Bioethics of the Use of Artificial Intelligence as a Clinical Decision Aid Using a Novel Methodology for Qualitative Data Analysis

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INTRODUCTION

Artificial intelligence is being increasingly used in a variety of domains – from autonomous cars, to weaponry used in war, and most importantly, to advance medical management. Artificial intelligence provides clinicians with new insights and different perspectives that increase productivity, generate positive, patient outcomes, and form a collaborative network of support, treatment, and healthcare for patients. Thus far, artificial intelligence is being used for diagnosis (dermatologist level classification of skin cancer, Esteva et al. 2017²; lung cancer diagnosis, Rabanni et al. 2018³), prognosis (ovarian cancer predictive tools, Enshaei et al. 2015⁴), and treatment paths. While artificial intelligence provides insights not readily available to the human eye and/or cognition, the use of big data, especially in a biomedical context, to deliver these analyses prompts questions of sensitivity regarding this personal medical information. There is minimal empirical literature regarding the ethical concerns of AI in healthcare and the public perception of this phenomenon. A qualitative approach can offer valuable information to researchers and those in a patient’s direct circle of a care on the best, most ethical way to incorporate use of AI and big data to maximize development of healthcare resources. Therefore, a literature search was performed to identify key ethical considerations surrounding AI that led to the development of a unique methodology: a vignette approach to qualitatively analyze public perception.

METHODS

Initial Search Strategy
What are the ethical issues associated with data-driven methods in health information research?

Criteria and Refinement:
- Identifying ethical concepts relevant to proposed work, focusing on biomedical issues
- Ethical issues surrounding both AI and Big Data within a biomedical context
- Ethical messages highlighted and reviewed by SA & MDM

Generating the Vignette
Relevant ethical issues operationalized into vignette to elicit responses
- Allow us to understand participants’ perspectives
- Balance of construct validity and external validity
- Minimize social desirability bias

Four Main Themes:
- Assessing initial knowledge of AI in general
- AI approaches to healthcare research
- Machine-learning
- Big data

Demographic: patients with meningiomas, English-speaking or with translator

RESULTS

Literature Review Generated Key Ethical Considerations:
- Informed consent
- Accountability
- Privacy
- Responsibility
- Public engagement/collaboration
- Public Good
- Equality
- Unintended consequences
- Trust

DISCUSSION

The preliminary results of the initial literature review reveals key ethical issues that have been incorporated into a vignette to produce specific attitudes and beliefs surrounding the issues of the use of AI in healthcare. Qualifying, consenting meningioma patients will undergo an interview process; for each scenario, salient features will be reviewed to give insight to how moral reasoning proceeds. For each ethical issue, the cumulative aspects identified across the scenarios will speak to the larger issues. This research will provide directions for researchers as well as other stakeholders and allow education for the public surrounding these key concepts.

CONCLUSION

The long term goal is the development of an artificial intelligence system that can be used for diagnostics, prognostics, and treatment path of brain tumors, more specifically, meningiomas. Before such a system can be developed, it is important to understand what moral framework the system will be operated under. Development of framework will occur after data analysis.

Meningioma (Frontal) – 57 year old woman in right frontal lobe

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REFERENCES