Promises and Challenges of AI-Enabled Mental Healthcare: A Foundational Study

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Abstract

Mental health and behavioural problems are the primary drivers of disability worldwide. Further escalated by the COVID-19 pandemic, millions across the globe are breaking traditional stigma by seeking professional support for their mental health. However, this increased demand for mental healthcare needs to be met by a limited number of services and professionals. We conducted qualitative interviews with mental health practitioners to understand the landscape of opportunities and challenges for AI-enabled mental healthcare in 2022, focussing on triage and decision support. Our findings suggest important opportunities for AI to accommodate the growing demand for mental healthcare, support clinicians' workload, and improve data management. However, there were also major challenges identified regarding practitioner trust in AI solutions and their incorporation into the care pathway. Our findings indicate a need for coordinated training and education for mental health professionals to improve trust in AI solutions and correspondingly facilitate wider adoption of this promising technology. Moreover, a re-positioning of AI solutions as decision *support* tools rather than absolute decision tools might lead to improved acceptance and adoption within the clinical community. Finally, our results highlight the importance of understanding the end-user's perspective (in this case, mental health practitioners) and including them in the process of developing AI solutions in order to achieve optimal real-world impact.

1 Introduction

The nature of stress and low mood in the 21st century is an ever-growing concern. The World Health Organisation (WHO)'s mental health atlas [25], reported that over a billion people (14% of the adults in the world) suffered from mental illnesses in 2019. A more recent report showed these figures to have increased by 25% following the COVID-19 pandemic [24]. Despite these alarming numbers, countries across the world have allocated only 2% of their budget to address mental health issues, and low-income countries have fewer than one mental health worker per 100,000 people [25]. Even in the western world, mental health services already experience a supply-demand imbalance resulting in poorer patient experience and ultimately worse treatment outcomes [21]. Since this increased patient demand is unlikely to be met any time soon through an increased clinical workforce [1], it has been repeatedly suggested that digital tools might present a way of bridging the gap and improving patient care [11, 19].

Triage and clinical assessment represent an aspect of mental health care which might be especially interesting for augmentation through AI as they follow relatively structured rules [8, 9], and are estimated to require up to 25% of resources from mental health services [20]. Thus, AI-augmentation of these early stages of the care pathway is an exciting opportunity for alleviating the tremendous burden experienced by mental health services and staff. In this paper, we present the opportunities and challenges for AI solutions in this space as found through structured interviews with mental health practitioners.

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2 Method

We interviewed 15 mental health professionals across 10 different cities in the United Kingdom and Ireland, with varying levels of experience (between 1 and 25 ($\mu = 11.26$; $\sigma = 7.82$) years of experience) and technological literacy (7 out of 15 were moderately experienced with technological solutions, and 8 out of 15 were highly experienced). All participants were practising clinicians who regularly screened, clinically assessed, and treated new patients within a care setting. Study participants were recruited by emailing NHS Improving Access to Psychological Therapies (IAPT [16]) services (4/15), advertising on social media platforms (3/15), and through the User Interviews[1] platform (8/15). By way of remuneration, £20 was donated to a charity of the participant's choice. Data collected and stored from this experiment is handled in compliance with the GDPR agreement [7].

The interviews were conducted virtually, one participant at a time and each session lasted around 60 minutes. All interviews were conducted by the primary author, who also recorded the virtual meeting. Each session began with a critical incident interview [10], where subjects were asked to narrate their experience of the most recent patient referral they had received and any challenges they experienced owing to increased burden on the mental health care system. After this brief interview, subjects were shown an AI-powered triage and assessment support tool, Limbic Access [2], and discussed if and how they would use the information provided by this tool to engage with their patients . In the rest of this paper, we discuss our findings on performing reflexive thematic analysis [4] of this study, by transcribing and open-coding the interviews, to elucidate the opportunities for AI-enabled mental healthcare today, and the key challenges faced by AI researchers and clinical practitioners around implementation of these technologies.

3 Findings

3.1 Effects of the pandemic

Evidently, the mental health across the globe was materially impacted by the COVID-19 pandemic. All clinicians interviewed (15 out of 15) reported that the pandemic had altered their work, perhaps forever. As in other professional sectors, most clinicians (14 out of 15) were continuing to work in a hybrid fashion, offering therapy sessions both online and in-person as stated by P2:

"So the pendulum really swung when compared. If we just said to someone that we are gonna do [Microsoft] Teams appointments for their therapy, they would just not have paid money for it. You wouldn't get anywhere with it before the pandemic. There would have been an uproar like 'we don't do online appointments.' Now it's the other way, if you say 'go back to face-to-face,' clients [patients] are like 'no no no no I prefer Teams.'... Moreover you can't find a clinician who would accept a contract without remote work." (P2 on the wide acceptance of virtual therapy today)

While online therapy delivery represents a drastic change to the mental healthcare industry, for our participants, the biggest impact of the pandemic was the rise in the number of new patients enrolling for therapy, witnessed by all clinicians (15 out of 15), as stated by P14 and P4:

"When the pandemic hit, our [new patient] referrals just literally went through the roof. I mean our waiting list now is about 18 months to see a therapist." (P14 on witnessing rise in new patients)

"Now I think our referrals, they've like truly doubled or tripled per month compared to what they were pre pandemic." (P4 on witnessing rise in new patients)

It is interesting to note that this subjective experience reported by our study participants aligns with other quantitative indicators regarding the increased pressure on mental health services [5, 15, 22, 17, 14]. Some participants (8 out of 15), believe that the pandemic acted as a catalyst for destigmatising mental illness in our society, leading to a mass normalisation around seeking help, as stated by P5:

"I think it's the awareness. People suddenly know! Everyone is talking about mental health. I'm really pleased that this has happened. COVID really brought that awareness up, which is great, but the problem is that the healthcare services weren't ready. So we don't have enough clinicians for the number of people who need our support, and there's quite a high turnover. So the therapists are coming in, leaving, coming in, leaving, because it's quite a high workload job, so people burnout really fast, and so they just want to do something else." (P5 on impact of high workload on clinicians)

[1] https://www.userinterviews.com/.

3.2 Opportunities for AI-enabled mental healthcare

All clinicians agreed (15 out of 15) that the use of an AI-enabled decision support tool would save time and enable them to be better prepared to deliver a high quality clinical assessment for their patients, as by P15:

"It would be great to get the questionnaire information like PHP9 and GAD7 done by it [AI], because it does take some time doing it over the phone. And it takes some time out of the appointment itself, so if we get that already you save some time. It is also helpful if you get the patient's problems and summarise that. Because, during the screening appointment on phone, sometimes it can be really difficult to interrupt the patient, or to tell them to be brief about their problem, because obviously they've been struggling with it for so long and there's a lot. It always feels like there's a lot that they want to talk about. And you have to keep redirecting them to the problem because you have no time! If you summarise into a few sentences it gives you an overview. And you know what to expect from the appointment." (P15 on usefulness of preloading information by using AI)

It is critical to note that clinicians mainly saw the value of AI in a decision support function rather than as a unilateral triaging tool, as stated by P3:

"I would read that [output generated by AI], then I've got a starting point for the conversation with the client [patient]... I wouldn't triage on that because we've tried it before with the forms, and it's too subjective. I think my view is that AI should enhance something and save time rather than try and replace it. And if for us, if you [AI] get it wrong,with a Step-care model, then you're just in a position where you're going to have to step somebody up or down again, and that is normal with or without AI... Using it just saves our time and enhances data work" (P3 on their next steps with the referral output)

Beyond the specifics of our product (Limbic Access [2]), clinicians reported multiple ways in which they see a potential use case for AI in their work as stated by P8 and P11:

"I can see a future where we would have it [AI assistant] running alongside a therapy session. The client [patient] would be OK with it, and it wouldn't take anybody photos or videos. But what it would capture using the AI software would be the key phrases, the keywords. The emotional sentiments and then it would then forward those back." (P8 on using AI to assist therapy sessions in the future)

"I can see AI being useful, there is a place for it. And particularly, if it gave you the opportunity, like rate some of your clients in terms of you know, their priority, importance of seeing them, like tell me have I got a client here that could wait actually two or three weeks and I've got some initial diagnosis to give me something to use, rather than wanting to see a client straight away so I can get an, you know, an immediate assessment, I think there's a place for it. It's just about how you sell it into the profession." (P11 on how AI can be useful for their practice)

3.3 Challenges for AI adoption in mental healthcare

The previous section indicates that AI is perceived as a promising avenue to reduce the burden on mental health services, especially through collection and provision of data ahead of appointments, which reduces the administrative burden on clinicians. However, the adoption of AI solutions is unlikely to be frictionless. Our data revealed that all clinicians (15 out of 15) had reservations around incorporating AI solutions into their workflow. When presenting the triage and assessment support decisions suggested by our screening tool (Limbic Access [2]), clinicians reported that they would be cautious and feel the need to validate every suggestion made by an AI algorithm, as stated by P5:

"So I think the clinicians are going to be suspicious of it, probably for a while. And I think that they're probably going to be more open to ways in which it's just makes things quicker and easier and takes the bit of our job that isn't assessing somebody out. So we're probably always going to have to, we'll always have to do a full risk assessment. We'll always have to do a full assessment of a patient that's always going to have to happen, and we'll always have to come to an agreement about clinical decisions to be made." (P5 on how AI will be treated initially by clinicians)

An interesting finding was that this type of caution and scepticism may not in fact be unique to the outputs of AI solutions, but actually extends to the diagnoses made by other clinicians, as stated by P6:

"Not only this bot, even if this is another mental health clinician giving me their assessment, I wouldn't take it as they might have been trained differently" (P6 on why they do not trust assessments from anyone)

Triage and clinical assessment within mental healthcare may therefore be an area where practitioners exhibit wider mistrust around information they receive (regardless of the source) and are compelled to re-engineer all conclusions themselves before proceeding. One might consider the role of clinical liability and governance in driving this behaviour. Another explanation could be that different categories of mental illness are far from distinct [12], which can lead to low agreement rates even between trained clinicians [23, 18]

3.4 Solutions for improved acceptance of AI solutions

Healthy scepticism is an important skill amongst clinicians and should be encouraged. Indeed, any AI solution in healthcare should be scrutinised to avoid unduly biasing clinical judgement. However, scepticism should always be justified. Given the potential opportunities identified earlier, unwarranted scepticism surrounding the utility of AI solutions could well be harmful and to the detriment of patients, practitioners, and health services. It seems essential then that AI and clinical communities must come together to find the optimal balance between scepticism and trust, such that AI solutions are held accountable, while being allowed to develop safely and ultimately deliver on the promise of improving the care pathway [3].

All clinicians (15 out of 15), expressed their need for a straightforward user interface, which they can use with ease and confidence. Designing clinician-centred intuitive interfaces and interactions, is likely a bridge towards greater adoption of AI as it can lower the perceived risk of misinterpreting the output of AI support systems from the clinician's perspective. Additionally, all participants (15 out of 15) stressed the importance of adequate training, which is a standard aspect of their professional development to ensure appropriate use of other medical software and hardware that forms part of day-to-day practise. Feedback from study participants specifically focused on understanding how any AI solution functions, and most critically, how to adequately use the output of the solution to inform decisions safely. Training of this kind was highlighted as critical by our participants in order to gain confidence and adopt AI solutions into their standard workflow, as stated by P4 and P11:

"And I think there would need to be some training, but I honestly think that, obviously, you can't take that as being the conclusion. I'm afraid that the risk could be that then people just don't look at any of it [output from AI] and actually, there's usually some quite useful information I think. So that would probably come down to the team leads and managers and supervisors telling clinicians what to do with AI" (P4 on the need for training to socialise clinicians to the usage of AI solutions)

"I think you need to train people like - 'You know, we're all human and when you're trying to express feelings to a robot, sometimes it is not asking you the right thing,' and that's why we still have that discussion to just clarify and confirm." (P11 on the need for training to socialise clinicians to the usage of AI solutions)

This aligns with other findings in the literature which state AI literacy as a critical step for gaining optimal trust in AI solutions [13, 6]. This literacy effort will not only increase the acceptance of AI but will also reinforce a responsible and efficient use of it.

4 Conclusion

We conducted a series of structured interviews with mental health practitioners to understand the opportunities and challenges around AI adoption in mental healthcare. Our findings reveal pressure on the mental health workforce today. AI solutions are perceived as a promising avenue to substantially alleviate this burden, especially when focusing on data collection and processing capacities as well as on decision support. Clinicians were cautious about using AI directly as a decision tool, an insight which has dramatic ramifications for the positioning of AI tools in order to achieve wide adoption in the mental health system. Finally, intuitive user experience and extensive training of mental health practitioners were identified as ways of increasing the acceptance of these novel tools in mental health practice. Overall, this study emphasises the critical importance of including end users (i.e. mental health practitioners) and understanding their viewpoint when building AI powered tools to support their daily workload.

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