

Empowering Mobility: Investigating the Mode Choice of Women Commuters in Developing Countries Using Multinomial Logit Modelling – A Case Study of Srinagar, India

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Broad Presentation Outline

- Introduction
- Objectives
- Literature Review
- Study Methodology
- Data Description
- Analysis and Result
- Conclusions
- Policy Implications

Introduction

- The women work force penetration is about 33 per cent after the pandemic (Reuters, 2023).
- For women to be able to visit locations like schools, markets, businesses, etc., they require basic transportation that is safe, pleasant, convenient, and economical.
- The present study aims to increase women's mobility in developing countries of urban and non-urban areas by identifying important elements that affect women's perceptions of safety, harassment, and other difficulties when using different forms of transportation.



Source: Hindustan Times

Objectives of the Study

To identify the key factors that influence the mode choice behaviour of women commuters.

To develop a mode choice model that can predict the probability of women choosing a particular mode of transportation for their daily commute, based on the identified factors.

Literature Review

Women's views of safety in public spaces have been the subject of numerous research. Little research has been done to know how safe they feel when utilising different modes of transportation in urban and non-urban areas of India.

Hoor-Ul-Ain (2020) considered the perils of public harassment that women encounter on public transport in megacities and found that women are not safe on roads and buses in developing countries due to a scarcity of available laws which can protect them in public spaces.

Indian researchers have been focusing on the overall state of women's safety. However, there has not been much research into how women feel about safety, harassment, and other issues when using different modes of transportation. However, no research has been done to determine women commuters' travel behaviour in Srinagar city, India.

The current study aims to close this knowledge gap by emphasising methods for improving women's mobility in developing nations' urban and non-urban areas.

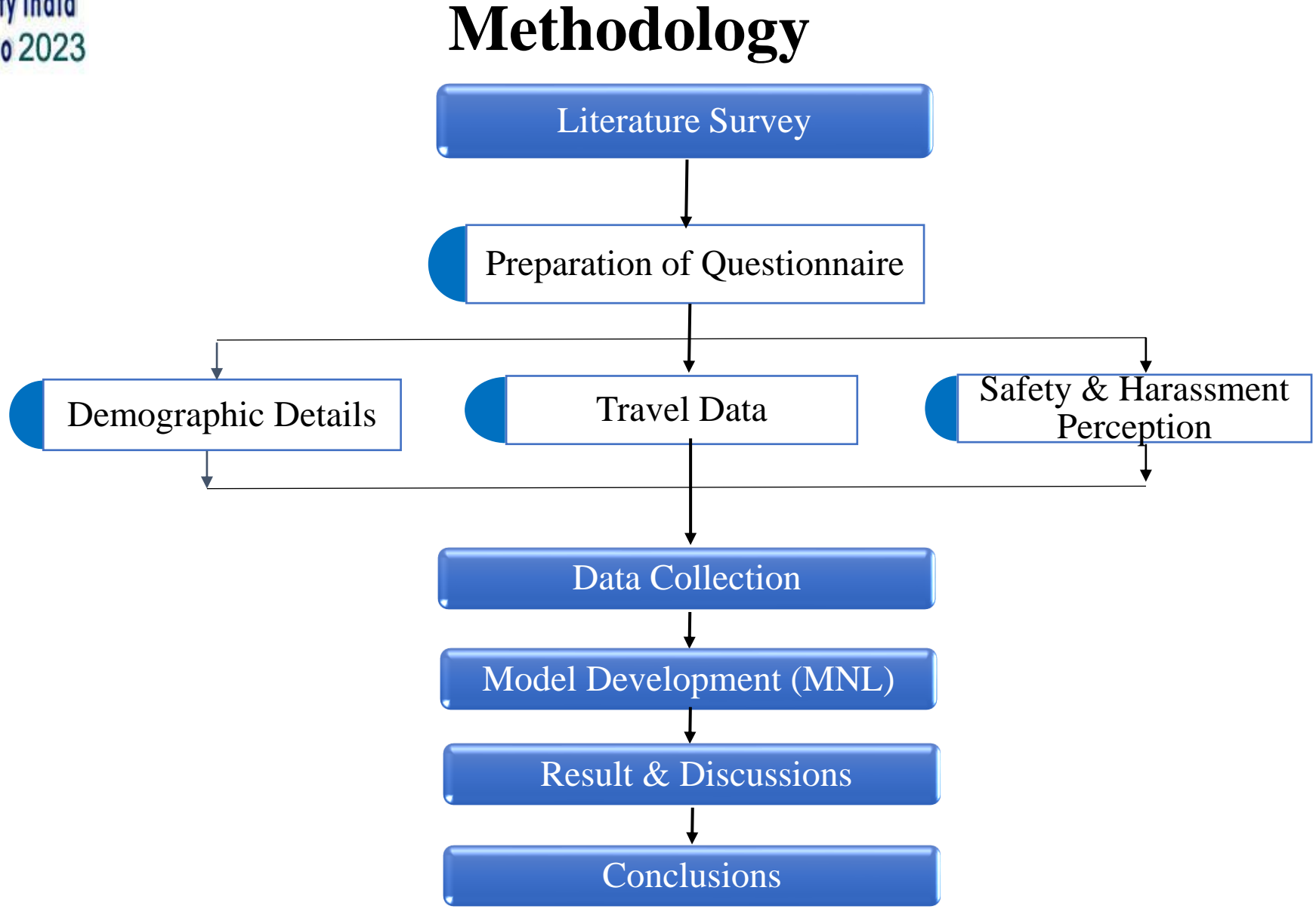
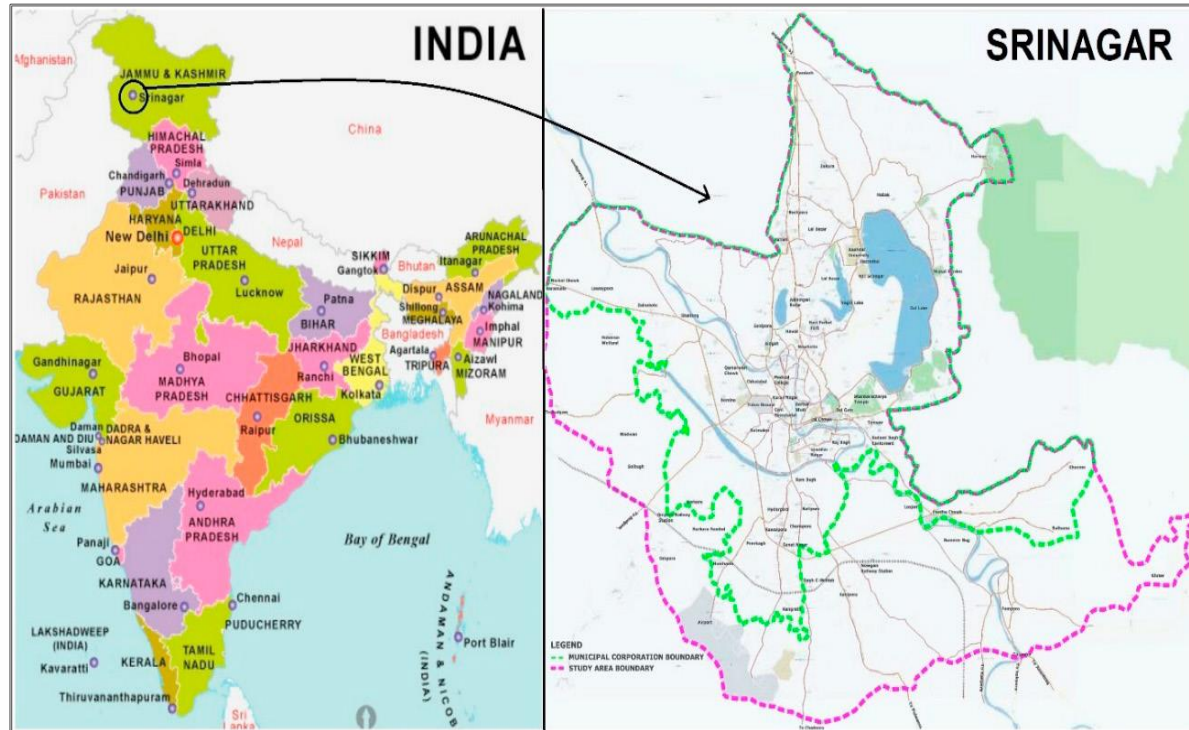


Fig 1. Methodological Framework of the Study

Data Collection



➤ Final cleaned sample size of 465 from the online survey and face to-face survey was collected.

Fig 2. Map of India showing the location of Jammu & Kashmir

Data Description

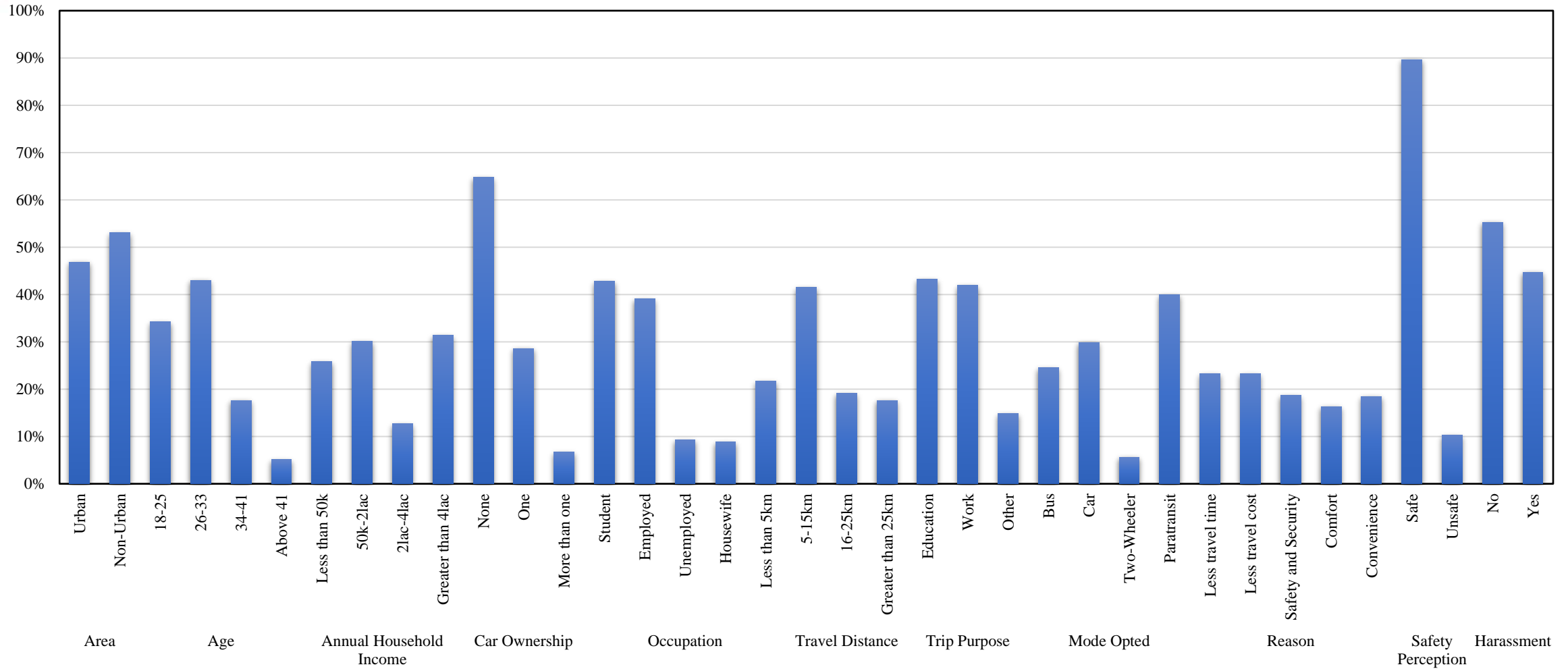


Fig 3. Variables vs Marginal Percentage

Data Description

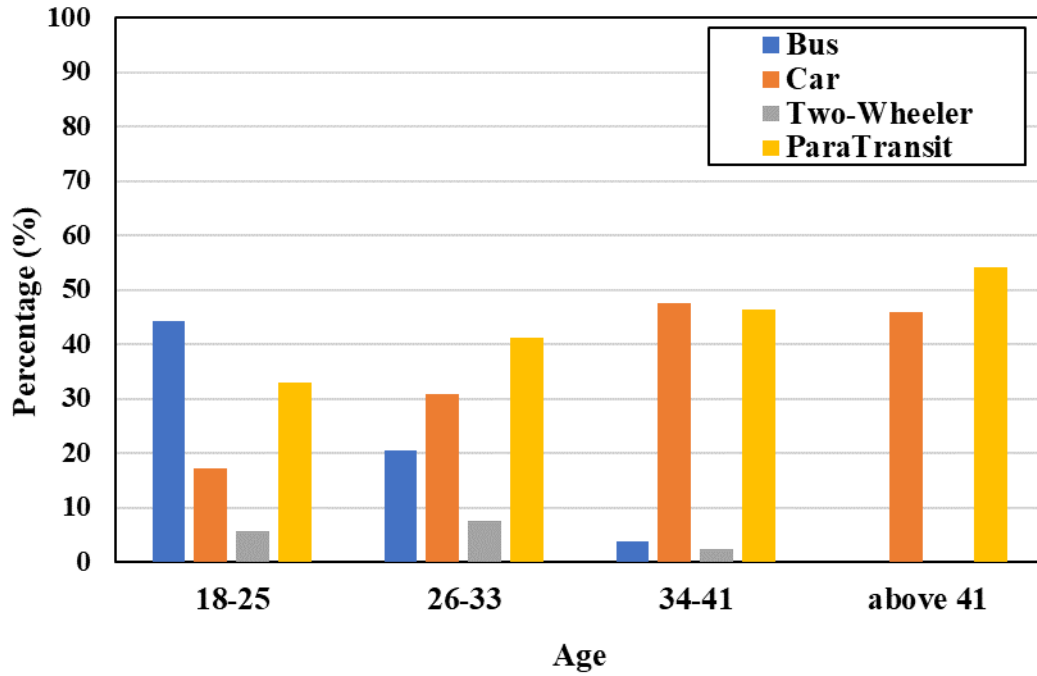


Fig 4. Age based classification of mode opted

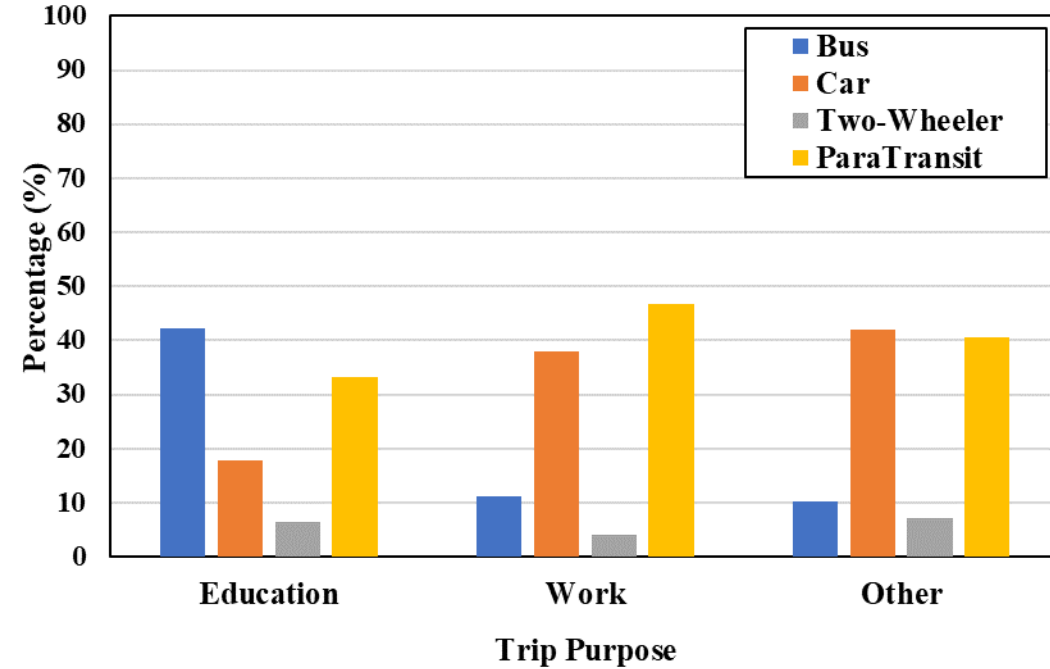


Fig 5. Trip purpose-based classification of mode opted

Data Description

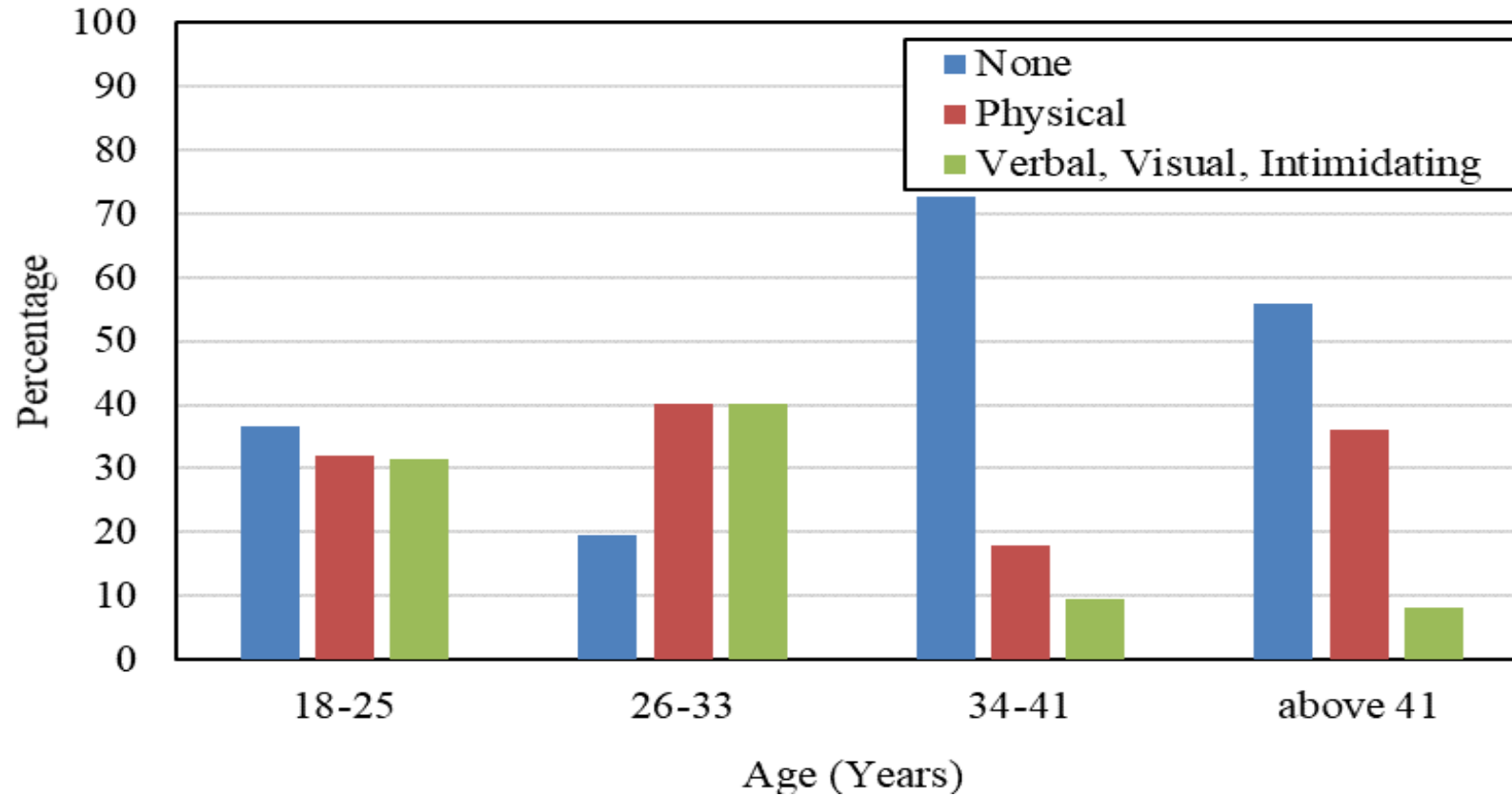


Fig 6. Bus Harassment based classification of age

Table 7. Parameter estimates of Choice between Two-wheeler and Bus



Response category	Predictor variables and their categories	B	Significance	EXP(B)
Two-wheeler	Intercept	-17.944	.998	
	travel expenses	-.339	.223	.712
	[Area=0]	-.040	.946	.961
	[Age=0]	.930	1.000	2.534
	[Age=1]	1.711	1.000	5.537
	[Age=2]	2.313	1.000	10.100
	[Annual Household Income=0]	.575	.528	1.778
	[Annual Household Income=1]	-.027	.977	.974
	[Annual Household Income=2]	1.526	.129	4.598
	[Car ownerships=0]	-.286	.829	.752
	[Car ownerships=1]	.920	.502	2.511
	[occupation=0]	-.652	.620	.521
	[occupation=1]	-.009	.994	.991
	[occupation=2]	-1.436	.286	.238
	[travel distance=0]	16.881	.996	21442428.623
	[travel distance=1]	16.917	.996	22240521.241
	[travel distance=2]	16.669	.996	17350531.868
	[trip purpose=0]	-1.242	.202	.289
	[trip purpose=1]	-1.495	.143	.224
	[reason=0]	1.442	.100	4.231
	[reason=1]	-1.403	.074	.246
	[reason=2]	-.554	.540	.575
[reason=3]	.234	.804	1.264	
[safety perception=0]	.122	.877	1.130	
[Harassment=0]	1.006	.073	2.734	

- Variables (travel expenses, annual household income, car ownership, purpose, and harassment) have p-values below 0.05, signifying their significant influence on predicting women commuters' transportation choices.
- Cox and Shell: 0.591
- Nagelkerke: 0.645
- McFadden: 0.362

Table 4. Parameter Estimates of Choice between Car and Bus

Response Category	Predictor variables and their categories	B	Significance	EXP(B)
car	Intercept	17.103	.000	
	travel expenses	.425	.015	1.530
	[Area=0]	.431	.319	1.538
	[Age=0]	-15.539	.000	1.784E-7
	[Age=1]	-15.532	.000	1.797E-7
	[Age=2]	-14.457	.000	5.267E-7
	[Annual Household Income=0]	-1.277	.052	.279
	[Annual Household Income=1]	-.795	.181	.452
	[Annual Household Income=2]	-.135	.861	.873
	[Car ownerships=0]	-1.147	.229	.318
	[Car ownerships=1]	.196	.848	1.216
	[occupation=0]	-2.261	.049	.104
	[occupation=1]	-.314	.772	.730
	[occupation=2]	-1.508	.167	.221
	[travel distance=0]	-1.006	.177	.366
	[travel distance=1]	-.610	.338	.543
	[travel distance=2]	-1.382	.046	.251
	[trip purpose=0]	-.641	.427	.527
	[trip purpose=1]	-1.170	.150	.310
	[reason=0]	1.477	.036	4.378
	[reason=1]	-4.037	.000	.018
	[reason=2]	.846	.180	2.329
	[reason=3]	1.160	.098	3.190
	[safety perception=0]	1.092	.163	2.982
	[Harassment=0]	2.511	.000	12.313

Response category	Predictor variables and their categories	B	Significance	EXP(B)
para transit	Intercept	17.041	.000	
	travel expenses	.449	.003	1.566
	[Area=0]	.865	.022	2.376
	[Age=0]	-15.985	.000	1.142E-7
	[Age=1]	-15.711	.000	1.503E-7
	[Age=2]	-14.862	.	3.512E-7
	[Annual Household Income=0]	-1.490	.009	.225
	[Annual Household Income=1]	-.559	.294	.572
	[Annual Household Income=2]	.513	.459	1.670
	[Car ownerships=0]	.909	.327	2.483
	[Car ownerships=1]	1.306	.195	3.691
	[occupation=0]	-1.014	.327	.363
	[occupation=1]	.138	.895	1.148
	[occupation=2]	-1.186	.255	.305
	[travel distance=0]	-.224	.723	.799
	[travel distance=1]	-.421	.451	.656
	[travel distance=2]	-1.538	.015	.215
	[trip purpose=0]	-.987	.153	.373
	[trip purpose=1]	-1.147	.129	.317
	[reason=0]	1.147	.073	3.148
	[reason=1]	-2.530	.000	.080
	[reason=2]	-1.032	.075	.356
	[reason=3]	-.382	.557	.682
	[safety perception=0]	.217	.654	1.243
	[Harassment=0]	1.868	.000	6.473

Conclusions

- In urban areas, women prefer cars and para-transit to buses.
- Younger women favor buses, while older age groups lean toward cars.
- Students prefer buses, while working women opt for para-transit and cars.
- Safety perception suggests para-transit and two-wheelers may be safer than buses, with cars deemed the safest.
- Car travel is associated with lower harassment odds compared to other modes.

Policy Implications

- Enhancing Safety and Security Measures in Public Transportation
- Improving Infrastructure and Facilities
- Tailoring Transportation Services for Students
- Gender-Responsive Policy Planning
- Awareness Campaigns and Education



Source: BBC News

THANKYOU