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Integrating Equity, Diversity, and Inclusion Throughout the Lifecycle of Artificial Intelligence for Better Health and Oral Health Care: A Workshop Summary

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Artificial Intelligence (AI) enabled technologies are increasingly being applied in all sectors of our society.[1–7] Its application in medicine and dentistry has demonstrated significant promise.[8–10] Its wide array of uses include screening, detection and treatment of diseases, clinical decision making, disease probabilities prediction, enhancing accessibility, patient data management, overseeing clinical practice, and facilitating patient record documentation and enhancing public health.[3–5, 7–11]

Despite the potential benefits of AI technologies, debates have been raised concerning the fairness, ethical and legal risks of their applications.[12–17] In fact, AI could lead to perpetuating health inequalities, stemming from biases in the algorithms generated by AI, an unintended consequence of using datasets that are not representative of the diverse populations they aim to serve.[18] For instance, an AI application failed to identify individuals from marginalized communities for "high-risk care management" tasks,[12] and recent studies further underscore potential age-related biases in AI algorithms, especially in areas such as computer vision.[19] Minorities are at an increased risk of discrimination due to systemic biases in the dataset, given their frequent struggles in accessing quality health care services.[12]

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Socially responsible AI can be achieved by integrating equity, diversity and inclusion (EDI) in the application of AI in health care for better and equitable health outcomes.[15–17, 20–22] Studies suggest that the building of AI systems for health care should be participatory in nature and should include diverse experts and stakeholders like system developers, health professionals, researchers, and end-users.[23, 24]

To our knowledge, no studies have assessed how research has pinpointed EDI variables or evaluated EDI concepts, practices and outcomes in AI technologies within the realms of health and oral health. Furthermore, current research shows that studies on the application of AI in health care rarely included all stakeholders in the design, development and implementation of the AI system.[7, 17, 21, 22]

Based on this knowledge gap, Professors Elham Emami and Samira Rahimi organized and co-led an international interdisciplinary workshop on June 15 and 16, 2023, at McGill University in Montreal, Canada. The workshop was built upon an intersectoral approach addressing an important social context in the field of AI. The main objectives of the workshop were:

1. Consolidation of prior and new research partnerships with representatives of socio/ethnocultural communities and end-users as well as with an international/intersectoral/interprofessional team of policy makers, researchers, clinicians and industry representatives.
2. Exchange knowledge on EDI and AI concepts and identify research gaps and needs.
3. Co-develop main constructs on the EDI-AI concepts and initiate the development of a preliminary framework on integration of EDI throughout the lifecycle of AI.

Over 40 participants from diverse backgrounds and expertise participated in the two-day workshop. This group included representatives from government and non-government organizations (NGOs), patient groups, academia, and industry as well as students and trainees. The workshop commenced with Professor Angela Campbell, Associate Provost (Equity & Academic Policies) at McGill University, briefly presenting McGill's EDI strategic planning and Professor Campbell emphasized the vital role that universities play in recognizing and addressing social inequities.

During the workshop, attendees benefited from a variety of scientific presentations that covered a broad spectrum of topics. These presentations delved into clinical perspectives and the application of AI technologies in both general health and oral health care spheres and explored EDI in research. Other topics included a comprehensive look at the ethical and technical considerations involved in applying AI in primary health care, a discussion on the legal dimensions of utilizing AI in dentistry, and an industry perspective on EDI within the context of AI. Also, study trainees presented findings from the "Integration of EDI in AI" scoping review, of which the protocol has already been published[17]. The presentations were then followed by panel and group discussions.

The members of the panel and workshop participants addressed the following questions:

1. What are the visions and values that guide the integration of EDI throughout the lifecycle of AI?
2. What are the facilitators and barriers to the integration of EDI throughout the lifecycle of AI within health and oral health care?

Multidisciplinary research team, collaborators and workshop invitees.

3. What should be the indicators of EDI in health and oral health care data and how can we measure the EDI variables throughout the lifecycle of AI?
4. How a conceptual framework should be framed and what are the main elements?

The workshop concluded with a summary of the workshop and restating the highlights of the discussions.

Workshop short-term outcomes

The workshop was well received by the participants. Following the workshop, new international and national research collaborations were developed which demonstrated the relationship between knowledge creation and action. The research team collectively reflected on the preliminary outcomes of the workshop and provided input regarding the subsequent progression of the study in this field. The initial skeleton of the EDI-AI framework was developed. The research team's interdisciplinary and intersectoral approach, combined with representation from visible minority communities, and the participation of health and oral health care providers, patients, industry partners, and policymakers, greatly enhanced our ongoing knowledge transfer activities. The research team is presently working on developing the EDI-AI framework and analyzing the data from group discussions. In summary, this workshop explored EDI in theory to practice of AI and the fundamentals of AI in health and oral health care and identified EDI-related gaps in AI sciences. Further, participants discussed EDI-related variables and measurement instruments in the field of EDI-AI; strategies to facilitate the integration of EDI principles in AI tools as well as future prospects of EDI in AI in health and oral health.

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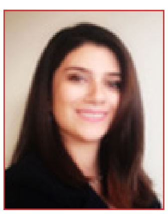

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