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An AI chatbot for talking therapy referrals

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Standfirst:

An AI-enabled chatbot increased self-referrals to psychological therapies for common mental health disorders; but further research is needed to ensure that better access translates into quality treatment experience and outcomes, for everyone.

Common mental health disorders - including different types of anxiety and depression - can cause marked emotional distress and debilitate personal and social functioning.¹ Prevalence of these conditions is increasing across populations; affecting nearly 1 in 5 people at any one time.² Early help-seeking and self-care is also increasingly common, probably in part thanks to the internet.³ Psychological therapies, in particular cognitive behaviour therapy (CBT), can effectively treat anxiety and depression. Indeed, the UK NICE clinical guidelines recommend CBT, rather than pharmacological anti-depressants, as the initial and mainstay of treatment for mild and moderate cases.¹ The UK National Health Service (NHS) Talking Therapies for Anxiety and Depression programme provides such treatment.⁴

Habicht et al.,⁵ in this issue of *Nature Medicine*, report a personalised AI-enabled chatbot named *Limbic* which helped people refer themselves for Talking Therapies. In a multi-site study including nearly 130,000 patients, *Limbic* increased self-referrals by 15% (relative to the pre-implementation period), while standard webform-filling increased self-referrals by 6%. Patients who were assisted by *Limbic* took less time in completing a self-referral, and had better recognition of their treatment needs. Most importantly, the enhanced self-referral rates were particularly pronounced for individuals from ethnic minority backgrounds (29% increase) and those identified as non-binary (179% increase).

Anxiety and depression are a major cause of disability and sickness absence from work.^{2,6} However, the very nature of these conditions - such as feeling low and growing withdrawn - means that many individuals do not reach out for treatment. For these people, being referred by GPs or other healthcare professionals - who often lack both time and skills to diagnose, let alone to refer onward - is a barrier to treatment.⁶ Early treatment leads to better prognosis and recovery, therefore self-referral to Talking Therapies can be a crucial first step, leading to a meaningful trajectory-change for the individual, their family and community. Assisting self-referrals to access evidence-based psychological treatment not only enables citizens to exercise their right to seek treatment, but the process of self-referral - including completion of self-reported symptom questionnaires - can also help individuals recognise their own treatment needs. This is one of the key mechanisms behind the *Limbic* effect.

Limbic's success in improving diversity of access to ethnic minority and non-binary individuals is particularly noteworthy. Against the backdrop of long-standing ethnic disparities in mental health service access in the UK⁷ (and elsewhere such as US⁸), people from minority ethnicities with depression or anxiety are often under-diagnosed or mis-diagnosed and are less likely to receive psychological therapies than their white counterparts. Furthermore, minority ethnic groups experience disproportionate exposure to social inequalities and multiple disadvantages, including poverty and discrimination.^{7,8} Hence, individuals from ethnic minority backgrounds often bear a disproportionately higher burden of disability from common mental health disorders, while stigma from within communities can be rife.⁹ The significant increase in self-referrals from ethnic minority individuals was partly

attributed to the perception of *Limbic* as non-judgemental. Perhaps this lack of judgement is itself a key to removing cultural barriers to accessing mental health services.

Non-binary people, despite having an increased risk for common mental health disorders, encounter more barriers to receiving quality healthcare.¹⁰ The 179% increase in self-referrals by this group suggests two things in sequential order. First, website-visiting for mental health information and treatment-seeking was already higher in this group, reflecting their greater need. Second, *Limbic* – by offering visitors personalised options for therapy in an adaptive and encouraging manner - reinforced their recognition of the need for professional help, which then seemed more inclusive. These positive experiences might also have been shared among peer circles, promoting others in similar position to seek help.

The leading positive feedback on *Limbic* was its convenience in facilitating the self-referral process. Patients described feeling hopeful in getting better through taking the initiative. The absence of human involvement was also mentioned as reducing stigma and judgement, although the standard webform (control) intervention also lacked human involvement. Another potential reason for the increased self-referral rate with *Limbic* could be that the chatbot appeared to be ‘alongside’ the person while they navigated a long list of questions, some which inevitably prompted reflection on difficult and/or suppressed feelings. Without the caring and non-judgemental prompts of the chatbot, many users might have abandoned the referral forms.

Although these are positive results from Habicht et al.,⁵ we are not reaching psychological therapy utopia yet; far from it. Although more than two-thirds of Talking Therapies referrals are online self-referrals, we must not forget those who cannot or would not do so. These include the most marginalised groups - people experiencing higher symptom severity, social and economic disadvantages, or lacking skills or means to use the internet.¹¹ They are the very people who are more vulnerable in developing mental health problems but less likely to receive adequate health care. Notwithstanding chatbot assistance is shown to widen access for many to Talking Therapies, it does not negate the risks of perpetuating pre-existing inequalities and inequities for those most in need.^{3,7}

The self-referral route through standard webform-completion on the Talking Therapies services website has existed for some time. In 2021, 70% of all Talking Therapies referrals were self-referrals; others were referred by GP or other healthcare professionals.⁴ The findings from Habicht et al⁵ show that the chatbot did its job well in terms of getting more people to fill the webform properly. But to what end?

A crucial question to ask is what were the experiences and outcomes that followed these increased self-referrals. Unless we can address this, we risk merely re-positioning the bottleneck of psychological treatment pathway for common mental health disorders, without improving rates of early and quality treatment. While the UK NHS Talking Therapies are still delivered by human therapists largely off-line (through face-to-face or phone), demand as well as research evidence for guided or blended internet-delivered CBT are rapidly growing.¹¹ It is possible to envision a future in which AI-enabled chatbots or AI-supported psychological therapies in general play an increasingly active role beyond the self-referral process, such as self-guided assessment, treatment, homework, ongoing self-care and relapse prevention. In the meantime, we need to consider how best to train human therapists to build therapeutic alliance with patients and deliver internet-based CBT in a way that suits diverse cultural or personal needs^{3,12} - with therapists working alongside their AI-enabled co-workers.^{11,12}

Image/figure:

1. [Virtual Assistant Flat Design Illustration Mobile Phone Screen Concept High-Res Vector Graphic - Getty Images](#)
2. [Screenshot Of A Video Conference With A Psychologist High-Res Stock Photo - Getty Images](#)
3. [A Middleaged Asian Woman In Blue Jeans Sitting On The Bed In A Yoga Pose In Front Of A Laptop High-Res Stock Photo - Getty Images](#)

Conflict of Interest statement: None

References

1. NICE (2011) *Common mental health problems: identification and pathways to care [CG123]*. <https://www.nice.org.uk/guidance/cg123/>
2. GBD 2019 Diseases and Injuries Collaborators (2020) Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Global Health*. 396:1135-59..
3. Sin J. et al. (2020) Digital Interventions for Screening and Treating Common Mental Disorders or Symptoms of Common Mental Illness in Adults: Systematic Review and Meta-analysis. *J Med Internet Res*. 22(9):e2058. doi: [10.2196/20581](https://doi.org/10.2196/20581)
4. NHS Digital (2022) *Psychological therapies, Annual report on the use of IAPT services, 2021-22*. [Psychological Therapies, Annual report on the use of IAPT services, 2021-22 - NHS Digital](#)
5. Habicht J. et al. (2024) Closing the accessibility gap to mental health treatment with a personalised self-referral chatbot. **Nature Medicine (2024)**
6. Henderson M. et al. (2011) Work and common psychiatric disorders. *Journal of the Royal Society of Medicine*. 104(5):198-207. doi:[10.1258/jrsm.2011.100231](https://doi.org/10.1258/jrsm.2011.100231)
7. Bhui K. et al. (2018) Making a difference: ethnic inequality and severe mental illness. *Br J Psychiatry*. 213: 574–8. <https://doi.org/10.1192/bjp.2018.148>
8. American Psychiatric Association (2017) Mental health disparities: diverse populations. [12-19-17 Fact Sheet Diversity.indd \(psychiatry.org\)](#)
9. Corrigan P.W. et al. (2014) The impact of mental illness stigma on seeking and participating in mental health care. *Psychol Sci Public Interest*. 15, 37–70 (2014).
10. Coyne C.A. et al. (2020) Evidence-Based Psychological Practice for Transgender and Non-Binary Youth: Defining the Need, Framework for Treatment Adaptation, and Future Directions. *Evidence-Based Practice in Child and Adolescent Mental Health*. 5:3, 340-353, DOI: [10.1080/23794925.2020.1765433](https://doi.org/10.1080/23794925.2020.1765433)
11. Etzelmueller A. et al. (2020) Effects of internet-Based cognitive behavioral therapy in routine care for adults in treatment for depression and anxiety: Systematic review and meta-analysis. *J Med Internet Res*. 22(8):e18100. <https://www.jmir.org/2020/8/e18100>
12. Torous J. & Wykes T. (2020) Opportunities from the Coronavirus Disease 2019 Pandemic for transforming psychiatric care with telehealth. *JAMA Psychiatry*. E1-E2.