EXPLORING PERCEPTION OF INDIVIDUALS ON USING ARTIFICIAL INTELLIGENCE FOR REPORTING SIDE EFFECTS OF MEDICINES

Dissertation submitted to

The IIHMR University, Jaipur
for the partial fulfilment for the award of the degree of
Master of Business Administration (MBA)
in
Hospital and Health Management
By

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Under the supervision & guidance
of

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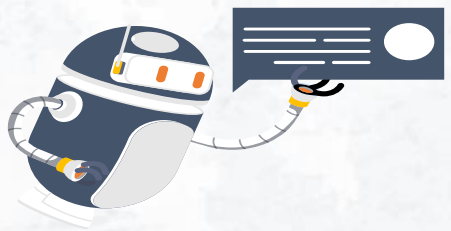
Reporting medication side effects is vital for patient safety and healthcare outcomes.

Existing reporting systems have **limitations and challenges**.
This study focuses on the importance of patient reporting and strategies to overcome limitations

- **Implementing user-friendly electronic platforms, providing education, and simplifying procedures enhance participation and accuracy**.
- May improve medication adherence, detect side effects early, enhance symptom management, and deliver cost-effective care.
- Transform medication safety and enhance patient well-being



➢ Objective

To assess patient perceptions of AI's benefits, concerns, and contributions to drug safety monitoring and identify factors such as demographics, technology experience, trust, and ease of use.

➢ Aim

The study aims to contribute to the advancement of drug safety practices by exploring the potential role of AI in enhancing adverse drug reaction reporting

REVIEW OF LITERATURE

Key findings and conclusions from each study:

1. "Adverse drug reactions reporting culture in Pharmacovigilance Programme of India" (Vivekanandan Kalaiselvan et al, 2014):
- Physicians contribute the highest number of ADR reports, emphasizing the need for increased awareness and participation of healthcare professionals in reporting.

2. "Under-Reporting of Adverse Drug Reactions" (Lorna Hazell et al, 2012):
- Widespread under-reporting of ADRs, with a median under-reporting rate of 94%.
- Internet reporting and improved healthcare professional education are potential interventions to enhance reporting.

3. "Artificial Intelligence Based on Machine Learning in Pharmacovigilance: A Scoping Review" (Benjamin Kompa et al, 2022):
- Only a small proportion of studies align with current best practices in machine learning.
- AI's penetration in pharmacovigilance is increasing, although further advancements are needed.

4. "An evaluation of knowledge, attitude, and practice of adverse drug reaction reporting among prescribers at a tertiary care hospital" (Chetna K. Desai et al, 2011):
- Most prescribers consider ADR reporting important, but barriers like lack of information and access to reporting forms hinder reporting.
- Increasing awareness and simplifying the reporting process can enhance spontaneous reporting of ADRs.

5. "Artificial Intelligence-Based Pharmacovigilance in the Setting of Limited Resources" (Likeng Liang et al, 2022):
- Enhancing data collection, training, and education can improve the effectiveness of AI-based pharmacovigilance in resource-limited settings.
- Collaborative research networks and advanced machine learning algorithms hold promise for enhancing AI-based pharmacovigilance.

6. "Innovation in Pharmacovigilance: Use of Artificial Intelligence in Adverse Event Case Processing" (Juergen Schmider et al, 2018):

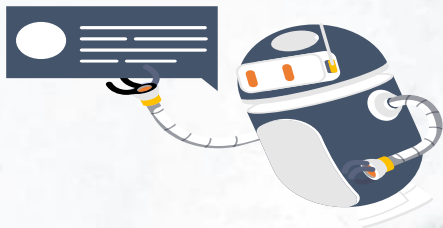
- AI can facilitate extraction from adverse event source documents and case validity assessment.
- Training machine-learning algorithms using safety database data fields is a feasible alternative to manual annotation.

7. "Prediction of Adverse Drug Reactions Using Decision Tree Modelling" (F Hammann et al, 2010):

- Decision tree models demonstrate high predictive accuracies for different types of ADRs.
- These models aid in drug selection, understanding drug interactions, and enhancing post-marketing drug surveillance.

8. "Artificial intelligence in pharmacovigilance: Practical utility" (Kotni Murali et al, 2019):

- Utilizing safety database data fields as a substitute for direct annotation can be a practical approach to train machine-learning algorithms.
- AI techniques have the potential to significantly advance the field of drug safety in pharmacovigilance.



METHODOLOGY

- **Cross-sectional survey** conducted online using **Google Forms.**
- survey was sent to **250 individuals** via email invitations and social media platforms.
- Focused on patients/consumers who have used prescribed medications in Allopathy.
- Exclusion criteria included healthcare professionals and individuals below 18 years of age.
- **Final sample size was 185 participants, determined based on a 95% confidence interval and a margin of error of 0.072%.**
- **Random sampling method was used to select participants.**

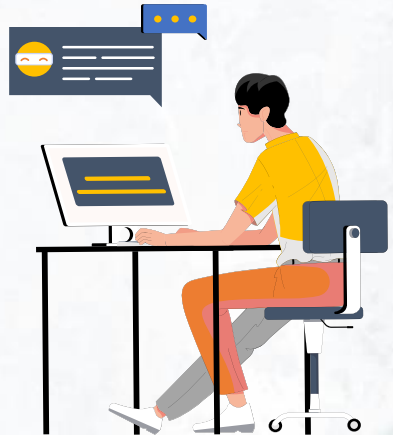
•**Tool** : Questionnaire divided into two sections, assessing demographic details, knowledge about reporting side effects, attitudes, and perceptions. Other section: Participants' willingness to accept new technologies for reporting side effects of medicines was also assessed.

•**Duration**: May 1st to May 15th, 2023

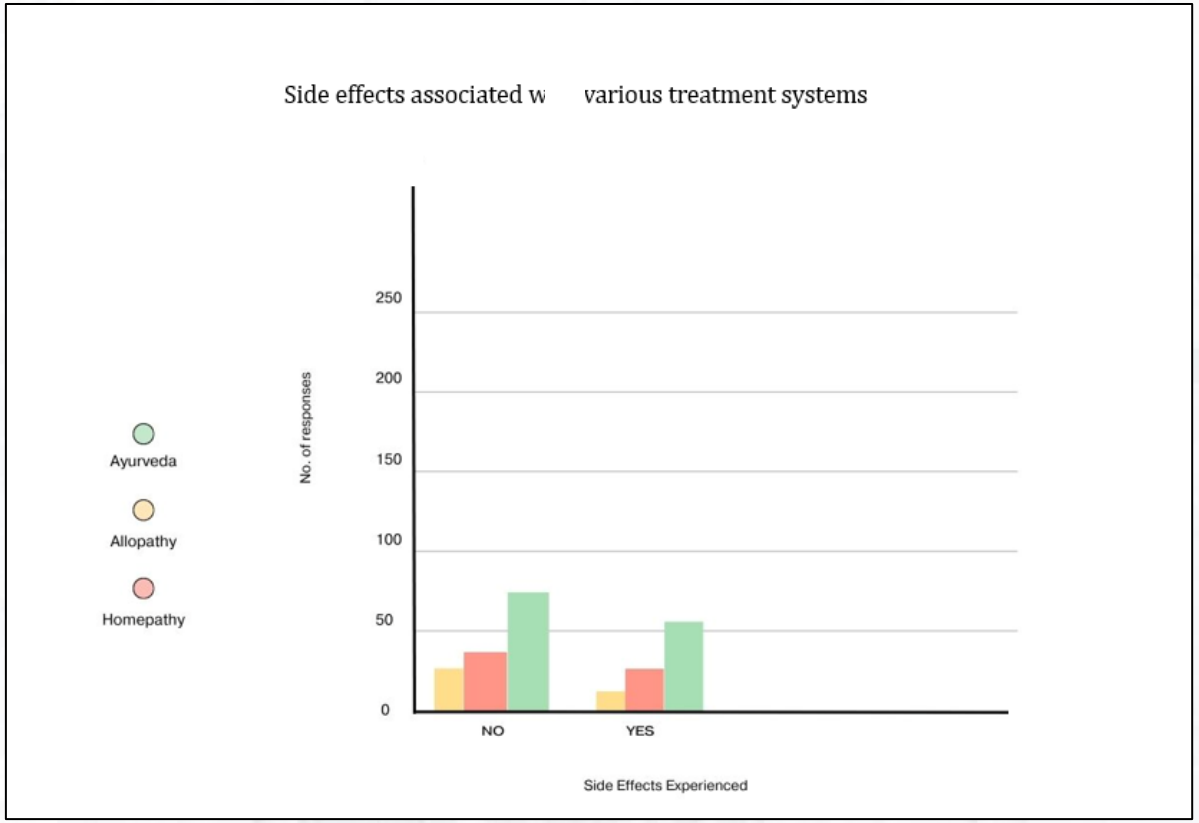
•**Data analysis**: SPSS and Excel, with the statistical technique of Chi-square test.

•**Potential biases**: self-selection bias, social desirability bias, and recall bias.

•**Limitations of the study**: limited sample size, limited control over external factors, reliance on self-reported data, and limited generalizability and representation.

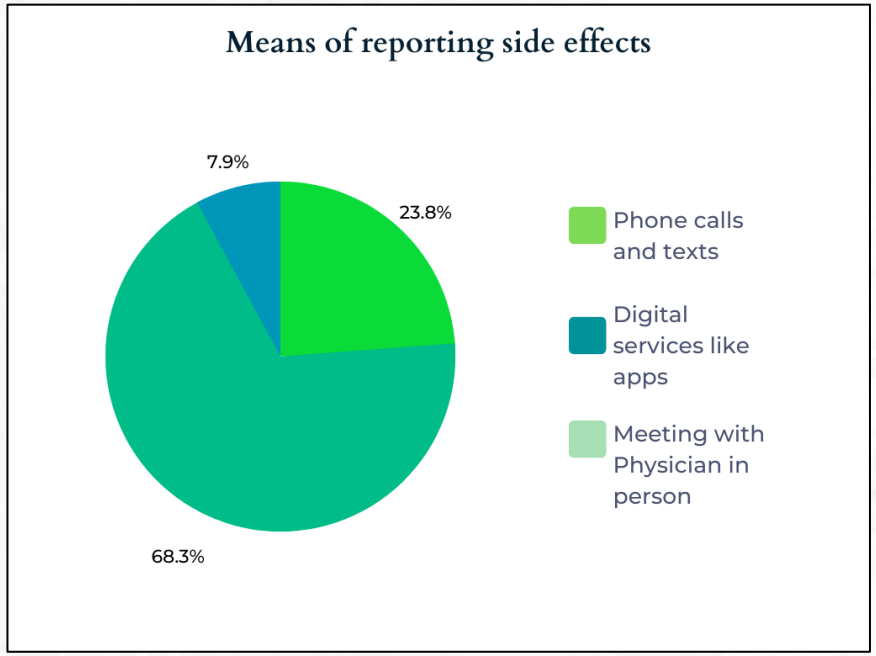


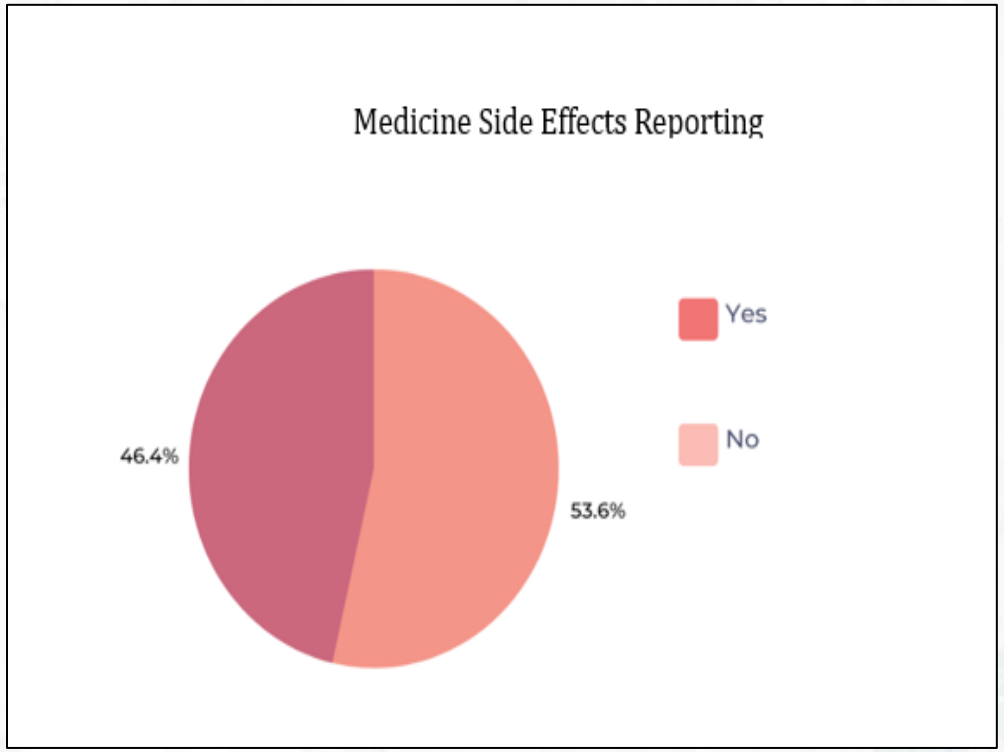
RESULTS



Among the 161 respondents, around 65% reported using allopathic medicines, with approximately 43% experiencing side effects.

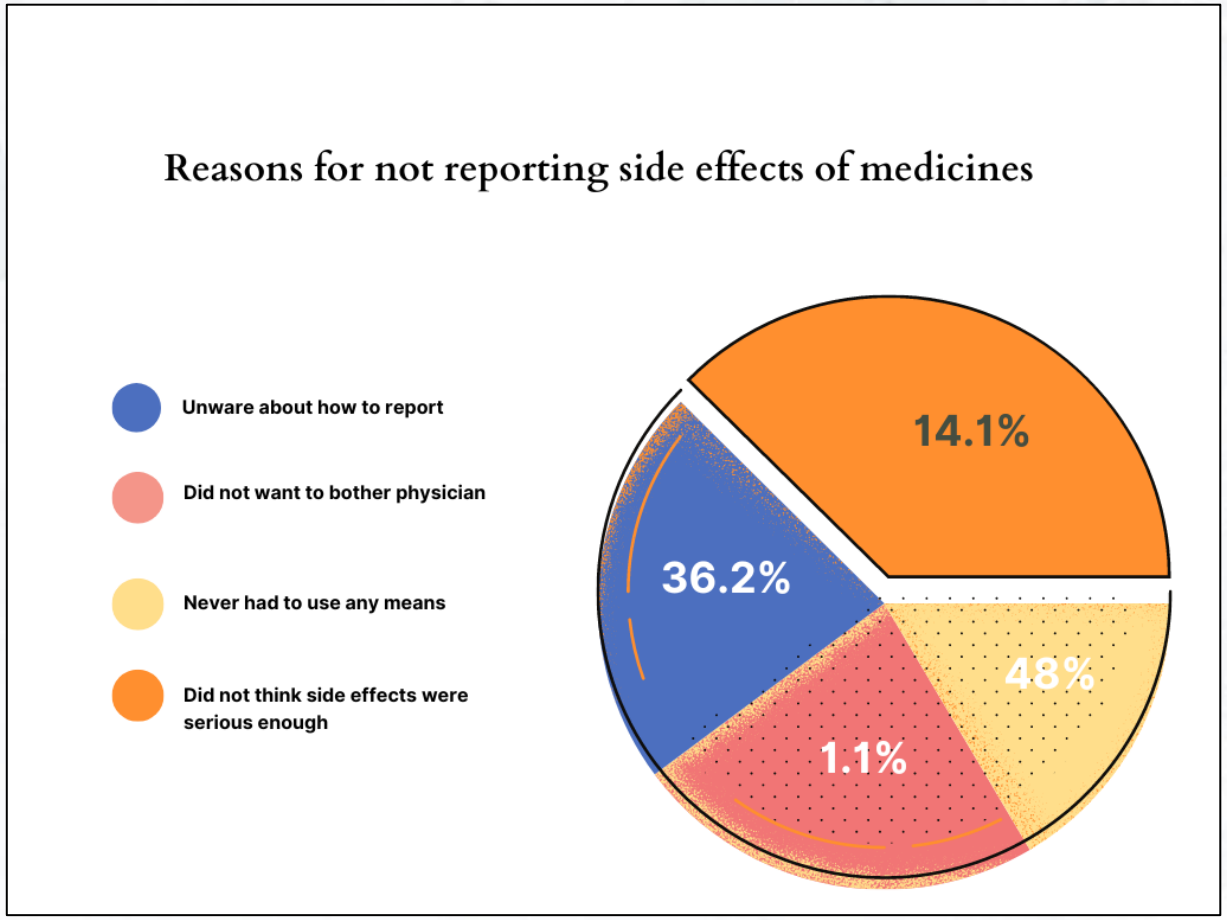
Of the users who reported side effects, 68% preferred in-person consultations with physicians, while 7% utilized digital services.

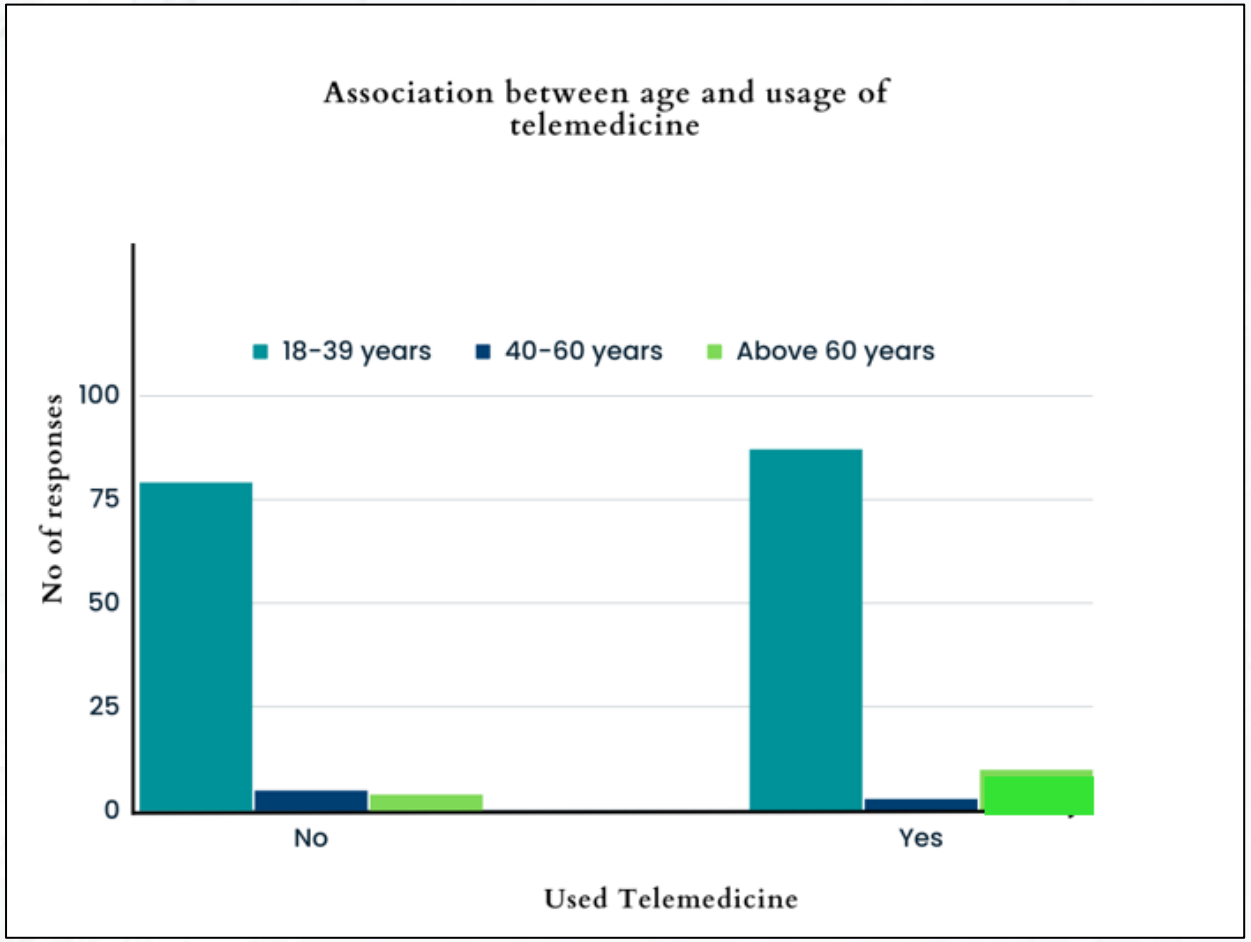




Out of 185 respondents, 53% did not report the side effects of any type of medical treatment that they pursued.

presents the reasons for not reporting side effects and the corresponding explanations provided by the respondents.



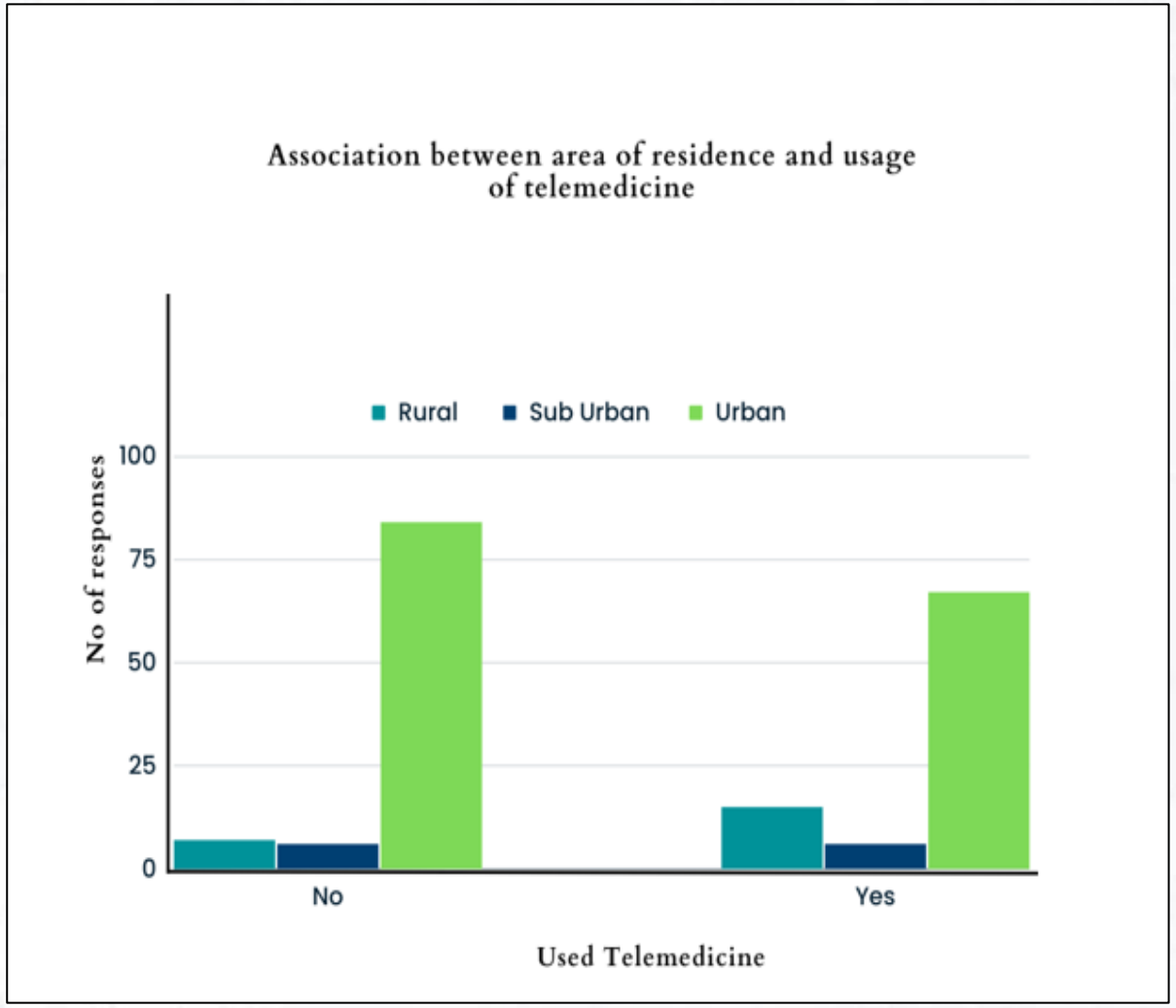


Out of 89%

18 to 39 year

52% used telemedicine services.

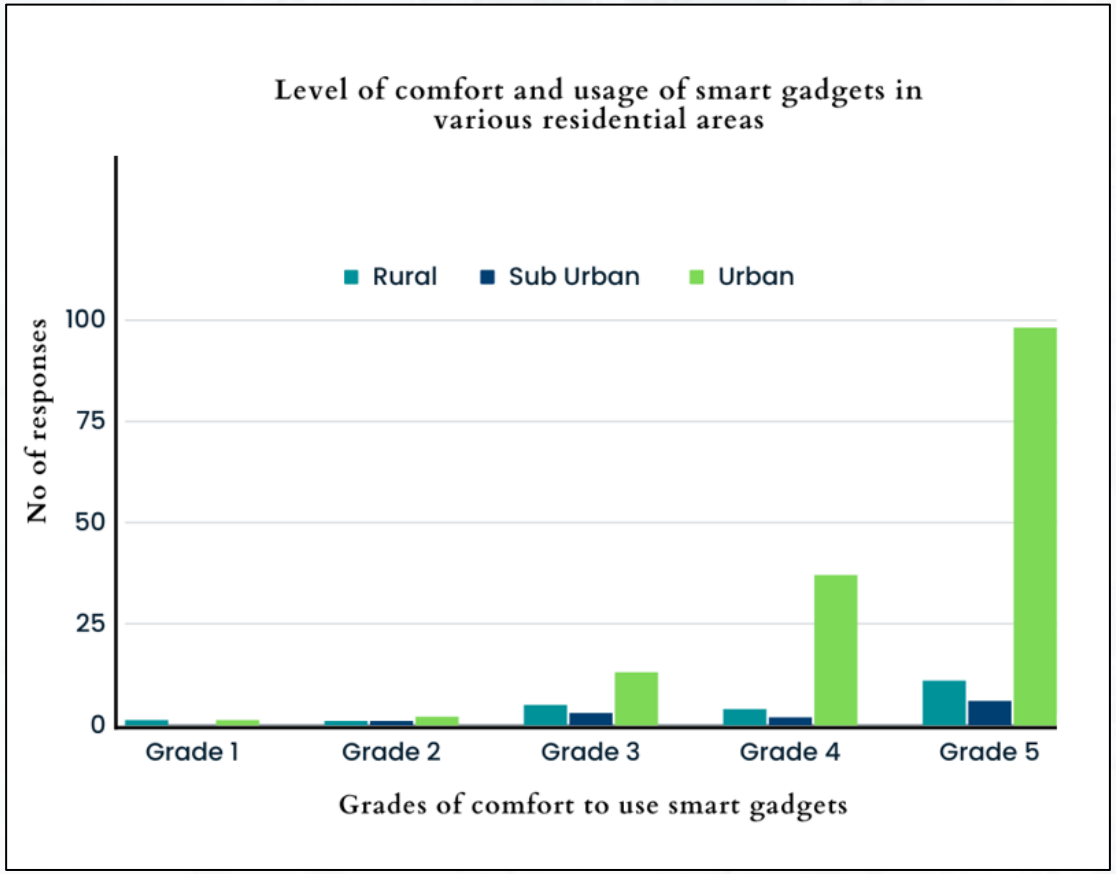
Less than 10% of the respondents from the age group of **40 to 60 years** old used telemedicine services.

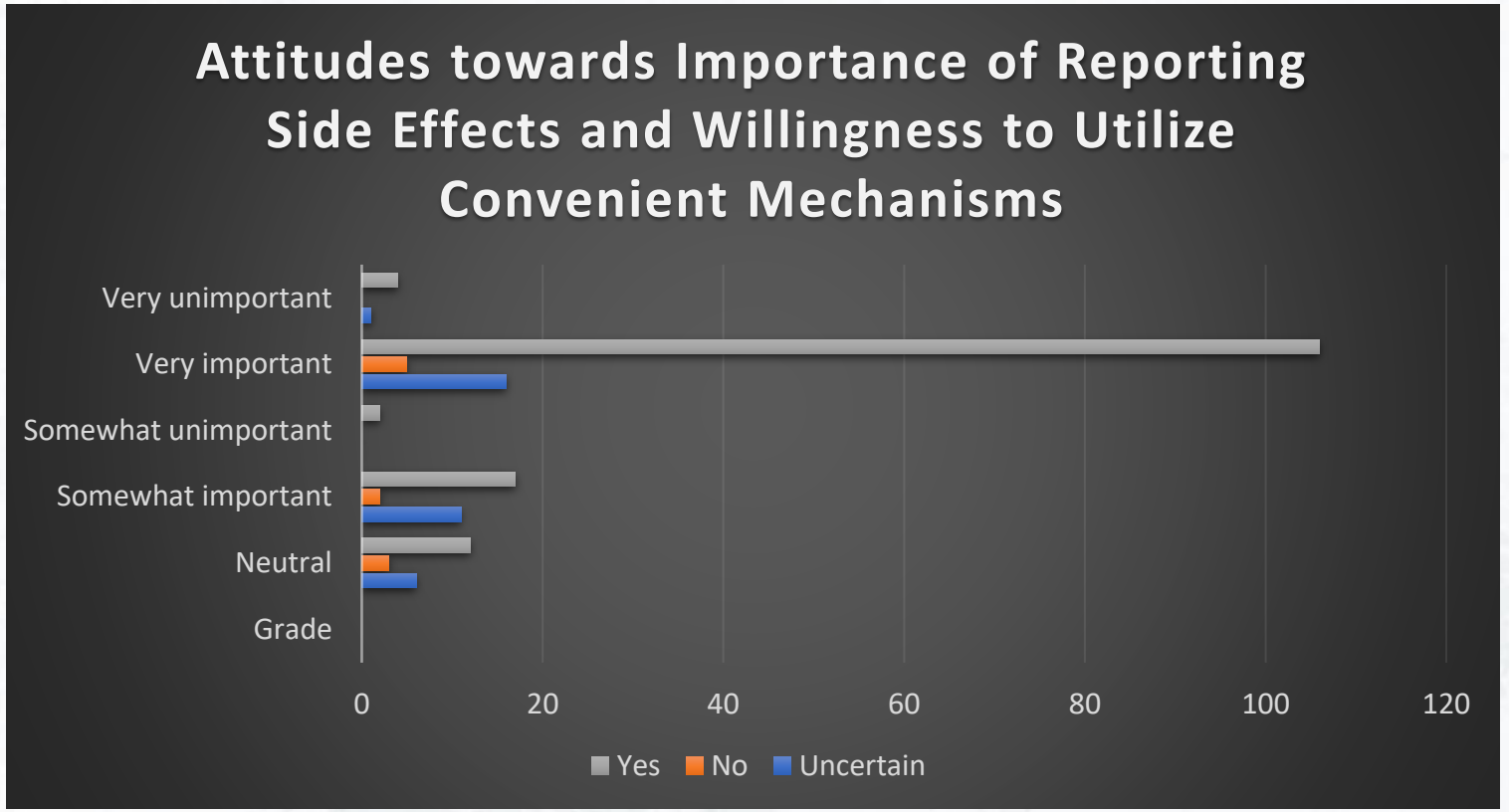


Out of 11%

Rural area residents only

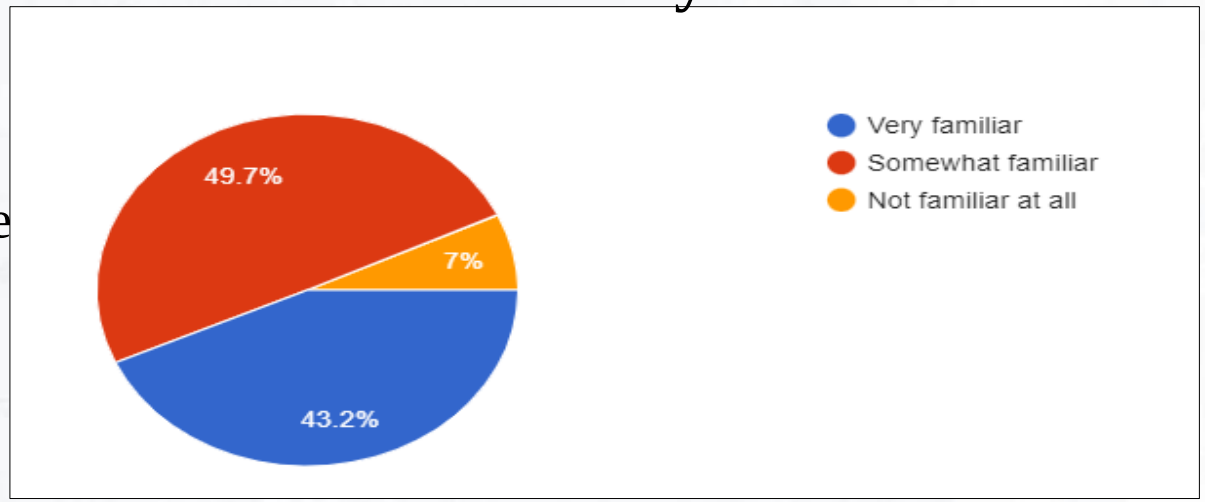
32% used telemedicine services.

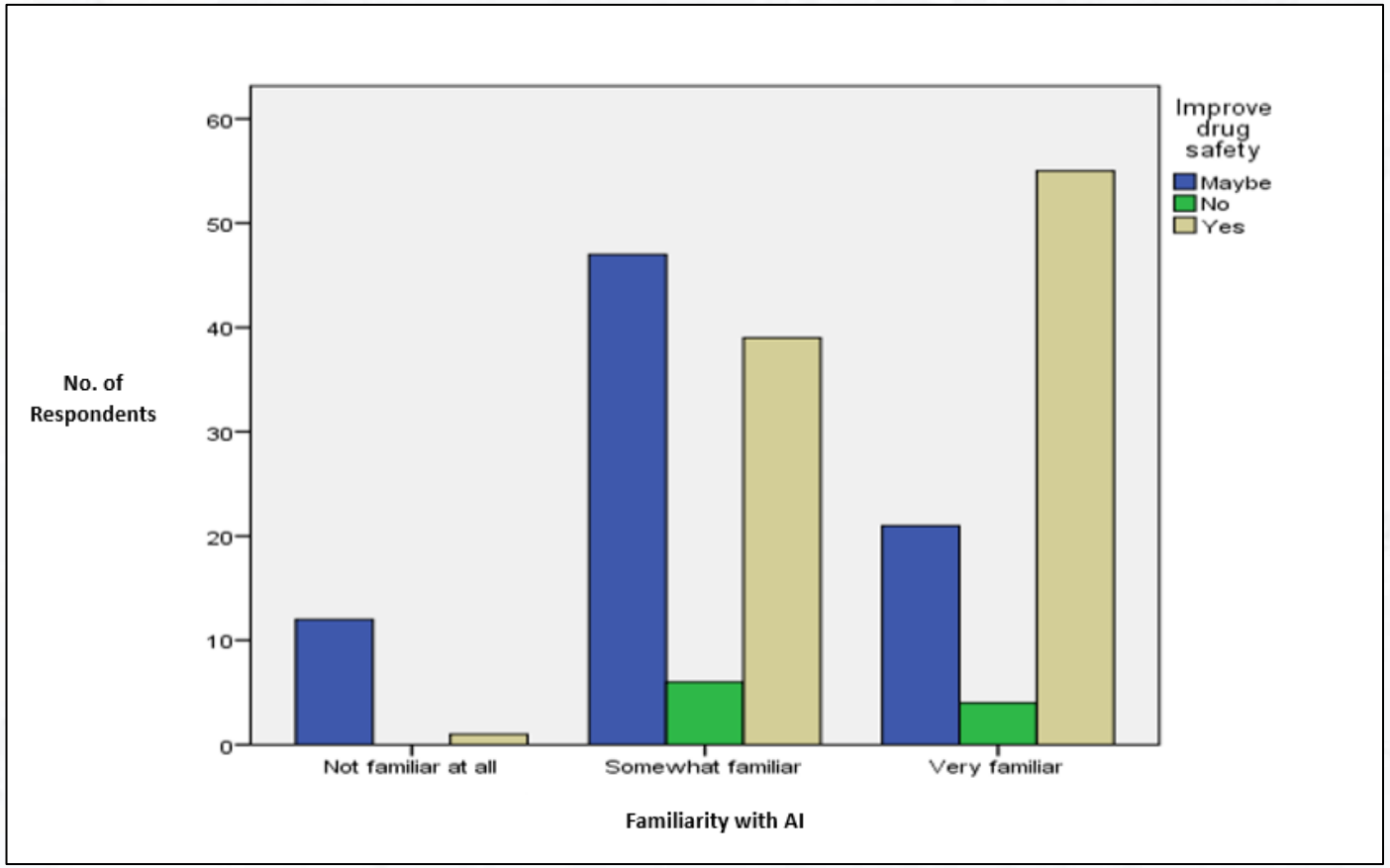


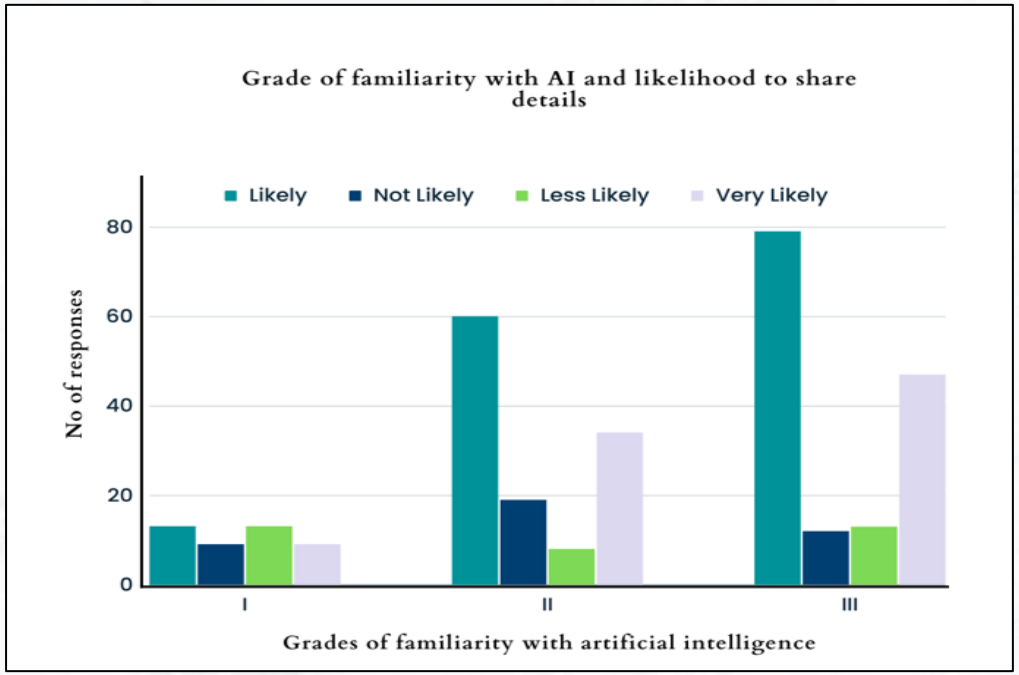


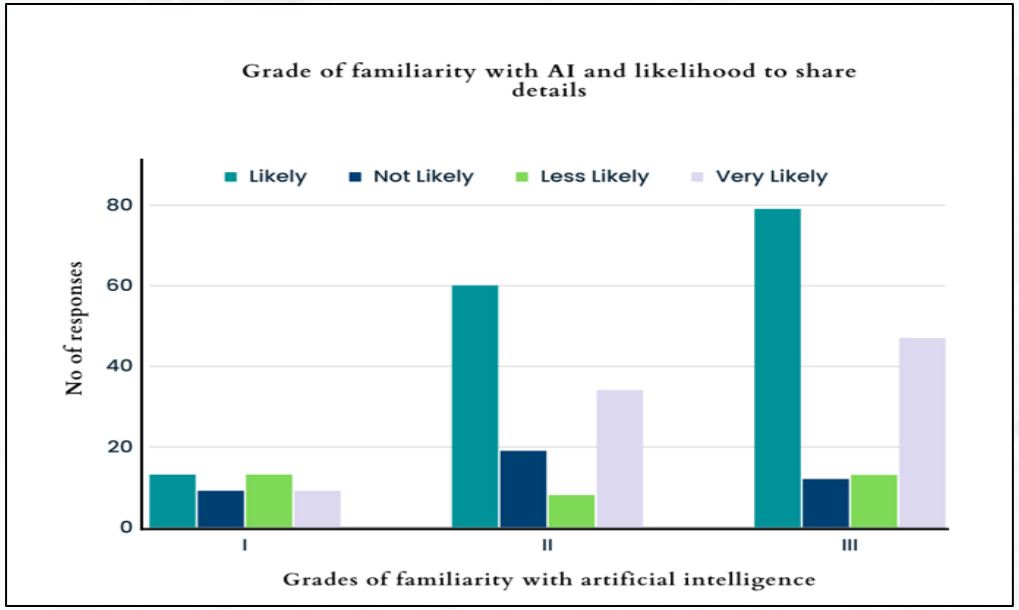
Among the respondents who consider it very important to report side effects (70% of the total), a significant majority (83%) expressed their willingness to report side effects if there was an easy and convenient reporting mechanism available

Familiarity with AI

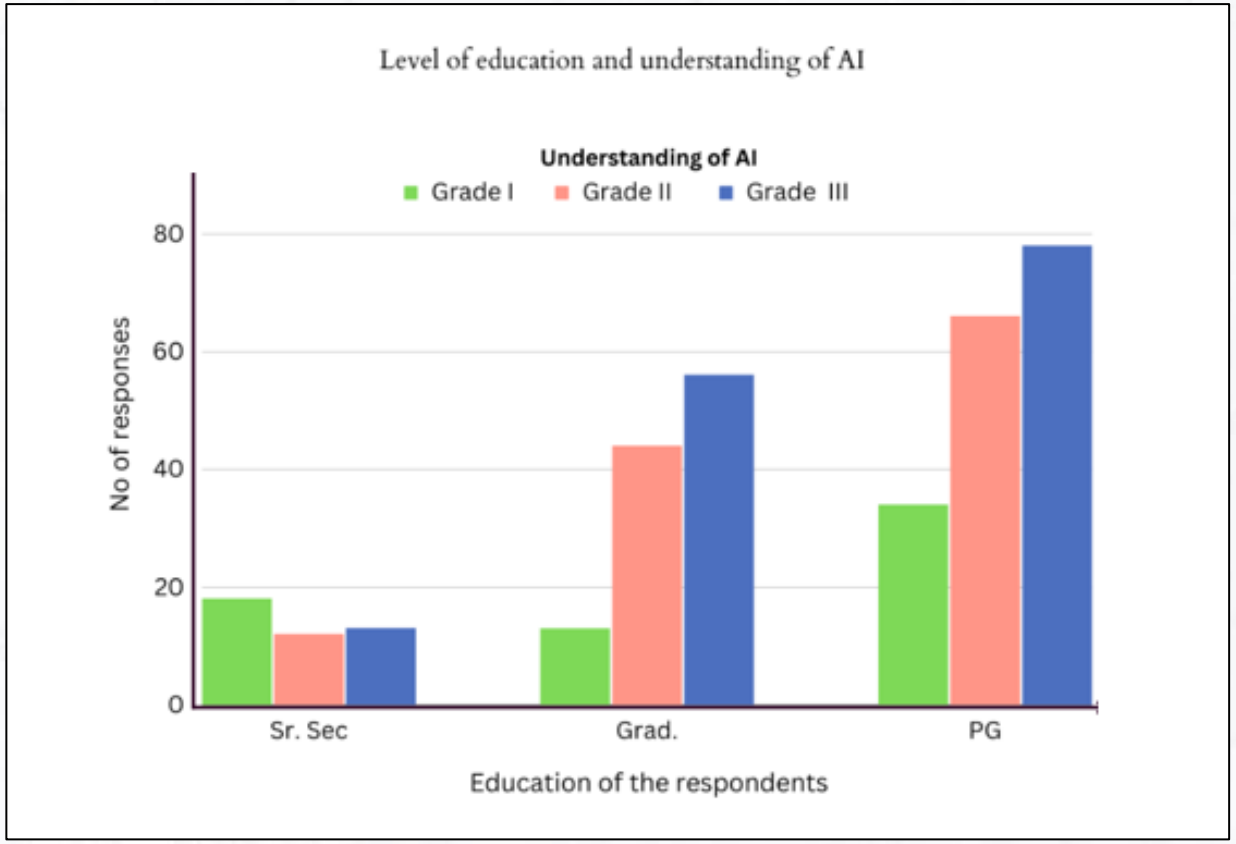




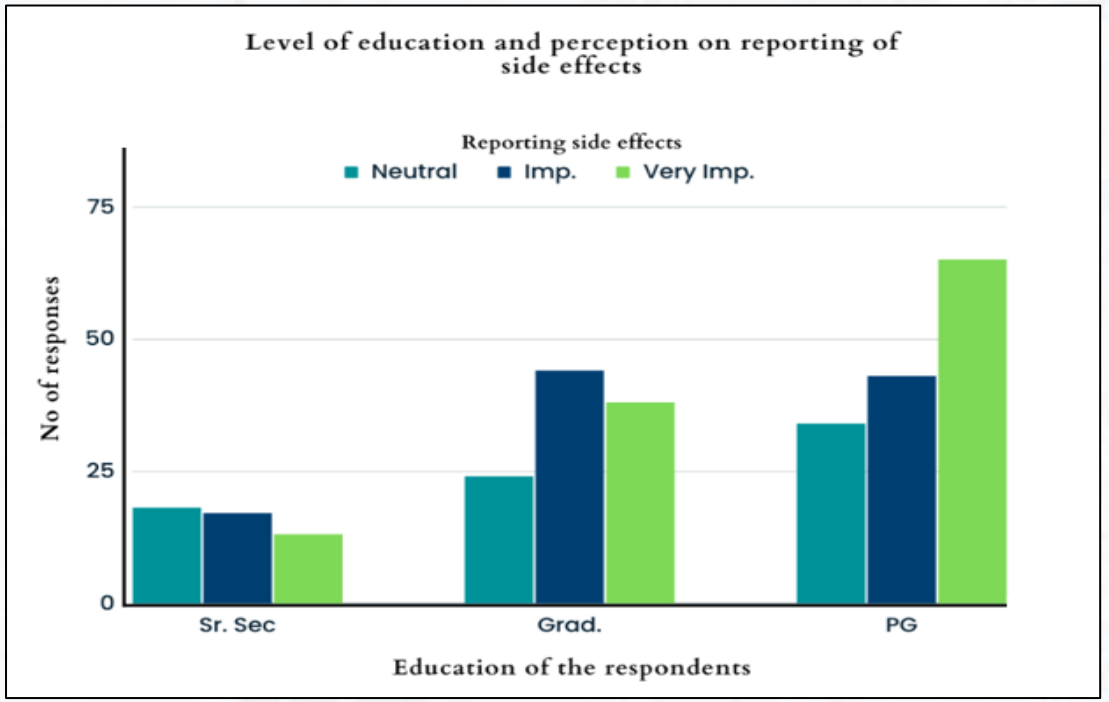




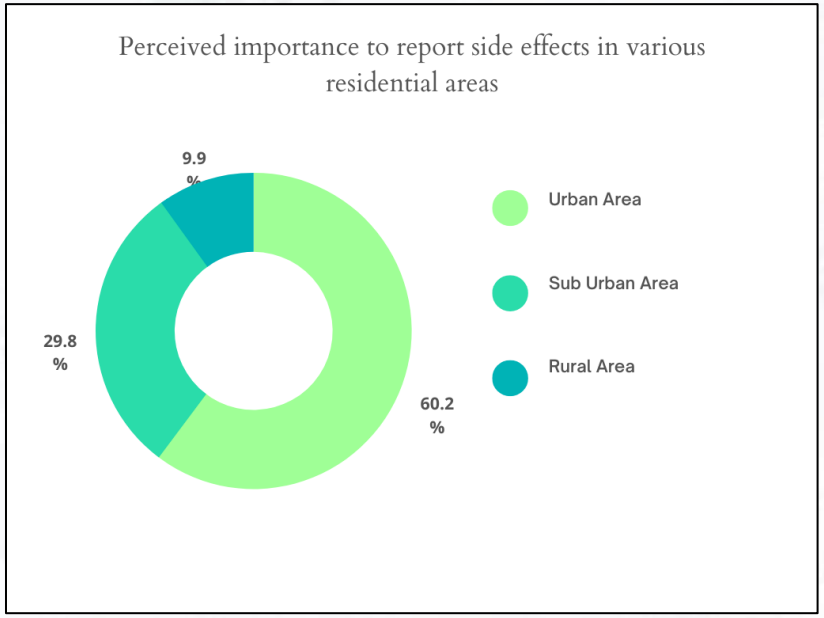
The data presented suggests that participants who reported being somewhat familiar or very familiar with the concept of Artificial Intelligence (AI) generally hold the belief that AI can enhance drug safety.



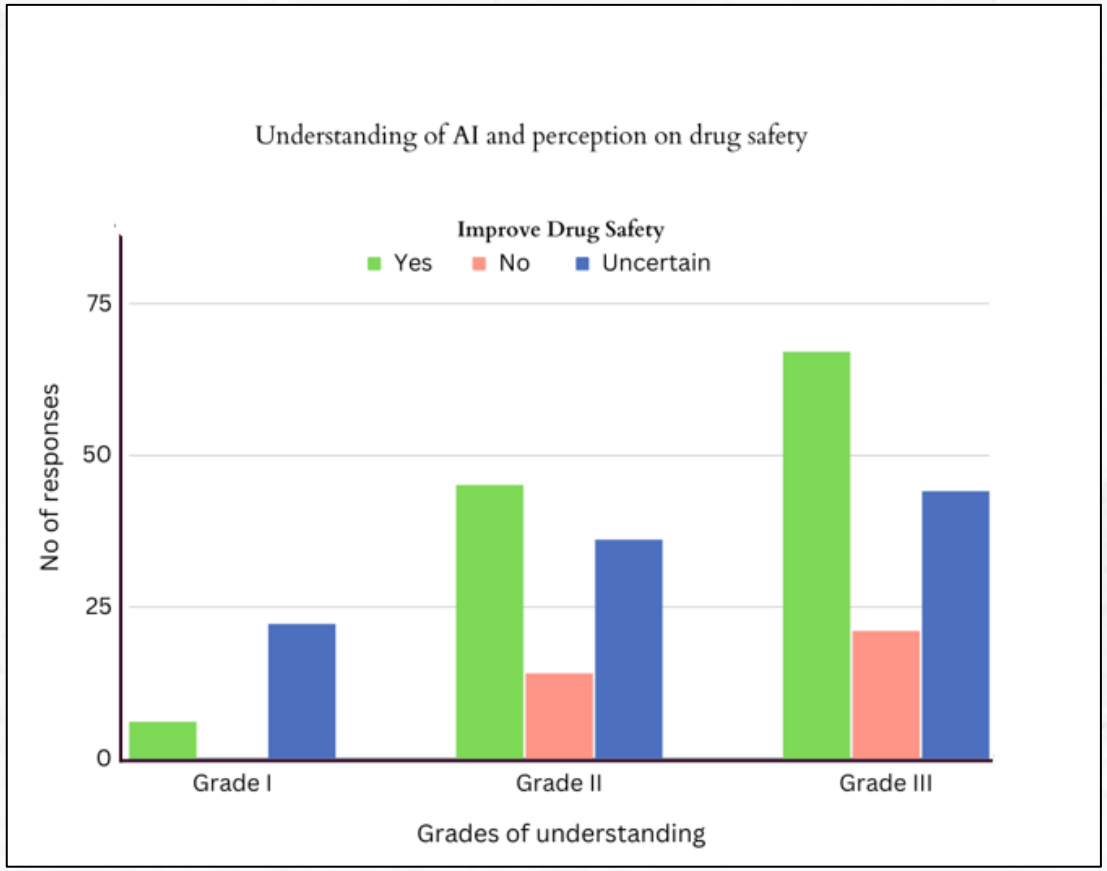
(Pearson Chi Sq =18.6; p value = 0.05) PS:



(Pearson Chi Sq = 23.4; p value < 0.01)



(Pearson Chi Sq = 18.5; p value < 0.05)



(Pearson Chi Sq = 25.4; p value < 0.01)

DISCUSSION & CONCLUSION

•Prevalence of side effects among allopathic medicine users highlights the need for monitoring and reporting.

•Low adoption of digital reporting methods indicates room for improvement in user-friendly platforms.

•Perception of side effects as not significantly risky or hesitance to bother healthcare providers calls for awareness campaigns on reporting importance.

•Variations in telemedicine usage based on age and location suggest the need for targeted strategies for equitable access.

•Positive attitude towards technology and AI among higher education participants underscores the role of education in promoting AI literacy.

•Findings provide insights for policymakers and healthcare stakeholders to enhance drug safety monitoring.

•Study emphasizes the importance of patient-centered utilization of digital health technologies.

•Recommendations include promoting awareness, improving reporting platforms, and enhancing AI education for effective healthcare engagement.

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Thank you!