide a greater difficulty in the future because it has a negative impact on employee productivity (Farooq and Sultana, 2021). Future research can look into the differences in work from home between younger and older employees, as well as differences by industry.

Interestingly, in contrast to 67% of persons working from home during COVID-19, only 35% of the persons will be working from home after COVID-19 (Table 2). For the users, who have an option to work from home, the primary reasons for the persons who would like to go to the office post-COVID-19 are efficiency is better in the office, boredom at home, and absence of proper facilities at home (e.g., personal space,
internet speed), and distraction at home. On the other hand, most persons who wish to work from home post-COVID-19 quoted reasons like the risk of infection or feeling safer at home for this. Similar inferences are found in the study conducted by Aaditya and Rahul (2021b) for the Indian scenario.

3.4. Psychological impact

In order to understand the psychological impact due to COVID-19, several questions are asked. About 51% of respondents have reported one or more psychological issues due to lockdown/quarantine and COVID-19 (Table 2). This reports that these individuals were having multiple psychological issues during lockdown/quarantine. Some of these issues are sleep and appetite change (36%), mood changes (31%), feeling disconnected (28%), problems in thought process (27%), fear (22%), nervousness, apathy, etc. Only 6% of persons reported that they were having a psychological issue before COVID-19. As a consequence of COVID-19, 49% of healthy persons have one or other psychological issue(s). The forced quarantined, fear of infection, lack of social support, loneliness, and frustration at home are some of the predominant reasons that healthy persons were suffering from psychological issues (Cao et al., 2020; Grover et al., 2020).

Fig. 3 demonstrates some important findings on the psychological behaviour of travellers. For instance, (a) a significant number of persons are likely to be anxious or insecure in a crowded place, which is likely to result in a change of transport mode, which is also verifiable from the modal share analysis (Fig. 1), (b) compared to 40% male, only 29.5% of female always or often feels secure alone in a vehicle, i.e., women are more likely to travel with co-passenger in a private vehicle or prefer public transport.

3.5. Impact on physical activities, health and food habits

Fig. 4 exhibits the physical activity patterns of the respondents
before, during, and after COVID-19. It can be observed that there is no significant difference between the physical activity patterns before and during-COVID-19. However, compared to before-COVID-19, more persons are likely to look after their health/fitness (79% before and 86% after) and healthy food habits (34% before and 47% after) (Table 2). The increase in physical activities after the COVID-19 scenario is to remain fit and healthy to increase the immunity against the COVID-19 virus. Similarly, good food habits are also required to remain physically fit and increase immunity. That’s why there is an increase in health/physical fitness and healthy food habits after the COVID-19 scenario (Chopra et al., 2020). Though the number of people exercising before and during-COVID-19 is almost the same (see Fig. 4), the number of healthy persons grew from 57% before-COVID-19 to 67% during-COVID-19. This is happening primarily due to the change in food habits (mostly switched from eating outside to healthy food at home).

3.6. Impact on driver behavior

In a question, most persons have reported that travel under the current circumstances is risky (32%), unsafe (27%), etc. Surprisingly, about 54% of persons have reported that it is not safe to travel for the rest of the year; 11% of persons say that it is fine to travel now. Moreover, the rest of the persons would like to start travelling once no more infected cases are present or even one month after that. Further, most persons reported being cautious while travelling and using a face mask, sanitizer, following physical distancing, avoiding crowds, etc. Cautiousness, worrisome, anxiety, stress, nervousness, etc., are likely to increase the psychological burden and consequently impact a driver/rider or a passenger’s behaviour. For instance, distraction, rash driving and feeling insecure when driving/sitting with a co-passenger. This happens because, under such conditions, sensory motors cannot function appropriately, and attention is diverted frequently. Fig. 3 shows that a significant number of persons are likely to have anxiety due to the current scenario.

Past literature shows that poor mental health can lead to poor driving behaviour (Abdoli et al., 2015). Stress, anxiety, and depressive symptomology have been identified as risk factors for aggressive or risky driver behaviour and collision risk (Wickens et al., 2013, 2014). Anxious drivers have been shown to engage in a variety of fear-related behaviours that may be considered reckless or dangerous driving behaviour (Taylor et al., 2008). Similarly, it is also found that the psychological issues during COVID-19 may increase alcohol consumption to cope with the stress (Avery et al., 2020). Interestingly, it is found that various psychological impacts will have various effects on people when they travel in different modes. Respondents reported that (a) 71% of persons are likely to be distracted in one or multiple travel modes, (b) 67% are likely to undergo rash driving, and (c) 72% will be insecure while sharing a transport mode with others (e.g., bus, car, auto-rickshaw, etc.) and (d) 50% will feel secure after consumption of alcohol just before driving.

These psychological changes may result in distraction, rash driving, and, on occasion, drivers may take alcohol to calm their nerves while driving, which may finally result in a crash. “Road Safety Monitor”

### Table 2
Changes in the behaviour of people in different COVID-19 scenarios.

| Work/Study from home | During | After |
|----------------------|--------|-------|
| Yes                  | 34.76% | 67.15%|
| No                   | 32.86% | 17.14%|
| Not applicable/Possible | 32.38% | 15.71%|
| Efficiency (Work/Study from home) Before | 10.39% | 8.07% |
| More than 20%        | 16.23% | 18.63%|
| 20%-40%              | 14.94% | 15.53%|
| 60%-80%              | 12.86% | 10.10%|
| More than 100%       | 11.69% | 9.32% |
| I never worked from home | 19.48% | 16.77%|
| Mental health        |       |       |
| Yes                  | 94.00% | 51.90%|
| No                   | 6.00%  | 49.00%|
| Health               |       |       |
| Frequent healthy issue and didn’t need medication | 2.86% | 1.43% |
| Frequent healthy issue and used medication   | 1.90% | 1.90% |
| Healthy              | 55.71% | 62.86%|
| Long-term disease and on daily medication     | 2.86% | 2.38% |
| Occasional health issues and didn’t need medication | 21.43% | 21.43%|
| Occasional health issues and need medication  | 15.24% | 10.00%|
| Food habits          |       |       |
| Always healthy diet  | 20.00% | 34.76%|
| Frequent fast food/oily food                   | 4.29% | 0.95% |
| Frequently eating outside                        | 2.86% | 1.90% |
| No such fixed pattern                            | 8.57% | 2.86% |
| Occasional eating outside                       | 17.62% | 4.76% |
| Occasional fast food/oily food                  | 12.86% | 8.10% |
| Preferred healthy food at home                  | 33.81% | 46.67%|

Fig. 3. Psychological behaviour of the travellers.
report shows that people are more likely to engage in risky or dangerous driving behaviours during the pandemic than before COVID-19 (Vanlaar et al., 2020). Similarly, Katrakazas et al. (2020) reported that due to COVID-19, there was an increase in speeds and harsh events. However, assessing whether these preliminary findings are short-term and local or a longer-term trend would be important.

3.7. Flexible and staggering working hours

During the recovery period, when the number of cases might start declining, physical distancing is likely to be a necessity. However, the infrastructure in most industries, organizations, schools, and universities is not suitable for that. This can trigger the staggered work/study shifts (50-50) or flexible work hours. This will facilitate the physical distancing in the organizations with a lesser workforce and flatten the peak hour (Thombre and Agarwal, 2021). The respondents were asked about their preferences for such policies. Approximately 70% of respondents would like to have flexible working hours, whereas 62% of respondents would like to have staggered working hours. About 68% of the respondents who would like to have flexible working hours say that it will reduce their stress, and 20% say it may reduce their stress.

Similarly, 65% of the respondents who would like to have staggered working hours say that it will reduce their stress, and 18.6% say it may reduce their stress. This happens because staggered working hours (a) might be undesirable timings (e.g., early morning, late evening/night) and (b) likely to have strict opening/closing hours for better management. Therefore, together with work/study from home, a flexible working hours policy can be adopted, which is likely to not only give an opportunity (i) to manage the physical distancing or reduce crowding at the institute/organization (ii) to reduce stresses and (iii) likely to flatten the peak hours.

3.8. Travel locations post-COVID-19

Post-COVID-19 is a situation where no travel restrictions are enforced. Along the lines of the Government of India, it can also be named post-UnLock. An increase in the traffic is reported during various phases of lockdown and Unlock because of ease in traffic restrictions during each phase of lockdown and Unlock and the non-availability of PT (Google, 2020). Apart from the primary activities (e.g., work, study), individuals will be travelling to religious places, sports centres, entertainment centres, restaurants, etc. About 23% of persons won’t visit eateries/restaurants, 22% won’t go to entertainment places, 20% won’t go to religious places, and 24% won’t go to sports centres. Of those who will visit eateries/restaurants, entertainment, or religious places, 40% will visit to release tension or calm the mind. More people will travel to religious places (16%) or sports centres (16%) than eateries (11%) and entertainment centres (13%) to lessen their anxiety.

4. Conclusions

This work has presented the findings from a survey that was conducted in the second week of June 2020. During the survey, the lockdown period was over, and the ‘Unlock’ period was in progression. The study provides some valuable insights into the primary (work/study) activities of the Delhi people. It was shown that due to COVID-19, the priorities of the travellers changed, which resulted in a substantial increase in the private mode of transport. About 28% of the mode-switchers are likely to continue using the new transport mode. This emphasizes the (a) ‘new-normal’ situation, which will have higher transport negative externalities, and (b) the need for sustainable transport policies in the long run. During the lockdown period, 67% of persons started working/studying from home. However, only half of them will continue to do so post-COVID-19. Compared to 70% of persons favouring flexible working hours, only 62% of respondents consented to staggered working hours. Most of these persons said that it would decrease their mental stress. Being in the state of fear of getting infected, losing the job, staying indoors, etc., affected human health (e.g., sleep and appetite change, mood swings, fear, nervousness, difficulty in thinking, etc.), and about 51% of respondents have reported that they have one or more psychological issues which were only 6% before COVID-19 situation. On a positive note, healthy food habits have increased the number of healthy persons from 57% (before-COVID-19) to 67% during COVID-19. Further, the study also exhibited that a significant number of persons will be tensed and anxious, which will impact their driving behaviour. For instance, 71% of persons are likely to be distracted in one or multiple transport modes, 67% are likely to undergo rash driving, 72% will be insecure while sharing a vehicle with others, etc. In a post-COVID-19 scenario, people are likely to visit eateries, restaurants, entertainment, or religious places to release the tension, calm the mind, lessen anxiety, etc. These findings will help tailor the transport policies towards sustainable and resilient transport and interventions (Dubey et al., 2020) to reduce the drivers’ psychological burden. In addition to flexible working hours, counselling/therapy, serological testing of antibodies to SARS-CoV2 may be adopted at the workplace, decreasing the employees’ anxiety levels.

The present study has two limitations. Firstly, the data collection was carried out entirely through online mode, i.e., missing out on a particular user group. Secondly, convenience sampling is used, in which the response rate turned out to be comparatively low, so the results of the
study should be interpreted accordingly. The study was conducted during the first wave of the COVID-19 pandemic when people were still learning to live with it. The offline survey was not possible, and clearly, there was a need to understand the impact of psychological factors on travel behaviour. In the future, the authors may extend the work to study the long-term travel behaviour and psychological changes as a result of COVID-19.

Declaration of competing interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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