

Perceived Behavioural Changes in Commuters' Mobility Aspect due to COVID Situation

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Abstract

The present study investigates the behavioural impact of COVID-19 on commuters mobility. For this purpose, an online questionnaire survey is 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 longer period. Due to lockdown, 65% of commuters who are working 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).

Keywords: COVID-19, Travel behaviour, Psychological impact, Anxiety, Public transportation

Introduction

In the year 2020, Severe Acute Respiratory Syndrome associated with Coronavirus (commonly known as SARS CoV-2, nCoV-19, or COVID-19) achieved pandemic status worldwide. People globally living in a state of constant fear due to the threat of infections accompanied with no assurance of safety are most likely to change the travel behaviour due to the travel restrictions for being safe from the infection. Several online surveys and studies have been conducted to determine the short-term and long-term effects of COVID-19 on people's travel behaviour. A study from China shows that 59% of people used Public Transport (PT) before COVID-19, 13% during COVID-19's peak, and 49% by the end of April 2020 [1]. In China, most travellers are expected to make their first leisure trip between Sept.-Oct. 2020 [2]. Similarly, a study from Spain with over 1,56,000 respondents showed that people mainly came out of the house to buy daily needs, and about 10% did not leave their house at all [3]. The private mode of transportation saw a surge as high as 84.5%. In the US, 60% of people cancelled their leisure trips during the second week of April 2020, and 33% of people rescheduled their plans [4]. In India, 35% of respondents reported that they were more likely to change their transport mode to work after COVID-19. The impact of physical distancing in PT on supply is estimated for different levels of reduced travel demand in Delhi, India [5]. It is shown that the current PT fleet cannot serve any levels of reduced travel demand and physical distancing. To control the spread of the COVID-19, the employees are asked to work-from-home if it is possible remotely. According to a US study, more than 35% of people were working from home in May 2020, up from 8.2% in February [6]. About 44% of the working people commuting in February 2020 continued to do so in May 2020. About 37% of the workers continue to commute amidst the pandemic [7]. Further, 15% of the people were working remotely before-COVID-19. About 12% of people working about a month before-COVID-19 outbreak reduced their working hours or not working at all.

People mental health is affected due to the fear of getting infected while travelling or being outside; consequently, psychological stress has been elevated during the lockdown. Perceived risk of infection could generate ill-adapted behaviours, emotional distress, and avoidance reactions among common

people [8]. Due to psychological stress, travellers' choices may be influenced, and to maintain physical distance, they may avoid PT [9]. Because of high psychological stress, many people may not travel or may start working/ studying from home, which is likely to bring down the overall travel demand [10]. Public transport usage is likely to see a sharp fall while private vehicles' concurrent use is expected to surge as people will like to travel alone or with their family members and friends [11].

As discussed above, during COVID-19 and the lockdown period, the psychological stresses have increased substantially, which is a result of as a consequence of fear of getting an infection. The world has faced no such pandemic, which has such an enormous impact on people worldwide. It becomes imperative to assess people's psychology that plays a vital role in human decision-making and their activities and actions. Therefore, this study attempts to bridge the gap by analysing the psychological impacts of COVID-19 and its effect on travel and driver behaviour.

Data collection

A cross-sectional and observational study is conducted in the capital city of India, Delhi, during June and July 2020 to capture the psychological impact of the ongoing Coronavirus pandemic and associated changes in travel behaviour. An online structured questionnaire is developed using Google Forms and then floated through (a) e-mails to public and private organisations in Delhi and (b) personal messages to persons working and residing in the Delhi NCR (National Capital Region). The survey was designed in the 2nd week of June. 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. Given the ongoing pandemic situation, convenience sampling is used, resulting in 210 useful responses, which are used for further analysis. The typical time to complete the survey was 6 to 8 minutes.

Results

Demographic attributes. About 54% male, 45% female, have responded to the survey. A good mix of working 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. Approximately 26% of the respondents are government employees, 38% work in private companies, 6% are in business, and 18.6% are students. The respondents are categorised 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.

Impact on travel behaviour. During the survey, the lockdown was relaxed through 'Unlock 1.0,' which allows for daytime travel within the district except in containment zones. During 'Unlock 1.0', PT services are not in operation. The after-COVID-19 situation is referred to a situation when the risk of getting the infection is negligible, and there is no restriction on travel. The study reveals that before the COVID-19, the preferred mode of travel in Delhi was PT and private transport mode. Fig. 1(a) shows that the modal share of travel modes with shared-space has decreased substantially (e.g., metro, bus, carpool, etc.). This is due to the risk of getting the infection in shared transport. On the other hand, the car's share (drive), dropped by a family member, the taxi has increased remarkably. In terms of non-motorised transport, the share of the walk is likely to increase, whereas the share of the bicycle is likely to drop. The negative perception of using a bicycle has led to a decrease in the bicycle share. Moreover, among PT users, women are likely to have health issues than men. The respondents' priorities are recorded on a Likert scale (1 to 5) to understand travellers' mode choice decisions. 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 further analysis.

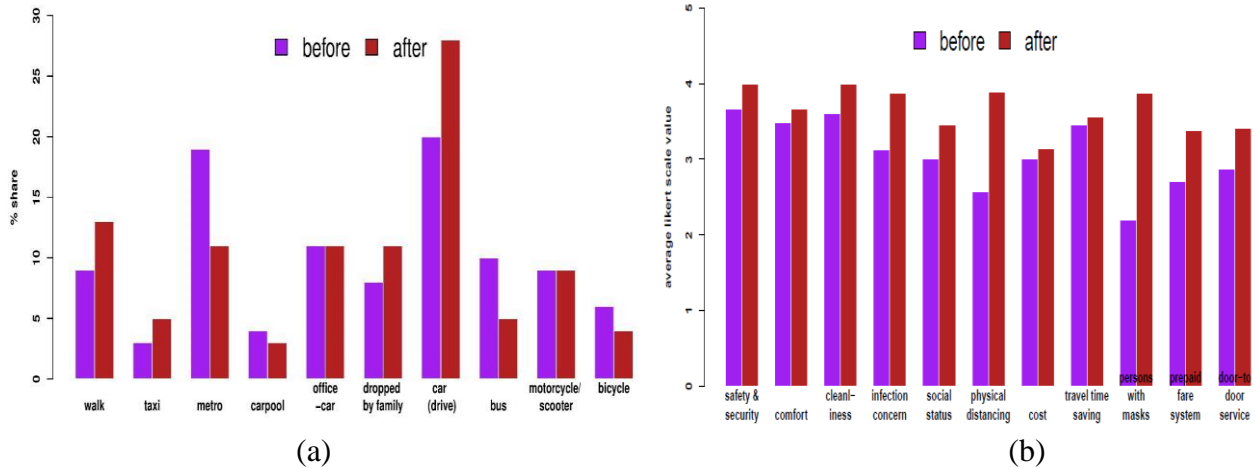


Figure 1: (a) Modal share before and after-COVID-19 (b) Priorities for the persons who are likely to switch from shared/ public transport to private vehicles after-COVID-19

Fig. 1 (b) shows the priorities for those who are likely to switch from shared/ public transport to private vehicles after-COVID-19. Findings show that after COVID-19, respondents give higher weights to the risk of getting the infection, physical-distancing, passengers with masks, prepaid fare system, etc. As expected, cost, travel time savings, comfort have priority almost similar to the situation before COVID-19. About 28.7% of those who reported changing their travel modes are likely to use it for an extended period, whereas 43% are unsure.

Impact on work. During the COVID-19 situation, about 67% started working/ studying at home, much less before the COVID-19 period. About 2.7 % of those who worked prior to COVID-19 lost their jobs, and 35% are not going to work at all. Surprisingly, 25% reported that nothing changed and they are working as before. This category includes people who were working from home before COVID-19 (8%) or those who are working in essential services (17%). The rest of the persons are going to work a few times or as on the requirement basis. Interestingly, in contrast to 67% of persons working from home during COVID-19, only 35% of persons will be working from home after the COVID-19 period.

Psychological impact. The survey includes questions related to the psychological impacts of COVID-19. About 51% of respondents have reported one or more psychological issues due to lockdown/ quarantine during COVID-19. 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). Findings show that (a) the significant number of persons are likely to be anxious or insecure in a crowded place, which is expected to result in a change of transport mode, (b) compared to 40% male, only 29.5% of female always or often feels secure alone in a vehicle.

Impact on driver behaviour. The majority have reported that travel under the current circumstances is risky (32%), unsafe (27%), etc. Surprisingly, about 54% of respondents have reported that it is not safe to travel for the rest of the year (i.e., up to 6 months from Unlock 1.0); 11% say that it is fine to travel now. Cautiousness, worrisome, anxiety, stress, nervousness, etc., are likely to increase the psychological burden and consequently impact a driver/ rider or a commuter's behaviour. For instance, distraction, rash-driving, feeling insecure when driving/ sitting with a co-passenger. This happens because, under such conditions, sensory motors cannot function properly, and attention is diverted frequently. Additionally, anxious persons may consume alcohol to calm down and drive afterwards. Interestingly, findings show that various psychological impacts will have various effects on people when they travel in different modes. According to respondents (a) 71%

persons are likely to be distracted in one or multiple travel modes (b) 67% are likely to undergo rash-driving, (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.

Conclusions

This work presented the findings from a survey that was conducted in the second week of June 2020 in Delhi. During the survey, the lockdown period was over, and the 'Unlock' period was in progression. The study provided some valuable insights into the working population in Delhi, India. Findings reveal that as a consequence of COVID-19, travellers' priorities changed, leading to a significant increase in private transport modes. About 28% of the mode-switchers were likely to continue using the new transport mode post-COVID-19 period. This emphasises the (a) new-normal situation, which will have higher transport negative externalities and (b) need for sustainable transport policies in the long-run. Being in the state of fear of getting infected, losing the job, staying-indoor, etc., affected human health (e.g., sleep and appetite change, mood swings, fear, nervousness, etc.). About 51% of respondents had reported that they had one or more psychological, which was only 6% before the COVID-19 situation. Further, the study also exhibited that a significant number of persons will be tensed and anxious, which will impact their driving behaviour. These findings will help tailor the transport policies towards sustainable and resilient transport and interventions to reduce the drivers' psychological burden.

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