



Digital Pharmacovigilance: Transforming Adverse Drug Reaction Monitoring Through Modern Health Technologies

Charlotte Turner*

Department of Pharmacy Practice, Maple Ridge University, Vancouver, Canada

DESCRIPTION

Digital pharmacovigilance has become an increasingly important field in medicine safety by incorporating advanced digital technologies into the detection, assessment, and monitoring of adverse drug reactions. As healthcare systems continue to generate large amounts of electronic information, digital tools provide new opportunities to improve medicine safety surveillance while supporting timely decision-making. The combination of electronic health records, mobile health applications, artificial intelligence, cloud-based databases, and data analytics has expanded the ability of healthcare professionals and regulatory authorities to evaluate medicine safety throughout the product lifecycle.

Pharmacovigilance traditionally depended on spontaneous reporting systems in which healthcare professionals and patients voluntarily submitted reports of suspected adverse drug reactions. Although these systems remain valuable, they may not capture every event because reporting depends on awareness, recognition, and willingness to submit information. Digital pharmacovigilance complements these traditional approaches by using electronic information sources that continuously generate clinical data during routine healthcare activities. This broader access to information improves opportunities for identifying medicine-related safety concerns.

Electronic health records represent one of the most important resources in digital pharmacovigilance. These records contain patient demographics, diagnoses, laboratory investigations, prescribed medicines, treatment duration, clinical progress, and documented adverse events. Researchers can evaluate these records to identify possible relationships between medicine exposure and unexpected clinical outcomes. The availability of comprehensive patient information allows more detailed safety assessments than isolated adverse event reports.

Artificial intelligence has become an important analytical tool within digital pharmacovigilance. Machine learning algorithms can examine extensive healthcare datasets to identify unusual

reporting patterns, detect potential safety signals, and recognize associations that may require additional scientific investigation. These computational methods assist pharmacovigilance specialists by rapidly processing information from multiple data sources while reducing the time required for preliminary data analysis. Human clinical expertise remains essential for interpreting these findings and determining their medical significance.

Mobile health applications have increased patient participation in pharmacovigilance activities. Many applications allow patients to record medicine use, document symptoms, receive medication reminders, and report suspected adverse reactions directly through digital platforms. These tools improve communication between patients and healthcare providers while encouraging earlier recognition of medicine-related problems. Electronic reporting also reduces paperwork and supports more efficient collection of safety information.

Social media platforms and online patient communities have emerged as additional sources of information regarding medicine experiences. Individuals frequently discuss treatment outcomes, adverse effects, and medication concerns through online forums and digital communication platforms. Researchers have explored methods for identifying useful safety information from these discussions while recognizing that online statements require careful scientific verification before being considered reliable evidence.

CONCLUSION

Regulatory authorities have incorporated digital technologies into routine pharmacovigilance activities. Automated adverse event management systems support efficient case processing, duplicate detection, coding of medical terminology, and signal evaluation. These technologies improve consistency while allowing pharmacovigilance professionals to concentrate on scientific assessment and regulatory decision-making. Digital submission systems have also improved communication between

Correspondence to: Charlotte Turner, Department of Pharmacy Practice, Maple Ridge University, Vancouver, Canada, E-mail: charlotte.turner@mapleridgeuni-ac.ca

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pharmaceutical companies and regulatory agencies by facilitating standardized reporting procedures. Information obtained from

digital discussions may support early identification of issues that deserve formal investigation.