

Public Transport or a Landmine: Insecurities, Harassment and its Effect on Mental Health in Women Using Public Transport System in Chennai District, Tamil Nadu

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ABSTRACT

Background: Crimes against women committed while traveling in public transportation is seldom understood, analyzed, and reported. The World Health Organization has stated that any form of violence against women must be considered a public health emergency. As a result of abuse, their overall health is impacted. This study was conducted to find the prevalence of insecurity and characterization of harassment among female passengers while traveling on public transport.

Subjects and Method: The cross-sectional study was conducted in the Chennai district, Tamilnadu between November 2023 to March 2024. A total of 270 women above 18 years of age and using public transport for a minimum period of 6 months for daily commuting were included as study participants selected using a simple random sampling method. Data related to Subjective fear of traveling alone in public transport was used as a dependent variable which was collected using a pre-tested semi-structured questionnaire comprised of questions related to sociodemographic characteristics, having faced verbal/physical harassment, and having experienced stalking while traveling in public transport, which were used as independent variables. Subjective response to harassment was assessed using the Impact of Event Scale-Revised (IES-R). Data was analyzed using SPSS version 26. Chi-square and logistic regression analysis were used to find the predictors that lead to the fear of traveling alone.

Results: A total of 270 participants were included in the study. The predictors for developing fear of travelling alone in public transport system were, belonging to a nuclear family (aOR= 2.12; 95% CI= 1.23 to 3.32), women who faced any kind of harassment (aOR= 2.56; 95% CI= 1.76 to 3.84), faced physical harassment (aOR= 3.92; 95% CI= 2.45 to 5.67) and faced verbal harassment (aOR= 4.11; 95% CI= 1.87 to 6.34).

Conclusion: It's not only enough to bring about policies, but the common public must be educated about harassments that happen on public transport. A special task force must be formed to apprehend the assailants.

Keywords: Harassment, gender-based violence, PTSD, fear of crime, mental health

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BACKGROUND

One cannot understand a city without riding in its public transport system (PTS). The connectivity that a PTS provides is unparalleled when it comes to acting as a medium to all social classes, enabling them to participate equally in their day-to-day activities (Asaad, 2024; Hörcher and Tirachini, 2021). In a huge economy like India, the majority of the population relies on PTS (Sahu et al., 2023). Out of the total population, women comprise a significant portion of users, relying on it for their daily commute to work and educational institutions (World Bank, 2023).

The persistence of harassment against women in both public and private spaces has led to the downfall of economies around the globe. Harassment in private places like workplace harassment is now viewed as a punishable offence (Acquadro et al., 2022), but harassment in public spaces especially in public transport is forsaken and the latest NCRB reports show that cases of harassment towards women is dangerously on the rise in India (Ceccato et al., 2021; Hoor-Ul-Ain, 2020; NCRB's Crime in India Report, 2022). As public transports are usually crowded places, it acts as a medium for the perpetrator to carry on the heinous act without the fear of being noticed (Ismawati et al., 2023).

Fear of crime is a reaction, encompassing both the psychological and social domains to the perceived risk of apprehension. This fear of crime (FOC) is contagious and generates a sense of insecurity (Collins, 2016). Studies have shown that women perceive fear of crime as greater than men. FOC stems not only from individual experiences of victimization but also from the narratives that have been projected onto women

throughout their lives, which has ingrained in women to fear public spaces. The social stigma of women being physically weaker, makes them believe they are at the mercy of their male counterparts (Ball and Wesson, 2017). Shakeshaft et al in their study had defined harassment into noncontact and contact categories (Shakeshaft and Cohan, 1995). Under the noncontact category, non-verbal sexual abuse (exhibitionism, showing sexually explicit pictures, or making gestures) and verbal sexual abuse (sexual comments, catcalling, taunting, and asking questions about sexual activity). The contact category includes sexual abuse of kinds like touching, kissing, and rape.

Enhancing the safety of cities for the inhabitants and making it a conducive environment of opportunities thereby improving economic growth, has been the 11th goal of The United Nations in their 2030 Agenda of Sustainable Developmental Goals (UN-Habitat, 2020). A safe city is characterized by environments devoid of risks or threats for everyone, enabling residents to navigate without the fear of harm. This assurance of safety extends beyond private car travel, encompassing secure options like public transportation, cycling, and walking, aligning with city goals to diminish single-car usage (AlKheder, 2021).

The existence of a gender-based pay gap coupled with harassment towards women can hinder their participation in the workforce, and social, educational, and political spheres of life (Beebeejaun, 2017). Even after adopting the mission to eliminate violence against women as one of the Sustainable Goals by 2030 (UN Goal 5, 2023), the notion is an improbable aspiration. PTS has not been designed keeping in mind the gender disparity (Tiznado-

Aitken et al., 2024). The lack of sufficient media attention, compounded by underreporting of the cases as still the mentality of victim blaming persists in a patriarchal society, adds to the existing problem. Cases like this if not reported are in imminent danger of becoming normalized (Ceccato et al., 2022; Zietz and Das, 2018). Harassment on public transportation, including verbal, physical, and non-verbal forms, can lead to significant psychological impacts and could lead to the development of Post-Traumatic Stress Disorder (PTSD). Victims may experience symptoms like flashbacks, severe anxiety, and avoidance behaviors (Creamer, 2003)

Keeping in mind the dearth of research in India and the public being oblivious to the fact of such incidents, the current study was formulated with the following objectives. Firstly, the study intended to find the prevalence of women who are insecure about traveling alone on public transport in Chennai and its associated factors. Secondly, to determine the prevalence of harassment among women passengers of the public transport system in Chennai and its characteristics.

SUBJECTS AND METHOD

1. Study Design

Cross-sectional study design conducted in Chennai district, Tamilnadu between the months of November 2023 to March 2024.

2. Population and Sample

Women above the age of 18 years and using public transport for a minimum period of 6 months for daily commuting were included in the study. The sample size required was calculated as 270. The list of 71 public transport terminals with 31 bus terminus and 40 Railway stations under Chennai Metropolitan Area were prepared in alphabetical order and numbered. By using lottery method, 3 bus terminus and 2 train stations

was chosen randomly. From each of the transport terminals, 54 female passengers above the age of 18 were chosen to be included in the study to arrive at the required sample size of 270. Based on a pilot study which included metro stations none of the women reported facing any kind of harassment. Because of this finding, metro stations were not included in the study.

3. Study Variables

Data related to Subjective fear of travelling alone in public transport was used as a dependent variable which was collected using a pre-tested semi-structured questionnaire comprised of questions related to sociodemographic characteristics, having faced verbal/physical harassment and having experienced stalking while travelling in public transport, which were used as independent variables.

4. Operational Definition of Variables

Physical harassment: Physical harassment in the present study was defined as having been touched inappropriately, being groped, and invading personal space.

Verbal harassment: Verbal harassment in the present study was defined as having experienced catcalling, being harassed using sexual remarks, and vulgar words.

5. Study Instruments

- a) Pre-tested semi-structured questionnaire: which comprised of questions related to the socio-demographic profile of participants, as well as questions related to experiences of harassment and the victim's behavior post the incident.
- b) Impact of Event Scale-Revised (IES-R): Participants who experienced any form of harassment or stalking in the past 7 days were asked to complete this questionnaire, a 22-item instrument designed to measure subjective responses to specific traumatic events. The questionnaire assesses responses in three areas: intrusion (e.g., intrusive thoughts, nightmares,

intrusive feelings and imagery, dissociative-like re-experiencing), avoidance (e.g., numbing of responsiveness, avoidance of feelings, situations, and ideas), and hyperarousal (e.g., anger, irritability, hypervigilance, difficulty concentrating, heightened startle). Additionally, it provides a total subjective stress score known as the IES-R score. It is important to note that the IES-R is not intended to diagnose Post-Traumatic Stress Disorder (PTSD). While there is no specific cut-off score, scores above 24 are concerning, with higher scores indicating greater concern for PTSD and related health and well-being issues (Creamer, 2003).

6. Data Analysis

Data was entered in Microsoft Excel and analyzed by using SPSS version 26. Bivariate analysis was done using chi-square test. Variable found to be significant at a 95% confidence interval in the bivariate analysis and was included in the enter method of a logistic regression model.

7. Research Ethics

Ethical approval was obtained from the Institutional Ethical Committee, Reference number: 002/SBMCH/IHEC/2023/2104 of the private medical college before the commencement of the study.

Table 1 shows that out of 270 women who were interviewed, around 141 (52.2%) of women responded to be insecure when travelling alone on public transport. The majority of the study participants belonged to the age group of <25 years (53.3%), and 76.3% said that they belonged to a nuclear family setup. Among them, 58.9% were students, 31.1% were working individuals and only 10% responded to be unemployed. 90.4% of women responded that they had heard of gender-based violence. 21.1% responded that they had faced some kind of harassment while traveling at a public transport in the last 6 months. Physical harassment was reported to be the main type of harassment with 19.3% of women experiencing it, while 16.7% of women replied having been verbally abused. It was found that 63.7% of women were stalked.

Table 2 shows the association between fear of crime in public transport and characteristics of women and harassment. It was observed that factors such as type of family (OR=2.57; CI=1.11 to 3.73), women who faced any kind of harassment (OR= 3.22; CI=1.69 to 6.16), women who faced physical harassment (OR= 3.86; CI= 1.92 to 7.75), women who faced verbal harassment (OR= 5.38; CI= 2.39 to 12.07) were found to be statistically significant with fear of crime with p <0.050.

RESULTS

Table 1. Sociodemographic characteristics of women and harassment

Characteristic	Category	Frequency (n)	Percentage (%)
Age group (years)	<25	144	53.3
	25 and above	126	46.7
Type of family	Nuclear	206	76.3
	Joint	46	17
	Three generation	18	6.7
Education	College Graduate	237	87.8
	Up to high school	33	12.2
	Unemployed	27	10
Employment status	Student	159	58.9
	Working	84	31.1
Awareness about the term gender-based violence	No	26	9.6
	Yes	244	90.4
Women who faced harassment	Yes	57	21.1

Characteristic	Category	Frequency (n)	Percentage (%)
Women who faced physical harassment	No	213	78.9
	Yes	52	19.3
Women who faced verbal harassment	No	218	80.7
	Yes	45	16.7
Women who were stalked	No	225	83.3
	Yes	172	63.7
Fear of travelling along	No	98	36.3
	Yes	141	52.2
	No	129	47.8

Table 2. Bivariate analysis to find the association between fear of crime and characteristics of women and harassment

Variable	Fear of travelling alone				OR	95% CI		p-value
	Yes		No			Lower limit	Upper limit	
	N	%	N	%				
Age Group (years)								
<25	76	52.8	68	47.2	0.95	0.59	1.53	0.840
25 and above	65	51.6	61	48.4				
Type of family								
Nuclear	116	56.3	90	43.7	2.57	1.11	3.73	0.040*
Joint	19	41.3	27	58.7	1.40	1.02	2.12	0.020*
Three generation	6	33.3	12	66.7		Reference		
Education								
College graduate	125	52.7	112	47.3	1.18	0.57	2.45	0.640
Upto high school	16	48.5	17	51.5				
Employment status								
Unemployed	10	37	17	63	2.15	0.88	5.26	0.220
Student	84	52.8	75	47.2	1.13	0.66	1.92	0.780
Working	47	56	37	44		Reference		
Awareness about the term gender-based violence								
Yes	12	46.2	14	53.8	0.76	0.34	1.71	0.510
No	129	52.9	115	47.1				
Women who faced harassment								
Yes	42	73.7	15	26.3	3.22	1.69	6.16	<0.001*
No	99	46.5	114	53.3				
Women who faced Physical harassment								
Yes	40	76.9	12	23.1	3.86	1.92	7.75	<0.001*
No	101	46.3	117	53.7				
Women who faced verbal harassment								
Yes	37	82.2	8	17.8	5.38	2.39	12.07	<0.001*
No	104	46.2	121	53.8				
Women who were stalked								
Yes	89	51.7	83	48.3	0.94	0.57	1.55	0.830
No	52	53.1	46	46.9				

* p<0.050, Statistically significant at 95% Confidence Interval in bivariate analysis (Chi-square)

In Table 3, the variables which were found to be significant in bivariate analysis were included in the regression model. On multi-variate logistic regression analysis, the main predictors for developing fear of travelling alone in public transport system were, belonging to a nuclear family (aOR= 2.12;

95%CI= 1.23 to 3.32), women who faced any kind of harassment (aOR= 2.56; 95%CI= 1.76 to 3.84), faced physical harassment (aOR= 3.92; 95% CI= 2.45 to 5.67) and faced verbal harassment (aOR= 4.11; 95% CI= 1.87 to 6.34).

Table 3. Logistic regression analysis to find the predictors of fear of crime

Independent Variables	aOR	95% CI		P
		Lower limit	Upper limit	
Type of family				
Nuclear	2.12	1.23	3.32	0.01*
Joint	0.76	0.45	1.34	
Three generation	Reference			
Women who faced Harassment				
Yes	2.56	1.76	3.84	0.012*
No				
Women who faced Physical harassment				
Yes	3.92	2.45	5.67	0.00*
No				
Women who faced verbal harassment				
Yes	4.11	1.87	6.34	0.00*
No				

*p<0.050, Statistically significant at 95% Confidence Interval in the regression model. (Logistic regression, Enter method), R – square of regression model: 0.712.

Table 4 shows the mean scores in different subscales of the IES-R scale. It was found that the intrusion score and avoidance score were highest in those who faced physical harassment. Increased arousal score was highest in those who faced verbal harass-

ment. Among women who were stalked, arousal score was found to be the highest. The total IES-R score was found to be the highest among those who faced physical harassment.

Table 4. IES-R scores among women who faced harassment

Components of IES-R	Physical harassment		Verbal harassment		Women who were stalked	
	Mean	SD	Mean	SD	Mean	SD
IES Intrusion score	20	5.30	17	4.60	11	3.20
IES Avoidance score	18	3.90	15	5.10	10	2.40
IES increased arousal score	19	4.70	21	6.10	19	5.70
Total score	58	13.20	53	14.70	41	10.20

From Figures 1 and 2, it could be observed that around 65% of women feel insecure about travelling by bus and using public transport at night (62%). In Figure 3, among women who faced verbal harassment (multiple options), more than half of them (56.14%) reported to have been a victim of catcalling. This was then followed by harassment using sexual remarks (19.29%) and

vulgar words (17.5%). Figure 4 talks about the different type of physical harassment (multiple options). A vast proportion of women (64.9%) answered that they had been touched inappropriately either during their travel or when they were waiting in transit hubs. While cases of invading personal space and groping were reported by 26.3% and 15.7% of respondents.

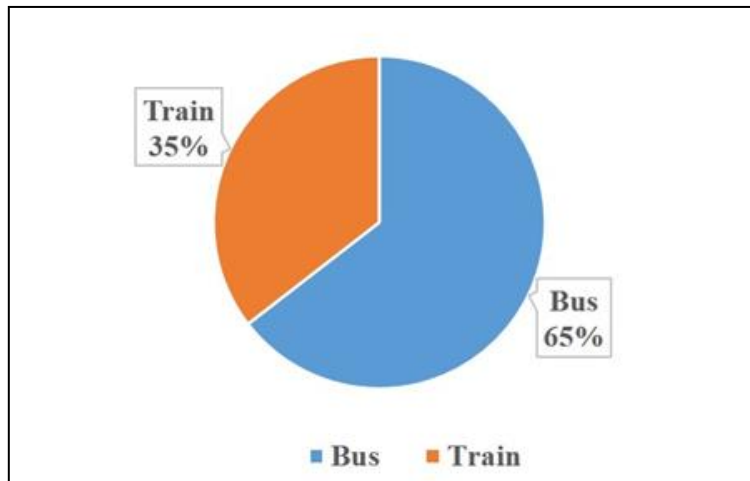


Figure 1. Feeling Of Insecurity- Based On Transportation (n=141)

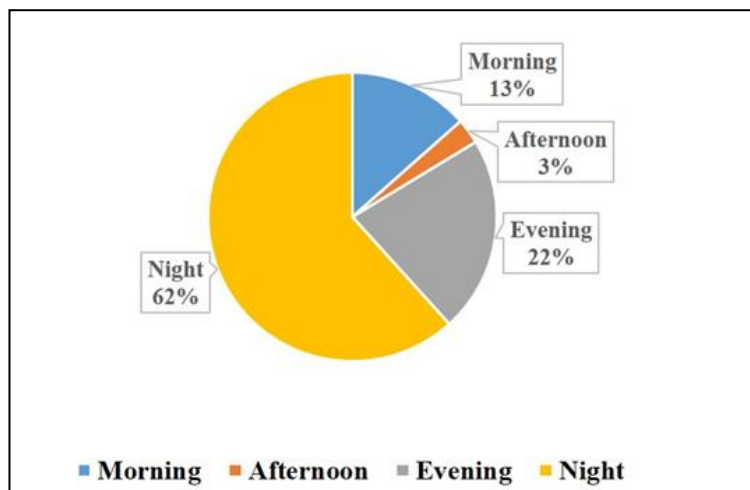


Figure 2. Insecurity By Time Of The Day (n=141)

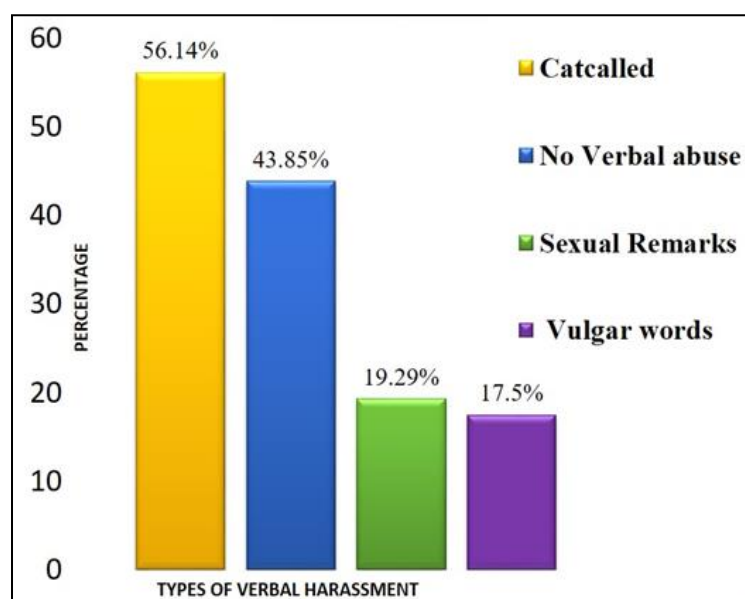


Figure 3. Types Of Verbal Harassment Faced By Study Participants

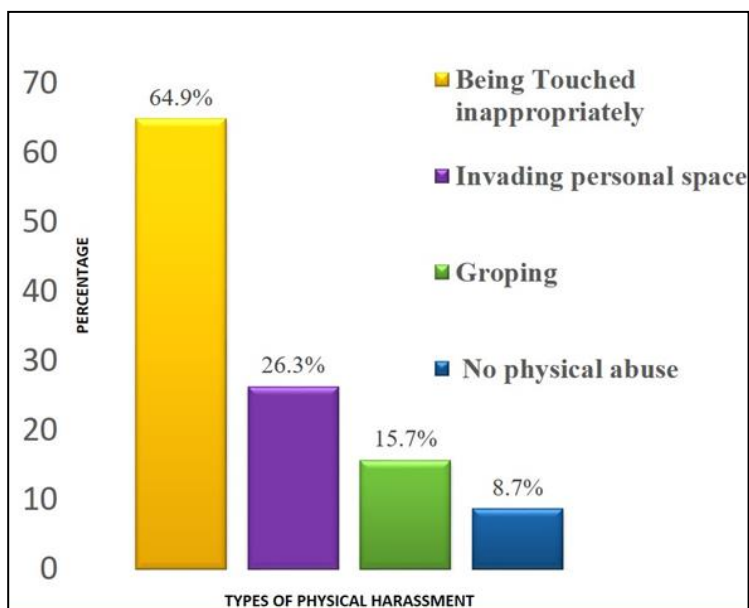


Figure 4. Types Of Physical Harassment

Table 5 describes the victimology of harassment. We can observe that more than half of women above 25 years (57.9%) were harassed, and majority were students (59.6%). Nearly 70% of women who were harassed were also stalked. From the response, most of the harassment took place inside the bus (61.4%) and 54.4% said, the incident took place in the evening. When asked about bystander intervention, 71.9% responded the bystanders didn't come to their rescue. Nearly 45.6% replied that though they were

harassed they haven't taken any safety measures post the incident. The majority (40.35%) chose to ignore the harassment, and nearly 31.58% panicked. While only 19.3% fought with the assailant, and 8.77% of women shouted for help. We can observe that the major psychological impact was women losing their confidence (42%), while the least reported was reduced sleep (7%). It was also found that only 1.5% of women reported the incident to the police.

Table 5. Characteristics of harassment faced by study participants (n=57)

Characteristic	Category	Frequency (n)	Percentage (%)
Age group (years)	<25	33	42.1
	25 and above	24	57.9
Type of family	Nuclear	45	78.9
	Joint	7	12.3
	Three generation	5	8.8
Education	College Graduate	53	93
	Up to high school	4	7
Employment status	Unemployed	2	3.5
	Student	34	59.6
	Working	21	36.8
Awareness about the term gender-based violence	No	5	8.8
	Yes	52	91.2
Number of times the harassment occurred	Very often	2	3.5
	Often	17	29.8
	Rarely	38	66.7

Characteristic	Category	Frequency (n)	Percentage (%)
Had experienced stalking	Yes	40	70.2
	No	17	29.8
Mode of transport/ transit hub harassment occurred	While travelling on bus	35	61.4
	While travelling on train	15	26.3
	While waiting at bus stand	15	26.3
	While waiting in the train station	8	14
Time of the day harassment occurred	Morning	21	36.8
	Afternoon	9	15.8
	Evening	31	54.4
	Night	14	24.6
Bystander intervention when the harassment happened	Yes	16	28.1
	No	41	71.9
Safety measures post the harassment	No safety measures	26	45.6
	Carrying a knife	9	15.8
	Carrying a pepper spray	22	38.6
	Ignored	23	40.3
Reaction to the harassment	Panicked	18	31.5
	Fought with the assailant	11	19.3
	Shout for help	5	8.77
	Decreased self-confidence	24	42
Psychological impact after harassment	Lost trust on humans	21	37
	Suppressed the memory of harassment	15	26.3
	Having nightmares	8	14
	Blamed themselves for the harassment	6	11
	Reduced sleep	4	7
	Women who complained to the police about the harassment	Yes	4
	No	53	93

DISCUSSION

In a century where the public transport system is being promoted keeping in mind the increase in population density, the exorbitant fuel rates and the worsening air quality, public transport must be a safe haven for all the travellers alike. The present study found that 52.2% of female riders felt insecure about traveling in public transportation. Another study done by Stjernborg, V. et al., in Sweden, found that only 11% of women answered that they were feeling insecure (Stjernborg, 2024). Studies done by Yasir et al. (2022) and Carver and Veitch (2020) from Bangladesh and Australia

found that 21% and 39% of women consider public transportation to be unsafe (Yasir et al., 2022; Carver and Veitch, 2020). The probable disparity could be due to the fact that crime rates in Sweden are comparatively low (Statista, 2024.). The current study found that women are more insecure about riding the bus and travelling by night. A study done by Soto et al. (2022) found that women felt more insecure at bus stops, as cases of theft in that region were higher at bus stops. However, the risk of sexual harassment was perceived more inside the bus. Carver and Veitch (2020) in their study found that 70% of women reported that they

felt more insecure about travelling in the night when compared to men and that they preferred not travelling even if it meant going to work. Another study done in 5 different global cities (Goulds, 2018), coincides with the findings from the present study where they found that 23% of young women believed it was unsafe after dark, particularly when traveling alone. This is in par with other international studies (Ceccato and Loukaitou-Sideris, 2022; Ison et al., 2023).

Secondly, the present study analyzed the distribution of crime that had occurred among the participants. It was found that 21.1% of participants had faced harassment, in the evening (54.4%) and the majority of abuse had taken place while travelling on bus and while waiting for transport. In line with the findings of the current study, Kacharo et al. (2022) in their research found that 50.8% of women had experienced at least one form of violence, and the majority of the incidents happened during the evening time as it is considered rush hours. An interesting aspect of this study was that the researchers categorized a different domain of violence, the psychological violence experienced by 84.1%. It involved insulting or making one feel bad (83.2%), intimidation, and belittling. Psychological violence usually was accompanied by physical or sexual violence (74.3%) and it leads to an increased fear of crime and insecurity which stems into anxiety. A study done by Ceccato et al. (2021) found that 61% of women reported having been harassed at least once. The high rate of victimization could be because the participants were asked to report harassment that had occurred in the last 3 years. It was also noted from the study that previous victimization did not warrant future victimization, but it could impose the fear of crime on the riders. The study also found that women are more likely

to experience physical harassment while in transit which was in line with the present study (Ceccato et al., 2021). Yasir et al. (2022) in their study found that young unmarried girls were more victimized when compared to married women because married women almost always traveled with a companion. Similarly, employed faced abuse more as they are more likely to travel to work alone thereby increasing the chances of harassment.

According to another study conducted in Lucknow, India, 45% of respondents believed that young women are the most common targets of harassment on public transportation. However, there was No. agreement on whether any attribute, such as traveling alone or during rush hours, makes them particularly vulnerable to sexual harassment on public transportation (Tripathi et al., 2017). According to another study conducted in Lucknow, India, 45% of respondents believed that young women are the most common targets of harassment on public transportation. However, there was No. agreement on whether any attribute, such as traveling alone or during rush hours, making them particularly vulnerable to sexual harassment on public transportation (Tripathi et al., 2017).

Similar findings were found in a study done by Tiznado-Aitken et al. (2024) in which physical harassment was the highest with groping to have been experienced by a majority of the bus stops (36.9%) especially by young women as they frequent public transport more, warranting increased abuse and victimization. In line with findings from our study where only 1.5% of women reported the crime, another study had 5.7% of victims lodging a formal complaint. Reasons like distrust in police, victims normalizing such incidences and in case they do report it, victims were scared their family members will restrict their mobility (Ison et al., 2023).

The current study revealed that individuals who experienced any form of harassment in public transport had elevated IES-R scores (above 33), indicating they might be at risk of developing PTSD and depression. This finding aligns with a study by Tanaka et al. (2023) which also found that harassment could trigger the onset of PTSD. These findings indicate an increased risk of developing PTSD and depression among those affected. This underscores the urgent need to address harassment and offer sufficient mental health support to alleviate its negative impact.

Though this study sheds light on the plight and troubles faced by women who travel by public transport it isn't without limitations. The various factors like the availability of police personnel in public transport and infrastructure were not included in the study. More prospective studies involving women who faced any form of harassment in public transportation, followed up over a period could yield us data about the coping mechanisms they have adopted and how effective it is in preventing future harassment.

From the present study, we can understand that insecurity, fear of crime, and harassment faced by women transcend beyond normal transit behavior. One must understand that for a change to happen, it must be focused from the grassroots level. The public transport system must be brought under a microscopic view. Introducing a working Closed Circuit Television (CCTV) cameras, right from the trains, to buses and transit hubs will make the travelers feel safe. Educating the public, bus conductors, and drivers, regarding gender-based violence is mandatory. Enhancing safety for women's mobility in the night. The norms must change where women are looked down upon traveling at night. Instead, the authorities can initiate a

women-only bus/train at night. Finally, media narratives surrounding the fear of crime must change and instead show how women can be empowered and be self-aware.

AUTHOR CONTRIBUTION

Dr Sushmitha G and Dr Anantha Eashwar VM conceived and designed the present study. Dr Monica Albert Sekhar, Dr Shirley Esther Priscilla helped in the review of literature and drafting the questionnaire. Dr Sushmitha G conducted the data collection. Data analysis was then done by Dr Sushmitha G, Dr Anantha Eashwar VM, Dr Sujitha P. W. Dr Sushmitha G, Dr Swathika Devi R, Dr Anantha Eashwar VM and Dr Sujitha P helped in drafting the final manuscript.

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Nil.

CONFLICT OF INTEREST

There are no conflicts of interest.

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