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Improving the Utility of Social Media in Pharmacovigilance: A Mixed Methods Study

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Abstract : Background: The COVID-19 pandemic has driven pharmacovigilance towards a new paradigm. Nowadays, more people than ever before are recognising and reporting adverse reactions from medications, treatments, and vaccines. In the modern era, with over 3.8 billion users, social media has become the most accessible medium for people to voice their opinions and so provides an opportunity to engage with more patient-centric and accessible pharmacovigilance. However, the pharmaceutical industry has been slow to incorporate social media into its modern pharmacovigilance strategy. This project aims to make social media a more effective tool in pharmacovigilance, and so reduce drug costs, improve drug safety and improve patient outcomes. This will be achieved by firstly uncovering and categorising the barriers facing the widespread adoption of social media in pharmacovigilance. Following this, the potential opportunities of social media will be explored. We will then propose realistic, practical recommendations to make social media a more effective tool for pharmacovigilance. Methodology: A comprehensive systematic literature review was conducted to produce a categorised summary of these barriers. This was followed by conducting 11 semi-structured interviews with pharmacovigilance experts to confirm the literature review findings whilst also exploring the unpublished and real-life challenges faced by those in the pharmaceutical industry. Finally, a survey of the general public (n = 112) ascertained public knowledge, perception, and opinion regarding the use of their social media data for pharmacovigilance purposes. This project stands out by offering perspectives from the public and pharmaceutical industry that fill the research gaps identified in the literature review. Results: Our results gave rise to several key analysis points. Firstly, inadequacies of current Natural Language Processing algorithms hinder effective pharmacovigilance data extraction from social media, and where data extraction is possible, there are significant questions over its quality. Social media also contains a variety of biases towards common drugs, mild adverse drug reactions, and the younger generation. Additionally, outdated regulations for social media pharmacovigilance do not align with new, modern General Data Protection Regulations (GDPR), creating ethical ambiguity about data privacy and level of access. This leads to an underlying mindset of avoidance within the pharmaceutical industry, as firms are disincentivised by the legal, financial, and reputational risks associated with breaking ambiguous regulations. Conclusion: Our project uncovered several barriers that prevent effective pharmacovigilance on social media. As such, social media should be used to complement traditional sources of pharmacovigilance rather than as a sole source of pharmacovigilance data. However, this project adds further value by proposing five practical recommendations that improve the effectiveness of social media pharmacovigilance. These include: prioritising health-orientated social media; improving technical capabilities through investment and strategic partnerships; setting clear regulatory guidelines using multi-stakeholder processes; creating an adverse drug reaction reporting interface inbuilt into social media platforms; and, finally, developing educational campaigns to raise awareness of the use of social media in pharmacovigilance. Implementation of these recommendations would speed up the efficient, ethical, and systematic adoption of social media in pharmacovigilance.

Keywords : adverse drug reaction, drug safety, pharmacovigilance, social media
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