Ethical dilemmas in using electronic medical records: a systematic review

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BACKGROUND

The dawn of this digital age fueled the development of electronic patient records which have drastically improved the quality of many healthcare activities like medication management, integration of patients' data, biomedical research and many other aspects. But this advancement has come at a cost of several socio-economic, legal and ethical problems.

INTRODUCTION

The development and use of electronic medical records have changed the dynamics of patient-physician relationship. Studies suggest it has led to better following of guidelines, prevention of medical errors, completeness of medical records, medication management and improved facilitation of patient access to medical records and communication.

However, the increasing digitalization occurring globally has raised many ethical dilemmas alongside. Concerns about data integrity, informed consent, confidentiality, trust, justice and equity have been raised. There's also the issue severe breaches of confidentiality and security of private data of patients.

The research aims at providing useful database for professionals working under various legal regimes, concerning research involving humans, privacy protection and data processing.
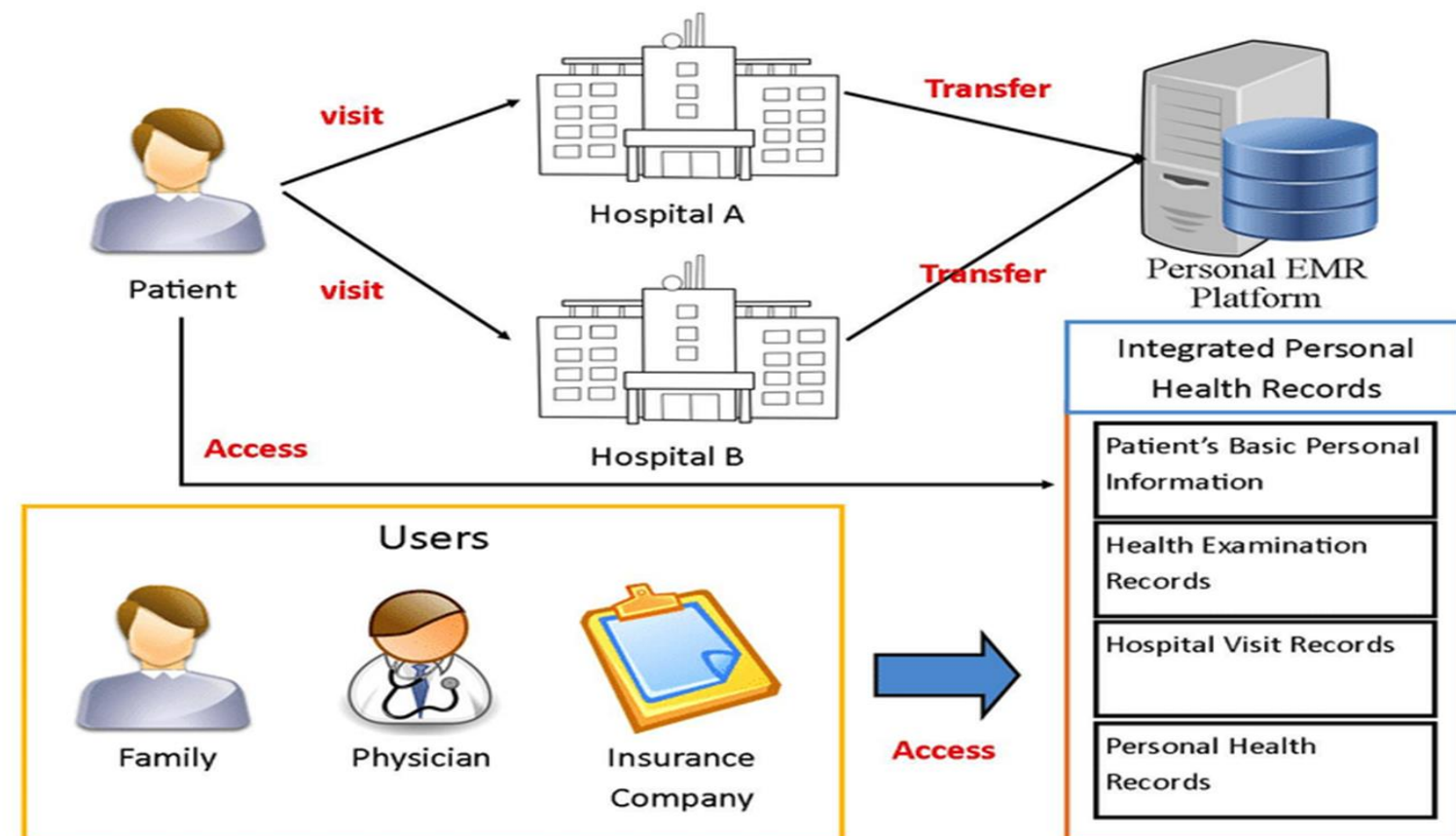
METHODS

- **Search Engines used:** PubMed, Cochrane Library, MDPI, Hindawi. (04)
- **Time Restriction:** 2017-Present
- **Search Term combinations used:** 'electronic health records' AND ethic*, 'electronic medical records' AND ethic*, 'electronic patient records' AND ethic*. (03)
- **Articles:** 624, after duplicate removal, title and abstract and full-text screening done independently by authors, 29 articles were included.
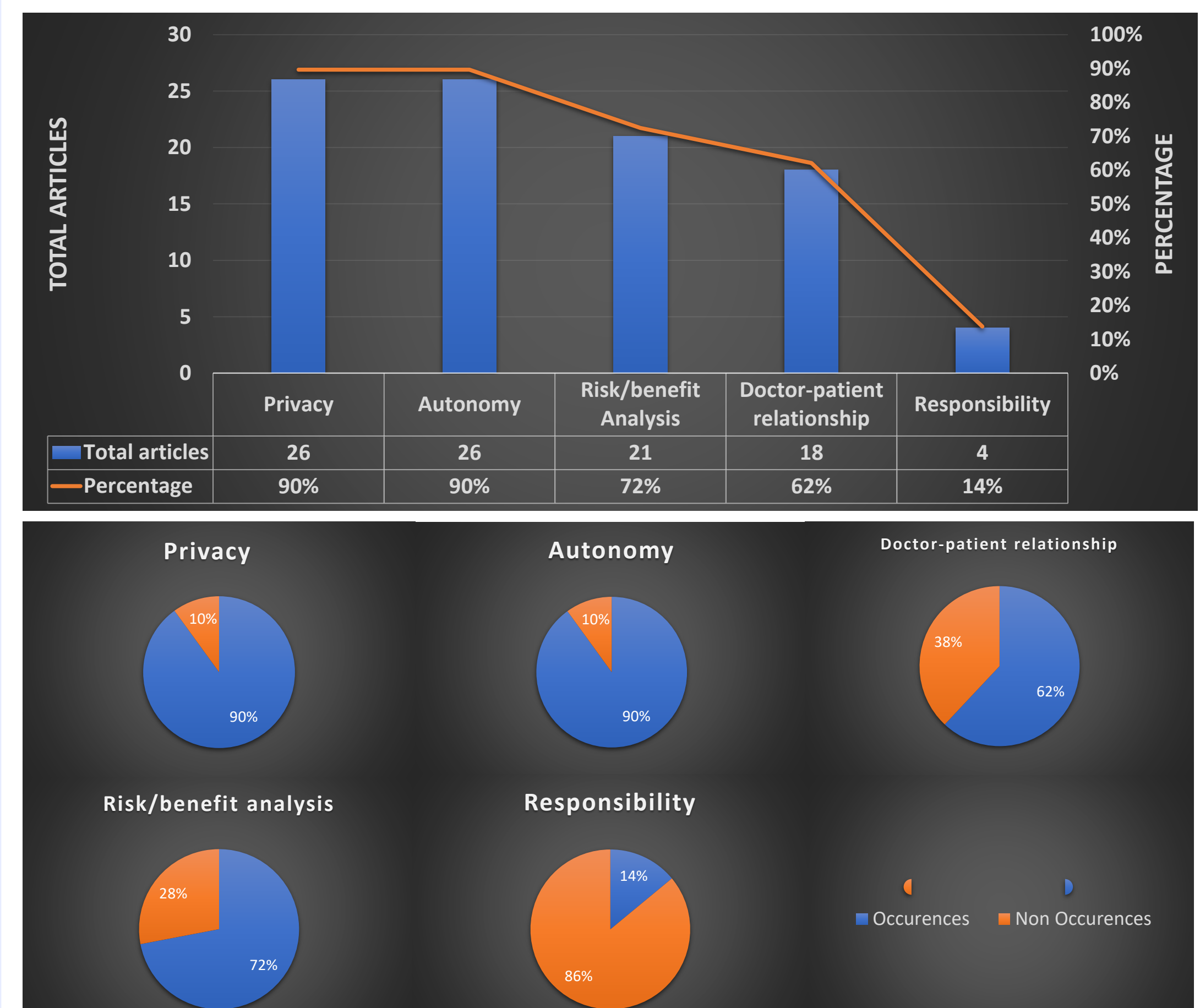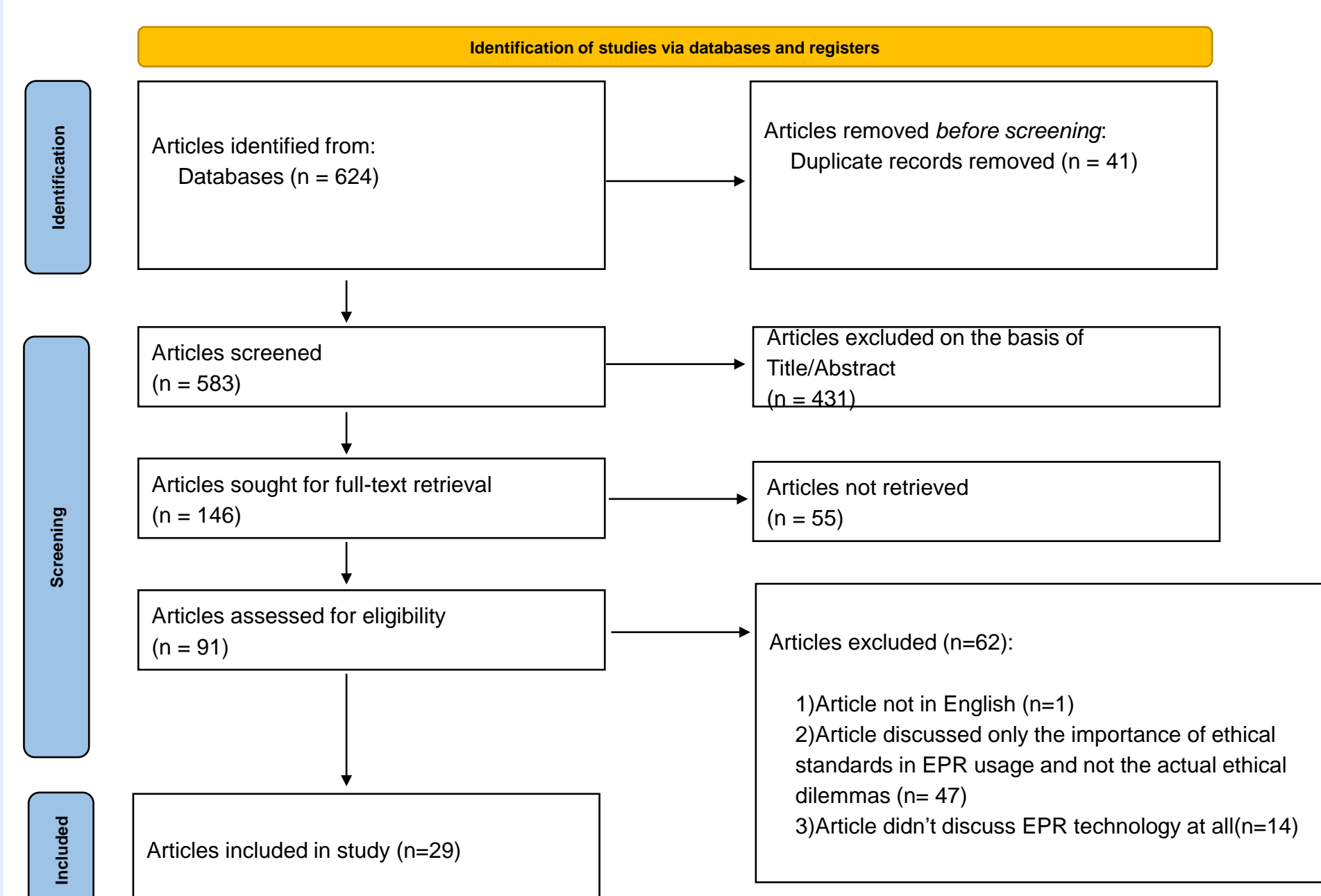
INCLUSION CRITERIA

- Only articles in English language to be included.
- To be included for further review, the articles must be in full text form. (Peer-reviewed and empirical research articles.)
- The articles should have discussed the ethical dilemmas associated with electronic medical records usage.

EXCLUSION CRITERIA

- The articles that discussed only the importance of ethical standards and not the actual ethical dilemmas were excluded.
- The articles that discussed the ethical standards of any technology other than electronic medical record technology were also excluded.

RESULTS

Of the total 624 articles, 41 duplicates were excluded. Then, from the remaining 583 articles, 437 articles were removed on the basis of title and abstract screening. The remaining 146 articles were searched for their full texts and 55 were removed because of unavailability of full texts. Of the 91 full text articles, 62 articles that did not meet our eligibility criteria were excluded. In all, 29 papers satisfied our eligibility criteria and were included by consensus agreement.

	Privacy	Autonomy	Risk/benefit Analysis	Doctor-patient relationship	Responsibility
Total articles	26	26	21	18	4
Percentage	90%	90%	72%	62%	14%

All the aspects of ethical concerns found in the articles were mainly divided into **five** main ethical dilemmas:

PRIVACY	DOCTOR-PATIENT RELATIONSHIP	AUTONOMY	RESPONSIBILITY	BENEFIT/RISK ANALYSIS
• It is defined as the right of the patient to decide when, how and to what extent others may access his protected health information. • It is legal and ethical duty of doctor to maintain privacy of patient and to ensure data security. Breaches of privacy can result in social psychological, ethical and legal harm to the patient. • The issue of privacy was discussed in **26/29 articles (90%)**.	• Doctor-patient relationship is based on trust and transparency. Doctor receives patient's information in terms of confidential relationship between doctor and patient and exposure of this information for any purpose can damage the trust of patient on doctor. • If patient thinks that his personal information is being accessed by third party, he would be reluctant to share his personal information. • It was mentioned in **21/29 articles (72%)**.	• Patients generally supported the use of Electronic Health Records for research purposes but they were of the concern that their consent should be taken above all. • Health care institutions should take informed consent from patients before sharing their data to AI institutions. • Autonomy was discussed in **26/29 articles (90%)**.	• Responsibility for safe and ethical application of electronic health records requires a complex network of interconnected channels. • It refers to being accountable or having control over something and was reported in **4/29 (14%) articles**.	• Patients, Clinicians and health care system is greatly benefiting from online electronic portals but the debate always exists that whether EPR technology is providing more risks or benefits. • This concern was discussed in **18/29 (62%) articles**.

DISCUSSION

This systematic review discussed about ethical issues such as privacy, autonomy, risk/benefit analysis, doctor patient relationship and responsibility. Privacy and confidentiality of a patient is highly compromised by this modern technology use in healthcare as seen in the recent pandemic. The confidential information can easily be accessed by any researcher and a pharmaceutical company for research purposes and so the ethical issues arise. The most crucial step for the prevention of this ethical issue is strict regulation of sharing highly confidential data and also imposing laws for its protection. Any violation of patient's confidentiality should be reported and so, more and more awareness should be directed toward this ethical issue. Autonomy is the right of a patient on his/her body.

CONCLUSION

The digitalization of healthcare and the rapid adoption of electronic health records (EHRs) of patients in recent times can prove very beneficial in the future of medicine, public health and epidemiological studies. Through the integration of the data of patients, clinicians can collaborate and identify the patterns and treatments of clinical conditions. But all of this comes at a cost. As digitalization of healthcare is relatively new, the basic standards can be compromised. The electronic health records contain sensitive information related to an individual and any breach in their integrity can prove to be a major ethical issue. The records might be vulnerable to hacks, and third-party attacks. The transparency of the EHRs should be made sure so that patient autonomy, privacy and security can remain intact. This will encourage patients to take part in the electronic health system and this will prove beneficial for public health.

LIMITATIONS

- The numbers of articles on the topic of interest are **low**.
- Moreover, the electronic health system is still somewhat **geographically limited**, leading to assumptions and extrapolations from data existing in specific regions.
- These digital systems are just starting out in many regions and at the start one can't appreciate the problems and concerns with these systems. These tend to unfold after some usage over time.

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