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Review Article

Recommendations on the use of artificial intelligence in health promotion

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ABSTRACT

The purpose of this perspective is to provide recommendations on the use of Artificial Intelligence (AI) in health promotion. To arrive at these recommendations, we followed a 6-step process. The first step was to recruit an international authorship team from the Healthy Living for Pandemic Event Protection (HL- PIVOT) network. This enabled us to achieve an international perspective with insights from Canada, Great Britain, Kenya, Italy, and the US. A philosophical inquiry was conducted addressing 5 questions. What should the relationship be between humans and AI in health promotion? How can the public and professionals trust AI? How can we ensure AI is aligned with our values? How can we ensure the ethical use of data by AI? How can we control AI? 4 hypothetical scenarios were also developed to provide perspectives on: i) Artificial 'Versus' Human Intelligence; ii) AI Empowerment in Self-Care; iii) Could AI Improve Patient Provider Relationship; and iii) The Kenyan Cancer Patient at the Height of a Pandemic. Based on the philosophical inquiry and the scenarios 11 recommendations are made by the HL-PIVOT on the use of AI in health promotion. The golden thread running through these recommendations is a human centric approach. The recommendations begin by suggesting that workforce planning should take account of AI. They conclude with the statement that any serious incidents involving an AI in Health Promotion should be reported to the relevant regulatory authority.

Contribution to Health Promotion

- This perspective offers recommendation on how Artificial Intelligence (AI) might best be used in Health Promotion.
- The philosophical inquiry included here puts the use of AI in health promotion within the context of 5 fundamental questions.
- Four hypothetical scenarios explore the possible positive and negative impacts of the use of AI in Health Promotion.

Abbreviations: AI, Artificial Intelligence; DL, Deep Learning; EDI, Equity, diversity and inclusion; HL- PIVOT, Healthy Living for Pandemic Event Protection; LLM, Large Language Models; ML, Machine Learning; NLP, Natural Language Processing; US, United States.

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- In presenting this perspective we hope to add to the debate on the use of AI in Health Promotion and other settings and encourage others to develop their own recommendations.

Introduction

It has become increasingly apparent that Artificial Intelligence (AI) is already being used in the health sector[1,2] ***(Recommendation 1 – see the explanatory note that follows)*** and its use and impact are likely to increase over the coming months and years. Arguably the sector had not been as prepared as it might have been for this significant development and has yet to reach a settled position or consensus on how best to implement these approaches in the context of health promotion and improving patient outcomes.

AI is a term used to describe machine-based systems designed to simulate human intelligence to perform tasks, such as analysis and decision-making, given a set of human-defined objectives. This definition treats machine learning (ML), natural language processing (NLP), large language models (LLM), and deep learning (DL), as subsets of AI. There is a general assumption that the use of AI should empower people to imagine and design a better future. However, that assumption comes with potential threats and risks that may negatively affect trust, transparency, privacy, compliance, inclusivity, representation, safety, and equity. Recommendations are needed to ensure AI applications support human-centered development principles.

The purpose of this paper is to provide recommendations on the use of AI in health promotion. These recommendations are presented not to direct its use but to encourage reflection and discussion on how AI can best be used to improve the health and wellbeing of individuals and communities. We trust that the recommendations provided here will be used voluntarily as it is not our intention that they should be seen as definitive statements. Rather we seek to add to the process and debate by which the health promotion community comes to a consensus on how AI could best be used.

Any recommendation on the use of AI needs to carefully define their area of application. As presented in Table 1, we recognize and adopt both a global perspective as per the definition of health promotion put forth by the World Health Organization and the approach and definition used in the 'Healthy People 2030' initiative in the United States (US) where health and wellbeing are considered as a single term.[3] Though this paper has adopted this US terminology, there is also an ingrained international perspective within this work with insights from Africa, Europe and North America.

Throughout this paper, material on which a specific recommendation is based is followed by the bracketed number of that recommendation as listed in Table 3. This is to ensure that readers can see how the methodology and literature cited here informed the development of our recommendations. An example of this is seen in the first sentence of this paper where the citation related to the increased use of AI in the health sector resulted in our first recommendation (i.e., R1 = workforce planning should take account of AI). Each recommendation is only referenced once in the text to help the readability of the paper. However, each of the recommendations are supported by more than one of the arguments made in the paper and should be seen as growing out of the work as a whole. The recommendations are a culmination of all that proceeds them and the reflections, as presented in Table 2.

Due to the broad definitions of health promotion and health and wellbeing the recommendations presented here have been developed with a view to them being applicable in a wide range of settings. These settings include clinical environments, policy making arenas, public health and education. Whilst our goal of generalisability has merit as a starting point, we encourage subsequent work to develop and produce more targeted guidance that is focused on specific areas in health promotion, behavioural change, and wellbeing.

Table 1
Key Definitions.

Key Terms	Definition	Source
Health Promotion	'The process of enabling people to increase control over, and to improve, their health…. Health promotion … covers a wide range of social and environmental interventions that are designed to benefit and protect individual people's health and quality of life by addressing and preventing the root causes of ill health, not just focusing on treatment and cure.'	World Health Organization.[16]
Health and Wellbeing	'How people think, feel, and function—at a personal and social level—and how they evaluate their lives as a whole'	Healthy People 2030

Table 2
Authors' Reflections on the Values of HealthPartners[17] in Relation to AI.

THE VALUES OF HEALTHPARTNERS	REFLECTION IN RELATION TO AI
Excellence: We strive for the best results and always look for ways to improve.	Excellence in health promotion is underpinned by evidence-based practice. Therefore, care needs to be taken to ensure that the use of AI in health settings has been shown to improve services. It cannot be assumed that AI is always better than human intelligence in all settings. Evidence is required to justify the introduction of AI and ongoing evaluation is required to ensure it is adding value.
Compassion: We care and show empathy and respect for each person.	As embodied mortal creatures, humans are conscious of and experience their own health and disease. Humans can feel wellbeing, hope, pain, and fear. This gives humans the capacity to empathise with others, to share experiences and to understand what others are going through and even to create a shared understanding of the meaning of suffering. Having a body gives humans certain advantages over a machine including the ability to empathise, to care, and to show respect for others. Nonetheless, it should be recognised that the rational, evidence based 'approach' AI could bring to health settings can enhance the care of humans.
Partnership: We are strongest when we work together and with those we serve.	Historically partnerships have been between people or legally constituted bodies. Arguably we are on the verge of a new set of partnerships between people and AIs and possibly between AI and AI. Whilst this is a development that requires our attention, more important is ensuring our use of AI facilitates the co-production of services between health professionals and users—be they individuals, communities, or populations. For example, care needs to be taken to ensure that a technological imbalance between professionals and Service Users does not threaten co-production. A situation where the professional has the power of an AI to design services where a voluntary User group does not may lead to the silencing of the user perspective.
Integrity: We are open and honest, and we keep our commitments.	Clearly health professionals need to be open and honest about how they are using AI. This should, at a minimum, include disclosure when AI is used and clearly communicating both the benefits and risks of the application of AI in specific settings.

Table 3
HL-PIVOT Recommendations on the use of AI in HP.

#	HUMAN CENTRIC RECOMMENDATIONS ON THE USE OF AI IN HP *The golden thread running through this recommendation document is a human centric approach*	CROSS REFERENCE
1	Workforce planning should take account of AI	Introduction
2	Health Professions should stay up to date on how the relationship between AI and health and wellbeing is emerging. Continuous professional development in this area is essential.	Philosophical Inquiry
3	Normally AI should be used to help humans make better decisions. When this norm is not applied a clear justification for allowing autonomy to an AI should be recorded.	Philosophical Inquiry
4	The data used by AI should reflect all members of society and regular equality, diversity and inclusivity impact assessments should be conducted.	Philosophical Inquiry
5	People should be empowered to make informed decisions about the level and type of AI involvement in their care.	Philosophical Inquiry
6	If some answers to questions posed by a health professional or patient are unacceptable or need to be blocked for good reasons, then an exclusion criterion needs to be built into the Algorithm to avoid them being recommended.	Scenarios
7	When making a recommendation that impacts the health or wellbeing of an individual or community the AI should also produce a rational or justification for that recommendation.	Scenarios
8	Health professionals should work with patients who are using AI to ensure that the benefits are maximised, and the risks minimised.	Scenarios
9	AI should be used in such a way as to promote good patient-provider interactions and not replace them.	Scenarios
10	How AI is best used to promote human health should consider international circumstances and cultural differences. How it is best deployed will also be partly determined by the threat to human health predominate at the time.	Scenarios
11	Any serious incidents involving an AI in health promotion should be reported to the relevant regulatory authority.	All

Methodology

To arrive at the recommendations presented in in this article, we followed a 6-step process. Each step was taken in series to ensure each was built on the proceeding one.

The first step was to recruit an international authorship team from the Healthy Living for Pandemic Event Protection (HL- PIVOT) network.[4] The overarching goal of this network is to promote human resilience and quality of life by increasing healthy living behaviours. A goal of the HL-PIVOT is to create a unified voice, promoting healthy living on a global scale, which will greatly move the field forward and translate to meaningful improvements in healthy living behaviours. To achieve this goal members of the network will increasingly need to lever the benefits of AI and mitigate its risk. The HL-Pivot network is committed to the values of equity, diversity, and inclusion (EDI) in research and publications.

The next step was to agree on the scope of the work, and particularly the definition of health promotion used here. These steps were followed by the drafting of a philosophical inquiry and the development of several scenarios to prompt reflection. Embedded within each of the components is extensive reference to the relevant literature. The outcomes from these components are reported below.

Method Component # 1 A Philosophical Inquiry

The role this part of the methodology played in the construction of the recommendations was to ensure that they were based on a solid foundation of human thought informed by reflection on a broad bibliography. Given the issues surrounding AI's rapid development, here we seek to prompt a philosophical debate to guide its use by posing and briefly addressing 5 key questions.

Before presenting the questions, it is important to observe that our perception is that the future nature of the human – AI relationship in health and well-being will be an emergent phenomenon ***(R2)***. Emergence refers to 'a phenomenon that is not predicted by the constituent parts and is more complex than the sum of its parts.[5] Therefore, whilst what follows seeks to cast the future relationship in terms of a human-centric, trusting, value-driven, ethical, and controlled framework, it is highly likely that other dimensions will evolve alongside or instead of these 5 questions. For example, given the emergent nature of the relationship, we foresee challenges in issues related to 'control' (see Q5 below). The recommendations presented here then are offered with the humility that they are the product of the evidence we have available at the time of writing and that it could and should be improved by the input of others. The authors are of the view that this is a 'living document' that needs to be applied in the context of the specific circumstances readers operate in and updated as the literature and our knowledge and experience develops and evolves.

Q1: What should the relationship be between Humans and AI in Health Promotion? Based on the two arguments that follow, we believe that the relationship should be, at its core, human-centred **(R = the 'golden thread')**. First the definition of health promotion includes the main notion of people "increasing control over" their health. This implies that AI should augment the notion of humans increasing control over their health, not giving it up or handing it over. Secondly, a human-centred approach is necessary where alignment of values needs to occur to ensure that the developers of algorithms and end-users prioritize human health and well-being outcomes.[6] The Stanford Institute for Human-Centred Artificial Intelligence note that the purpose of alignment of values is to mitigate potential harm and to ultimately promote human well-being.[7] A human-centred approach should include not only concern for the individual but also for social and community well-being. Community-centred approaches to AI design should address the underlying social, physical, and economic environments that determine the overall health of people and populations.[8]

We conceive a human-centred relationship as having several key dimensions. The first is that humans should be the primary beneficiaries of the use of AI. The application of AI in health promotion has two potential advantages: i) It can manage and learn from big data more efficiently than humans; and ii) it can perform a variety of predefined tasks continuously without compromising performance. Therefore, in drafting the recommendations presented later in this paper we were led, in part, by the question - *how can AI systems be effectively integrated into health promotion systems while maintaining a human-centred approach?* Posing this question raises the fundamental issue as to how much AI should be making decisions or aiding health professionals to make better decisions **(R3)**.

Another key dimension of human-centeredness is ensuring equity. Human-centred approaches to AI should be based on unbiased methods using data that reflect all members of society.[9] As much of the health-related scientific data has been collected on an unrepresentative sample of the world's population in controlled environments and not through real-world pragmatic trials this challenge, whilst achievable, requires careful thought and significant resources if it is to be mitigated and, eventually, overcome. **(R4).**

Q2: How can the public and professionals' trust AI? Interpersonal trust is defined as a human belief based on the 3 main dimensions of benevolence, integrity, and ability.[10] Both health professionals and the public must trust any AI that they are working with, or which is involved in their care.

Health professionals' perception of an AI system depends on several factors in a complex mix which, at the risk of oversimplification, may include the quality and quantity of data it uses, and the algorithms used in the decision-making process. The level of trust and aptitude a health

professional has in an AI will have a significant impact on how much they rely on it and consequently on the efficacy and effectiveness of clinical decisions. As both AIs and humans can make mistakes, the goal should be to achieve an "optimal trust" where people have a degree of scepticism about the decision arrived at by an AI.[11] To achieve this, it may be necessary to accept that deep learning models are built to incorporate multiple representations of data and are often unintelligible to most people. Therefore, in this context the focus may need to be on those parts of the model that are driving decisions rather than the model itself. This type of trust-based relationship is a requirement for effective decision making in health and well-being environments. Where such trust is lacking, it will fast become a substantial barrier to the adoption of the technology and the benefits it can bring. If the kind of trust described here is established, a balanced collaboration between AI-driven automation and human intelligence will allow AI to support and enhance health professionals' decision-making rather than replace it.

It is important to carefully consider how the public perceive the involvement of AI in the context of their health promoting behaviours. In the human-centric and trust-based approach advocated here, members of the public should be empowered to make informed decisions about the level and type of AI involvement as part of the care that addresses their health and well-being **(R5)** as they should be about other aspects of their care. This will require people to have a basic understanding of the nature of AI and to be provided with clear and accessible information. How to ensure informed consent in matters related to AI in health is something that requires more research, debate, deliberation, and continued reflection. This will need to consider the important distinction between trust in AI; and trust in the system in which that AI is located, including the human involvement and decision making that utilises it.

Q3: How can we ensure AI is aligned with our Values? The starting point is ensuring that the host institution has an agreed, published, and appropriate vision and set of values which are lived by the people in the organization. For example, the vision of HealthPartners, a large integrated health system located in Minneapolis, Minnesota, USA, explicitly foregrounds the importance of building relationships based on trust. To achieve this vision, transparency and openness is required. Therefore, when AI is being used, the organization needs to be confident that the social trust carefully built over time between HealthPartners, its members, patients, and the community-at-large, is not diminished or negatively affected. Relationships and trust are central to their thinking about AI.

The Table below presents the 4 values of HealthPartners and reflects on the implications for the use of AI by the organization.

Q4: How can we ensure the ethical use of data by AI? The ethical use of data by AI raises several concerns about privacy, accessibility, and security. As AI systems become more advanced, it is essential to ensure that they are designed and deployed ethically, with human oversight, and that they comply with all regulatory guidelines. As stated by Gabriela Ramos, Assistant Director-General for Social and Human Sciences for UNESCO;

"*In no other field is the ethical compass more relevant than in artificial intelligence. These general-purpose technologies are reshaping the way we work, interact, and live. The world is set to change at a pace not seen since the deployment of the printing press six centuries ago. AI technology brings major benefits in many areas, but without the ethical guardrails, it risks reproducing real-world biases and discrimination, fuelling divisions, and threatening fundamental human rights and freedoms*."

In 2021 UNESCO published the first-ever global standard on AI ethics based on fundamental principles such as transparency, fairness, and the importance of human surveillance of AI systems.[12] These recommendations can be translated into action and applied by policymakers to ensure the respect and integrity of all types of data.

Q5: How can we control AI? Can we truly control AI given the complexities involved and the emergent nature of the phenomenon? A commonly expressed concern is how will humans maintain control over AI? We believe that humans can place control measures and protections into organizing frameworks and models to prevent misuse and reduce the potential for unintended consequences by including standardized approaches to access, use, consent, sharing, and security protocols.[13] When using AI, and applied in the context of health promotion, we may achieve this by: i) Setting the goals we want the AI to achieve and the parameters within which it can act; ii) providing ethical oversight; and iii) having the ability to override the AI as and when deemed appropriate.

Q1 – Q5: Whilst we have tackled each of the 5 questions in turn, we recognize that they are intwined and all require ongoing reflection and dialogue. We are also of the view that the impact of AI on society will play a large part in determining how it is used and or abused in health promotion. As Yuval Noah Harari[14] asks 'what will happen to society, politics and daily life when non-conscious but highly intelligent algorithms know us better than we know ourselves?'

Method Component # 2 Hypothetical Scenarios and Possibilities

In this section we present 4 hypothetical scenarios to inform the development of the recommendations on the use of AI in HP.

Scenario 1 The Artificial* 'Versus' *Human Intelligence Perspective: Imagine this scenario in five years' time when AI has significantly advanced**.** You are a health professional tasked with working with an underserved community to help improve their health and wellbeing. The community has a high incidence of cardiovascular diseases, obesity, and type 2 diabetes. It suffers from multiple indices of inequality related to education, employment, and health. The community also suffers from high levels of crime including racially motivated violence and is politically divided. The local housing stock is poor, and the areas main employer is about to close.

Given the complexity of the situation and the multiple needs of the community you ask for and receive funding from a Philanthropist to deploy a state-of-the-art AI to help.

Over a six-month period, the AI learns about the community. The AI does this by a variety of means including accessing and/or tracking:

- ➢ The health, education, employment, and legal records of every citizen in the community.
- ➢ The health behaviours of every citizen using their devices to measure physical activity and their retail records to estimate their diet.
- ➢ Every published research study on behaviour change, behavioural interventions, and the determinants of health.

The AI then recommends a plan to improve the health and wellbeing of the community.

The plan is very clear, concise, and easy to understand. The only problem is you don't agree with it, and you can't understand how the AI reached the recommendations that it put forward. What do you do?

This scenario aims to foreground 4 things:

1. In such a situation whose judgment should take precedence? That of an experienced health professional, a super rational AI, or should judgment be suspended until the community has been engaged in co-creating the plan? This might be framed as human wisdom versus AI, or professional judgment versus AI, or gut feeling and intuition versus AI, or "nothing about us without us" versus AI.
2. Does it matter if we don't know how an AI reaches its recommendation? Herein lies a paradox. The value of an AI is that it can compute better than a human and perhaps analyse and understand complex situations better than 'us.' AI is nothing else, but advanced statistics and mathematics. Therefore, we might not be able to understand the mechanism and/or mathematical calculations by which it reached its recommendation. So, to reject its 'answer' because of

not understanding how it reached it is to limit the intelligence of the AI to that of a human – so what's the point in having an AI?
3. To demonstrate just how intrusive AI could be; and
4. To raise the questions - who is going to pay for AI and what conflict of interests might arise and who may benefit the most?

Reflecting on this scenario led to the development of recommendations **R6** and **R7**.

Scenario #2 AI Empowerment in Self-Care Perspective - Unveiling the Impact on Patient Self-Efficacy: This scenario was written with aid from an AI as an illustration of the power of such an approach. Imagine a not-so-distant future, when a range of advanced AI-powered health apps and self-care tools have become readily available to patients. These tools offer personalized recommendations, real-time monitoring, and insightful data analysis to help individuals manage their health behaviours. Patients, from diverse backgrounds and health conditions, begin integrating these AI tools into their daily routines. This scenario foregrounds the potential effects of AI on patient self-efficacy in making informed decisions about their health behaviours. It raises questions about how the utilization of AI can influence patients' confidence, motivation, and competence in managing their well-being.

In this scenario, and in reality, health professionals find themselves navigating a rapidly evolving landscape where AI is playing an increasing role in patient self-care. To help patients achieve the benefits of AI and mitigate the risks health professionals should address 5 key areas as follows **(R8)**.

1. Education and Recommendation: Health professionals should educate patients about the capabilities and limitations of AI tools. By helping patients understand the basis of AI recommendations, health professionals empower patients to critically evaluate and make informed decisions based on AI-generated insights.
2. Collaborative Approach: Health professionals must emphasize that AI tools are not a replacement for personalized medical advice. Encouraging patients to view AI as a complementary resource to their expertise fosters a collaborative approach, where patients actively engage in discussions about their health goals and strategies.
3. Addressing Anxiety: Some patients might feel overwhelmed or anxious about relying on AI for health decisions. Health professionals should provide reassurance, stressing that AI is a tool designed to enhance self-care and augment patients' abilities rather than replace their judgment.
4. Personalization: Recognizing that each patient's needs and preferences are unique, health professionals should assist patients in tailoring AI-generated recommendations to align with their individual circumstances and values.
5. Continuous Learning: Encourage patients to view AI as an opportunity for continuous learning and skill development. Health professionals should emphasize that using AI tools can enhance patients' health literacy and empower them to take an active role in their well-being.

This imaginary scenario highlights the potential of AI-powered health apps and self-care tools to impact patient self-efficacy positively. By guiding patients on informed AI engagement, health professionals can play a pivotal role in ensuring that AI enhances patients' confidence, empowerment, and ability to manage their health behaviours effectively.

Scenario #3 Could AI improve patient provider relationship and enhance healthy living behaviours? The provider-patient relationship is a crucial aspect of healthcare, and when it's negative or ineffective, it can hinder a patient's ability and willingness to engage in healthy behaviours. Poor therapeutic results due to the lack of optimal patient-provider communication is highlighted in many recent preventive guidelines. Fig. 1 illustrates some of the ways in which an inadequate patient-provider relationship can impact healthy living behaviour.

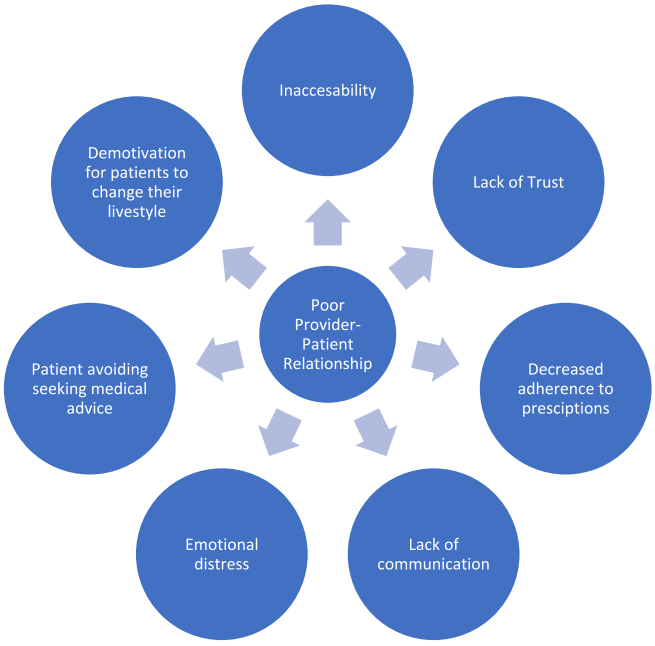

Fig. 1. The negative impacts on the patient of a poor provider patient relationship.

It is possible to imagine scenarios in which AI could play a significant role in overcoming a poor/ subpar patient-provider relationship and positively influencing healthy living behaviours **(9)**. In these scenarios AI could be used in the 8 following ways:

1. Improved Communication: AI-powered chatbots and virtual assistants can facilitate better communication between patients and providers. Patients could ask questions, voice their concerns, and receive personalized responses, even outside regular office hours. AI chatbots can also provide health-related information, reducing misunderstandings and increasing patient knowledge about healthy living behaviours.
2. Personalized Health Recommendations: AI can analyse patient data, including medical history, behavioural habits, and health goals, to generate personalized health recommendations. These recommendations can include tailored diet plans, exercise routines, and preventive measures, encouraging patients to adopt healthier behaviours.
3. Behavioural Monitoring: AI can be used to monitor patient behaviours, such as exercise patterns, sleep quality, and dietary choices. These insights can help providers understand their patients' habits better and provide targeted advice to improve healthy living behaviours.
4. Remote Health Tracking: AI-powered wearables and mobile apps can track various health metrics, such as heart rate, blood pressure, and activity levels. This remote health tracking enables providers to monitor their patients' progress, offer feedback, and intervene when necessary, fostering a sense of continuous care and support.
5. Virtual Support Groups: AI can facilitate the creation of virtual support groups where patients with similar health conditions or goals can connect and share experiences. These groups can offer emotional support, motivation, and accountability, encouraging positive behavioural changes.
6. Reminders and Adherence Support: AI-powered reminders and alerts can help patients stay on track with their treatment plans, medication schedules, and behavioural changes. Consistent reminders can improve adherence to prescribed therapies and enhance healthy living behaviours.

7. Mental Health Support: AI-driven mental health apps and chatbots can offer emotional support, stress management techniques, and coping strategies. Addressing mental health concerns can positively impact overall well-being and healthy living behaviours.
8. Empowering Shared Decision-Making: AI can provide evidence-based information to both patients and providers during medical consultations. This facilitates shared decision-making, where patients are actively involved in the treatment planning process, promoting a sense of ownership and cooperation.

While AI can be a valuable tool in enhancing the patient-provider relationship and promoting healthy living behaviours, it should complement, not replace, human connections in healthcare. Ethical considerations, patient privacy, and ongoing evaluation of AI systems are essential to ensure responsible and effective implementation in healthcare settings. Moreover, fostering empathy and effective communication skills in healthcare professionals remains crucial for building a strong patient-provider relationship.

Scenario #4 - The Kenyan Cancer Patient at the height of a Pandemic perspective: This scenario is based, in part, on reflection of experiences during COVID-19. What follows lead to ***G10*** which aims to ensure we think and act globally in relation to AI and health promotion and seek to apply it as circumstances, in this case the Pandemic, dictate.

At the height of the COVID-19 pandemic many measures were put in place around the world to help manage and control the spread of the disease.[15] These included lock downs and the closure of some health clinics, rehabilitation programmes, and other health services. These measures had many negative impacts on those patient groups effected including lack of access to routine healthcare checkups.

In this context imagine that in Kenya there is a middle aged, educated, female patient. Consider that her specific circumstances are a history of breast cancer, hypertension, lymphedema post right breast mastectomy, cancer related fatigue, low level of physical activity, pain in the right shoulder with a reduced range of motion, and intermittent back pain. Suppose that prior to the pandemic she had attended chemotherapy, physiotherapy, and group counselling at a clinic many miles from her home. During the Pandemic currently available technology was used as a service medium. Specifically, services were provided using WhatsApp and other on device Apps as: i) it was what was available and ii) it was the only medium she was able to use comfortably.

In this scenario twice weekly online treatment sessions involved a lot of education on the use of technology to monitor vital signs, drug intake, fatigue, different exercises performed, and the interaction of all these factors. Consequently, the first treatment sessions involved going through expectations from the patient and the therapists and an orientation on the use of mobile phone friendly applications with user friendly language related to cancer rehabilitation. In such settings the technology used included a smart phone and a smart watch, and a smart blood pressure machine. The applications in use were mobile apps with the ability to make video calls, applications to monitor heart rate, blood pressure, fatigue levels, and lymphedema. All of which were used to track symptoms and measure treatment effectiveness.

Learning from a situation like this there are two issues to reflect on given the possibility of future pandemics. First there is a lack of clinician specialists in some parts of Africa leading to a lack of specialised and individualised treatment plans for patients with pathologies that require consultant clinicians. In such circumstances AI might be able to increase access. Second in some parts of Africa (and other parts of the world) the electricity supply cannot be relied upon particularly in rural settings. In addition, poor network coverage, application malfunction, and lack of funding can limit the utility of technological based health interventions.

HL-PIVOT Recommendations On The Use of AI in HP

Based on the proceeding philosophical inquiry and scenarios, the following recommendations may help professionals in health promotion as they, like the authors, navigate the evolving impacts of AI on health.

Discussion and Conclusion

In offering our peers recommendations on how to respond to the increasing use of AI in health promotion we have taken care to describe how we reached the recommendations made here. We believe that authors of such recommendations should always explain their reasoning and the process they followed to reach the position they adopted.

For recommendations to become guidelines, they should be evidence based and informed by careful reflection rather than being justified on the grounds of the ‘esteem’ or ‘authority’ of those who formulate them. Likewise, these recommendations are open to challenge, improvement, and revision. For those seeking to develop their own recommendations it might be helpful to note that we found stepping back to consider the philosophical aspects of the topic and reflecting on hypothetical scenarios a useful exercise. In addition, we are of the view that the creation and discussion of hypothetical scenarios may be a helpful way to train colleagues in this area.

Authorship statement

AS/MF/RA – conceived the idea for the manuscript and recruited members following an expression of interest from membership of the HL-Pivot. All authors contributed to the development of the manuscript and approved the final manuscript for submission.

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CRediT authorship contribution statement

Andy Smith: Supervision. **Ross Arena:** Supervision. **Simon L. Bacon:** Supervision. **Mark A. Faghy:** Supervision. **Giovanni Grazzi:** Supervision. **Andrea Raisi:** Supervision. **Amber L. Vermeesch:** Supervision. **Martin Ong'wen:** Supervision. **Dejana Popovic:** Supervision. **Nicolaas P. Pronk:** Supervision.

Declaration of competing interest

No conflicts of interest declared.

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