

## IMPACTS OF COVID-19 ON INDIVIDUALS' BEHAVIOUR & PERCEPTION IN PUBLIC SPACE: A CASE STUDY OF COLOMBO, SRI LANKA

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**Abstract:** SARS-CoV-2 has become a global pandemic while impacting most sectors including public space (PS). In the citizens-view, PS have become unfamiliar places with distant social interactions in a pandemic. This study aimed to investigate the impacts of covid-19 on individuals' behaviour & perception in PS. Limited studies attempted and different contexts find out the different results, make curiosity to apply it into the Sri Lankan context with case studies of Galle Face, Pettah Railway Station, World Trade Centre and Independent Square. Using semi-structured interviews carried out data among 27 participants. Public perception is measured using changes of experience, interest & their satisfaction level. Individual behaviour measured using Frequency of visiting place and time duration spent there. According to the results, 92.6% of respondents have a sufficient understanding of pandemic. Therefore, they adapt their behaviour to reduce the risk and protect themselves. Because even 62% of respondents answered that they feel more insecure in place than before the pandemic, 56.5% did not change their frequency of visiting the place. But 68% of respondents changed their spending time. Observations shows, people mostly use, move, and react in wide places without being crowded.

**Keywords:** Public Perception, Individual Behaviour, Public Space, Covid-19

### 1. Introduction

SARS-CoV-2 has become a global pandemic, changing social, economic, and environmental aspects, and rapidly disrupting what is considered a "normal" way of life (Daniel Inkoom, 2021). Changes in the relationship between people and public space are one of the consequences of pandemic restrictions (UN Habitat, 2020). Because one of the key policy measures to protect public health and reduce the case rate of Covid-19 is to restrict use in public spaces. This situation affects more than half of the world. People are engaging with provided public health recommendations, as evidenced by prominent images of emptiness and a calm environment in public spaces (Jasiński A, 2020). Even more active cities, such as New York, Barcelona, and Rome, have become ghost towns as a result of pandemics (Jordi Honey-Rosés *et al.*, 2020).

Covid-19 has had a significant impact on major cities in Sri Lanka, including Colombo, Gampaha, and Kaluthara. As a result of the restrictions, the most active areas prior to the covid-19 appeared to be deserted. During the pandemic, Pettah market area, bus station and railway station, Paliyagoda Manin market, Pamunuwa clothing market, Galle face and other highly active public spaces became ghost places.

Public spaces are the most important elements for the liveability of the city (Rossini F and Nervino E, 2019). It should include a secure, viable, and sustainable environment. In present, most restrictions have been lifted, and people are attempting to return to normalcy. However, even today, we do not see a complete recovery of public space. Because of this pandemic, public spaces have become unfamiliar places with distant social interactions. Therefore, the question raised in this time about how the relationship between public and public spaces may be changing. Planners, architects, designers, and most journalists are already focused on this question (Jordi Honey-Rosés *et al.*, 2020).

Especially in town planning, there are several uncertainties that have arisen. How health crisis impact the design of public space in future (E. L. Bird *et al.*, 2018), what kind of changes will happen to public relationship with public space (Jordi Honey-Rosés *et al.*, 2020), the changing of social behaviour and perceptions are remaining or be

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DOI: <https://doi.org/10.31705/FARU.2022.30>

ephemeral (Lisa Law, Simona Azzali, and Sheila Conejos, 2020), how this pandemic change the design of the street (Xinyao Song *et al.*, 2021), what are the challenges of sustainable public spaces & sustainable development with this kind of crisis and so on. Considering the above question arising in the town planning field, this study aims to identify the impacts of covid-19 on individuals' behaviour & perception in public space with references of Colombo, Sri Lanka.

The main objective of the research is to investigate the impacts of Covid-19 pandemic on people's behaviours & perception in public places. Belong to that, research will address the following two main questions.

- What: What are the impacts of public perceptions and behaviour for use of public space due to the Covid-19?
- Why: Why do those impacts happen to perceptions and behaviour for use in public space?

Concepts of Protection Motivation Theory (PMT) (Ronald Rogers and Prentice-Dunn s, 1997), Theory of Reasoned Action (TRA) (Fishbein M and Ajzen I, 1980) and Theory of Planned Behaviour (TPB) (Icek Ajzen, 1991) are applied to explain the changes of public perception and behaviour in the due to the Covid-19. People get knowledge from past events that have led to the current situation. Based on that the prediction of the near future is possible (Baumgartner H, Pieters R, and Bagozzi R. P, 2008). Therefore, in this kind of global crisis, knowing accurate information is essential. In 2009, people believed that H1N1 is more dangerous than H5N1 human avian flu because different forms of new infectious diseases were merged with that (Joseph T.F *et al.*, 2010). Early warning and awareness of the outbreak will help to identify the people's risk behaviour and the reaction for perceived it (Hanan H Balkhy *et al.*, 2010). According to the above studies, awareness of the situation may impact individual perception as per the protection motivation theory. Here mainly consider the knowledge of Covid-19 and knowledge of policies introduced in pandemic as measurement factors under the knowledge. Experience, interest and satisfaction are considered as main attributes under the perception (Schwartz R, 2004) (Figure 1).

Perceiving is any information that can get from anywhere for the perceiver, and perception occurs as a result of that (Schwartz R, 2004). In this process, the information in the world is larger than the perceiver and picked up, overlooked, or ignored and that kind of action may be the reason for that (Liyang Jin *et al.*, 2011). An example is some mega-events with the potential of environmental degradation. In this context, public attitude will change with perceiving information. If these mega-events were arranged to serve as catalysts for bringing attention to the natural environment and preserving the local heritage and landscape, sometimes that would have been ignored. If that event may negatively impact the environment, public attitudes may be negative. But if that event is organised as beneficial to the natural environment people will have a positive attitude (Ritchie, J. R. B, 1984). According to the Social Exchange Theory, if residents can perceive that the benefits from hosting the green Olympics exceeded the costs, they will have a positive attitude towards them (Liyang Jin *et al.*, 2011). Therefore, it provides evidence for the relationship between perception and attitude as discussed in TRA. In this study, the attitude was measured using security as an attribute (Khalil Waln, 2016) (Figure 1).

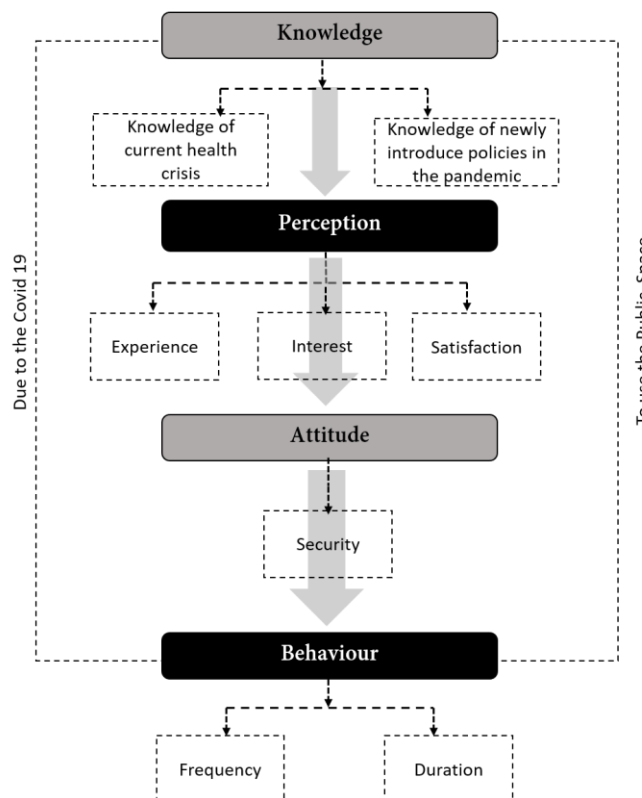


Figure 1, Proposed conceptual framework (Source: Compiled by Author)

Based on the Theory of Planned Behaviour (TPB), human behaviour performs according to the attitude toward behaviour, subjective norms, and perceived behavioural control (Icek Ajzen, 1991). Attitude is one of the driving forces that refers to the degree of a person's behaviour towards positive or negative. That means people's favourable or unfavourable attitudes control their behaviour (Icek Ajzen, 1991). When people have a positive attitude, they will comply to follow the requirements, rules, and guidelines (Mcmillan B and Conner M, 2003). But if they have a negative attitude they will ignore the rules, requirements, and guidelines (Seppo Pahlila, Mikko Siponen, and Adam Mahmood, 2007). According to that, this study will use the concept of the link between attitude and behaviour to address the research problem while testing the below hypothesis. To measure the behaviour of the individual, frequency of visiting and duration of spending the time in a particular area has been taken as attributes (Figure 1).

## 2. Material and Method

In Sri Lanka, public space categories are based on the purpose of people’s gathering (Siriwardane, 1997). Accordingly, gatherings that take place periodically are called periodic occurrences, gathering places for special events are called special occurrences and gathering places for people in their daily routine is called daily occurrence. Considering impacts of Covid-19, Daily occurrence public places are selected for the study. Daily occurrence public space is also divided into three categories based on their activities as Recreational-oriented activities, Transport-oriented activities and commercial oriented activities (Rajapaksha, 1994). Five case studies have been selected covering these three categories. All case studies are in the Colombo district and those are highly impacted from Covid-19 (Table 1).

Table 1, Selected case studies & categories (Source: Siriwardane & Rajapaksha)

Main Category	Subcategories	Case Studies
Daily Occurrences	Recreational-Oriented Activities	Galle Face
		Independent Square
	Commercial-Oriented Activities	Delkanda Market
		World Trade Center
	Transport-Oriented Activities	Pettah Railway Station

Using semi-structured interviews carried out data among 27 participants. The order between question items was modified according to the feedback from the small samples test before going to the field to take the interview. Method of analysis carried out using thematic analysis through NVIVO application.

Table 2, Details of the participants of semi-structure interview (Source: Compiled by Author)

Case Study	No of Participants	Gender		Age Category		Relationship with the place	
		Male	Femal e	15-47 (Youth group)	48-63 (Middle age group)	Daily Visitor	Occasi onal Visitor
Galle Face	7	3	4	4	3	1	6
Pettah Railway Station	7	4	3	5	2	3	4
Delkanda Market	5	4	1	4	1	2 (Every Weekend)	3
World Trade Center	4	3	1	3	1	1	3
Independent Square	4	3	1	3	1	1	3
Total	27	17	10	19	8	4	19

## 3. Results & Discussion

The results explain under two main topics. They are the **impact of public perception to use public space due to the Covid-19** and the **impact of individual’s behaviour to use public space due to the Covid-19**.

### 3.1. IMPACT OF PUBLIC PERCEPTION TO USE PUBLIC SPACE DUE TO THE COVID-19

Public perception has been measured through experience, interest, and satisfaction of the public regarding selected areas. Figure 2 shows the overall perception analysis results of the respondents. According to that, changes of attributes are different from different places. Changes in experience, interest and satisfaction have been measured

using code prepared from the responses of the participants. The below graphs show the used codes and how change the perception through experience, interest & satisfaction.

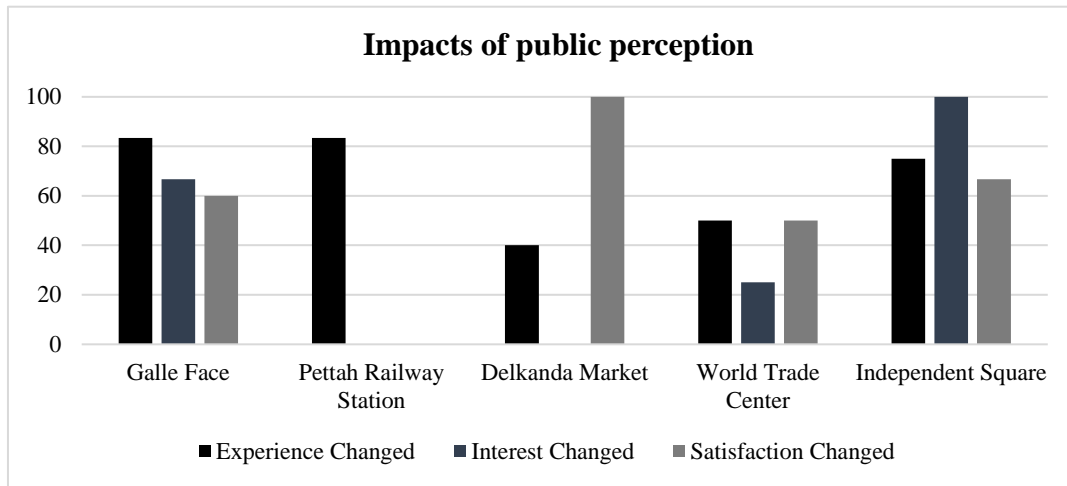


Figure 2, Overall result of impact of public perception (Source: Compiled by Author)

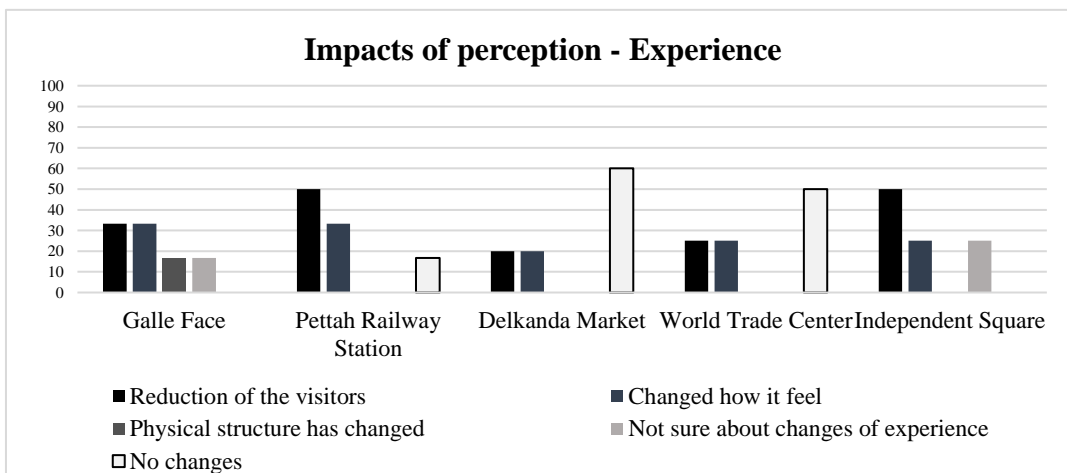


Figure 3, Impacts of public perception - Experience (Source: Compiled by Author)

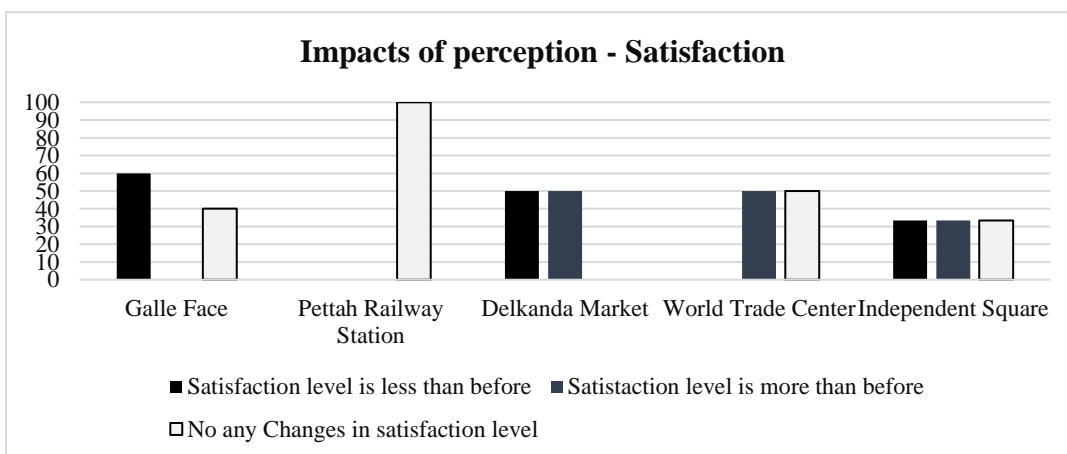


Figure 4, Impacts of public perception - Satisfaction Level (Source: Compiled by Author)

Experience has changed more than 50% of respondents in Galle face, Pettah railway station & independent square. Only Galle face & independent square data show the difference of more than 50% in individual interest under the perception. Considering overall analysis, there is a huge difference in public satisfaction from pre-pandemic to the new normal era in all cases except pettah railway station, all places rated the value as half or more than half. Figure 6 shows the respondents' answers as separate words according to the frequency. It will make sense of majority answers regarding perception.

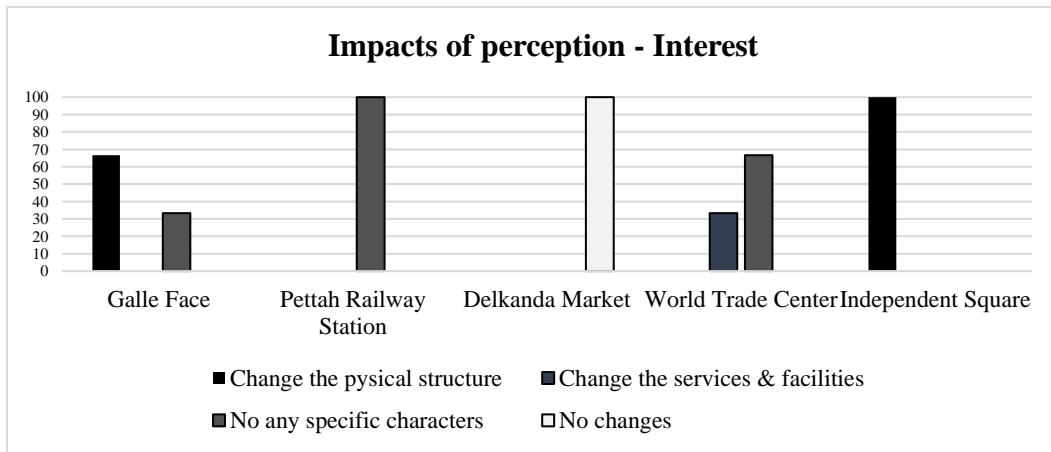


Figure 5, Impacts of public perception - Interest (Source: Compiled by Author)

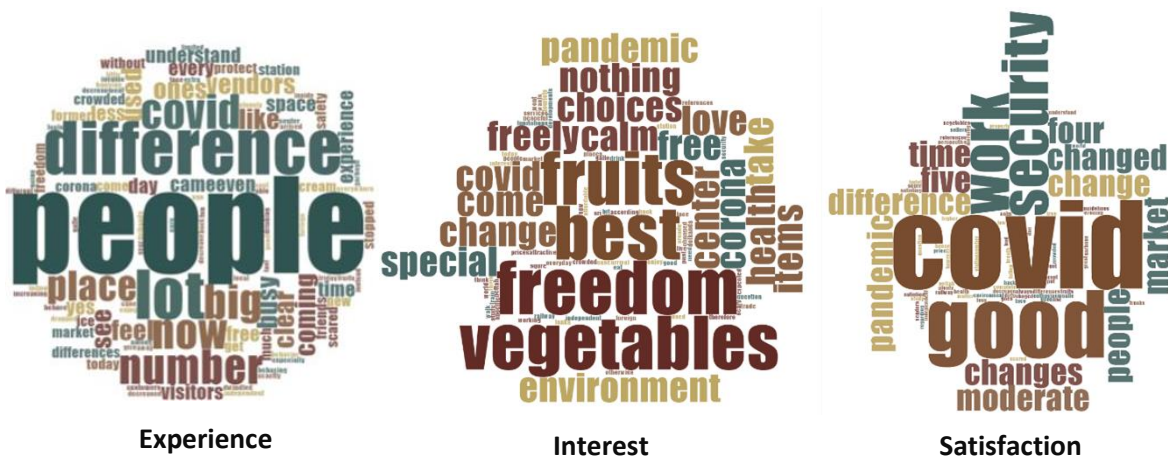


Figure 6, Impacts of public perception - Words Frequency Analysis (Source: Compiled by Author)

3.1.1 Impacts of public perception based on use

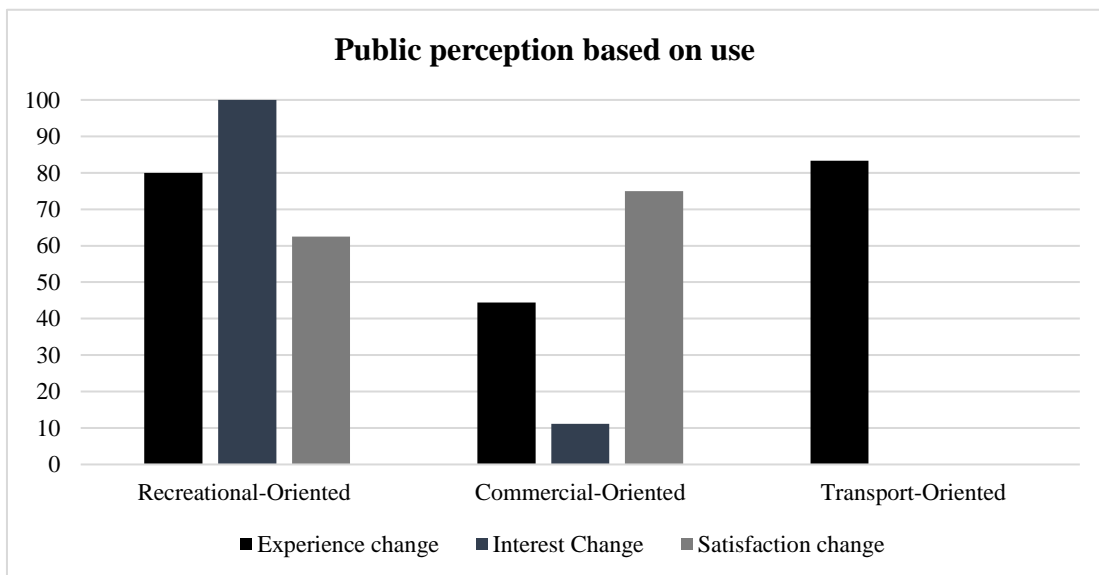


Figure 7, Impacts of public perception - Based on use (Source: Compiled by Author)

Galle face and independent square taken as recreational-oriented public space, Delkanda market and world trade centre as commercial-oriented public space and Pettah railway station taken as transport-oriented public space.

Comparing all three uses, it can identify that the recreational-oriented public space has significant changes in public perception. In that case, all attributes that measure the perception is different more than 50% from pre-pandemic to new normal era. According to respondents' answers, their interest has changed as negative, as well as

positive in this health crisis. As usual, most people came to recreational oriented public spaces to take a rest and relax their minds. All participants in these places also came based on the above purposes. In that sense, the characters or expectations are different from each other, and their answers also become negative or positive concerning that.

Example: Interest changed as positive

*"In the past I did not like it much, because every day there are so many people here. But now I like the freedom here."*

Example: Interest changed as Negative

*"I really like the freedom had here before Covid-19 came. Very peaceful here we can walk anywhere. We can eat and drink as freely. I like that freedom a lot. But now all those things have changed. There are so many limitations."*

In commercial-oriented public space, changes of experience & interest are 44.5% & 11% as respectively. Commercial spaces are places that most people need to go. With the restriction of the pandemic, people are not able to fulfil the most commercial purpose. But on this day, the country has reopened and most of the services are reactive following the providing regulation. Therefore, people go there without hesitation and fulfil their needs. Because of that, the experience and interest there have not made a big difference, but satisfaction level has changed 75% because of the yet unavailability of some services.

Transport-oriented public space becomes a quieter place, because of the smaller number of people. The use of public transportation is still less. Therefore, the experience of the railway station has changed by 83%, because of the reduction of users. But other than that, they have no difference in interest or satisfaction regarding the place.

### 3.1.2. Impacts of public perception based on income level

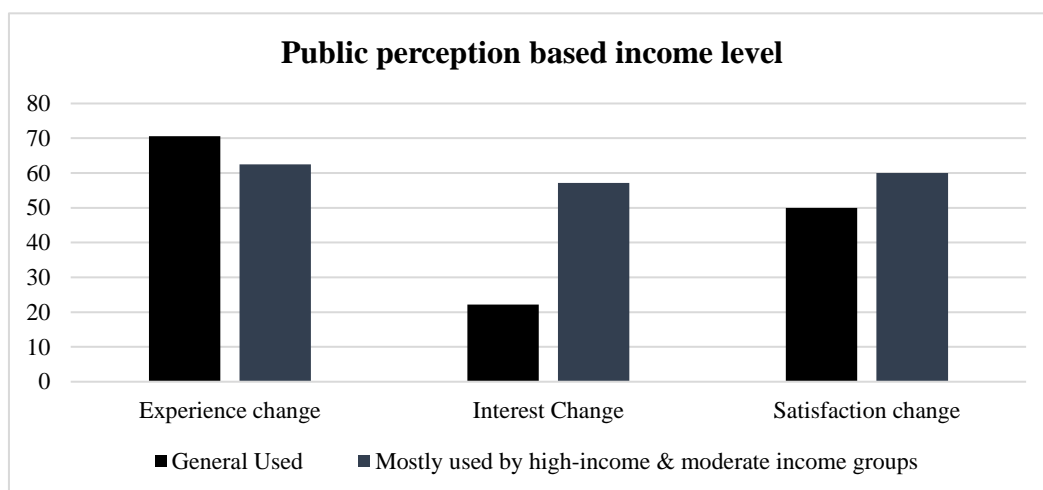


Figure 8, Impacts of public perception - Based on income level (Source: Compiled by Author)

Figure 8 shows that there is a difference of impact for individual perception to use public places due to Covid-19 based on income level. In the study, Galle face, Pettah railway station and Delkanda market are taken as general use and rest taken as mostly used by high income & moderate-income groups.

The results show the places that are mostly used by high-income & middle-income groups have a significant impact on perception through experience, interest, and satisfaction due to the pandemic. All attributes changed more than 50% of participants.

But in general, used places, only experience has changed more than 50%. These places are usually used by lower-income and lower-middle-income groups. In the pandemic, public spaces users also become more homogenous, while decreasing visitors in socially vulnerable groups and lower incomes (Lincoln R. Larson et al., 2021). In the Sri Lankan context also, the users of these groups decrease in public places and therefore the experience of most participants have changed. But interest and satisfaction do not have big differences.

### 3.2 IMPACT OF INDIVIDUAL BEHAVIOUR IN THE USE OF PUBLIC PLACE DUE TO COVID-19

In this study, the impacts of individual behaviour are measured through changes in the frequency of visiting the place and changes of time duration that spend in the place. The below graphs show the used codes and how change the behaviour through frequency & duration.

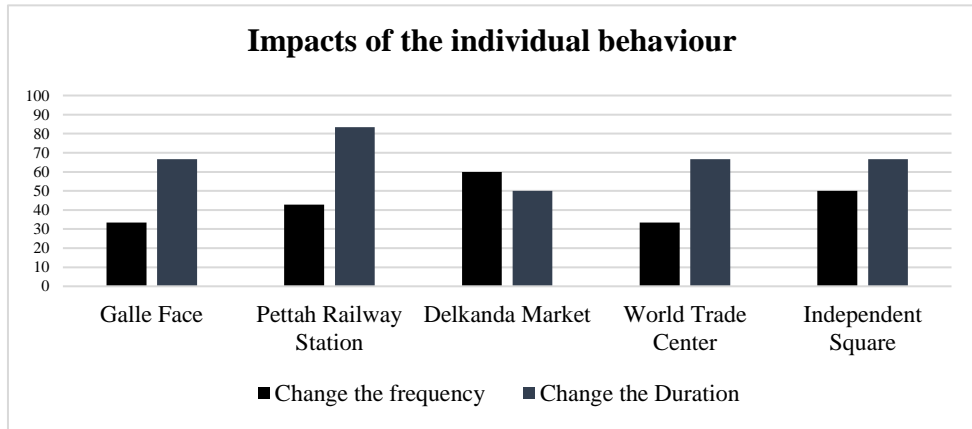


Figure 9, Overall results of impact of individual's behaviour (Source: Compiled by Author)

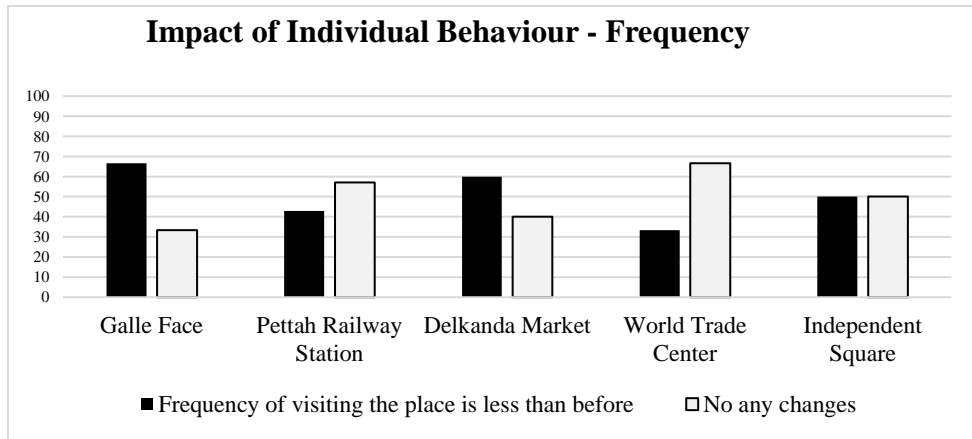


Figure 10, Impacts of individual's behaviour - Frequency of visiting the place (Source: Compiled by Author)

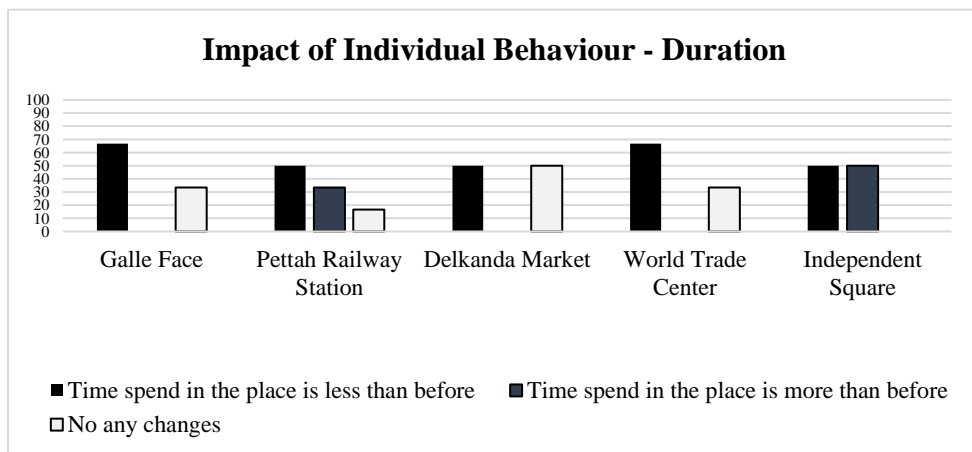


Figure 11, Impacts of individual's behaviour - Time duration spend in the place (Source: Compiled by Author)



Figure 12, Impacts of individual's behaviour - Word Frequency Analysis (Source: Compiled by Author)

Figure 9 show that only Delkanda market respondents have changed the frequency of visiting the place by more than fifty (60%). But the time duration stays in place has a significant impact on the pandemic. 83% of respondents in Pettah railway station changed their time duration after the corona. But in the Delkanda market, half of the population did not change their spending time, because they came back after buying what they wanted as before and after the pandemic.

Figure 12 show the respondents' answers as separate words according to the frequency. It will make sense of majority answers regarding perception.

3.2.1 Impacts of individual behaviour based on use

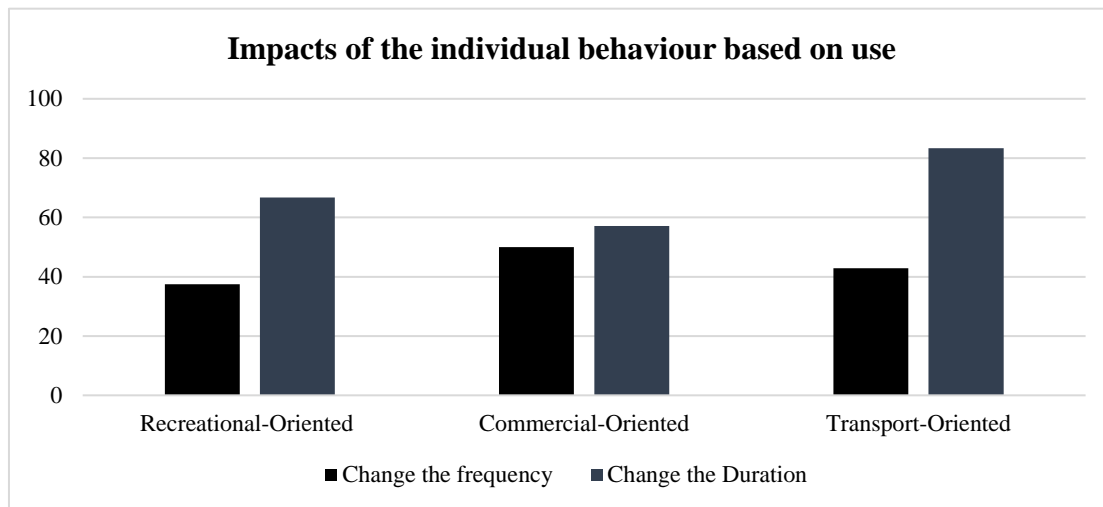


Figure 13, Impacts of individual's behaviour - Based on use (Source: Compiled by Author)

Figure 13 show that there is no big difference in the frequency of visiting the place in all three types of places. But considering the time duration spent in the transport-oriented public place, the amount is high. The reason for this is, only 50% of respondents have changed their spending time as less than before purposely. But another 33% of respondents must wait for more than before the Covid-19 due to the delay of the train. 67% and 57% of respondents changed their spending time in recreational-oriented and commercial-oriented places respectively.

3.2.2 Impacts of individual behaviour based on income level

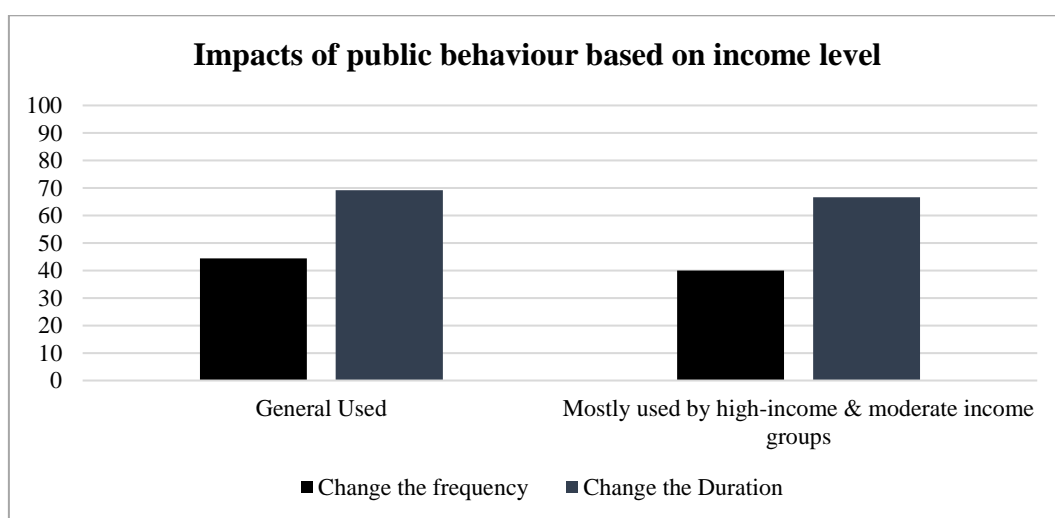


Figure 14, Impacts of individual's behaviour - Based on income level (Source: Compiled by Author)

No differences in individual behaviour due to the Covid-19 based on income level. More than half of them did not change the frequency of visiting the place and more than half of respondents changed the time of spending in the place as same in both categories.

3.3 DISCUSSION

The preceding finding indicates that the public's perception of using public space has changed as a result of the health crisis. The perception has a significant impact on their experience. However, when asked about their experiences,



37% of them stated that the change they experienced was the reduction of people. Only 29% of respondents responded, indicating a change in their feelings. Even though the majority of respondents (33%) indicated that their satisfaction level is lower than before, 20% indicated that their satisfaction level is higher than before. Changes in interest affect less than half of all respondents (37.5%).

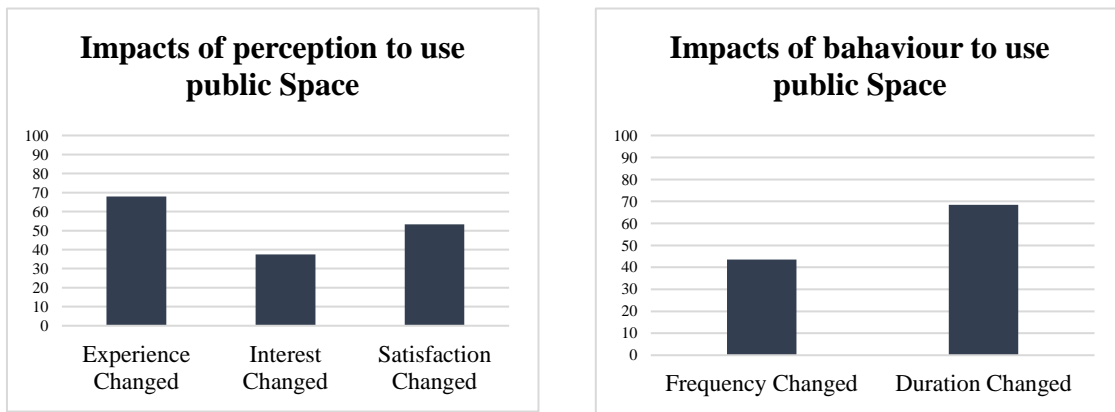


Figure 15, Summary of the analysis of collected data from semi-structured survey (Source: Compiled by Author)

The behavioural changes of individuals have highly impacted in developed cities such as Texas, USA. There sidewalks, crosswalks and such recreational spaces were quiet and unused. Most gatherings of them were converted from physical to virtual spaces (James A. C, 2020). But in Colombo, changes of the frequency of visiting the place are less than half, but changes of time duration spent at the place is as high as 68%. Even if it is not necessary to be in a recreational-oriented public space at this time, it is also used. Because people were stuck at home in the past few months with the restrictions. So now they are trying to use recreational-oriented public spaces to get rid of their stress.

Considering all these factors, it can identify people are trying to adapt to the new normal era. Because 62% of respondents answered that they feel insecure in place than before the pandemic. But 56.5% of respondents did not change their frequency of visiting the place out of that. In Malioboro city, most of them did not have much idea about health protocols & they did not care about those. Therefore, the perception & behaviour of the residence does not change much (Yordan Kristanto Dewangga, Sita Yuliastuti Amijaya, and Hoseo Viadolorosa, 2021). But in Sri Lankan context, 92.6% of respondents have a proper understanding of the current situation. Therefore, they adapt their behaviour to reduce the risk and protect themselves. That is the reason for 68% of respondents changing their spending time in public space. Based on observations it highlighted they follow health guidelines and always try to avoid interacting with others.

In some cases, such as North Carolina, USA the reduction of user groups reminds the inequitable society while public space users become more homogeneous. Socially vulnerable groups and low-income groups declined (Lincoln R. Larson *et al.*, 2021). In Colombo, reduction of users is common in all places, but current users are trying to adapt to the new normal era and fulfil their needs. Therefore, even these days perception changed; it will automatically adapt to the situation with their behavioural changes. Less number of changes in interest proves that. Because due to this pandemic, they try to fulfil their interest with available. With these new safety guidelines, other factors will also adapt to the new normal era. They will accept the changes and continue that with their day-to-day life.

#### 4. Conclusion

This study investigated the impact of public perception and behaviour to use public space due to the Covid-19. The results show that there are significant impacts on perception, but the behaviour is automatically adapting the situation. And when the above statement is compared based on income level, the results show that there are no significant differences in their behaviour between income levels. In the Sri Lankan context, all income groups attempt to adapt to the situation and use public space in an equitable manner. Consider the places in terms of use; commercial and transportation-oriented public spaces are places where people occasionally need to go. As a result, the majority of respondents went there on a regular basis. However, most respondents from recreational-oriented locations do not change their frequency of visits. Because they are aware of the threat and how to protect themselves. They mentioned how important public places are for maintaining their mental health.

According to this study, people are now ready to embrace this new era. Due to the fact that many people in public places observe laws and health regulations, protecting both themselves and others while attending to their needs. In light of the epidemic, the best way to restore normalcy is not to further exclude people from public spaces, but rather to accommodate their requirements while providing a safe and secure environment. since we are unsure of how long this virus will remain active. Therefore, Public places should be part of the virus eradication process rather than isolated.

Physical distance is the easy choice for people to make a safe and secure environment. Because the observations show that, people mostly use, move and react in wide places without being crowded. However, Planners should take responsibility for this. Because the design of public places in this new normal era will decide the relationship of people and public space. And the regulations that they provide in the public space will make the health security and comfortable environment of users in this kind of health crisis.

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