Brain and Neuroscience Advances

From laboratory to life: Integrating diverse ways of knowing in mental health science

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Neuroscience and the challenge of translation

Neuroscience is advancing at an extraordinary pace, offering new opportunities to develop treatments for complex conditions. Yet, despite major breakthroughs, many promising findings fail to translate into effective therapies. The gap between laboratory research and real-world outcomes remains wide, particularly in areas such as mental health, where biological, psychological, and social factors interact in ways that cannot always be fully captured by traditional models (Holmes et al., 2018).

As a person with lived experience of mental and physical illnesses, neurodivergent conditions, and expertise in co-produced research, I have seen how research findings are often slow to make any positive, real-world impact for people like me. For example, as someone with a long-standing and severe eating disorder, I am encouraged by the recent focus on the gut–brain axis, with growing evidence that microbiome-based interventions – such as probiotics or dietary modifications – could help improve symptoms (Fan et al., 2023).

However, these insights have been slow to translate into accessible, evidence-based treatments. Most clinical interventions remain focused on weight restoration and cognitive approaches, with little integration of biological mechanisms that could enhance long-term recovery (Downs, 2024). This disconnect between research progress and frontline care reflects a broader issue in mental health science – where promising discoveries struggle to bridge the gap from laboratory to life.

Beyond laboratory models: triangulating evidence

The challenges of translation in mental health research are exemplified in the reliance on preclinical models. Animal studies have long been central to psychiatric research, providing insights into neurobiology and treatment mechanisms (McGonigle and Ruggeri, 2014). However, they often fail to capture the complexity of human experience, including the deeply personal and socially embedded nature of mental distress. If animal models are to have relevance for clinical practice, they must demonstrate face validity – accurately mirroring clinical symptoms; construct validity – replicating the underlying neurobiology; and predictive validity – reliably forecasting responsiveness to current treatments. Essentially, they must be relevant to lived experiences, recognising that there is only really one model of the human: the human (Howland et al., 2019).

Even within human research, methodological limitations persist – randomised controlled trials focus on symptom reduction but often neglect aspects of recovery that matter most to individuals, such as agency, social connection, and identity (Damsgaard and Angel, 2021). To address these limitations, we need a more integrated approach that draws on multiple sources of evidence – from animal studies and human biology to clinical trials in real-world settings. Most importantly, if research outcomes are to be meaningful for patients themselves, it is essential to include people with lived experience alongside these more traditional ways of knowing.

Breaking down barriers: co-production in practice

The case for including people with lived experience is clear, and patient and public involvement is increasingly mandated by

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research funding bodies (National Institute for Health Research [NIHR], 2020). However, operationalising co-production in the field of mental health science is still a work in progress. In my own experience, I have seen wide variation between research projects in terms of how lived experience is included, resourced, and supported. Often, I have been included with the best of intentions, but have only been able to contribute in very limited, predefined ways. I have encountered assumptions that I would not engage with scientific discussions because they might be too abstract or technical for me to understand.

For co-production to be meaningful, it must go beyond mere consultation or tokenistic involvement. Arnstein's (1969) *Ladder of Participation* distinguishes between lower forms of engagement – such as passive consultation – and genuine power-sharing, where lived experience experts are involved at every stage of research, from defining priorities to disseminating findings. Achieving this requires structural changes to be made to the ways in which research traditionally takes place. This includes providing people with lived experience with financial remuneration for their contributions, offering training in research methodologies, and creating more accessible and flexible modes of participation (Jones et al., 2021).

When done well, I have seen how co-production can be a meaningful process for people with lived experience, creating reciprocally valuable benefits for the research teams, and improving the quality of research itself (Richmond et al., 2023). In this sense, co-production is much more than working with people with lived experience: it can break down barriers across mental health science. In fact, one of the greatest barriers within mental health science today is the fragmentation of knowledge across disciplines. Neuroscientists, psychologists, social scientists, and individuals with lived experience often work in isolation, leading to fragmented - and sometimes contradictory - understandings of mental health. Even multidisciplinary research often lacks true integration, bringing together experts who remain in disciplinary silos rather than collaborating meaningfully. The challenge of moving from multidisciplinary to truly *transdisciplinary* research involves dissolving boundaries between disciplines and creating entirely new conceptual frameworks that all stakeholders can share (Choi and Pak, 2006).

Rethinking mental health science: ontology, epistemology, and power

At its core, the crisis of translation in mental health research is not merely methodological – it is ontological and epistemological. Ontology concerns what we assume mental illness to be – whether it is best understood as neurobiological dysfunction, a psychological response to adversity or a social construct. Epistemology, in turn, shapes how we generate and legitimise knowledge about mental health (Stein et al., 2024).

Biomedical models, which dominate much of psychiatric research, rely on positivist epistemologies that privilege objective, measurable data – such as findings from animal studies, neuroscience, and randomised controlled trials. Yet, these approaches frequently neglect first-person experience, which have the potential to provide equally useful - if distinct - insights into how distress is lived, contextualised, and made meaningful. This exclusion reflects a broader 'epistemic injustice', where individuals with lived experience of mental illness are often positioned as passive subjects rather than active contributors to knowledge production (Fricker, 2007).

Traditional research often operates within this hierarchical, extractive model, where data are gathered from individuals with mental illness and analysed by academic researchers who hold greater power to determine what is true about people's experiences. When research agendas are set by those within academic and clinical institutions, we risk sidelining the experiential and community-based knowledge that is needed for research to have real-world relevance (Kulmala et al., 2024). Co-production challenges these power imbalances by treating those with lived experience as epistemic agents, recognising their expertise as equal to that of scientists and clinicians.

A more inclusive mental health science therefore requires epistemic pluralism – that is, the recognition that multiple ways of knowing are necessary to capture the full complexity of mental distress (Downs et al., 2025). Neuroscientific insights into neurotransmitter dysfunction, for example, must be contextualised alongside psychological theories of meaning-making and sociological analyses of structural inequalities. Critically, lived experience provides access to the forms of knowledge that cannot be accessed through traditional research methods alone.

Conclusion

The failure of many findings from mental health research to deliver real-world impact reflects not only represents methodological challenges - it also raises deeper epistemological and ontological questions for the field. Addressing these requires a shift towards epistemic pluralism, recognising that different ways of knowing – biomedical, psychological, social, and experiential – must be integrated to capture the full complexity of mental health, illness, and recovery.

Co-production represents one pathway towards this goal, but its significance extends beyond the participation of patients to a rethinking of how knowledge itself is generated and legitimised – and who gets to decide. Similarly, truly transdisciplinary research depends on breaking down knowledge silos and fostering new conceptual models that bridge neuroscience, clinical practice, and lived experience. By embracing these shifts, mental health science can move beyond its historical limitations towards a future where research is not only rigorous but also deeply relevant to those it seeks to serve. Rather than treating complexity and uncertainty as obstacles to be simplified, we must embrace them as opportunities to rethink how we grapple with the unknown and develop methodologies capable of capturing what it is to be human.

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