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ARTÍCULO

"Mental Disorders as Brain Diseases": Bioethical, Cultural, and Social Implications

"Trastorns mentals com a malalties del cervell": implicacions bioètiques, culturals i socials

"Trastornos mentales como enfermedades del cerebro": implicaciones bioéticas, culturales y sociales

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Abstract

Background: Advances in modern neuroscience have led to a transformation in the understanding of mental disorders, which are now being reinterpreted as "brain diseases." **Objective:** To analyze the social, cultural, and bioethical implications of the shift towards a neurobiological paradigm in the understanding of mental disorders. **Methods:** A critical literature review was conducted, integrating insights from neuroscience, psychiatry, sociology, and bioethics to evaluate the impact of the neurobiological perspective. **Results:** The reinterpretation of mental disorders as brain diseases has significant implications, including changes in patient autonomy, the concept of biosociality, and ethical considerations regarding treatment. Initiatives like the "Decade of the Brain" and the "BRAIN Initiative" have fostered research linking brain dysfunctions to clinical symptoms, shaping both clinical practice and public perception. **Conclusion:** The neurobiological paradigm shift offers opportunities for advances in treatment but raises ethical, social, and cultural challenges. A balanced, interdisciplinary approach is essential to ensure fair and inclusive mental health policies and practices.

Keywords: bioethics; behavioral sciences; psychiatry; mental disorders; public health.

Resum

Introducció: Els avanços en les neurociències modernes han transformat la comprensió dels trastorns mentals, que actualment estan sent reinterpretats com a "malalties del cervell". **Objectiu:** Analitzar les implicacions socials, culturals i bioètiques del canvi cap a un paradigma neurobiològic en la comprensió dels trastorns mentals. **Mètodes:** Es va realitzar una revisió crítica de la literatura, integrant aportacions de la neurociència, la psiquiatria, la sociologia i la bioètica per a avaluar l'impacte de la perspectiva neurobiològica. **Resultats:** La reinterpretació dels trastorns mentals com a malalties cerebrals té implicacions significatives, incloent-hi canvis en l'autonomia del pacient, el concepte de biosocialitat i consideracions ètiques relacionades amb el tractament. Iniciatives com la "Dècada del Cervell" i el "BRAIN Initiative" han impulsat recerques que vinculen disfuncions cerebrals amb símptomes clínics, influint tant en la pràctica clínica com en la percepció pública. **Conclusió:** El canvi cap a un paradigma neurobiològic ofereix oportunitats per a avançar en els tractaments, però planteja desafiaments ètics, socials i culturals. Un enfocament equilibrat i interdisciplinari és essencial per a garantir polítiques i pràctiques de salut mental justes i inclusives.

Paraules clau: bioètica; ciències del comportament; psiquiatria; trastorns mentals; salut pública.

Resumen

Introducción: Los avances en las neurociencias modernas han transformado la comprensión de los trastornos mentales, que actualmente están siendo reinterpretados como "enfermedades del cerebro". **Objetivo:** Analizar las implicaciones sociales, culturales y bioéticas del cambio hacia un paradigma neurobiológico en la comprensión de los trastornos mentales. **Métodos:** Se realizó una revisión crítica de la literatura, integrando aportes de la neurociencia, la psiquiatría, la sociología y la bioética para evaluar el impacto de la perspectiva neurobiológica. **Resultados:** La reinterpretación de los trastornos mentales como enfermedades cerebrales tiene implicaciones significativas, incluyendo cambios en la autonomía del paciente, el concepto de biosocialidad y consideraciones éticas relacionadas con el tratamiento. Iniciativas como la "Década del Cerebro" y el "BRAIN Initiative" han impulsado investigaciones que vinculan disfunciones cerebrales con síntomas clínicos, influyendo tanto en la práctica clínica como en la percepción pública. **Conclusión:** El cambio hacia un paradigma neurobiológico ofrece oportunidades para avanzar en los tratamientos, pero plantea desafíos éticos, sociales y culturales. Un enfoque equilibrado e interdisciplinario es esencial para garantizar políticas y prácticas de salud mental justas e inclusivas.

Palabras clave: bioética; ciencias del comportamiento; psiquiatría; trastornos mentales; salud pública.

1. Introduction

The rapid advancement of modern neuroscience, driven by innovative techniques in molecular and cellular biology, has revolutionized our understanding of brain mechanisms (Altimus *et al.*, 2020). These technologies have enabled the identification of new neural and genetic systems related to mental and behavioral disorders. This scientific (re)evolution has transformed not only the field of research in this area but also the way healthcare professionals, patients, and society at large perceive, and address issues related to mental health (Baratta *et al.*, 2022; Brown, 2019).

Historically, mental disorders have been interpreted through various paradigms, ranging from spiritual and moral conceptions to (bio)medical and psychological understandings (Schauer, 2021). In antiquity, behaviors considered deviant were often attributed to spiritual possession or supernatural influences (Ahonen, 2019). With the advent of modernity and corresponding scientific development, there was a shift towards understanding these disorders as mental illnesses, grounded in psychological and social aspects (Foucault, 2013).

In the 1950s and 1960s, psychiatric reform movements in several countries led to a shift in perspective from "mental illness" to "mental health" (Eghigian & Hornstein, 2009; Srinivasa Murthy, 2024). The psychiatric reform movement challenged traditional psychiatric practices (Christodoulou, 2009), and led to the emergence of new therapeutic models based on community and the environment where the individual resides (Sampaio & Bispo Júnior, 2021). This shift reflected a more humanistic approach, considering not only symptoms but also the overall well-being of the individual and the community.

Currently, mental disorders are being understood as "brain diseases," emphasizing their neurobiological basis (Insel 2010). This perspective suggests that specific dysfunctions in the brain are responsible for the observed symptoms, shifting the focus to interventions aimed at "correcting" or "compensating" for these neurobiological "anomalies" (Hyman, 2021; Insel 2010; Leshner, 1997). During his tenure as director of the National Institute of Mental Health (NIMH), Insel developed the Research Domain Criteria (RDoC) framework, aiming to integrate neurobiological and psychological dimensions for a more comprehensive understanding of mental disorders (Insel 2010). Unlike traditional diagnostic systems such as the DSM-5, often criticized for their limited correspondence with neurobiological findings, the RDoC focuses on dimensional constructs that bridge biology, behavior, and cognition.

Emerging integrative perspectives in this discussion, such as the concept of "second-person neuroscience" proposed by Schilbach (2016a), emphasize the critical role of social interaction in understanding psychiatric conditions. This perspective suggests that disruptions in interpersonal dynamics, supported by neurofunctional systems, are central to the etiology of many mental disorders (Kendler, 2024a). Furthermore, research on inter-brain processes highlights the need to investigate the breakdown of interaction to elucidate neural mechanisms in psychiatric disorders (Schilbach, 2016b).

This article critically examines the implications of framing mental disorders as brain diseases, exploring the bioethical, cultural, and social consequences of this paradigm shift. By incorporating historical and contemporary debates, it aims to provide a comprehensive analysis of the challenges associated with this evolving understanding, emphasizing the need for interdisciplinary and integrative approaches.

2. Historical contextualization

2.1 From Soul Ailment to Mental Health

The understanding of mental disorders has been subject of controversy and transformation throughout history (Schauer, 2021; Srinivasa Murthy, 2024). In antiquity and various traditional cultures, behaviors considered abnormal or unusual were often interpreted as manifestations of spiritual forces, demonic possessions, or supernatural influences (Ahonen, 2019; Muñoz-Negro *et al.*, 2018). These spiritual interpretations attributed extrinsic causes to the individual, often resulting in exorcism practices, religious rituals, or even severe punishments.

During the Middle Ages, mental disorders continued to be viewed through a moral and spiritual lens (Schauer, 2021). Madness was associated with sin, immorality, or a lack of faith. Individuals exhibiting deviant behaviors were marginalized, incarcerated, or subjected to inhumane treatments (Kroll & Bachrach, 1984). The lack of scientific understanding contributed to the perpetuation of deep stigmas and prejudices (Rössler, 2006).

With the Renaissance and subsequently the Enlightenment, these interpretations began to be questioned (Mora, 2008). Thinkers like Philippe Pinel and Jean-Étienne Esquirol proposed that madness was a disease that could be treated with humane and rational approaches (Crocq, 2015). The creation of the first asylums and the implementation of morally oriented treatments represented significant steps in the development of care for people with mental disorders (Richa *et al.*, 2019).

In the 1950s and 1960s, psychiatric reform movements gained strength in several countries (Lipsedge & Watson, 2016; Rössler, 2006). Inspired by humanistic ideals and criticisms of the then-dominant asylum model, these movements promoted deinstitutionalization and the social reintegration of psychiatric patients (Christodoulou, 2009; Lipsedge & Watson, 2016; Rössler, 2006). The approach began to emphasize "mental health" rather than "mental illness," recognizing the importance of psychological, social, and emotional well-being (Srinivasa Murthy, 2024).

This transition reflected a paradigm shift in how society understood and addressed mental disorders. Emphasizing mental health promotes a humanized approach, considering economic, and social determinants of mental health. However, challenges persisted, including the need for adequate resources, professional training, and overcoming persistent stigmas.

2.2 The Emergence of a New Paradigm

In recent decades, we have observed the emergence of a new paradigm in Behavioral Sciences and Psychiatry: the scientific understanding of mental disorders as "brain diseases" (Frisch, 2016; Insel 2010; Leshner, 1997; Ramos *et al.*, 2019). This perspective has been driven by significant advances in neuroscience, genetics, and brain imaging technologies, which have enabled a more detailed understanding of the neurobiological processes underlying behaviors and emotions (Altimus *et al.*, 2020; Baratta *et al.*, 2022; Brown, 2019).

This neurobiological approach gained prominence through initiatives like the "Decade of the Brain" in the 1990s (Goldstein 1990, Goldstein 1994) and the "BRAIN Initiative" in the 2010s, which massively invested in research to uncover the mysteries of the human brain (Adams *et al.*, 2020; T. R. Insel *et al.*, 2013). These initiatives not only advanced basic science but also influenced clinical practice and mental health policies in the U.S.

The publication of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) in 2013 by the American Psychiatric Association (APA) also reflects this paradigm shift. The manual incorporated new diagnostic categories based on neurobiological criteria and recognized the importance of genetic and neurochemical factors in the etiology of mental disorders (Kudlow, 2013).

As Kendler (2024b) highlights, the conceptualization of psychiatric disorders as brain diseases has sparked considerable debate. Critics warn that an excessive focus on neurobiology risks oversimplifying the complexity of mental disorders, reducing them to mere brain

dysfunctions while neglecting the interplay of psychological, social, and cultural factors (Hart, 2017; Lewis, 2017; Schilbach, 2016b). This reductionist approach raises concerns about its potential to limit a holistic understanding of mental health, ultimately restricting efforts to address the multifaceted nature of these conditions (Parker, 2022).

In response to these critiques, integrative frameworks such as the RDoC have sought to bridge the gap between reductionist and holistic approaches. By considering behavioral, cognitive, and neurobiological dimensions, the RDoC framework aims to capture the multifaceted nature of mental disorders and move beyond the limitations of traditional categorical diagnoses (Insel 2010).

Recent perspectives, such as those proposed by Schilbach (2016b), advocate for rethinking mental disorders as "disorders of social interaction," emphasizing the critical role of interpersonal dynamics and social contexts in their development and progression. This perspective challenges traditional, brain-centric models by highlighting that many psychiatric conditions may arise not solely from intrinsic brain dysfunctions but also from disruptions in social relationships and interactive processes. Schilbach's approach introduces the concept of second-person neuroscience, a methodology that focuses on studying real-time interactions between individuals rather than isolated cognitive or neural processes. This framework shifts the focus from observing the individual in isolation to analyzing the dynamic interplay between two or more people, enabling a deeper understanding of how social interactions influence neural and psychological mechanisms. By investigating these inter-brain processes, this perspective offers novel insights into how psychiatric disorders manifest as breakdowns in interaction, paving the way for more integrative and socially attuned therapeutic approaches.

3. Public Policies and Investments in Neuroscience

The proclamation of the "*Decade of the Brain*" in the 1990s marked a turning point in neuroscience, aiming to enhance understanding and treatment of neurological and psychiatric conditions (Goldstein, 1990, 1994). This initiative catalyzed the development of advanced neuroimaging technologies—such as fMRI, PET, and MEG—that revolutionized the study of cognition, emotion, and behavior. Simultaneously, breakthroughs in genetics and molecular biology enabled the identification of genes and proteins linked to psychiatric and neurological disorders (Tandon, 2000).

Building on these advances, the *BRAIN Initiative* (Brain Research through Advancing Innovative Neurotechnologies), launched in 2013 by the Obama administration, sought to map complex neural circuits and decode how they generate behavior, thoughts, and emotions (T. R. Insel *et al.*, 2013; Koroshetz *et al.*, 2018). It emphasized interdisciplinary collaboration, engaging neuroscientists, engineers, physicists, and computer scientists (Adams *et al.*, 2020) - and created ethical oversight committees to address challenges such as neural privacy, data use, and the broader societal impacts of discoveries (Amadio *et al.*, 2018; Ramos *et al.*, 2019). These programs reflected an increasing recognition of neuroscience's relevance not only for health but also for economic growth and national security (Ngai, 2024).

The influence of these initiatives reshaped Psychiatry and Behavioral Sciences. The National Institute of Mental Health (NIMH) redirected funding priorities toward studies that integrate genetics, neuroimaging, molecular biology, and clinical data (Insel *et al.*, 2010), culminating in projects like the *Research Domain Criteria* (RDoC). RDoC proposed a novel framework for classifying mental disorders based on neurobiological and behavioral dimensions, challenging traditional nosologies.

This shift also fueled the emergence of *precision psychiatry*, which seeks to tailor treatment based on biomarkers, genetic profiles, and individual neuropsychological patterns (Passos *et al.*, 2022; Williams *et al.*, 2024; Zanardi *et al.*, 2021). In response, training programs for mental health professionals began incorporating content in neuroscience, genetics, and psychopharmacology (Balon *et al.*, 2022). Curricula grounded in RDoC and precision psychiatry underscore the value of integrating biological understanding with psychological and sociocultural perspectives.

Still, these innovations have not been exempted from critique. Scholars like Kendler (2024b) warn that a disproportionate focus on neurobiology risks encouraging a reductionist view of mental illness, in which complex psychiatric phenomena are oversimplified as brain malfunctions. This perspective may obscure the relevance of environmental, relational, and sociocultural factors that shape the onset, persistence, and recovery of mental health conditions. Consequently, it can limit the development of policies and interventions that adequately address social determinants of health or promote community-based and psychotherapeutic strategies.

Adding to this critique, emerging perspectives such as *second-person neuroscience* advocate for shifting from brain-centric paradigms toward approaches that emphasize the role of interpersonal interactions and social dynamics (Schilbach, 2016b). These models encourage a more comprehensive understanding of mental disorders and highlight the need for research and policy frameworks that bridge neurobiological advances with psychosocial realities.

3.1 Ethical and Policy Implications

The increasing focus on neuroscience has sparked critical bioethical discussions regarding the implications of framing mental disorders as brain diseases (del Brío León, 2011; Estevez Abad, 2024; Seigi Hashimoto *et al.*, 2024). While this paradigm has fostered advancements in diagnostics and treatments, it has also raised concerns about equity, autonomy, and societal impacts (Brigard & Sinnott-Armstrong, 2022).

One of the most pressing issues is the equitable distribution of resources. Precision psychiatry and neuromodulation therapies, such as transcranial magnetic stimulation (TMS) and deep brain stimulation (DBS), promise individualized and potentially effective treatments. However, these technologies still present limited evidence regarding their long-term efficacy and safety, requiring continued rigorous investigation (Cotovio *et al.*, 2023; Wellnhofer & Preuschhof, 2024). Furthermore, their high costs and reliance on advanced technologies risk excluding low-income and underserved populations (Harding *et al.*, 2023). This raises ethical questions about fairness in access to mental health care, particularly in countries with significant socioeconomic disparities. Policymakers must address these inequities by ensuring that public health systems integrate these innovations carefully and equitably, thereby avoiding deepening existing gaps in mental health care access (Cabrera *et al.*, 2014).

Moreover, public health campaigns influenced by the "brain disease" framing of mental disorders aim to reduce stigma by legitimizing these conditions as medical issues akin to physical illnesses. However, this approach can have unintended consequences. Biological explanations of mental disorders may inadvertently reinforce perceptions of chronicity, immutability, and even dangerousness, exacerbating stigma rather than alleviating it. This highlights the need for careful messaging in public health campaigns to avoid reinforcing misconceptions about mental illness.

The conceptualization of mental disorders as brain diseases also raises questions about autonomy and informed consent. Advanced treatments, such as neuromodulatory therapies and pharmacogenomic interventions, require a nuanced understanding of risks and benefits. Patients may face challenges in fully grasping the implications of these interventions, particularly when decision-making capacity is compromised by their condition (Brigard & Sinnott-Armstrong, 2022; Cabrera *et al.*, 2014; Harding *et al.*, 2023). This underscores the importance of developing communication strategies tailored to patients' cognitive and emotional states, as well as ensuring robust ethical oversight in clinical and research contexts.

In addition to these individual-level concerns, broader societal implications warrant attention. The "brain disease" paradigm has influenced mental health policies, leading to an

increased emphasis on biomedical research at the expense of psychosocial approaches. While advancements in neuroscience are invaluable, the neglect of social determinants of health—such as poverty, inequality, and discrimination—risks perpetuating a fragmented view of mental health care. An integrative approach that combines biomedical advances with policies addressing social and environmental factors is essential for fostering a comprehensive mental health care system. As neuroscience continues to shape the future of psychiatry, ethical vigilance is essential. Policymakers, researchers, and clinicians must work collaboratively to ensure that advancements in mental health care are inclusive, equitable, and responsive to the complex interplay of biological, psychological, and social factors.

4. Social and Cultural Implications

4.1 Biosociality and New Subjectivities

The redefinition of mental disorders as “brain diseases” has profound implications for identity formation and social belonging. This phenomenon aligns with the concept of biosociality, coined by anthropologist Paul Rabinow (2005), which describes how individuals form new social identities and communities based on shared biological or medical conditions. In other words, biosociality refers to social groups and interactions organized around genetic, medical, or biological characteristics. This process can provide patients with a sense of identity and belonging, empowering them to navigate the challenges posed by their conditions (Rose, 2007). For example, communities formed around shared mental health diagnoses often act as spaces for mutual support, advocacy, and collective action (Creary, 2021; Ortega, 2009).

These new subjectivities can foster a sense of belonging and identity by providing a rationalized explanation for the challenges faced, but they can also lead to feelings of fatalism or dependence on medical interventions due to their medical conditions (Creary, 2021; Dimond *et al.*, 2015; Wiese *et al.*, 2018). Additionally, biosociality facilitates the formation of communities based on shared diagnoses. These communities, often organized through digital platforms, provide spaces for exchanging experiences, mutual support, and advocacy (Bradley, 2021; Creary, 2021; Raz *et al.*, 2018). They can influence scientific research, directing attention to areas of specific interest, and also impact health policies by mobilizing resources and advocating for recognition and rights (Bradley, 2021).

However, the formation of these biomedical identities also raises questions about stereotypes and stigmatization. While some individuals find empowerment through identifying

with a diagnosis, others may feel reduced or defined by it. There is a risk that overemphasis on biological bases may reduce the individuality and diversity of human experiences (O'Donnell & Habenicht, 2022; Quinn *et al.*, 2020). Therefore, it is important to examine how these new (inter)subjectivities interact with broader social structures. Factors such as social class, gender, ethnicity, and culture influence how diagnoses are received and interpreted. For example, in some cultures, attributing symptoms to biological causes may be more acceptable than in others, affecting the pursuit of treatment and available social support (Alarcon, 2009; Harper, 2001; Lewis-Fernández & Krishan Aggarwal, 2013).

4.2 Reducing Stigma and Changing Public Perception

The redefinition of mental disorders as brain diseases has been promoted as an attempt to reduce the stigma associated with these conditions, according to proponents of this paradigm (Corrigan & Watson, 2004; Luchins, 2004). By framing mental disorders as legitimate medical issues, similar to physical illnesses, the goal is to increase public understanding and reduce prejudice. A key component of this strategy is the change in language used to describe mental disorders and those who experience them. Pejorative or negatively connoted terms are being replaced with more neutral, person-centered terminology (Botticelli & Koh, 2016). For example, instead of "schizophrenic," the term "person with schizophrenia" is used; instead of "addict," "person with substance use disorder" is preferred.

These linguistic changes reflect a recognition of the importance of language in constructing social realities (Volkow *et al.*, 2021). Words can reinforce stereotypes or promote empathy (Zayts-Spence *et al.*, 2023). By adopting language that separates a person's identity from their diagnosis, the goal is to acknowledge individuality and reduce labeling (Ahad *et al.*, 2023; Martinelli *et al.*, 2020). However, the effectiveness of this strategy in reducing stigma is debated (Foundation, 2013). Bedrick (2014) suggests that attributing mental disorders to biological causes may paradoxically increase stigma by reinforcing perceptions that conditions are chronic, immutable, or dangerous. Furthermore, changes in language need to be accompanied by concrete actions in health policy, education, and society. Without real improvements in support systems and social inclusion, linguistic changes may be perceived as superficial or insufficient (Ahad *et al.*, 2023; Botticelli & Koh, 2016).

One of the primary motivations for framing mental disorders as brain diseases has been to reduce stigma. Proponents argue that biological explanations position mental disorders alongside physical illnesses, fostering public acceptance and empathy. For instance, campaigns emphasizing

the neurobiological basis of conditions like depression and schizophrenia aim to normalize these experiences and combat prejudice.

Moreover, linguistic shifts—such as replacing terms like “schizophrenic” with “person with schizophrenia”—have emerged from efforts to decouple identity from medical diagnoses, thereby aiming to reduce stigma and foster respect and empathy (Healy *et al.*, 2022; Volkow *et al.*, 2021). Although at first glance these linguistic modifications might appear superficial, evidence shows that the language used by healthcare professionals significantly influences public perception, healthcare delivery, and patient experiences (Healy *et al.*, 2022). Volkow *et al.* (2021) highlight that stigmatizing language not only diminishes the likelihood of individuals seeking care but also negatively impacts the quality of care provided. Thus, person-centered language that emphasizes the individual rather than the condition may indeed contribute meaningfully to humanizing clinical interactions and mitigating stigma (Adams *et al.*, 2020; Botticelli & Koh, 2016; Healy *et al.*, 2022; Volkow *et al.*, 2021). Nonetheless, for linguistic changes to be genuinely effective and not merely symbolic, they must occur alongside broader systemic reforms that enhance access to treatment and social support, addressing the structural factors that perpetuate stigma and discrimination (Healy *et al.*, 2022).

4.3 Formation of New Social Groups and Advocacy Movements

The understanding of mental disorders as brain diseases could empowered the formation of new social groups and advocacy movements for the rights of those affected (Petersen *et al.*, 2019). Patients, family members, and allies organize around shared diagnoses, creating communities that seek mutual support, information, and political influence. These groups play multiple roles, providing safe spaces for sharing experiences (Li & Wang, 2021; Vernooij, 2022). Support groups, both in person and online, help individuals cope with everyday challenges and develop coping strategies.

In addition to emotional support, these groups are often involved in advocacy and lobbying. They can influence research agendas by pushing for studies in specific areas, participating in clinical trials, or collaborating with scientists. They can also direct political agendas by influencing funding for specific public policies (Levina *et al.*, 2018). Movements like those of patients with bipolar disorder or autism, for example, have significantly impacted the direction of research and the development of treatments (Levina *et al.*, 2018). In the political arena, these groups act as collective voices that can influence health policies, legislation, and resource allocation. They may

lobby for better mental health services, insurance coverage, labor rights, and protection against discrimination.

However, the formation of these groups also presents challenges, particularly concerning issues of representation and inclusion. Not all individuals with a given diagnosis have the same experiences or needs. Differences in social class, race, gender, and culture can lead to diverse perspectives within the same diagnostic group (Harris & McDade, 2018). Thus, it is essential to investigate how these groups negotiate the identities and power associated with these new identities organized in terms of biosociality. Furthermore, the relationship between these groups and the pharmaceutical and medical technology industries deserves attention. While collaborations can be beneficial, there are concerns about conflicts of interest and corporate influence on group agendas.

4.4 Cultural Dimensions and Global Perspectives

The conceptualization of mental disorders as brain diseases is not universally accepted or understood across cultures. In some societies, mental health continues to be framed through spiritual, moral, or communal lenses, which may conflict with biomedical narratives. For instance, attributing symptoms to biological causes may be less acceptable in cultures that emphasize social or religious explanations. This divergence underscores the importance of culturally sensitive approaches to mental health care that respect and integrate local beliefs and practices.

Additionally, the global adoption of neurobiological frameworks may perpetuate inequalities in mental health care. High-resource countries are better equipped to implement advanced technologies and treatments, while low-resource settings may lack the infrastructure to integrate these innovations. Ensuring equitable access to mental health care requires balancing global scientific advancements with local needs and priorities.

5. Emerging Bioethical Issues

5.1 Autonomy and Decision-Making Capacity

Autonomy is a fundamental principle in bioethics, representing individuals' rights to make informed and voluntary decisions about their healthcare (Beauchamp & Childress, 2019). In the context of mental disorders as brain diseases, complex issues arise regarding how to assess and

respect patient autonomy, especially when decision-making capacity may be compromised by neurobiological dysfunctions (Sisti *et al.*, 2013).

Decision-making capacity is a multidimensional concept involving the ability to understand relevant information, appreciate the situation and its consequences, reason about treatment options, and communicate a choice (Libby *et al.*, 2024). Mental disorders can affect these abilities variably and dynamically. For instance, a patient with bipolar disorder in a manic phase may exhibit impulsivity and impaired judgment, while someone with severe depression might experience apathy or hopelessness that influences decision-making (Bergamin *et al.*, 2022).

It is important to distinguish between temporary and permanent incapacity. Some mental conditions are episodic, and decision-making capacity can fluctuate over time (Bergamin *et al.*, 2022). This raises the question of when it is appropriate to intervene to protect the patient and when to respect their decisions, even if they may not appear to be in their best interest. Capacity assessment should not be based solely on diagnosis but on individualized and contextualized evaluations (Sisti *et al.*, 2013).

Moreover, interpreting mental disorders as brain diseases can influence perceptions of autonomy. If behaviors and decisions are viewed as results of brain dysfunctions, there may be a tendency to underestimate the patient's capacity and overestimate the need for intervention (Bergamin *et al.*, 2022; Thurin *et al.*, 2019). This can lead to excessive paternalism, where healthcare professionals make decisions on behalf of the patient, justifying their actions based on the supposed neurobiological incapacity of the individual.

Finally, the role of informed consent must be considered. In innovative or invasive treatments, such as neuromodulatory therapies, ensuring that the patient understands the risks, benefits, and alternatives is crucial (Barstow *et al.*, 2018). This may require adapted communication approaches, accessible educational materials, and involvement of family members or legal representatives when appropriate.

5.2 Vulnerability and Social Determinants of Health

Vulnerability is a complex and multifactorial concept encompassing inherent or acquired fragilities that may make an individual or group more susceptible to harm (Fineman, 2019; Macklin, 2003). In the context of mental disorders as brain diseases, there is a risk of focusing exclusively on biological vulnerabilities, thereby neglecting social determinants of health that significantly contribute to mental well-being (Valera, 2022).

Factors such as poverty, social inequality, discrimination, violence, and lack of access to basic services play critical roles in the etiology and course of mental disorders. Studies show that marginalized populations have a higher prevalence of mental health issues, often resulting from chronic stressors and lack of support (Kirkbride *et al.*, 2024; Mezzina *et al.*, 2022).

Thus, it is important to recognize that vulnerability is not solely an individual characteristic but also the result of social and political structures (Macklin, 2003). Interpreting mental disorders primarily as brain dysfunctions risks pathologizing individuals without addressing the conditions contributing to their suffering. This may lead to interventions that treat symptoms without addressing underlying causes, limiting long-term effectiveness. Moreover, excessive focus on biomedical solutions can exacerbate existing social inequalities. Advanced treatments and innovative technologies may not be accessible to low-income populations or those in remote areas. Mental health policies must therefore integrate approaches addressing social determinants, promoting equity and justice.

5.3 Advance Directives in Mental Health

Advance directives (ADs) are legal documents that allow individuals to express their wishes for future medical care in case they become unable to make informed decisions. In the context of mental health, ADs gain particular relevance as many disorders can temporarily affect decision-making capacity, leading to situations where patient preferences are unclear (Sedini *et al.*, 2022).

Mental health ADs may include instructions about preferred or refused treatments, choice of healthcare providers, emergency contacts, and hospitalization dispositions. They have the potential to enhance patient autonomy, ensuring that their choices are respected even during crises (Gaillard *et al.*, 2023). However, implementing ADs faces significant challenges. One of the main challenges is determining competence at the time of drafting the directive. Ensuring that the individual has full capacity to understand and decide on future options is essential for the legal and ethical validity of the document (Sedini *et al.*, 2022).

Another area of debate involves situations where patients request drastic interventions, such as refusal of feeding or assistance in dying in cases of unbearable mental suffering. In countries where euthanasia is legalized for psychiatric conditions, such as the Netherlands, Belgium and, more recently, Spain, complex ethical issues arise regarding the permissibility of these actions (Kim *et al.*, 2016). The Spanish law enacted in March 2021 explicitly includes psychological suffering as a valid criterion for access to euthanasia, further intensifying the ethical

and clinical debates surrounding decision-making capacity, vulnerability, and the scope of mental health care (Jefatura de Estado, 2021).

There are also practical considerations regarding awareness and effective use of ADs. Many patients are unaware of this option, and healthcare professionals may not be adequately trained to discuss or implement advance directives. This requires educational efforts and institutional policies promoting responsible use of Ads (Kim *et al.*, 2016). Finally, integrating ADs into the mental health and legal systems demands harmonization between laws, regulations, and clinical practices. Directives must be easily accessible, recognized by institutions, and supported by mechanisms for conflict resolution (Gaillard *et al.*, 2023).

5.4 Ethical Challenges in Research and Technology

The growing emphasis on neurobiological aspects of mental disorders drives research and technological advances that present new ethical challenges. Studies involving neuroimaging, genetics, and neuromodulatory interventions require careful consideration of issues such as informed consent, privacy, and potential harm (González-Márquez, 2023; Rusconi & Mitchener-Nissen, 2014).

Research participants may not fully understand the implications of sharing genetic or brain data, which may reveal sensitive information about disease predispositions or personal characteristics (Vidal, 2022). Risks include discrimination by employers, insurers, and even social stigma. Additionally, technological interventions like brain-computer interfaces raise questions about personal identity, autonomy, and control. The potential to deeply alter brain functions requires rigorous ethical evaluation regarding the limits of treatment and enhancement (Vidal, 2022).

Therefore, it is essential that research ethics committees are prepared to address these emerging issues. Research protocols must be established to protect participants, ensure transparency, and promote social benefits. Collaboration between scientists, (bio)ethicists, legislators, and civil society is crucial to address these complexities.

6. Conclusion

The reinterpretation of mental disorders as "brain diseases" represents a significant shift in neuroscience and psychiatry, offering both opportunities and challenges. This perspective has advanced the understanding of mental disorders by emphasizing their neurobiological

underpinnings, fostering innovations in diagnostics and treatments. However, it has also raised critical questions about reductionism, equity, and the neglect of psychological, social, and cultural dimensions of mental health.

While the neurobiological framework has contributed to reducing stigma by legitimizing mental disorders as medical conditions, its unintended consequences—such as reinforcing perceptions of chronicity and immutability—must be addressed. Public health messaging should adopt a balanced approach, integrating biological narratives with empowering stories of recovery and resilience. Additionally, the ethical implications of advanced therapies, including their potential impact on autonomy and identity, require ongoing scrutiny to ensure informed and equitable access for all populations.

This paradigm shift also highlights the importance of addressing social determinants of health. Mental health policies must move beyond a sole focus on biological mechanisms to include systemic efforts aimed at reducing inequality, improving access to care, and promoting community-based interventions. An integrative approach that combines neuroscientific advancements with social justice initiatives is essential for developing a mental health care system that is both effective and inclusive.

Future research and policy efforts should prioritize interdisciplinary collaboration, incorporating insights from neuroscience, psychology, sociology, and bioethics to develop holistic frameworks for understanding and managing mental disorders. The integration of perspectives such as "second-person neuroscience," which emphasizes the role of social interactions, and patient advocacy movements underscores the need for a broader, human-centered approach to mental health.

Ultimately, the success of this paradigm depends on the collective ability of researchers, clinicians, policymakers, and society to balance scientific advancements with ethical, social, and cultural considerations. By fostering dialogue and collaboration, it is possible to build a mental health care system that respects human dignity, promotes equity, and advances well-being for all.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used CHATGPT 4o preview model in order to the writing process to improve the readability and language of the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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