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Artificial intelligence-based sentiment analysis of social media on Gender-based Violence in Sri Lanka

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Background: Sri Lanka has been experiencing rising cases of domestic violence and workplace and online harassment, making Gender Based Violence (GBV) a major social problem. This study aimed at exploring the representation of GBV on social media and the various perceptions that people have concerning the violation of the rights of base on gender in the society using Artificial Intelligence (AI) and Natural Language Processing (NLP).

Method: A quantitative, AI-driven approach was used to analyze the sentiment of about 24,500 posts and comments from Facebook, Instagram, YouTube, and Tok-tok over the period from June 2023 to November 2024. In the data preprocessing stage, the data was converted into words, stop words were removed, words were stemmed, and lemmatization was done. The sentimental analysis of the data was carried out using Transformer-based deep learning models (BERT, RoBERTa) which were trained with a labeled dataset of GBV in Sri Lanka. Latent Dirichlet Allocation was used in the study to explore the topics of the discussions embedded in the data. Statistical analyses such as the Pearson correlation analysis was used to determine the relationship between the sentiment trends and the GBV incident reports from the police and Non-Government Organizations. The analysis was performed using R and Python.

Results: The results of the online discussions showed that 47.8% (n=24,500) of the posts were supportive of victims of GBV, while 33.2% (n=24,500) had negative sentiments and 19.0% (n=24,500) had neutral sentiments. The results of the topic model revealed that the most discussed topics were legal justice, victim-blaming, social stigma, and policy reforms. There was a statistically significant correlation (r =0.71; $P < 0.01$) between increases in dismissive sentiment and actual GBV cases. The deep learning models had an F1-score of 89.2 which showed that the models were very accurate in sentiment classification.

Conclusions: This study establishes that social media discourse affects the perceptions of GBV in the society in Sri Lanka. The result of this study also showed that there is the existence of a dismissive attitude which calls for awareness campaigns and policy changes to change the notion of the society. Furthermore, the results presented herein suggest that AI-driven sentiment monitoring tools can be effectively used for the early identification of GBV incidents. Future work may involve expanding the dataset for multilingual sentiment analysis and further exploring the impact of media framing on GBV discourse.

Keywords: Sentiment analysis, gender-based violence, natural language processing, social media, artificial intelligence.