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POTENTIAL BENEFITS OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TO OVERCOME HEALTH CONSEQUENCES OF SEXUAL VIOLENCE: THE CASE OF THAILAND AND INDIA

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Abstract

Sexual violence has become a significant global issue that can result in everlasting and life-threatening consequences that directly impact women's health. Also, Sexual violence is considered perhaps the most severe form of violence, often taking place among other forms of violence. The exact prevalence appears to be challenging to figure out, however, it probably impacts a minimum of one-third of women at least once in their lifespan. This paper will examine whether the integration of modern techniques can be a game-changer for dealing with the health outcomes of sexual assault survivors, Artificial Intelligence and machine learning will involve significant change, particularly in countries like Thailand and India where there is societal stigma around sexual violence along with massively underreported cases. In this research, we discuss the potential benefits of AI and ML in alleviating health effects on sexual assault survivors by discussing technological advancements including data-driven insights to influence healthcare delivery.

Keywords: Sexual Violence, Artificial Intelligence, Machine Learning, Thailand, India

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Introduction

Sexual violence constitutes a serious infringement of human rights as well as a matter of crucial public health consequence. subsequently, it also affects social and ethnic barriers and can happen throughout both harmonious and conflict-ridden societies. Eventually, many offenders are often male individuals who are acquainted with the victims, often being an intimate partner or, in the instance of child sexual abuse, a trustworthy family or community member responsible for the offence committed against them (Socatiyanurak et al., 2021). The brief description of this research paper intertwined with sexual violence and the health consequences includes several factors, including rape and genital mutilation to coerced marriages, and may occur place in various situations. While the health implications and necessitate associated with various kinds of sexual violence generally happened in a comparable trend, particular instances of sexual violence may have distinct characteristics that will be further discussed in this paper as also the major impact on the health of the women victims. Despite the various forms of medical treatment for the health of women victims, there is still a need for further introspection by the government and non-government organizations to proper health care to tackle long-term and instant health issues due to sexual violence. Meanwhile, women themselves have reported that the emotional abuse that typically accompanies coercive control has significant psychological consequences. However, its specific impact on women's health has rarely been assessed independently. For instance, women who experienced physical abuse from their spouse or live-in partner or by the Offender were substantially more likely than other women to perceive their health as average or inadequate, to be diagnosed with sexually transmitted infections (STDs) and other gynecological issues, and to report having required medical attention instead of obtaining it (Raj et al., 2021).

Research Methodology

Doctrinal approach will be used based on secondary data to examine the potential benefits of artificial intelligence (AI) and machine learning (ML) in addressing the health consequences experienced by victims of sexual violence. Also, this methodology will be examined through a comprehensive review of peer-reviewed literature from resources like PubMed, Scopus, and Google Scholar will be necessary for this, with an emphasis on papers that address the application of AI and ML in the prediction, detection, and treatment of health problems associated with sexual violence.

Literature Review

The literature review in this paper explores the potential utility of artificial intelligence and machine learning technologies in remediating the multi-faceted negative health consequences for women exposed to sexual violence. Consideration is provided to the challenges of their further review in concern to detection, prevention, and treatment.

Raj et al.'s (2021) Machine Learning Analysis of non-marital sexual violence in India, this research paper author explores iterative theme analysis (ITA) to determine what is indicated in machine learning with violence-related factor discovery. Although findings replicated previous literature linking NMSV with other forms of violence, they also identified additional correlates including lower knowledge and utilization of SRH services as well as gender norms that support more traditional girls' roles. Interventions aimed at addressing the determinants of NMSV in India with a special focus on adolescents may need to account for sexual and reproductive health, gender equity, and safety.

Shikhila & Kanth (2023) Intimate Partner Violence among Married Couples in India: A Systematic Review: This research paper examines that intimate partner violence (IPV) is widespread in India, with only 14% of women who have suffered physical and or sexual abuse

from their husband's seeking assistance from anyone. Interestingly, less than 1% of these women reached out to formal institutions for help.

Socatiyanurak et al. (2021) Law-u: Legal guidance through artificial intelligence chatbot for sexual violence victims and survivors in this research paper author suggested that LAW-U, an AI chatbot, advises sexual violence survivors on the most relevant Supreme Court decisions.

Impact of Violence Against Women in Thailand and India

Crime against women is not a new phenomenon in the society. However, the impact of these crimes against women especially in Thailand and India is a major issue that not only directly affects the physical, psychological, and social health of women but also can result in the loss of both the social well-being of the women and development in their community. Thus, both countries face significant issues regarding the prevalence of crime against women (Harbishettar & Math, 2014; Sumano, 2020; Somhar, 2023; Saaliq, 2024).

Overview of Sexual Violence in Thailand and India

Thailand and India both show concerning statistics when it comes to sexual violence. According to reports, in India, a sexual assault occurs every 20 minutes, while in Thailand, one out of every three women has been subjected to some form of sexual violence during their lifetime. The consequences of such violence are beyond immediate physical harm, giving rise to enduring mental health conditions such as post-traumatic stress disorder (PTSD), depression, and anxiety. These mental health difficulties are worsened by social disapproval, insufficient support networks, and inadequate accessibility to healthcare services (Shikhila & Kanth, 2023; Somhar, 2023).

Violence Against Women in India

In India, as per studies show that approx. 26 percent of women have experienced partner physical violence at least once during their lifetime, although the numbers soar to as high as 45% in some regions. National Crime Records Bureau is throwing some alarming facts like one crime against women every three minutes and sexual assault cases significantly ending into more serious crimes such as murders, rape, or suicide (Harbishettar & Math, 2014).

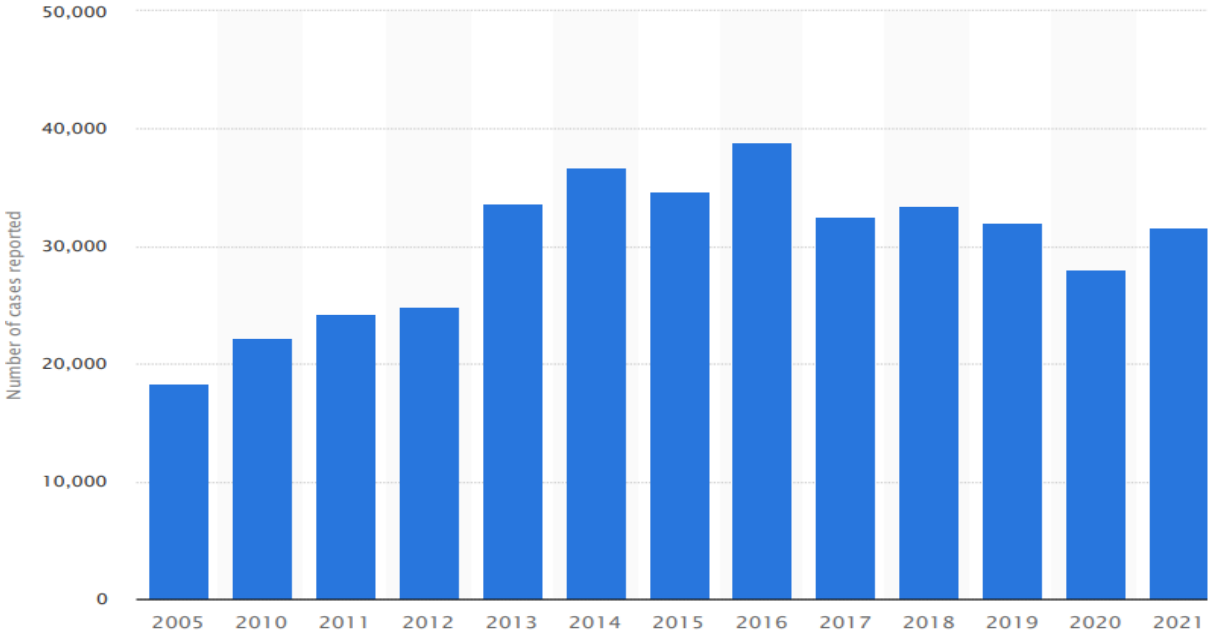

Figure 1 Total number of rape cases reported in India from 2005 to 2021
Source: Statista (2022)

Violence Against Women in Thailand

In Thailand, Violence is also a major problem for women, where over 30,000 cases are reported per year in data collected by the Ministry of Public Health through its One Stop Crisis Center. Unfortunately, most cases of violence against women are not reported to the police so underreporting is extensive and justice remains difficult for those that do. Also, the Thai government has implemented a range of measures to support survivors including working with civil society partners to increase service availability as well as better monitoring incidents of sexual and gender-based violence (Socatiyanurak et al., 2021; UNFPA, 2024)

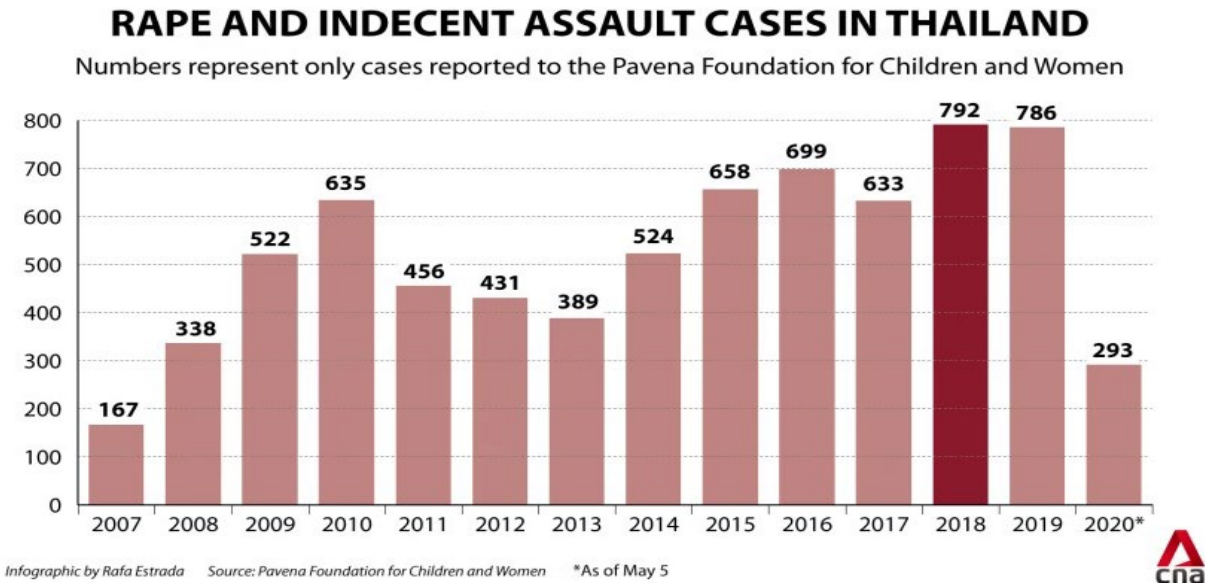

Figure 2 Rape and indecent assault cases in Thailand
Source: Promchertchoo (2020)

Overview of Women's Health Consequences of Post-Traumatic Stress Disorder and Cognitive-Behavioral Due to Sexual Violence

Victim of sexual violence mainly experience both instant and long-lasting consequences that impact their psychological and physical health. However, the instant physical, reproductive, and health consequences can be severe and fatal for survivors. Thus, immediate medical attention, which includes handling injuries, screening and prevention of sexually transmitted infections, and the provision of emergency contraception, proves essential for women who promptly seek assistance after sexual violence. Sexual Violence is a significant issue in both the countries like Thailand and India. Also, the Static data provided by both governments especially highlighted that a substantial percentage of women encounter sexual assault during their lifetimes. However, In India, a rape happens every 20 minutes. Women are among the victims who experience barriers like societal shame, and the stigma of retaliation.

Impact of Sexual Violence on Women's Health

Physical Health Consequences: Sexual violence has drastic effects on women's health. Physically, it can cause STIs such as HIV, gonorrhea, chlamydia, syphilis, herpes, and HPV. However, infection occurs in 20% of assault survivors tentatively within two weeks after the incident. Also, thirty-nine percent of the females have reported that they experienced violence during pregnancy, and it raised the risk of losing their children by 16% and preterm birth by 41 percent. Thus, sexual violence causes serious adverse effects on most women's health in the short and long term. It is a significant health problem that demands a comprehensive, multisectoral reaction to assist survivors and avoid recurrence. Additionally, one vital element

of this reaction is enhancing the ability of the health sector to deliver quality, victim-centric treatment (Singh, 2024).

Psychological Impact: Post-traumatic stress disorder (PTSD) is a prevalent condition that affects many women who have experienced sexual violence. Women suffering from PTSD have a significantly increased risk of experiencing suicidal thoughts and attempting suicide. Moreover, PTSD many times due to psychological toll that may lead to co-occurring mental health disorders such as depression or anxiety. Several research studies have suggested that females with PTSD are more likely to exhibit internalizing disorders like anxiety and depression compared to males, who may display greater externalizing behaviors such as substance abuse and violence (Pathak et al., 2024)

Role AI and ML to Overcome Health Consequences Due to Sexual Violence

Artificial intelligence and machine learning are acknowledged to be transformative approaches to addressing the health consequences of sexual violence incurred by women. Similarly, these appear to provide affordable opportunities to exert transformative change in healthcare and society.

Early Detection and Intervention: First and foremost, the most important early case indicators are the prompt identification and treatment of sexual assault and intimate partners. Particularly, about intimate partner violence, the evidence shows the vulnerability of machine learning algorithms to detect and analyze full-text patterns from medical records and the entirety of medical Twitter, to the analysis of reports from not just social media but radiology. Social media can even help break down patterns in reporting that allow identification of the dynamics of abuse within intimate partner violence relationships. This allows for subsequent attempts to allocate resources and interventions where and when prevention is possible (Singh et al., 2024).

Prevention Strategies: Integration of AI and ML to prevent sexual violence through law enforcement and community organizations can train machine learning models on historical gender violence data, pinpointing regional high-risk factors in time to zero in preventative measures where these are required the most. For instance, there have been a few predictive policing models offered in different cities that predict violence by identifying historical patterns and allowing for preventative measures. In addition, apps powered by AI can also be created to inform people of what the signs are of abuse and where they can find help as victims (Muneer & Fati, 2020).

Treatment and Support: Sexual violence can have serious health impacts, like PTSD (Post Traumatic Stress Disorder), anxiety, and depression and some issues may last for years. Using artificial intelligence and machine learning, the treatment for these conditions can be improved by determining personalized care plans based on patient information. For example, machine learning algorithms can review patient histories and treatment responses to suggest more personalized therapeutic strategies that would result in increased recovery rates of survivors. Such technologies are a way to let potential victims access the support they need and ensure that this help is available when it matters, especially to overcome all these health consequences (Nascimento, 2021).

Ethical Concerns and Limitations: AI and ML have a lot of potential to help with the health effects faced by sexual assault survivors, but there are also limitations as well as significant ethical concerns.

Data Privacy: Such tools also involve challenges with privacy and consent, as they collect and analyze sensitive information about sexual violence. Stronger data protection needs to be in place to protect victim identities and ethical use of the information (Sharma et al., 2021)

Algorithmic Bias: The effectiveness of an AI system is directly dependent on the quality of the data. Data is the most crucial factor for optimal performance. In case the data describes societal prejudices, AI algorithms can reinforce these biases which results in outputs that are inefficient

or even harmfully wrong. These risks could be mitigated via the continuous monitoring and evaluation of AI systems (Julián & Acevedo, 2022).

Accessibility and Inclusivity: AI solutions must be available to all victims, especially those in marginalized communities. Resources should be available in a variety of languages and formats to ensure that work reaches different communities effectively (Daniel, 2023).

Large potential benefits exist for the use of AI and ML in managing health effects resulting from sexual violence. However, concerns around ethics must be addressed. Thus, applying AI in sensitive areas brings with it related issues of privacy, consent, and potential bias from algorithmic decision-making. Similarly, if healthcare and social services do start using AI in their provision of care then practitioners must be fully trained. More importantly, healthcare providers need to learn how to interpret AI-generated insights in a way that they can be practically applied. This training is needed to ensure AI tools complement rather than substitute the important role of human care in helping survivors of sexual violence (Singh, 2024)

Conclusion

AI and ML methods to treat the health effects of victims of sexual assaults in Thailand and India is a revolutionary step that needs lots of effort. These technologies can dramatically expand the support that survivors have access to through more and better reporting mechanisms, mental health interventions, telehealth services, and predictive analytics. While the progress made so far is commendable, there is still a significant distance to cover before this type of empowerment can effectively result in substantial safeguards for the communities they aim to shield from malicious individuals. Thus, as both countries battle with one of the most common crimes in our society which is sexual violence, application AI and ML could be a game-changer to pave the way for safer living conditions for survivors.AI and ML seem promising measures to address the health effects of sexual violence against women. These technologies have the potential to revolutionize survivor's lives by improving detection, informing preventative strategies, and guiding treatment. Maximizing such potential requires the ethical and proficient training of practitioners. However, this ongoing research will require cooperation from members across the technology development, healthcare provisioning, and survivor advocacy communities to develop effective and ethical reparations for this pervasive problem.

References

Daniel, C. (2023). *Socio-Economic Determinants of Gender-Based Violence [GBV]: SDG Analytics on the Global GBV Scenario with Special Reference to Technology Facilitated Gender-Based Violence and Adolescent Birth Rates*. Doctor of Public Health Thesis, New York Medical College.

Harbishettar, V., & Math, S. (2014). Violence against women in India: Comprehensive care for survivors. *Indian Journal of Medical Research, 140*(2), 157-159.

Julián, R., & Acevedo, D. (2022). The Banality of (Automated) Evil: Critical Reflections on the Concept of Forbidden Knowledge in Machine Learning Research. *RECERCA. Revista De Pensament I Anàlisi, 27*(2), 1-26.

Muneer, A., & Fati, S. (2020). A Comparative Analysis of Machine Learning Techniques for Cyberbullying Detection on Twitter. *Future Internet, 12*(11), 187.

Nascimento, F. (2021). *Contributions of Machine Learning to Knowledge Acquisition in the Field of Social Sciences*. Master of Computer Science Thesis, Universidade Federal do Rio Grande do Sul.

Pathak, S., Solanki, V., & Linh, N. (2024). Gender Biasness – A Victim of Artificial Intelligence-Based Development. In D. Mishra, A. Ngoc Le, & Z. McDowell. (eds.). *Communication Technology and Gender Violence* (pp. 81-98). Cham: Springer.

Promchertchoo, P. (2020). *Alleged sex attacks on schoolgirls in Thailand prompt national reckoning on patriarchy, gender bias*. Retrieved from www.channelnewsasia.com/asia/thailand-rape-patriarchy-power-gender-933231.

Raj, A., Dehingia, N., Singh, A., McAuley, J., & McDougal, L. (2021). Machine learning analysis of non-marital sexual violence in India. *eClinicalMedicine, 39*, 101046.

Saaliq, S. (2024). *Gang Rape of a Tourist in India Highlights Culture of Downplaying Sexual Violence.* Retrieved from https://thediplomat.com/2024/03/gang-rape-of-a-tourist-in-india-highlights-culture-of-downplaying-sexual-violence/.

Sharma, S., Singh, G., & Sharma, M. (2021). A comprehensive review and analysis of supervised-learning and soft computing techniques for stress diagnosis in humans. *Computers in Biology and Medicine, 134*, 104450.

Shikhila, T., & Kanth, B. (2023). Intimate partner violence among married couples in India: A systematic review. *The Open Psychology Journal, 16*, e187435012309110.

Singh, B. (2024). Social Cognition of Incarcerated Women and Children: Addressing Exposure to Infectious Diseases and Legal Outcomes. In K. Reddy. (ed.). *Principles and Clinical Interventions in Social Cognition* (pp. 236-251). Pennsylvania: IGI Global.

Singh, B., Jain, V., Kaunert, C., Dutta, P., & Singh, G. (2024). Privacy Matters: Espousing Blockchain and Artificial Intelligence (AI) for Consumer Data Protection on E-Commerce Platforms in Ethical Marketing. In S. Saluja, V. Nayyar, K. Rojhe, & S. Sharma. (eds.). *Ethical Marketing Through Data Governance Standards and Effective Technology* (pp. 167-184). Pennsylvania: IGI Global.

Socatiyanurak, V., Klangpornkun, N., Munthuli, A., Phienphanich, P., Kovudhikulrungsri, L., Saksakulkunakorn, N., Chairaungsri, P., & Tantibundhit, C. (2021). LAW-U: Legal Guidance through Artificial Intelligence Chatbot for Sexual Violence Victims and Survivors. *IEEE Access, 9*, 131440-131461.

Somhar, T. (2023). *Thailand ranks among top 10 countries for violence against women and girls.* Retrieved from https://www.nationthailand.com/thailand/general/40031638.

Statista. (2022). *Number of reported rape cases in India 2005-2021*. Retrieved from www.statista.com/statistics/632493/reported-rape-cases-india/.

Sumano, B. (2020). *Abuse against women still prevalent.* Retrieved from https://tdri.or.th/en/2020/11/abuse-against-women-still-prevalent/.

UNFPA. (2024). *Technical Consultative Meeting on Universal Health Coverage (UHC) Package for Gender-Based Violence (GBV) Cases in Thailand.* Retrieved from https://thailand.unfpa.org/en/Consultative-Meeting-UHC-GBV-package.

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