

IMPACTS OF COVID19 ON WOMEN'S MOBILITY IN KUALA LUMPUR

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ABSTRACT

COVID-19 has undoubtedly led to challenges in mobility, yet the extent to which it has impacted women of different income levels and work backgrounds remains unknown. It is important to understand how the pandemic has affected women's mobility, particularly in terms of changes and constraints in their perceived mobility. More research is thus required on mobility during and after the COVID-19 pandemic in Malaysia, especially among working women with small children. It is erroneous to assume that working women have stayed home during the pandemic, as we found that a significant number of women were and are going to work throughout this period. It will further contribute to less traffic congestion on the road by boosting women's reliance on public transportation. Given that most previous studies on women's travel using public transportation do not incorporate children as a key factor in women's decision of travel mode to work or other places, this study's survey sought to discover if women, namely mothers with younger children, are highly affected by their children's travel needs in terms of their preference for public transportation during the COVID-19 pandemic and movement restriction order in Malaysia. Our results suggest that blue-collar women with lower income levels still travel outside their homes for work. However, their mobility was limited during the height of the pandemic due to the restricted movement order and strict standard operation procedures for public transportation. Further studies are needed to distinguish the challenges faced by women who lost their jobs during the pandemic and the changes to their mobility in the post-pandemic era.

Keywords: COVID19, Mobility, Women, Transportation Planning

INTRODUCTION

Mobility is generally considered to be a subset of the bigger perspective of transportation. Mobility on its own is equally important. When we talk about human movement, being mobile is the most vital aspect that ensures movement is possible regardless of an individual's background, marital status, number of children, or nature of travel. Therefore, in the context of the female population, women's mobility refers to women's ability to move in and outside their homes with dependents or without, alone or in groups. The need to be mobile has been widely discussed for decades, especially after the 1960s when more women began to travel for work purposes. Nonetheless, work is not the only purpose for women's travel; instead, movement for non-work trips also requires women to be mobile. Previous researchers have found that women's travel can be distinguished by shorter trips, distinct trip behaviours, and factors like driving license ownership. Thus, examining how this gender travels uniquely from men is imperative to understand why certain mobility issues cannot be addressed with a "one-size-fits-all" universal solution, especially during an unprecedented pandemic like COVID-19. This study, therefore, sought to examine the impacts of the COVID-19 pandemic on women's mobility in Kuala Lumpur, Malaysia.

WOMEN'S MOBILITY

Major dissimilarities have consistently been identified between the travel patterns of men and women based on demographic, socio-economic, and household factors (Crane R, 2007). For example, women's trips to work are generally shorter than men's (Fanning Madden, 1981). In fact, this finding is relevant to date despite women's growing involvement in the economy (Brömmelhaus et al., 2020). However, when women have children, their trip distance increases three times the rate of men's (Crane R, 2007). Rosenbloom (1987) stated that working women have noticeably different travel patterns than their male counterparts because they accept responsibility for most of the travel needs of their children. With children present in the household, women make 300% more chauffeuring trips than men who live alone (Boarnet & Hsu, 2015). Moreover, women's trips are more complex in households with two or more people (Morency & Valiquette, 2010), implying that women are more likely than men to undertake multiple trips in a sequence of travel that leads to complex "trip-chains" (Craig & van Tienoven, 2019). Because of their obligations to childcare and household care, as well as their concerns about safety, women are more reliant on cars than men (Bianco & Chatherine, 1996). Maciejewska and Miralles-Guasch (2019) concluded that travelling between work and chauffeuring children is the key factor behind women's choice to drive a car despite having other alternatives, wherein the more complex the trip-chain, the greater the dependence on the car. However, though women are twice as responsible as men for chauffeuring children (Schwanen, 2011), they are often "second in line" for a car and can only have one "if he does not want it" (Dobbs, 2005). According to Harumain et al. (2019), travel patterns differ across working women with children, with toddlers, and without children. Most working mothers prefer their children to be near their workplace, which is not always possible due to a lack of available childcare. Therefore, they are sometimes forced to leave their child(ren) at any childcare centre along the route to their workplace. This has forced them to drive a car to drop off their children on the way to work, which has contributed to the increasing number of cars on the road, especially during rush hour. Oakil et al. (2016) emphasized the influence of daily schedules and household responsibilities on rush-hour commuting by car, as cars dominate the roads during those hours. They found that household and child-related tasks are important daily activities most associated with commuting during rush hour.

In other situations, women's selection of transport mode depends on whether they are travelling with children or alone. In the previous research by Harumain et al. (2019), the current condition of Malaysian public transport modes (e.g., bus, LRT) does not support working women with younger children, thus increasing their preference for private vehicles. For instance, bus service is often slow and inconsistent during non-peak times, while the overall frequency of bus trips is inadequate. There has been growing demand for more frequent bus services due to the uncertain schedule of working women with younger children. Indeed, working women's schedule is often erratic due to flexible working hours, type of job (e.g., food service), child-related emergencies, and so on. However, the waiting time at bus stations fails to support their schedule, discouraging them from using public bus services entirely. On top of that, women with babies find it difficult to use any type of public transportation because of the limited space, especially for mothers with strollers or big bags for children's items. There is also an issue with the unavailability of space for breastfeeding mothers in public transport areas. It is evident that public transportation services are designed for universal use, without taking into consideration the needs of women and children. For example, the lift size in LRT stations is too small to fit two strollers, while the platform is not safe for children as it is not secured with rails. Due to these challenges posed by public transportation, the use of cars for daily travel is the only viable option for working women with younger children. Previous research has further revealed that age and household income affect women's selection of transport mode for work. Sanchez and Gonzalez's (2016) findings showed that women aged 30 to 39 are the most prominent users of private vehicles for work travel. This age group also records the highest number of daily trips and the lowest usage of public transport. These statistics indicate that these women's busy careers and household responsibilities increase their mobility needs, which are currently not covered by public transport. The same study found that women workers from families with very low income (<€ 1,100) opt to use private vehicles for 53% of their trips; this statistic increases to 72% for women from families with a net income above € 2,700.

WOMEN'S MOBILITY AMID THE COVID-19 PANDEMIC

The COVID-19 pandemic has greatly impacted daily travel. Since the first COVID-19 case in Wuhan, China, the virus has rapidly spread and infected almost 169 million people across the globe as of May 2021. Lockdowns and social distancing measures were adopted by governments around the world to minimise close contact among community members and to isolate outbreaks. The terms "social distancing" and "new norm" have been widely used since then to encourage people to keep a distance and practice protective measures (Arimura et al., 2020). Following the measures implemented to control the pandemic, mobility witnessed major shifts in both travel demand and behaviour (De Vos, 2020). In Sapporo, Japan, the emergency declaration by the government halted the public transport system and shifted citizens' travel demands from public to private modes (Arimura et al., 2020). In

Poland, the lockdown reduced travel time by an average of 66% across all age groups (Borkowski et al., 2021). Barbieri et al. (2021) studied the impact of mobility before and during COVID-19 restrictions in ten countries on six continents (i.e., Australia, Brazil, China, Ghana, India, Iran, Italy, Norway, South Africa, and the United States). They reported that the major impact of the travel restriction was on school and work trips, as 87.1% of the population had shifted to the online or remote environment.

Large droplets and direct contact transmission are the primary causes of COVID-19, according to the World Health Organisation (WHO), the Centre for Disease Control and Prevention (CDC), and other organisations. On public transportation, there is a higher possibility of inhaling droplets at an early stage due to the close social distance. The risk of infection thus increases substantially when the number of passengers increases as well as when the duration of exposure lengthens in a restricted traffic space (Chen et al., 2021). Consequently, a decrease in the number of passengers using public transportation has been observed. In line with this notion, the Global Public Transport Report in 2020 by Moovit reported that 34.3% of people no longer use public transport because of COVID-19. In the Greek city of Thessaloniki, 45% said their use of public transport has reduced, while nearly half of all commuters in the United States reportedly used public transportation less frequently during the pandemic. The American Public Transportation Association stated that compared to 2019, transit usage in 2020 fell by 79% across the nation. While some riders have returned to public transportation, ridership remained roughly 65% below pre-pandemic levels from June to December 2020 (Due & Act, 2021).

In Malaysia, the government implemented strict preventive measures, called the Movement Control Order (MCO), cordon sanitaire, or lockdown, based on the pandemic's developing situation. The Prime Minister of Malaysia officially promulgated the first MCO nationwide on 16th March 2020, following which various stages and forms of the MCO have remained in force until recently. The Malaysian Ministry of Health further outlined five strategies to reduce the impact of COVID-19: (1) cut off the transmission chain of COVID-19 to less than 500 cases a day; (2) reduce morbidity and mortality by avoiding death cases among high-risk individuals; (3) ensure smooth health services by strengthening diagnostics and surveillance of COVID-19; (4) increase herd immunity; and (5) increased awareness among the community on the new norm. Working from home and social distancing are part of these strategies. During the MCO, only essential economic sectors were permitted to operate under strict adherence to SOPs. Interstate travel was also prohibited nationwide in line with the development of COVID-19 cases. Consequently, these various measures have caused a major shift in mobility for all citizens, including women.

During the pandemic, social distancing has undeniably been an important factor in reducing COVID-19 transmission and containing the virus in Malaysia. In this regard, the pandemic has allowed several local authorities, including urban planners, to rethink mobility needs in consideration of social distancing and restricted movement measures, so as to prevent complicated mobility issues. In addition, the government decreased public transportation capacity by half while employers shifted to work-from-home (WFH) practices. These actions were echoed by other countries around the world to reduce physical contact not only at the office but also during public transportation commutes. WFH has become a reality, which has finally materialized the desire of countless women who have longed to work at home where their children are. However, this raises the question of how this has impacted or changed women's mobility. The magnitude and quantifiability of this impact on women are also of concern, as they have mostly been able to move only within their home compound and neighbourhood periphery. It has been found that women with younger children rely significantly on personal transportation, as it is difficult to move with younger children using public transportation. As such, travelling using public transportation is never the first choice for mothers in Malaysia, including during COVID-19. Women who work outside their home while their children are being cared for at kindergartens or school thus need to have greater efficiency, ability, and mobility to be the best mother to their child(ren). Improving mothers' mobility in public transportation also means that more women will be able to explore a wider job market, thereby increasing the percentage of women in all working fields. It will further contribute to less traffic congestion on the road by boosting women's reliance on public transportation. Given that most previous studies on women's travel using public transportation do not incorporate children as a key factor in women's decision of travel mode to work or other places, this study's survey sought to discover if women, namely mothers with younger children, are highly affected by their children's travel needs in terms of their preference for public transportation during the COVID-19 pandemic and movement restriction order in Malaysia. This study investigates on women mobility during the pandemic in Kuala Lumpur and aims to identify factors influencing women with small children daily transportation mode and their mobility.

METHODOLOGY

This research methodology was designed based on a review of the literature, which was conducted during the height of the pandemic in the year 2020. As such, papers related to COVID-19 were limited at the time, especially in the field of travel behaviour. Nonetheless, careful measures were taken to ensure that the non-probability sampling performed in this study was representative and reflected the phenomenon under observation. Specifically, snowball sampling was used to draw voluntary respondents from the population of women with younger children. As data collection was conducted during the Restricted Movement Order (RMO) amid the pandemic, the face-to-face survey method was unfeasible; therefore, an online structured survey (i.e., Google Forms) was utilized to collect data from the respondents. The questionnaire consisted of three parts: 1) respondents' profile and travel behaviour; 2) respondents' mode of transport; and 3) respondents' trip pattern. To avoid bias, the nominal scale and multiple-choice questions were employed in the questionnaire to specify the selection of answers. The questionnaires were distributed by sending the online survey link via WhatsApp, whereby participants were asked to provide verbal consent to fill in the Google Form. The final sample size of 97 yielded a response rate of 60%.

RESULTS AND DISCUSSION

The Statistical Package for the Social Sciences (SPSS) version 24 was used to analyse the data. A total of 97 working women participated in this study. However, responses for some items were incomplete or missing, accounting for the varying sample size (N). Based on the results, most of the respondents were from the age group of 36 to 55 years old (52.6%), followed by the 18 to 35 years old group (46.4%) and 92.8% are married. In terms of educational background, most of the respondents possessed an SPM/STPM/STAM or equivalent certificate (39.6%), followed by a bachelor's degree or higher (33.3%). Moving to their work nature, slightly over half (51.5%) the women worked in the government sector, 76.3% of them worked full-time, and 44.2% of them had fixed working hours. More than half the women (65.2%) had a household monthly income less than RM4,850. Consistent with the respondents' age, their spouses were also mostly from the same age category of 36 to 55 years old (53.9%). Half (50%) the respondents' spouses worked in the government sector, while 86.4% worked full-time and 55.2% followed fixed working hours.

As the data was collected during the COVID-19 pandemic, most of the respondents (60.3%) reported working from home, with 64.1% of them involved in scheduled WFH. However, more than 70% of the respondents' spouses were not working from home at the time. Interestingly, though most of the women were able to WFH during the outbreak, more than half of them (62.2%) stated they do not prefer WFH. About their travel before the pandemic, almost 77.9% of the respondents travelled less than 30 minutes to work before the MCO, as they reported that their workplace was less than 10 km away from their home (70.8%). For mode of transport, 64.1% of the total respondents used a car to travel to work, followed by a motorcycle (17.9%). Likewise, in choosing a mode of transport for school/childcare services, most respondents selected a car (60.9%) as shown in Figure 1. Before MCO, more than 60% of the respondents travelled with their children to work. However, almost half of them travelled alone to work during the MCO (48.6%) due to the closure of schools and childcare services at the time as well as the shift to online classes for children.

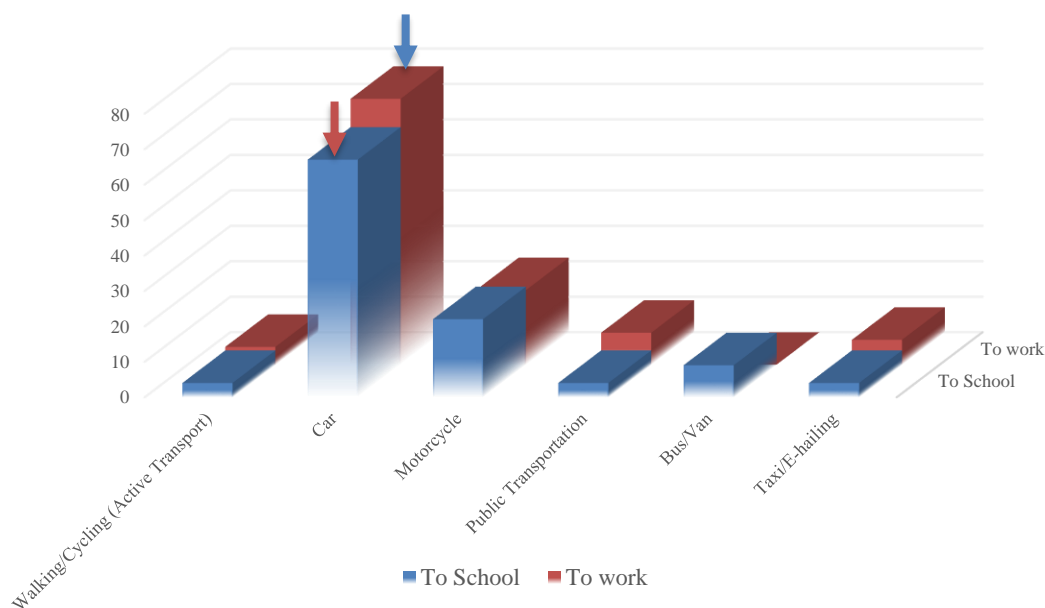


Figure 1: The figure above compares different mode of transport based on two different trip that is with child (to school) and without child (to work).

Pelclova et al. (2014) used binary logistic regression (BLR) to analyse dichotomous outcomes in recommending walking for transportation and walking for leisure for separate genders. In 2021, Koh et al. (2021) used the same method to detect associations between neighbourhood walkability and BMI in studying a walkable environment for rural communities in Japan. BLR needs to be performed on descriptive data to filter out missing data. It is used to measure the relationships between the categorical data of independent variables to identify the factors impacting the target variables, which suited the purpose of this study. Therefore, BLR analysis was performed using the SPSS software. In this case, the dependent variables were women's travel to work by car (see Table 1) and women's travel to school/childcare by car (see Table 2), while the independent variables were age, job sector, working hours, monthly household income, distance from home to work before MCO, trip pattern before MCO, and trip pattern during MCO. Comparisons were made between the results of both dependent variables, which are presented in Table 1 and Table 2.

TABLE 1. BLR Results of Dependent Variable “Travel to Work by Car”

| Independent Variables | | B | Sig. | Exp(B) | 95% C.I. for EXP(B) | |
|---|---|-------|------|--------|---------------------|-------|
| | | | | | Lower | Upper |
| Age (years) | 18-35 VS 36-55 | .0341 | .524 | 1.368 | .522 | 3.590 |
| Job sector | Government VS Private | -.642 | .388 | .526 | .123 | 2.260 |
| | Government VS Freelance | .347 | .288 | 1.414 | .747 | 2.679 |
| | Government VS Other | .017 | .933 | 1.017 | .681 | 1.520 |
| Working hours | Fixed VS Shift | .125 | .751 | 1.133 | .524 | 2.448 |
| | Fixed VS Flexible | .168 | .556 | 1.183 | .676 | 2.071 |
| Household monthly income | < RM4,850 VS RM4,850 – RM10,959 | .28 | .621 | .750 | .240 | 2.347 |
| | < RM4,850 VS > RM10,960 | -.347 | .536 | .707 | .236 | 2.120 |
| Distance from home to work (before MCO) | < 5 KM VS 6 KM – 10 KM | .899 | .141 | .407 | .123 | 1.347 |
| | < 5 KM VS 11 KM - 20 KM | -.045 | .893 | .956 | .494 | 1.850 |
| | < 5 KM VS > 20 KM | .006 | .983 | 1.006 | .593 | 1.706 |
| Trip pattern before MCO | Travel with child VS Travel without child | .975 | .060 | 2.650 | .959 | 7.322 |
| Trip pattern during MCO | Travel with child VS Travel without child | .661 | .273 | 1.937 | .594 | 6.316 |
| | Travel with child VS WFH | .363 | .378 | 1.438 | .642 | 3.219 |

TABLE 2. BLR Results of Dependent Variable “Travel to School/Childcare by Car”

| Independent Variables | | B | Sig. | Exp(B) | 95% C.I. for EXP(B) | |
|---|---|---------|-------|--------|---------------------|--------|
| | | | | | Lower | Upper |
| Age (years) | 18-35 VS 36-55 | -.077 | .873 | .926 | .362 | 2.368 |
| | 18-35 VS Above 55 | 3.178** | .000 | 24.000 | | |
| Job sector | Government VS Private | -.247 | .752 | .781 | .169 | 3.633 |
| | Government VS Freelance | .162 | .636 | 1.176 | .602 | 2.297 |
| | Government VS Other | .026 | .901 | 1.026 | .686 | 1.534 |
| Working hours | Fixed VS Shift | .236 | .520 | 1.266 | .617 | 2.600 |
| | Fixed VS Flexible | .409 | .133 | 1.506 | .883 | 2.566 |
| Household monthly income | < RM4,850 VS RM4,850 – RM10,959 | .405 | .488 | .667 | .212 | 2.096 |
| | < RM4,850 VS > RM10,960 | .347 | .399 | 1.414 | .632 | 3.164 |
| Distance from home to work (before MCO) | < 5 KM VS 6 KM – 10 KM | .236 | .704 | 1.267 | .375 | 4.280 |
| | < 5 KM VS 11 KM - 20 KM | .118 | .757 | 1.125 | .532 | 2.383 |
| | < 5 KM VS > 20 KM | .445 | .098 | 1.560 | .921 | 2.645 |
| Trip pattern before MCO | Travel with child VS Travel without child | .390** | 0.000 | 10.909 | 3.610 | 32.962 |
| Trip pattern during MCO | Travel with child VS Travel without child | 1.705** | .014 | 5.500 | 1.417 | 21.355 |
| | Travel with child VS WFH | 1.031** | 0.014 | 2.803 | 1.230 | 6.388 |

**Significant at $p < 0.05$

Based on the results, women aged over 55 years old are 24 times more likely to travel to children’s school/childcare service by car compared to women aged between 18 and 35 years old. Car ownership and affordability may be the reason for this result, though it is not certain whether the children are theirs or their family members’ (e.g., grandchildren, nieces/nephews). It also cannot be confirmed whether this result is a stable pattern or situational. However, it suggests that older women’s dependability on cars is higher than younger women. Moreover, no significant difference was observed between women aged 18 to 35 and women aged 36 to 55 years old in terms of their travel to school/childcare service by car. This is an important finding as is highlighting that age variation among women with small children may not be relevant in future studies.

It was further revealed that before MCO, women with children were 10.9 times more likely to travel to school/childcare services by car compared to women without children. This pattern was also prevalent during the MCO, wherein women travelling to school/childcare services with children were 5.5 times more likely use a car than women travelling without children. It was also found that women with children were 2.8 times more likely to travel to school/childcare service by car compared to women under the WFH policy. These findings imply that the dependability on cars is higher for women with children than for women without children or women who WFH, as the former prefer to use cars to transport their children to school/childcare. In contrast, women without children would not need to use a car for travel to child-related activities, while mothers working from home would probably care for their children themselves at home without having to travel. Movement restriction measures during the pandemic severely impacted Malaysian citizens. During the MCO period, movement was constrained within one’s neighbourhood with a maximum

allowed distance of 10 kilometres from home. Interstate and inter-district travel were also prohibited; as such, the use of public transportation or even private transportation was minimal. But what really happened to mobility during the pandemic? Staying and working at home affected people's movement in numerous ways. Google's COVID-19 Community Mobility Report data from the World Bank showed a significant decrease in mobility in the year 2020, including a drop in transit stations to 31.33% in South Asia. However, the report also revealed, rather interestingly, that people in low-income countries did not lose their mobility as much as those in high-income countries, as fewer could stay and work at home. This finding aligns with our result that there has been no significant increase in the percentage of women working from home. Although some of the respondents were under WFH orders, less than half preferred it. Moreover, a majority were in the lower income group with a household income less than RM4850. Thus, working at home would be difficult for these women, who probably are blue-collar employees.

Our results further show that parents who are travelling with children prefer to use private vehicles for commuting because it is more convenient. They need to send and pick their children to and from school/childcare, which is far easier if they own personal transport instead of relying on public transportation. This is supported by the research of Chakrabarti and Joh (2019), which indicated that car use among parents who have school-age children (six to 15 years old) but no other small children (five years old or less) is significantly higher than among childless couples. These families engage in relatively more auto use possibly due to location transfers, activity schedules, and stress. Nonetheless, the addition of younger children to a household in addition to school-age children seems to be a barrier to active travel (such as walking and cycling) and transit use among working parents (Chakrabarti & Joh, 2019). This means that the preference for private vehicle usage increases with the presence of small children in a family. It seems that regardless of whether a woman needs a car or not, the determination to drive a car to work or school/childcare centre points to the financial capacity and driving ability of the woman. This explains the high percentage of cars with single occupant drivers on the road, which contributes to traffic congestions. Litman's (2017) recent publication in the Victoria Transport Policy Institute stated that it is common for households to spend more on transportation than on the cost of housing. Litman (2017) also mentioned that the factors affecting the affordability of transportation vary from travel demands, accessibility, and mobility to land development patterns and transportation options. Affordability factors were also discussed in the paper written by Greenlee and Wilson (2016), who found that balancing the cost of housing with transit affordability holds a vital role in people's mobility decisions.

CONCLUSION

In Malaysia, particularly Kuala Lumpur, land development is rapid, resulting in many housing developments within the city centre. The Malaysia Property Market Trend report in 2019, which was published before the pandemic, identified that Malaysia's house prices are growing at a slower pace, with lower demands for terrace and semi-d housing. On the contrary, high-rise residences and detached housing types are becoming more costly, such that the price range for high-rise residential in a compact city like Kuala Lumpur is 5.5% higher than the average housing price range of RM500,000 to RM1 million. This has affected transportation affordability in Kuala Lumpur, given that newer developments' terrace and semi-d housing are located at the periphery of the city, resulting in higher transportation costs for women to travel to work (e.g., fuel, tolls). Women who live closer to the Kuala Lumpur city centre, in turn, face issues like accessibility or mobility when using public transportation, thereby increasing their reliance on cars. Ultimately, despite the drastic actions taken by the Malaysian government to control the spread of COVID-19, mobility needs remain the same for mothers who are still working on site or at the office during the pandemic. For them, being mobile during the pandemic is more difficult to achieve using public transportation. Therefore, the reliance of women always reverts to private vehicles like the car or the motorcycle.

At the time this paper was written, the MCO had just ended, and Malaysia had begun moving forward with strategies like phasing and locality-based movement restriction. Since then, areas with a high infection rate are closed off to a smaller neighbourhood radius. This restricts the mobility of women in affected areas, forcing them to work from home. Blue-collar workers have been forced to take annual leave or be dismissed from work, especially if they had to care for ill family members during the pandemic. These issues were not discussed in this paper; thus, future research should take them into account. Moreover, although not directly related to mobility, jobless mothers impact household travel behaviour, especially in terms of the household's affordability and ability to travel. Our analysis revealed that working women from the lower income group were still working and travelling outside their home during the pandemic. Their movement also involves their children, as the closure of schools during the pandemic forced women to send their children to caretakers or rely on family members who were not working or working from home. We therefore conclude that mobility for working women from the lower income group has not changed but has become even more challenging due to the SOPs enforced for public transportation, forcing them to use private vehicles (e.g., car, motorcycle) that they may not be able to afford. In contrast, women within the medium to high income level tend to follow WFH schedules and do not travel as much as they did before the pandemic. These women face a different struggle at home in the form of working while caring for their children. Scholars should note that the findings of this study are preliminary; therefore, deeper investigations are needed to escalate the understanding of working women's mobility with smaller children in different built environments and settings.

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