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Ethics Of Ai In Healthcare Marketing

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Abstract: The Artificial Intelligence (AI) and Machine Learning (ML) have brought in drastic changes on how the healthcare works, it has changed the capability and capacity of the traditional healthcare approach of doctor referrals to the one in need to business and spending money on advertising to attract patients. However, artificial intelligence involves in decision making controls and extends support in diagnostics by performing a robotic surgery, communicating with the patient and express empathy in speech, touch and decision support in disease diagnosis and screening. But AI has to be used cautiously due to its issues in the bias, ethics, fairness that may occur is not applied properly. The research involves in understanding the Usefulness of AI in healthcare, ethical and biases involved in application of AI, application of Marketing ethics in responsible AI, appropriateness of machine learning models and consumer perspectives and trusts on AI in using their clinical data for marketing and making profits.

Index Terms - Artificial Intelligence, Machine learning, global health, Healthcare, Social Media Marketing, Consumer trust, Marketing ethics.

Introduction

With emerging growth of Internet brought in various emerging technologies that changed the standards of healthcare service being provided over the years. AI and the Internet of Medical Things (IoMT) has brought in lot of changes in the healthcare sector in terms of services being provided and even in formulating marketing strategies. AI's evolution in medical science started with and attempt of diagnosis using the digital devices which over years have brought in many use cases of AI that include the decision making, disease diagnosis and identifying different comorbidities involved in cause of disease. AI can handle vast amount of data and help in making clinical decisions easier. Towards, on side of coin AI has been making the Healthcare service sector more robust in terms of predicting risk factor of patient's life and saving lives. Whereas, the Healthcare marketing activities have also evolved over years where organizations started to spend money on their marketing activities to attract patients and make profits. This brings us to a questionable aspect of how ethical is it to manage a patient's data in terms of healthcare marketing and does it involve the patient involvement or consent for any organization to use their data. This fear of marketing brings in concern of the ethical principles being followed by the organizations in today's outrageous competitive world on using the patient's data and building profits that would not deliver the patients get the care they need. The AIs perspective in healthcare is exciting as well as distracting with the ethical concerns in place. Now a days the users spend their most of time on smartphones, updating on social media and many online applications discuss about their well-being, thoughts, experiences or search results for information related to their health which generates lot of relevant data. With AI and Machine Learning in place social media is also being used in prediction, detection, and for treatment solutions for mental healthcare via web and smartphone applications (D' Alfonso,2020). Therefore, consistently changing and co-shaping human actions make technology accountable for the ethical questions on how the consumers act on (Peters et al.,2020).

I. LITERATURE REVIEW

AI has been a part of medical science since 1950s, where physicians used computer aided programs to improve their diagnosis (Yang et al., 2021). With availability of huge data and enhanced computer intelligence made AI sustainable in healthcare. AI is changing the medical practise as it has various applications in decision making and diagnosis. AI analyses, ingests and reports huge data across different comorbidities (Hamid, 2016). ML and AI have changed the healthcare in the Low- and Middle-Income Counties (LMICs) by offering attractive solutions and improving the local health care infrastructure. LMICs population can be particularly vulnerable to bias, fairness and appropriateness. Considering Global health AI and ML represent a great opportunity as a part of digital healthcare initiative (Labrique et al., 2020). Despite the shortage of resources, the LMIC have seen a increasing presence of computers and smart phones which led them to explore ways on how computers can be used. Some of such tasks include assisting the unexperienced doctors, perform better disease diagnosis, analyse the medical data (Elgendi, 2020). Machine Learning can also be helpful in optimising the process and help in predicting the human behaviour. Present AI is not just used in healthcare to diagnose but also its used for the hospitals to formulate their marketing strategies. (Gaughran,). In today's healthcare marketing is very important for organisations to build on profits. Gone the days where patients choose a nearest hospital or clinic or referred by doctors. AI has evolved the marketing strategies of the healthcare sector. (Rui. Lui,et.al, 2021) With social media in place AI have opened up digital capabilities in healthcare to select, screen and detect problems with best solutions with available healthcare digital data. Here comes to a discussion to understand how this evolution took place and ethical concerns for the organisations to handle the data. (Wendy A et.al.,) the ethical concerns include lack of patient and public involvement in Healthcare AI development and deployment also lack of attention towards AI impact on healthcare relationships. (Gaughran,) Until 1947, there was no ban on the Healthcare marketing or advertisements but American Medical Association (AMA) started to face issues when doctors started to promote certain pharmaceutical products and even promotion of tobacco. In 1957, AMA lifted some restrictions by allowing physician referrals. In 1970s, Healthcare business took a paradigm shift where patients started to choose healthcare services based on their preference rather than the physician referral which led to era of starting marketing activities for organisations and public relations department to promote with the help of sponsored events, community events etc., 1980s Federal Trade Commission said that AMAs ban effectively restricted trade in the pharma and medical field. Today's marketing activities are still tightly controlled while providing the ethical standards for marketing of hospitals or practises. How can an ethical healthcare marketing can actually make difference in a patient's life with the availability of wide variety of traditions and digital marketing and advertising platforms? With lots of platforms and data being available there are people or organisations who are already taking advantage of it as many cases the public and patient involvement is lacked in such kind of activities. There is always a fear of ethics that stands in the way of giving patients good care that they need. (Eitel Porter,2021) Ethical principles that need to be focused mainly in AI are trust, fairness, privacy. The increased use of AI in decision making also had its effects on perceptions of fairness and satisfaction. It also lacked transparency in terms of design challenges. The term Responsible AI is stated which seeks support of design, implementation, use of ethical, transparent and accountable AI solutions that reduce bias, fairness, equality, interpretability (Trocin et al., 2021). (ibid.) Ethics have impact people's decision making in terms of privacy issues, fairness, inclusiveness, transparency, accountability, reliability and safety as barriers for sustainability of organisations. (Richard F, et al,2021). (Wendy A et al.,) Lack of patient and public involvement in developing AI raises ethical concerns. There is a strong necessity for patient public involvement (PPI) while developing, designing and deploying the Healthcare AIs. The potential effects include impaired communication, loss of trust, conflict decision making,

II. NEED FOR STUDY

In today's world the use cases of AI have increased impact on the healthcare sector where it serves to be a helping hand in terms shaping healthcare infrastructure, decision making. In terms of robotic surgery, predicting the risk factor. Whereas, it's also helping the healthcare organizations to get more footfalls by processing the huge heath data of the patients. Using the data reports the organizations can analyze the best specialty, best doctor or which service is most preferred by the patients etc., and plan their marketing activities surrounding this data results. Understanding these use case of AI in healthcare brings us a serious question of knowing how ethical is it to manage a patient's data in terms of healthcare marketing, does it involve the patients consent on using the data, the biases and ethical issues that may arise due to lack of proper accuracy. Since Healthcare is a sector where there is no chance of 0.001% of error. It's necessary for us to understand

how AI can shape for better healthcare services overcoming the ethical concerns and have patient and public involvement in process of shaping AI.

3.1Objectives

- To understand the usefulness of AI to provide advanced care
- To understand the consumer trust over AI in healthcare
- To understand ethical implications of AI on using the clinical data.

3.2 Data and Methodology

The following research is done by reviewing 15 Scopus Indexed peer reviewed papers from years 2000-2024. The research mainly focused on the qualitative study on the uses and ethical concerns of AI in healthcare.

IV. THEORIES

- AI technologies can identify subtle signs of disease in medical images faster and more accurately than humans. - Dr. Sobia Hamid
- Digital health - advanced medical technologies, disruptive innovations and digital communication have gradually become inseparable from providing best practice healthcare - Zsuzsanna Győrffy
- The high levels of resistance to advertising and other forms of healthcare marketing by healthcare professionals has been largely based on the grounds that the practices are unethical. - Kevin L Hammond
- AI can help divide customers into segments, which marketers can then examine and use to ascertain customer motivations and devise need-based marketing syst - Casey Schmidt
- AI involves integrating insights from diverse disciplines such as computer science, mathematics, psychology, linguistics, philosophy, neuro-science, artificial psychology, and many others. - Ryan Byrne
- Bibliometrics is the quantitative study of literature and a measurable method used to identify the developmental trends within a certain field to obtain quantifiable, reproducible, and objective data - Yuqi Guo, Zhichao Hao

  (i) AIM cannot be isolated from the rest of biomedical informatics nor from health planning and policy - Manh-Tung Ho

  (ii) the applicability of AIM in real-world settings depends on the integration of various knowledge-based tools, rather than the stand-alone consultation systems of the 1980s - Manh-Tung Ho

  (iii) politicians and policymakers need to understand the strategic role of and, thus, investment into clinical and biological computing infrastructure - Manh-Tung Ho
- The practice of using AI with good intention, to em- power employees and businesses and create a fair environment for customers and society, enabling organizations to generate trust and bring AI deployments to scale. - Eitel-Porter
- Marketing AI can be categorized according to two dimensions: intelligence level and whether it's stand-alone or part of a broader platform. - Dhruv Grewal

Appropriateness - criteria to find how well the machine learning algorithm is matched to the specific context and to the specific population. - Richard Ribon Fletcher.

V. USEFULNESS OF AI IN HEALTHCARE

AI offers attractive solutions in healthcare by addressing problems like shortage of health care resources, improving the local health care infrastructure it also enabled automation and accelerated productivity (Fletcher et al.,2021). It enables computers to make optimal decisions. Human Intelligence with AI involve more in decision making and also solves complex problems by having effective communication with patient, expressing empathy with speech, infer high level of abstractions, associations from the patient. In healthcare its currently used for tasks like decision support like disease diagnosis and screening. Processing the patient data that helps in detecting the abnormalities, optimising the services and process in delivering the healthcare, increases the capacity and reduces the financial losses (Beam and Kohane, 2018; Ngiam and Khor, 2019). AI in LMICs find themselves understaffed, overburdened, lack of proper education with AI LMICs have started

exploring options that computers can assist in tasks that would help health workers in better diagnosis and analyse medical data. For eg: Identifying the presence of coronavirus in a Chest X-ray image. (Elgendi,2020).

VI. ETHICAL ISSUES IN AI (WENDY.ET.AL,2021):

Ethical Considerations	Applicability	Impact	Actions to be taken
Transparency	Explain ability and interpretability, nature and scope of communication	Avoid harm, Improve AI, enables trust	Disclosure of information by those designing, developing and deploying AI. Include public and stake holder interactions
Justice, Fairness and equity	Fairness, minimise bias, fair access to data and fair benefits	Ensure equity in access to AI, minimise harms.	Ensuring laws/ regulations that serve the purpose
Non- Maleficence	Safety, security, unintentional harms	Prevent loss of trust, avoid privacy violations	In built security and privacy, appropriate process and practices
Privacy	Protecting data privacy with respect to data protection and security	To protect privacy, build trust	More research, improved awareness, regulatory approaches
Responsibility and accountability	Act with integrity, transparency, legal liability	Avoid harm, promotes diversity, justice in redress of harm	Degree of responsibility to be attributed to AI or human need to be defined

VII. ETHICAL MARKETING PRINCIPLES OF AI

One of the most effective ways to enrich your marketing strategy is to constantly abide by certain ethical principles. Some marketing strategies may be suitable to draw in guests by using shady practices (similar as spamming, which no one appreciates) – but the cost now's serious.

By using shady marketing tactics, you damage the long- term fame of the company. Brand image isn't a commodity to be taken smoothly, as it drives faithful clients.

still, you'll be capable to maximize client satisfaction, maintain consumer trust, If you concentrate on ethical marketing rather.

Ethical marketing should always aim to be honest and fair. Unethical practices won't guarantee you further deals or unavoidably cut costs in the long- term. What it does do, however, is put your company's viability at threat.

Ethical marketing, on the other hand, is always the wisest route to success.

Some of the ways by which ethics can be assured in medical marketing are as follows-

- All claims made regarding the marketing of a product must be true and accurate
- Products above 12 months shouldn't be declared as new
- all side effects must be disclosed
- In the use of any audio-visual promotional material, specific exposure conditions on the nature of the product, its active components, recommended cap, adverse responses, approach of administration and the date on which alike information has been last streamlined must be followed.
- If journals or studies are used for the creation of any pharmaceutical products.

Names or photos of healthcare professionals for advancements aren't to be used.

- The function of Medical Representatives (" MRs") in the creation of pharmaceutical products must be set out.
- Samples must be allocated.
- furnishing gifts to anyone capable to specify medicines is banned.
- About the connections between croakers and druggists, giving any journey or transportation/ hospitality establishments, supplying any financial allocations, etc. aren't permitted.

8.1. Some of the do's and don'ts's in maintaining marketing ethics are as follows-

- Being transparent
- Guarding consumer data and sequestration
- Commitment towards sustainability and human rights
- Responding to client problems

Don'ts

- Never exaggerate about the product
- Don't make false comparisons
- Don't do conception kind of elevations
- Don't take advantage of feelings

8.2. Some of the underlying principles of AI in marketing are as follows

- **Anticipating the future**- In digital business, AI generates perceptivity that led directly to business prosecution. A strategic AI operation can produce grainy perceptivity into what clients, demands or other beings are likely to do in specific coming situations and what the enterprise can do to impact them. The further secure the perceptivity, the further enterprises will depend on them to guide coming performance systems.
- **Acting Autonomously-** AI operations give value by automating being manual processes, but can also go a step further by enabling independent operation of the business. A strategic AI operation that acts autonomously can operate without mortal direction, producing significant productivity earnings as it augments the work done by humans and frees them for further substantiated tasks.
- **Establishing connection with the client**- Digital businesses thrive on knowledge of demands and clients. To support digital business enterprise, AI operations must get as close to clients as possible
- **Detecting the unnoticeable**- AI can manage operations in ways that humans cannot, and strategic AI exercises should take advantage of this capability. Strategic AI operations can make conclusions much faster than humans about increasingly complex situations.
- **Threat management**- Security, threat and privacy form the biggest barriers to the development of AI operations and are indeed further of an issue when AI operations serve a strategic business purpose. A mistake does not just disrupt operations; it harms the brand or the enterprise. As a result, CIOs should define gusted limits. These limits reduce the threat of conception drift and prevent any damage the operation could do.

VIII. Technical Challenges of AI in Healthcare

AI and Machine Learning algorithms in healthcare is fundamentally evaluated basis below criteria (Appropriateness, Bias, Fairness).

9.1. Appropriateness:

There are few criteria in the real-world operational context for an algorithm to be assessed and evaluated to meet this we term it as Appropriateness that addresses how well a ML algorithm matches the specific context to specific population. In a public service such as delivering healthcare services, it is important to understand why are we using this technology. It is been quite popular in terms of using ML algorithms for different decision-making needs in healthcare. However, with limitations in place it's important to understand why the algorithm is used and consequences of the decision. For Eg: Deciding whether a patient should be removed

from a life support system or not. These decisions should be taken by the machine or humans also should be part of such decision-making process. While applying a ML problem to global health it is important to understand the model and how it is being used. For Diagnosis in healthcare the interpretability of it is highly dependent on the doctors.

9.2. Bias:

The term Bias in terms of algorithms is defined as a systematic error or an unexpected tendency to favour a outcome over other (Mehrabi et al., 2019). It could be due to algorithm having undesired dependence on specific attribute of the data that can only be attributed to the specific demographic group. Whereas and ideal unbiased algorithm should not be dependent on any attributes like age, gender, race, religion. In healthcare due to algorithm bias it may lead to unfavourable treatment of one patient as a individual or a group versus the other. The Bias is also judged to be unfair from legal or ethical point of view. Some researchers have identified more than 20 different types of biases (Mehrabi et al., 2019) categorised basis of having implicit and explicit causes. It could include problems due to data sampling, unexpected human behaviour in data collection. A well know example of bias (Joy Boulamwini,2017) was on the performance of the facial detection algorithms when applied to different skin colours. Its seen that facial detection models created by IBM and Microsoft performed surprisingly poor with accuracy less than 40% when applied on dark skinned women. The algorithm bias can be reduced by including the larger proportion of dark-skinned faces in process of training the model.

9.3. Fairness:

Fairness of a Machine Learning model is judged basis the legal and ethical principles of the local government and culture. In use cases like diagnostic prediction, the algorithms are now applied to improve the healthcare operational aspects like health care delivery, determining the cost of insurance premiums that a patient needs to pay. These all-use cases can have an unfair outcome due to demographic groups. The different ways of fairness have to be defined and measured for proper tuning of a machine learning algorithm.

IX. CONCLUSION

There needs to be further use cases to specify the ethical standards, the force of ethical frameworks in healthcare to facilitate AI. AI projects require skills and data quality awareness for data-intensive analysis and knowledge-based management. It is evident that the processes involved in global health are complex and can often include hidden variables. AI can still accomplish only narrow tasks, not run an entire marketing function or process. Investment into AI research or infrastructure for AI can be expensive, the irrational perspective of the public can slow down substantially the transitioning to an AI-powered healthcare sector. Marketers can easily obtain troves of data, which before now would have taken weeks or even months to parse and analyze, and the power of AI doesn't stop there. Once the market segments have been identified, AI can help target them with smarter ads by analyzing social media profiles, keyword searches and other elements. Online search dominates the market when it comes to finding healthcare needs. For the most part, prospective patients will simply move on if they can't find your practice online. And unless your organization actively builds brand awareness (through online ads, mailers, etc.), you can rule out referrals altogether. The accuracy, reliability, security and clinical use of medical AI technologies would need to be ensured through a combination of standards and regulation. Advances in AI algorithms, particularly in deep-learning approaches, accompanied by increasing architectural hardware specialization (e.g., GPU, TPU, and large-scale parallel computing)19 and the availability of big data, have catalyzed the rapid development of AI technology, bringing about the third wave of AI. The role of patients also needs to shift from being a passive stakeholder of care to becoming proactive with tools and information at their disposal to perform health and disease management. E-patient movements and advocacy have been assisting this transition. The accuracy, reliability, security and clinical use of medical AI technologies would need to be ensured through a combination of standards and regulation. The acceptance of healthcare marketing by all stakeholders is important for successful marketing.

REFERENCES

1. Rogers, W. A., Draper, H., & Carter, S. M. (2021). Evaluation of artificial intelligence clinical applications: Detailed case analyses show value of healthcare ethics approach in identifying patient care issues. Bioethics, 35(7), 623–633. https://doi.org/10.1111/bioe.12885
2. Secinaro, S., Calandra, D., Secinaro, A., Muthurangu, V., & Biancone, P. (2021). The role of artificial intelligence in healthcare: a structured literature review. BMC Medical Informatics and Decision Making, 21(1). https://doi.org/10.1186/s12911-021-01488-9
3. Fletcher, R. R. (2021). *Addressing Fairness, Bias, and Appropriate Use of Artificial Intelligence and Machine Learning in Global Health*. Frontiers. https://www.frontiersin.org/articles/10.3389/frai.2020.561802/full
4. *How to Design an AI Marketing Strategy*. (2021, August 30). Harvard Business Review. https://hbr.org/2021/07/how-to-design-an-ai-marketing-strategy
5. Vuong, Q. (2019). *Artificial Intelligence vs. Natural Stupidity: Evaluating AI Readiness for the Vietnamese Medical Information System*. MDPI. https://www.mdpi.com/2077-0383/8/2/168/htm
6. Schmidt, C. (2019, June 26). *How Artificial Intelligence is Shaping Medical Device Marketing*. Big Buzz. https://www.bigbuzzinc.com/how-artificial-intelligence-is-shaping-medical-device-marketing/
7. *Healthcare Professionals and the Ethics of Healthcare Marketing*. (2008). Taylor & Francis. https://www.tandfonline.com/doi/abs/10.1300/J026v11n01_03
8. Gaughran, K. R. (2020, August 8). *Marketing Ethics in Healthcare: What Every Organization Should Know*. Healthcare Success. https://healthcaresuccess.com/blog/healthcare-marketing/marketing-ethics-in-healthcare.html
9. Global Legal Group. (2021). *Pharmaceutical Advertising Report 2021–2022 India*. International Comparative Legal Guides International Business Reports. https://iclg.com/practice-areas/pharmaceutical-advertising-laws-and-regulations/india
10. Rui Liu, Suraksha Gupta, Parth Patel(2021,Aug22). *The Applications of the Principles of Responsible AI on Social Media Marketing for Digital Health. https://link.springer.com/content/pdf/10.1007/s10796-021-10191-z.pdf*
11. Mehrabi, N., Morstatter, F., Saxena, N., Lerman, K., and Galstyan, A. (2019). A survey on bias and fairness in machine learning. preprint: arxiv:1908.09635.
12. Buolamwini, J. A. (2017). Gender shades: intersectional phenotypic and demographic evaluation of face datasets and gender classifiers. Masters Thesis. Cambridge (MA): Massachusetts Institute of Technology.
13. Beam, A. L., and Kohane, I. S. (2018). Big data and machine learning in health care. *JAMA* 319 (13), 1317–1318. doi:10.1001/jama.2017.18391
14. Ngiam, K. Y., and Khor, I. W. (2019). Big data and machine learning algorithms for health-care delivery. *Lancet Oncol.* 20 (5), e262–e273. doi:10.1016/S1470-2045(19)30149-4
15. Elgendi, M., Nasir, M. U., Tang, Q., Fletcher, R. R., Howard, N., Menon, C., et al. (2020). The performance of deep neural networks in differentiating chest X-rays of COVID-19 patients from other bacterial and viral pneumonias. *Front. Med.* 7, 550.
16. Labrique, A., Agarwal, S., Tamrat, T., and Mehl, G. (2020). WHO digital health guidelines: a milestone for global health. *Npj Digital Medicine* 3 (1), 1–3. doi:10.1038/s41746-020-00330-2
17. The Opportunities and Risks of Artificial Intelligence in Medicine and healthcare, CUSPE, The Babraham Institute, University of Cambridge)
18. Digital health is a cultural transformation of traditional healthcare, Mhealth. 2017; 3: 38.Published online 2017 Sep 14. https://www.tandfonline.com/doi/abs/10.1300/J026v11n01_03
18. Concepts of Artificial Intelligence for Computer-Assisted Drug Discovery, ACS Publications, July 11, 2019
19. Artificial Intelligence in Health Care: Bibliometric Analysis, Medical Internet research, 29.7.2020 in Vol 22, No 7 (2020): July
20. Artificial Intelligence vs. Natural Stupidity: Evaluating AI Readiness for the Vietnamese Medical Information System, JCM Volume 8 Issue 2
21. Global Evolution of Research in Artificial Intelligence in Health and Medicine: A Bibliometric Study, National Library of Medicine
22. 6 Design Principles for Artificial Intelligence in Digital Business. (2019). Gartner. https://www.gartner.com/smarterwithgartner/6-design-principles-for-artificial-intelligence-in-digital-business
23. D'Alfonso, S. (2020). AI in mental health. Current Opinion in Psychology,36, 112–117

24. Peters, D., Vold, K., Robinson, D., & Calvo, R. A. (2020). Responsible AI—two frameworks for ethical design practice. IEEE Transactions on Technology and Society,1(1), 34–47

24. Rauniar, R., Rawski, G., Yang, J., & Johnson, B. (2014). Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. Journal of Enterprise Information Management,27(1), 6–30. https://doi.org/10.1108/JEIM-04-2012- 0011

25. Hamid S. The opportunities and risks of artificial intelligence in medicine and healthcare [Internet]. 2016 [cited 2020 May 29]. http://www.cuspe.org/wp-content/uploads/2016/09/Hamid_2016.pdf
26. Eitel-Porter, R. (2021). Beyond the promise: implementing ethical AI. AI and Ethics,1(1), 73–80
27. Trocin, C., Mikalef, P., Papamitsiou, Z et al. (2021). Responsible AI for Digital Health: a Synthesis and a Research Agenda. Inf Syst Front. https://doi.org/10.1007/s10796-021-10146-4