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Patterns of Pain: Mapping Misogyny Through A Decadal Crime Trend Analysis in Metropolitan India

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Abstract

Gender based violence continues to challenge urban safety in India. Metropolitan expansion mixed with patriarchal norms and uneven law enforcement has reshaped crime profiles against women from 2011 to 2021. Using a positivist quantitative approach, the study compiles secondary crime records from fifty-three metropolitan cities and applies graphical analysis and Pearson correlation to track patterns. The research aims to expose decadal trends, spatial disparities and systemic links among major crime categories to inform evidence-based policy. Rape rates rose in most cities with Kota and Jaipur showing the highest growth while Kolkata and Chennai remained nearly unchanged. Dowry deaths fluctuated modestly without clear regional clustering. Molestation and cruelty by husbands escalated sharply particularly in Vishakhapatnam Jodhpur and Delhi. Kidnapping and abduction displayed a marked upward trajectory across northern and central corridors. Correlation analysis identified a strong positive association between rape and molestation and moderate ties involving cruelty by husband and kidnapping whereas dowry deaths moved independently. These results highlight interconnected threats and context specific drivers within metropolitan environments. The study delivers the first city level decade long synthesis of gender related crime in urban India integrating spatial and temporal analytics across a nationwide metropolitan dataset.

Keywords: Gender Based Violence, Metropolitan India, Crime Correlation, Decadal Trends, Urban Safety, Pearson Correlation, Crime Hotspots, Policy Recommendations.

1. Introduction

Gender-based violence in urban India remains a significant concern despite ongoing modernization, legal reforms, and increasing awareness. Patriarchal norms, entrenched cultural attitudes, and systemic inequalities continue to reinforce female subordination and male dominance, thereby normalizing violence within familial and intimate relationships (Bramhankar and Reshmi 2021; Kumar 2021). Economic insecurity and social vulnerabilities among the urban poor further exacerbate domestic tensions, making women particularly susceptible to abuse (Ahmad et al. 2021). A lack of awareness about legal rights and limited access to support services discourage victims from seeking help (Dandona et al. 2022), while ineffective policing and delays in justice systems create a culture of impunity (Kadiwal 2021).

Urbanization in India has changed crime patterns in many ways. Some traditional crimes have declined due to better policing and infrastructure (Maity and Roy 2021). But rapid urban growth has created informal settlements and wide gaps in income. These gaps have helped petty and violent crimes to stay (Bhargavi et al. 2023; Hazra 2021). Migration tension, mental health stress, and political corruption add to urban risk (Prathap et al. 2021; Kalim 2022). Digital growth has also created new safety issues (Gupta et al. 2022).

New tools are now used to study crime like spatial temporal mapping and models. GIS, Kernel Density Estimation and space time cube are key methods (Zhou et al. 2023; Du and Ding 2023; Sun et al. 2022). They show hotspots and key crime trends. Yet there are limits in data and risk of wrong use of results (Mondal et al. 2022; Tasnim et al. 2022).

This study will look at crime against women in metro cities in ten years. It will check trends and spatial gaps in such crimes from 2011 to 2021. It will also find links among crime types and see how urban growth is shaped by gender crimes.

2. Aim and objectives of the study

The study aims to analyze the temporal and spatial patterns of gender-based crimes in metropolitan India from 2011 to 2021. It seeks to uncover interrelations among different crime categories to understand the evolving landscape of violence against women in urban settings.

- To examine the decadal trends in major categories of crimes against women across the 53 metropolitan cities in India.
- To conduct a spatial temporal analysis to identify urban patterns and regional disparities in gender-based violence.
- To investigate the interrelationships between different types of crimes through correlational analysis to understand systemic linkages.
- To explore how social and structural transformations in urban India may have influenced crime patterns over time.
- To provide data-driven recommendations for enhancing women's safety and informing urban crime prevention policies.

3. Literature Review

3.1 Conceptualizing Gender-Based Violence in Urban India

Gender-based violence in urban India stays a concern even today despite laws and modern life. Bramhankar and Reshmi (2021) say old patriarchy still shapes norms and keeps women low in homes and work. Ahmad et al. (2021) show that poor jobs and unequal pay among city poor make fights at home worse so women face more risk. Dandona et al. (2022) found that many women do not know legal rights or help centers so they do not report abuse. Kumar (2021) adds that violence feels normal in homes and this belief keeps it alive in cities. Sivakumar and Manimekalai (2021) say moving to cities and tight living cause less support and weak safety net for women. In new time the web gives rise to fresh abuse like cyber threats and stalking to urban women. Kadiwal (2021) points that schools fail to break gender bias or teach equal respect and this feeds the problem. Weak police action and slow court steps lower trust but also let abusers go free so crime stays. All these things in culture law and city life join to make gender violence hard to end in India.

3.2 Crime Trends and Urbanization in India

Crime trends in India's cities change in mixed and odd ways. Urban growth has brought roads, jobs and more police yet crime still stay. Maity and Roy (2021) say old crimes drop in cities as cameras grow, schools rise, and police work more. But deep social gaps and weak systems keep crimes alive in towns. Bhargavi et al. (2023) show that fast growth makes slums with no good water or lights and such places see theft and gangs grow. Prathap et al. (2021) note that big moves to cities bring fights for work and space, and they turn violent at times. Bhattacharyya et al. (2022) claim that in a dense town people feel lost and so crimes hide in crowds. Hazra (2021) points out how rich and poor gaps in cities spark hate and anger, so theft and hurt crimes rise. Vivek and Prathap (2023) add that bad cops and dirty leaders keep crime strong in city life. Kalim (2022) stress that tight rooms and noise harm mind and so acts turn rough and harsh. Gupta et al. (2022) show that with tech in towns comes scams and hacks that hit homes and shops. So while some crimes fall in city change new ones come fast and this needs many fixes not just roads or bricks.

3.3 Spatial Temporal and Correlational Approaches to Crime Analysis

Crime study now uses spatial temporal and link-based tools for clear view of women abuse. These ways show time and place of crimes and bring links with social and area facts. Zhou et al. (2023) note GIS maps spots of crime to give clear view and guide police plan. Du and Ding (2023) state that cluster tools like Kernel map show hot spots and help send force quick. Jiang et al. (2021) say that time-based checks track change by day or month so plans can shift.

Sun et al. (2022) talks on space time cube which blends map and time to give live view. Rodrigues et al. (2023) add that math like regress and links find tie with things like cash gap or bar count. But Mondal et al. (2022) warn map data is not full in slums and low report zones.

Tasnim et al. (2022) point that link check can't prove cause and may cut rich facts too short. Zhu and Xie (2022) say group data can fool so it led to false blame on each man. Plus, these ways need tech skills and full data that is hard in all towns. Yet these tools stay key for planning and act on crime as it rise in city life. Mix with talk-based work they give a deep base for fix plans and street steps.

3.4 Policy Responses and Urban Safety Interventions

To curb crimes on women in cities, strong plans and steps are a must. One key part is to build city space with care for women needs. Stiuso (2024) says bright lights, signs and safe rides can cut risk on roads and stops. Ceccato and Loukaitou-Sideris (2022) also back the idea of design that stop crime in plan of new towns. Navarrete-Hernandez et al. (2021) urge for plan meets where women take part, so rules fit their life and space. More cops in weak zones and quick help line is also a main point in this fight.

Al-Ghiyadh and Al-Khafaji (2021) note cops must get train on gender, so they act with care on women cases. Tech tools like apps and cams now add to safe move in cities where risk is high. Sorenson et al. (2021) say these tools must link with quick help teams for real use in field. Rights and law drive in streets can shape mind and push women to tell on crime. Polko and Kimic (2022) stress that towns need many hands from state, NGOs and firms to make safe zones. If all join these plans will build open space where women can walk free with no fear in city life.

3.5 Research Gap

Though many works exist on gender crime in cities, big gaps still stay in what we know on change in women abuse in metro India. Past work looks on old norms, weak groups and failed rules (Bramhankar and Reshmi 2021; Ahmad et al. 2021; Kumar 2021) but few ask how this shape in time and space as towns grow fast. Dandona et al. (2022) and Sivakumar and Manimekalai (2021) note walls in system and lone life in towns, yet they do not blend this with map and time data that can show change and gaps in crime flow. Urban rise links with both fall and rise of some crimes (Maity and Roy 2021; Hazra 2021) but links of women harm with sprawl and slum build is still not deep in study.

Gupta et al. (2022) write on net crimes but miss a clear time map of such acts as it spread fast. While world use map and time tools a lot now (Zhou et al. 2023; Du and Ding 2023) its use in India's big towns is rare and weak.

Most work stay in one zone or skip a cross look on more than one city. This work fills these blanks by tracking ten-year change, showing map gaps and linking crime types in 53 big towns from 2011 to 2021.

4. Methods and Materials

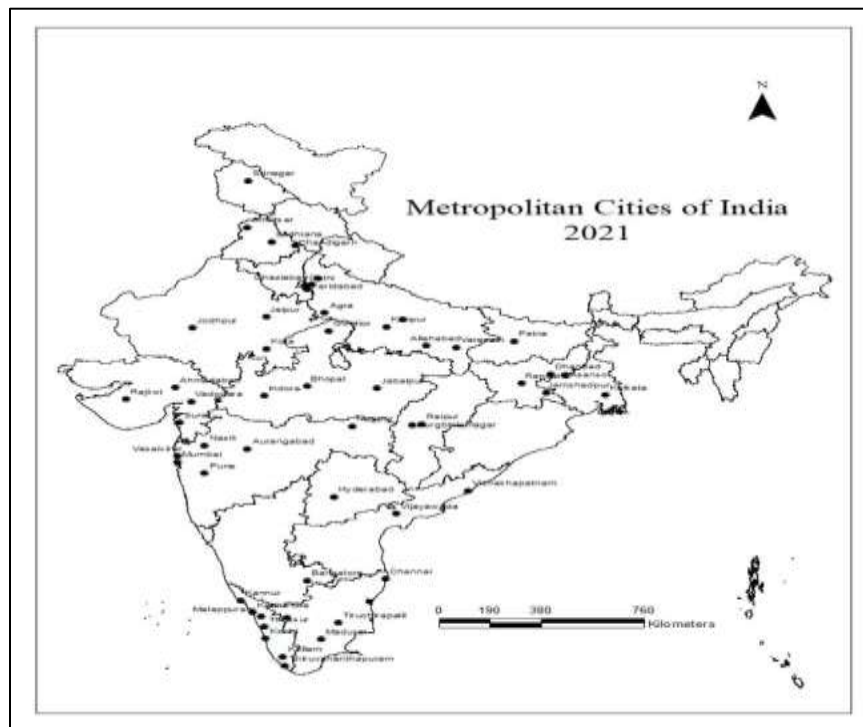


Figure 1. Map Of Metropolitan cities in India

A positivist view was used in this work which sees facts as real and can be proved by data (Park et al., 2020; Alharahsheh & Pius, 2020). Under this frame, math-based ways were picked to draw trends from big data for broad claims (Ghanad, 2023; Mohajan, 2020). The work is set as a probe that looks at new crime shifts in big towns with no fixed guess (Olawale et al., 2023; Casula et al., 2021).

Crime files gave base facts and came from past work and state sites to build a wide view on crime shape (Sukhtankar et al., 2022; Agarwal et al., 2021). The file holds note from 53 big towns so cross check was done for rich set of views (Mithun et al., 2021; Verma et al., 2021). This mix of sources give trust and full sweep that help hard math test fit the view of this work. All these picks join to form a strict and data led study on city crime and also build base for more cause and plan-based work next. Figure 1 represents metropolitan cities in India based on 2021 which will be considered for data collection.

4.1 Data Analysis Tools

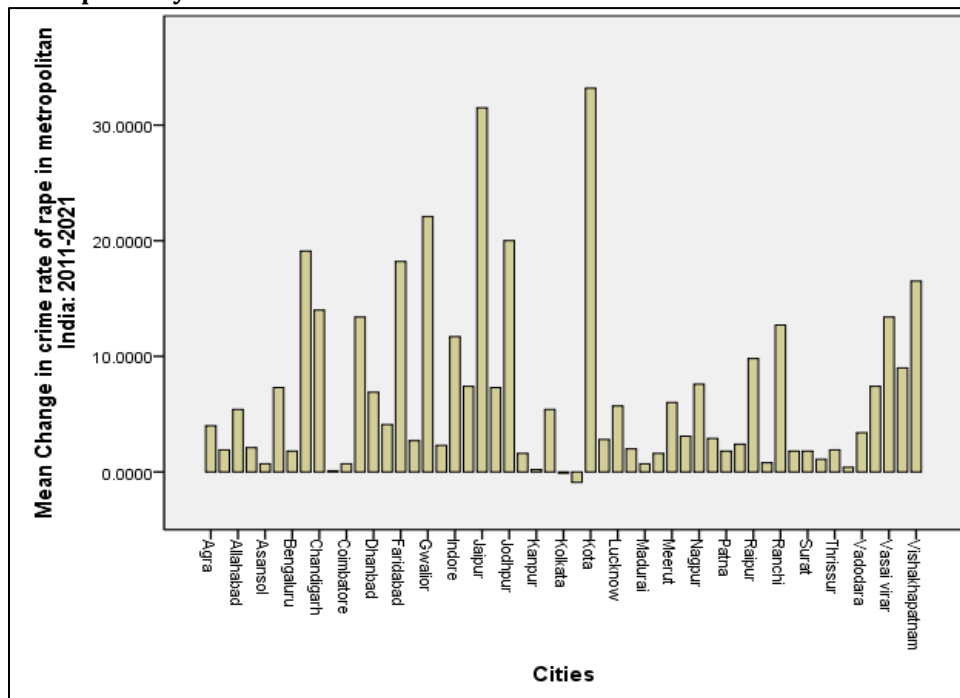
The study's data work took place in two main steps for clear view. First step used simple stats and charts to sum and show the data. Mean, median, spread and count were used to note shape and change in set (Hill, 2025; Kaewkungwal, 2025). Tools like bars, hist map and box plot gave view of trends and odd points and how data spread (Zhao and Gaschler, 2025).

Albers et al. (2022) stress that such charts give trust and quick eye on facts in number work. Next step was link check to find ties in core facts that shape this work. Pearson test was used to rate and show both force and way of link for the main sets (Sutradhar et al., 2023; Okagbue et al., 2021). Rule of line form, norm and same spread were seen first so math stays sound (Watkins, 2021).

Links were read by rules from George and Mallery (2024) where 0.1 to 0.3 is weak, 0.3 to 0.5 is mid and more than 0.5 is strong. Both steps gave wide sense of the facts and helped build true end in this work.

5. Results and Discussion

5.1 Rape Analysis


Figure 2. Rape Analysis

Among 52 metropolitan cities in India, most witnessed an increase in the reported rape crime rate from 2011 to 2021 as noted in figure 2, with an average change of 7.17. Kota recorded the highest increase at 33.2, followed by Jaipur at 31.5, Gwalior at 22.1, Jodhpur at 20.0, and Bhopal at 19.1. In contrast, cities like Kollam (minus 0.9),

Kolkata (minus 0.1), and Chennai (0.1) showed little or no change. Delhi (13.4), Ranchi (12.7), and Indore (11.7) reflect moderate rises. The variation ranges from minus 0.9 to 33.2, suggesting city-specific influences such as urbanization, law enforcement efficiency, awareness levels, and reporting practices.

5.2 Dowry Death Analysis

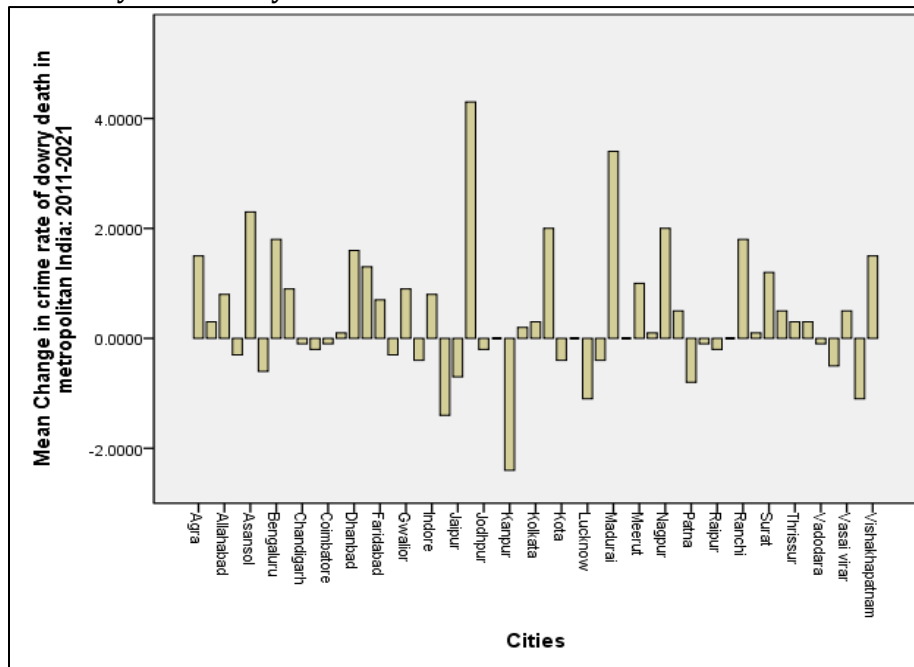


Figure 3. Dowry Death Analysis

The change in dowry death rates across metropolitan India from 2011 to 2021 ranges from a decline of 2.4 percent in Kanpur to an increase of 4.3 percent in Jamshedpur as highlighted in figure 3. Most cities experienced minor changes between minus 1.5 percent and plus 2 percent, indicating overall stability. Cities with notable increases include Jamshedpur at 4.3 percent, Madurai at 3.4 percent, and Asansol at 2.3 percent. Decreases were seen in Kanpur at minus 2.4 percent, Jabalpur at minus 1.4 percent, and Vijayawada at minus 1.1 percent. These trends suggest localized variations in awareness, enforcement, and reporting, with most cities showing only small fluctuations.

5.3 Molestation Rate Analysis

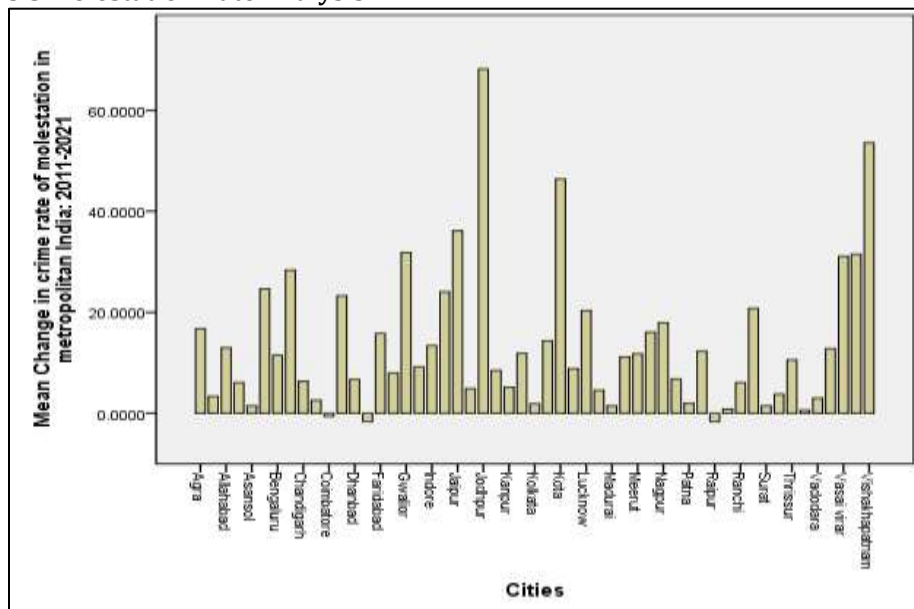


Figure 4. Molestation Rate Analysis

Molestation crime rates in metropolitan India showed a wide range of change from minus 1.6 percent to a sharp increase of 68.2 percent in Jodhpur between 2011 and 2021 as evident from figure 4. Cities with very high increases include Vishakhapatnam at 53.6 percent, Kota at 46.4 percent, Jaipur at 36.2 percent, and Bhopal at 28.4 percent. Moderate to high increases were seen in Delhi at 23.3 percent and Madurai at 20.4 percent. A few cities like Patna and Durg Bhilainagar showed small declines around minus 1.6 percent, suggesting localized stability or underreporting.

5.4 Cruelty by Husband Analysis

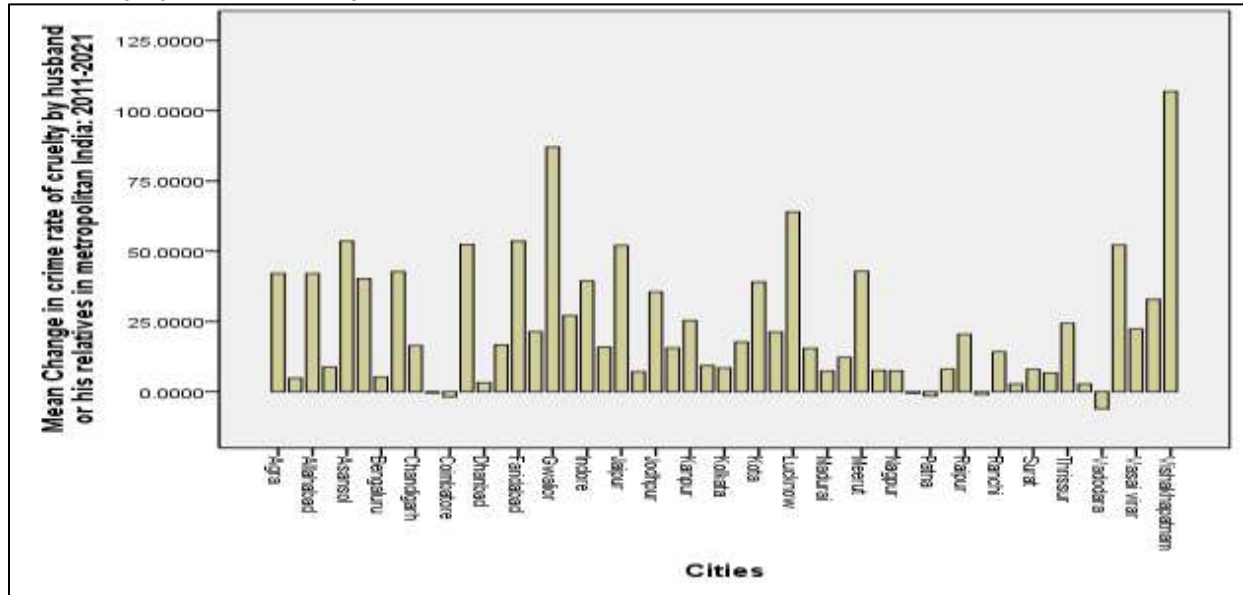


Figure 5. Cruelty by Husband Analysis

Cruelty by husband or relatives in metropolitan India saw substantial increases from 2011 to 2021, ranging from a decline of minus 6.1 percent in Vadodra to a sharp rise of 106.9 percent in Vishakhapatnam as highlighted in figure 5. Other cities with very high increases include Gwalior at 87.1 percent and Delhi at 52.5 percent. Moderate to high rises were noted in Bhopal at 42.7 percent and Indore at 39.4 percent. Some cities like Chennai at minus 0.4 percent and Patna at minus 1.5 percent showed slight decreases, suggesting localized variation in trends.

5.5 Sexual Harassment Analysis

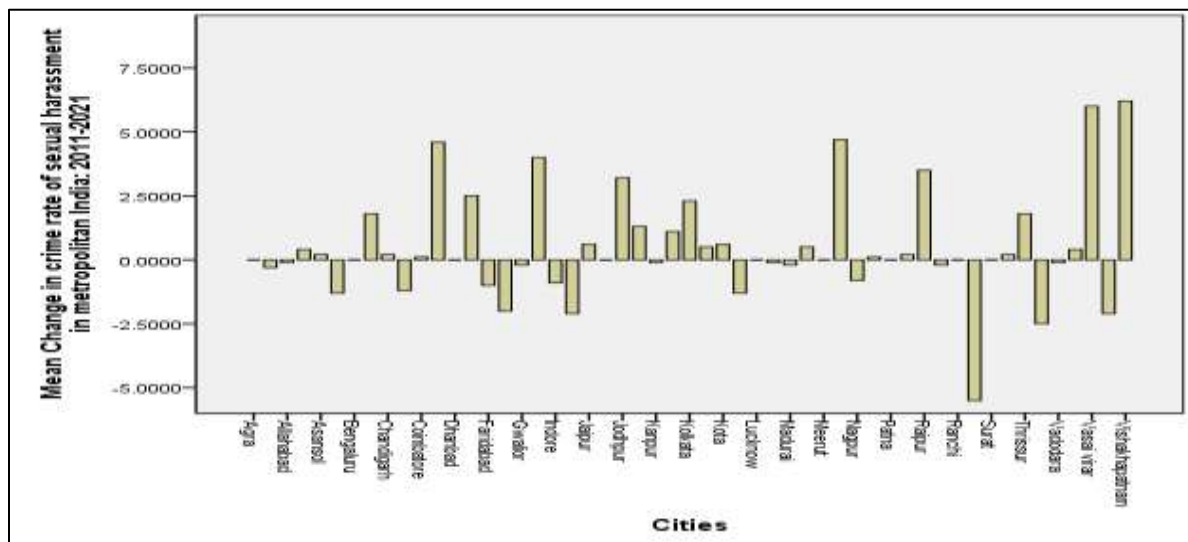


Figure 6. Sexual Harassment Analysis

From 2011 to 2021, sexual harassment crime rates in metropolitan India showed relatively minor changes, mostly ranging between minus 5.5 percent and plus 6.2 percent. The average change is close to zero, indicating overall stability based on figure 6. Cities with modest increases include Vishakhapatnam at 6.2 percent, Raipur at 6.0 percent, and Mumbai at 4.7 percent. Slight decreases were seen in Vadodara at minus 5.5 percent, Patna at minus 2.5 percent, and Jabalpur at minus 2.1 percent. Most cities had changes within plus or minus 2 percent, suggesting consistent reporting trends.

5.6 Kidnapping Analysis

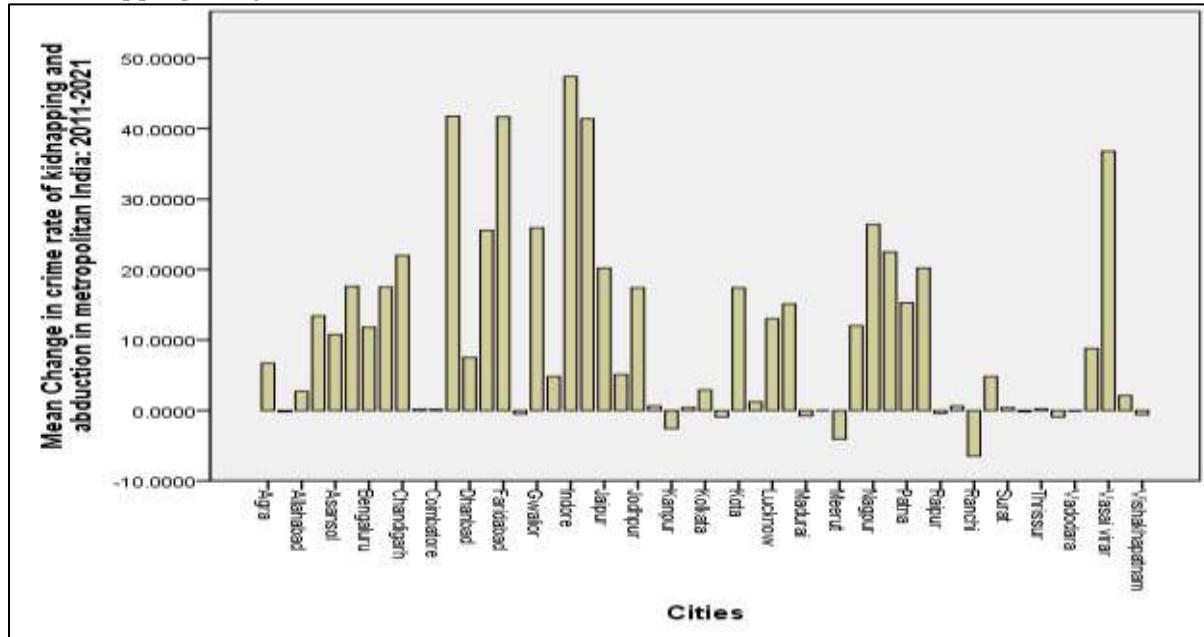


Figure 7. Kidnapping Analysis

Kidnapping and abduction crime rates in metropolitan India from 2011 to 2021 show a general upward trend, with changes ranging from minus 6.5 percent in Vadodara to a high of 47.4 percent in Indore as evident from figure 7. Other cities with very high increases include Delhi at 41.8 percent and Jabalpur at 41.4 percent. Moderate rises were noted in Jaipur at 20.2 percent and Nagpur at 15.3 percent. Slight decreases occurred in Kanpur at minus 2.6 percent and Kolkata at minus 0.9 percent, reflecting city specific crime patterns.

5.7 Correlation Analysis

Table 1. Correlation Analysis

Correlations

	Change in crime rate of rape in metropolitan India: 2011-2021	Change in crime rate of dowry death in metropolitan India: 2011-2021	Change in crime rate of molestation in metropolitan India: 2011-2021	Change in crime rate of cruelty by husband or his relatives in metropolitan India: 2011-2021	Change in crime rate of sexual harassment in metropolitan India: 2011-2021	Change in crime rate of kidnapping and abduction in metropolitan India: 2011-2021

Change in crime rate of rape in metropolitan India: 2011-2021	Pearson Correlation	1	-.051	.731**	.583**	.233	.463**
	Sig. (2-tailed)		.718	.000	.000	.094	.000
	N	53	53	53	53	53	53
Change in crime rate of dowry death in metropolitan India: 2011-2021	Pearson Correlation	-.051	1	-.139	-.014	.071	-.082
	Sig. (2-tailed)	.718		.322	.923	.615	.559
	N	53	53	53	53	53	53
Change in crime rate of molestation in metropolitan India: 2011-2021	Pearson Correlation	.731**	-.139	1	.613**	.279*	.332*
	Sig. (2-tailed)	.000	.322		.000	.043	.015
	N	53	53	53	53	53	53
Change in crime rate of cruelty by husband or his relatives in metropolitan India: 2011-2021	Pearson Correlation	.583**	-.014	.613**	1	.291*	.264
	Sig. (2-tailed)	.000	.923	.000		.035	.056
	N	53	53	53	53	53	53
Change in crime rate of sexual harassment in metropolitan India: 2011-2021	Pearson Correlation	.233	.071	.279*	.291*	1	.117
	Sig. (2-tailed)	.094	.615	.043	.035		.405
	N	53	53	53	53	53	53
Change in crime rate of kidnapping and abduction in metropolitan India: 2011-2021	Pearson Correlation	.463**	-.082	.332*	.264	.117	1
	Sig. (2-tailed)	.000	.559	.015	.056	.405	

N	53	53	53	53	53	53
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The Pearson correlation analysis of metropolitan India crime data from 2011 to 2021 reveals several significant relationships among different types of crimes against women as evident from analysis of table 1. A strong positive correlation was found between rape and molestation rates ($r = 0.731$, $p < 0.01$), indicating that as rape incidents increased, molestation cases also rose significantly. Rape also showed a moderate positive correlation with cruelty by husband or his relatives ($r = 0.583$, $p < 0.01$) and with kidnapping and abduction ($r = 0.463$, $p < 0.01$), suggesting these crimes tend to increase together. The relationship between rape and sexual harassment was weak ($r = 0.233$) and not statistically significant ($p = 0.094$).

Dowry death showed no significant correlation with any other crime types, indicating its trends are independent. Molestation displayed a moderate positive correlation with cruelty by husband or relatives ($r = 0.613$, $p < 0.01$), a weak to moderate correlation with kidnapping and abduction ($r = 0.332$, $p < 0.05$), and a weak correlation with sexual harassment ($r = 0.279$, $p < 0.05$). Cruelty by husband or relatives had a weak positive correlation with sexual harassment ($r = 0.291$, $p < 0.05$). However, sexual harassment and kidnapping or abduction had a very weak and statistically insignificant relationship ($r = 0.117$, $p = 0.405$). These patterns suggest interlinked trends among certain crime types.

5.8 Discussion of Results

The analysis of metropolitan crime data from 2011 to 2021 reveals complex and regionally diverse patterns in crimes against women. The significant rise in rape and molestation cases, particularly in cities like Kota and Jodhpur, reflects broader socio structural shifts, echoing Kamal's (2022) assertion that increasing urbanization and media visibility may be influencing higher reporting rates rather than actual incidence. However, as Dandona et al. (2022a) argue, systemic underreporting in certain regions due to stigma, institutional apathy, and fear must not be ignored, especially in cities that show minor or no changes.

The steep rise in cruelty by husband or relatives in cities like Vishakhapatnam and Gwalior supports Vinnakota et al. 's (2021) framework on the normalization of intimate partner violence within patriarchal settings. Similarly, the correlation between rape, molestation, and cruelty suggests interdependent crime dynamics, reinforcing Pitre and Lingam's (2022) argument that violence against women is often cyclical and interrelated rather than isolated.

Contrastingly, the relative stability in dowry death rates, with negligible correlation to other crimes, highlights unique socio-cultural factors influencing this crime, aligning with Kulshreshtha's (2023) thesis that dowry deaths are more resistant to temporal or regional fluctuations due to deep rooted cultural norms. Moreover, as Deosthali et al. (2022) highlight, community-based interventions rather than legal deterrents are more effective in curbing such entrenched practices.

Rajan et al. (2025) stress the need for disaggregated, context sensitive data, which this analysis underscores. Cities showing declines, such as Chennai and Patna, may either reflect successful localized interventions or persistent underreporting, as noted by Jaiswani et al. (2021). Thus, while increases in reported cases can signal worsening crime, they might equally indicate improved awareness and institutional response mechanisms, necessitating nuanced interpretation over simple conclusions.

6. Conclusion and Recommendations

Crime check from 2011 to 2021 shows sharp gaps in women harm in big towns of India. Rise in rape, molest and hurt by kin was seen in some towns like Jodhpur, Kota, Delhi and Vizag. On the other hand, dowry death and sex tease rate stay near same in most zones. Link check shows rape has strong tie with molest and kin hurt which hint at mix social and act ways. Kidnap and take away acts jump high in Indore and Delhi which show big risk in those streets. Based on these facts, clear and aimed steps are now a need in planning. City cops must grow and more eyes on red spots should be set for fast stop of crime. Group teach on women rights, care and help net need to spread wide. Use of data corps should rise to track and cut crime sets that hit one town more than next.

Judicial reforms aimed at quicker redressal of crimes against women can improve public trust and reporting. Investment in educational campaigns, especially in cities showing alarming crime spikes, can influence societal attitudes. Further, continuous and standardized crime data collection is vital for monitoring progress and

guiding future strategies. An integrated approach involving legal, societal, and administrative efforts is necessary to curb the rise in gender-based violence.

7. Theoretical Implications or Managerial Implications

Theoretically, the study highlights the interconnected nature of various crimes against women, reinforcing the importance of using multidimensional frameworks to understand gender-based violence. Strong correlations between rape, molestation, cruelty by husband or relatives, and kidnapping suggest that these crimes often escalate together and may stem from common socio-cultural factors.

For policymakers, the findings stress the need for integrated safety policies and improved law enforcement in urban areas showing sharp increases. Law enforcement agencies must enhance data-driven surveillance and responsiveness. For civil society organizations, the trends underline the urgency of targeted awareness and support programs, especially in high-risk cities. Educators and community leaders can use these insights to promote gender sensitivity and early intervention. Finally, researchers can build on this data to explore causal mechanisms and develop localized strategies to reduce violence against women across urban India.

8. Limitation of the Study and Any Future Research Direction

This study faces several limitations. Firstly, the analysis relies solely on reported crime data, which may not accurately reflect the true incidence due to underreporting, especially in cases involving social stigma like sexual harassment and domestic cruelty. Differences in law enforcement efficiency, public awareness, and local governance can influence reporting practices across cities.

The study do not check age or class facts that may show why zones differ in crime. Shifts in time data or change in crime law terms across years may hurt match of trends.

Next work shall try full ways by blending talk data like victim words, culture and cop steps for deep sense. They shall look too on how town growth, school and rule steps shape crime lines. Scope must grow to farm zones and use smart math like machine learning or hard stats to see links of all crime forms on women.

Disclosure of interest

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