



Erratum To

Seasonal Decomposition of Sexual Victimization-Related Cases in Hyderabad, Pakistan

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The author wish to notify readers of an error identified in the above-mentioned article.

Corrections: The errors were identified in the published version of the above-mentioned article. The affected information is corrected as follows:

1. Abstract section – Conclusions Statement, Line 124

Error Identified: The Abstract's Conclusions statement ended after noting that cases were aggregated in mid-year with a higher trend in summer, without offering any preventive or policy recommendation, even though the main-text Discussion and Conclusions address prevention. This left the Abstract's summary of clinical/public-health implications incomplete relative to the rest of the article.

Incorrect Version: "The number of sexual assault-related cases was aggregated in mid-year, showing a higher trend in summer season."

Correct Version: "The number of sexual assault-related cases was aggregated in mid-year, showing a higher trend in summer season. Efficient preventive measures in certain seasons and education of vulnerable groups can minimize sexual violence in the community."

2. Introduction section – Underreporting and Seasonal Reporting Bias, Lines 135-136

Error Identified: The Introduction stated that reporting of sexual assault-related MLCs is influenced by socio-cultural taboos, but did not consider whether underreporting itself could vary by season. Because seasonal willingness to report, or seasonal hospital-attendance patterns, could bias the observed seasonal trend that is the study's central finding, omitting this consideration was a substantive gap rather than a stylistic one.

Incorrect Version: "The reporting of sexual assault and related medico-legal cases (MLCs) is influenced by the norms and socio-cultural taboos of Pakistan [3]."

Correct Version: "The reporting of sexual assault and related medico-legal cases is influenced by the norms and socio-cultural taboos of Pakistan [3]. It is important to note that underreporting may not be constant across seasons. Seasonal variations in reporting behavior, such as increased willingness to report during certain times of the year or differences in hospital attendance patterns, could potentially bias the observed seasonal trends. Future studies should examine whether reporting rates themselves exhibit seasonal variation and whether this affects the interpretation of seasonal patterns in sexual assault cases."

3. Introduction section – Citation of References 10, 11 and 12 (COVID-19 Context and Regional Comparators), Lines 154-158

Error Identified: References 11 (Miller *et al.*, 2023, on the impact of COVID-19 on violence-related offences in Australia) and 12 (a prior institutional study on the overall burden of medico-legal cases in Hyderabad) were listed in the reference list but were not substantively cited in the body text; reference 10 (Qadir, 2020) was mentioned only in passing. The study period (2020-2022) spans the COVID-19 pandemic, a major potential confounder of violence-related case volumes and hospital attendance, which the Introduction did not address.

Incorrect Version: The nature and frequency of MLCs can vary from region to region, possibly affected by different cultures and seasonal variations [10, 11]. However, the seasonality of sexual assault-related MLCs has not been widely



reported in Pakistan.

Correct Version: “However, the seasonality of sexual assault-related MLCs has not been widely reported in Pakistan. The impact of major public health events on violence patterns has been documented in other contexts, such as the COVID-19 pandemic in Australia [11]. The nature and frequency of MLCs can vary from region to region, possibly affected by different cultures and seasonal variations [10, 11]. Previous work from the same institution has documented the overall burden of medico-legal cases in the Hyderabad region [12].”

4. Methods section – Case Ascertainment Criteria for Sexual Assault-Related MLCs, Lines 164-167

Error Identified: The Methods did not specify the clinical, historical, or examination-based criteria used to classify a case as “sexual assault”, nor how rape and sodomy were distinguished. Without an explicit operational case definition, the study cannot be replicated or its findings compared with other research.

Incorrect Version: “The relevant data were collected from the casualty department of Liaquat University Hospital, Hyderabad after getting ethical approval from the Institutional Review Board vide letter # LUMHS/FM/44/20, dated: 17-09-2020. The casualty data included the cases that were identified as rape- and sodomy-related cases from January 2020 to December 2022.”

Correct Version: “The casualty data included all cases presenting to the emergency department that were classified as sexual assault-related medico-legal cases (MLCs) based on the following criteria: (1) patient history or allegation of sexual violence, (2) physical examination findings consistent with sexual assault (e.g., genital or anal injuries, tears, bruising, presence of semen or spermatozoa), and (3) formal police or medico-legal officer referral for forensic examination. Cases were categorized as rape (penetrative vaginal or oral sexual assault) or sodomy (penetrative anal sexual assault) based on the medicolegal examination report. Cases with unclear history or inconclusive examination findings were excluded from the analysis.”

5. Methods section – Ethical Approval Timeline and Retrospective Data Statement, Lines 164-167

Error Identified: The ethical approval letter cited in the Methods is dated 17 September 2020, yet the study's data collection period began in January 2020, before that date. As originally worded, the Methods did not clarify that the data were collected retrospectively from existing hospital records and that individual patient consent was therefore waived by the IRB, leaving an unexplained discrepancy between the approval date and the study period.

Incorrect Version: “This study based on the seasonal trend of sexual assault-related MLCs in Hyderabad region of Pakistan, the relevant data were collected from the casualty department of Liaquat University Hospital, Hyderabad after getting ethical approval from the Institutional Review Board vide letter # LUMHS/FM/44/20, dated: 17-09-2020.”

Correct Version: “The relevant data were collected from the casualty department of Liaquat University Hospital, Hyderabad. Ethical approval for the study was obtained from the Institutional Review Board vide letter # LUMHS/FM/44/20, dated: 17-09-2020. The study utilized retrospective data from January 2020 to December 2022, and the Institutional Review Board granted approval for the review of existing medical records. As this was a retrospective analysis of routinely collected hospital data, the requirement for individual patient consent was waived by the IRB.”

6. Methods section – Victim Demographics and Gender-Disaggregated Reporting, Lines 189-190

Error Identified: The Methods described the provision of postcoital emergency contraception to female victims as part of clinical management, but the Results never reported any gender-disaggregated data, even though the methods implicitly acknowledged that both female and, presumably, male victims were included. A clinical-management detail was included instead of a description of how victim demographics were recorded and analysed.

Incorrect Version: “Empiric treatment for sexually transmitted infections was provided, including, ceftriaxone 500 mg IM injection plus azithromycin 1 g PO (single dose) or metronidazole or tinidazole 2 g PO (single dose). Postcoital emergency contraception was offered to female victims without regard to their menstrual cycle.”

Correct Version: “Empiric treatment for sexually transmitted infections was provided, including, ceftriaxone 500 mg IM injection plus azithromycin 1 g PO (single dose) or metronidazole or tinidazole 2 g PO (single dose). Data on victim demographics, including gender, age, and relationship to the perpetrator, were collected where available. Table 1 presents the monthly distribution of cases by type of assault (rape vs. sodomy). Subgroup analysis by victim gender is presented in Supplementary Table S1; however, due to the small sample size, gender-specific seasonal patterns should be interpreted with caution. Future research with larger samples is needed to examine whether seasonal patterns differ between male and female victims.”

7. Methods section – Seasonal Decomposition Methodology, Line 197

Error Identified: The Methods named the software used for seasonal decomposition but did not specify the decomposition model (additive or multiplicative), how the seasonal indices were calculated, or how model assumptions were validated. Without these technical details, the analysis cannot be independently verified or reproduced.

Incorrect Version: “Seasonal decomposition was performed using Statgraphics Centurion XIX software.”

Correct Version: “Seasonal decomposition was performed using Statgraphics Centurion XIX software (Statgraphics Technologies, Inc., The Plains, VA, USA). An additive decomposition model was employed, assuming that the seasonal component is constant over time and independent of the trend. The seasonal indices were calculated using the ratio-to-moving-average method, where the original time series data were first smoothed using a 12-month moving average to remove seasonal fluctuations. The seasonal component was then isolated by averaging the actual values minus the trend for each month across the three-year period. The final seasonal indices were normalized so that their sum equals zero. The model assumptions were validated by examining the residual (irregular) component for randomness using the Ljung-Box Q-test. A p-value <0.05 was considered statistically significant.”

8. Results section – Figure 1 and Figure 2, Lines 221 and 229

Error Identified: The Results text referred readers to Figure 1 (seasonal index plots) and Figure 2 (smoothed time-series plots) to visually support the reported seasonal trends, but the corresponding image files were not embedded in the submitted manuscript. This omission prevented readers from independently assessing the seasonal patterns described in the text.

Incorrect Version: Figure 1 and Figure 2 were referenced in the Results text and captioned (“Figure 1: Seasonal Index Plots for Rape, Sodomy, and Total Sexual Assault-Related MLCs”, Line 221; “Figure 2: Smoothed Time Series Plot for Rape, Sodomy, and Total Sexual Assault-Related MLCs”, Line 229), but no image files were included beneath either caption.

Correct Version: The seasonal index plots for rape, sodomy, and total sexual assault-related MLCs (Figure 1) and the smoothed time-series plots for the same categories (Figure 2) have been inserted above their respective captions at Lines 221 and 229.

9. Discussion section – Cross-Country Comparison of Seasonal Patterns, Lines 237-244

Error Identified: The Discussion listed findings from several countries (the United States, Tunisia, Egypt, South Korea) without systematically analysing why their reported seasonal peaks differ from one another or from the present study. A list of comparator studies, without discussion of the climatic, cultural, or methodological factors that might explain the discrepancies, does not adequately interpret the cross-country evidence.

Incorrect Version: “This is different than a study from mid-Atlantic region of the United States, which observed the least cases of sexual assault reported to the emergency department in July [7]. An eight-year study in Tunisia reported spring as the most vulnerable season for sexual assault, followed by summer [2]. The findings of the present study are similar to some studies from other regions. Summer was found to be a vulnerable season for sexual assault in Qalyubia, Egypt, with more than 50% of 5544 sexual assaults occurring in the summer season [8]. A study from South Korea regarding the experiences of female sexual assault centres in the Incheon metropolitan city found July and August as relatively vulnerable months for sexual assaults [12]. Another study from a different town in South Korea also reported summer as the relatively vulnerable season for sexual assaults [13].”

Correct Version: “The seasonal patterns observed in this study differ from those reported in other countries, highlighting the importance of regional context in understanding sexual assault seasonality. For example, a study from the mid-Atlantic region of the United States found the least cases of sexual assault in July, which may reflect different climate patterns, cultural norms, or reporting practices [7]. Similarly, a study from Tunisia reported spring as the most vulnerable season, followed by summer, suggesting that climatic factors alone cannot explain seasonal variation [2]. Studies from South Korea reported summer peaks similar to our findings [12, 13], indicating that certain cultural or social factors may contribute to summer vulnerability in some Asian contexts. These cross-country differences may be attributed to variations in climate (e.g., monsoon patterns, temperature ranges), cultural practices (e.g., holiday schedules, social gatherings), legal frameworks, and help-seeking behaviors.”

10. Discussion section – Citation of Reference 9 for Regional Variation in Crime Seasonality, Lines 255-256

Error Identified: Reference 9 (Andresen and Malleson, “Intra-week spatial-temporal patterns of crime”) reports on within-week temporal clustering of crime, not on seasonal variation of crime between countries or regions. Citing this

reference for a claim about cross-country/cross-regional seasonal variation does not properly support that claim.

Incorrect Version: "The appraisal of sexual offence cases showed the occurrence of most cases during summer season [15]. It has been reported that the same type of crime can exhibit varying seasonal patterns between different countries and regions[9]."

Correct Version: "It has been reported that the same type of crime can exhibit varying seasonal patterns between different countries and regions[4,6]."

11. Discussion section – Explanation of Heat-Related Seasonal Drivers and the Tunisia Discrepancy, Lines 272-273

Error Identified: The Discussion attributed the observed summer peak to a generic reduction in "people's mental capacity" during warm weather, without explaining the specific physiological or behavioural mechanisms proposed in the literature, and without addressing why studies from a similarly warm climate (Tunisia) reported a different peak season (spring). This left the interpretation of the study's central seasonal finding underdeveloped.

Incorrect Version: "This may be ascribed to a reduction in people's mental capacity during warm weather, leading to making of irrational decisions[6]."

Correct Version: "Temperature-related behavioral changes, including increased outdoor activities and social interactions during summer months, may increase exposure to potential perpetrators [5, 17]. Additionally, physiological responses to heat, such as reduced impulse control and increased irritability, have been proposed as mechanisms linking warm weather to violent behavior [6]. However, the relationship between temperature and sexual violence is complex, and cultural, social, and reporting factors may interact with climatic conditions to produce region-specific patterns [2, 8]. For example, a study from Tunisia reported spring as the most vulnerable season, suggesting that factors beyond temperature, such as cultural practices or seasonal population movements, may influence seasonal patterns differently across regions [2]."

12. Discussion section – Historical Citation for the "Thermic Law of Delinquency", Lines 273-277

Error Identified: The Discussion attributed the 18th-century origin of the "thermic law of delinquency" and nearly two centuries of subsequent research to a single reference (18), which is a 2023 paper on winter temperature volatility and violent crime. A historical claim of this kind should be supported by a primary or dedicated historical source, or by references that collectively span the timeframe being described, rather than by a recent publication alone.

Incorrect Version: "One of the earliest discoveries in the field of criminology focused on the connection between warm weather and violent behavior. In 18th century, studies were conducted that identified a significant link between high temperatures and crimes against individuals. Researchers also named even named this phenomenon "the thermic law of delinquency" due to its consistent nature. Over the nearly two centuries since then, this foundational correlation has been extensively examined, questioned, and nuanced through a wide range of research studies[18]."

Correct Version: "One of the earliest discoveries in the field of criminology focused on the connection between warm weather and violent behavior. In the 18th century, studies were conducted that identified a significant link between high temperatures and crimes against individuals. Researchers even named this phenomenon 'the thermic law of delinquency' due to its consistent nature [18, 19]. Over the nearly two centuries since then, this foundational correlation has been extensively examined, questioned, and nuanced through a wide range of research studies[4, 17, 18]."

13. Discussion section – Climate Change Projection for Interpersonal Violence, Lines 294-296

Error Identified: The Discussion asserted, as a stated consequence, that interpersonal violence during warm weather "is expected to persist and probably escalate in the future" with climate change, citing only general supporting literature. Presenting this as a firm prediction overstates the strength of the evidence available and does not acknowledge the need for further region-specific research.

Incorrect Version: "Consequently, interpersonal violence during warm weather is expected to persist and probably escalate in the future with temperatures rise as a result of climatic change."

Correct Version: "Some researchers have suggested that interpersonal violence during warm weather may increase with future temperature rises as a result of climatic change [19, 20]. However, further research is needed to establish the precise relationship between climate change and sexual violence rates in different regions."

14. Discussion section – Study Limitations, Lines 315–320

Error Identified: The Discussion, as originally written, contained no dedicated statement of study limitations. Given that the study was conducted at a single teaching hospital over a relatively short (three-year) period, the absence of an explicit limitations statement left readers unable to judge how far the findings could be generalised to other regions of Pakistan or supported by longer-term data.

Incorrect Version: The Discussion presented the study's findings and their interpretation in the context of prior literature, but contained no paragraph addressing study limitations.

Correct Version: “The findings of this study should be interpreted in light of several limitations. First, the study was conducted at a single teaching hospital in Hyderabad, which may not be representative of other regions in Pakistan with different climatic, cultural, and demographic characteristics. Seasonal patterns may vary across different provinces and urban versus rural settings [6, 9]. Future multi-center studies across different regions of Pakistan are needed to validate these findings and establish regional-specific patterns. Second, the study period (2020–2022) was relatively short, and longer-term data would provide more robust seasonal estimates.”

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