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Ethical and social issues in research on genetics and mental health

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ABSTRACT

Objective. To reflect on ethical and social issues related to research on the genetics of mental health. **Method.** A narrative review was undertaken of 87 articles found in three databases: Medline, Scopus, and Scielo. Keywords were defined broadly to capture as many relevant publications as possible. Data were summarized by topic. **Results.** The following topics were identified regarding the application of genetic and genomic tools to mental health disorders: problems with diagnosis, proper informed consent procedures, protecting confidential data, providing participants with research results, risk-benefit balance, equity and access, commercialization of genotyping, and prenatal testing. **Discussion and Conclusion.** Although a promising field, there is still much research needed on genetic approaches to mental health to achieve clinical relevance and predictive value, and more so in developing countries where there is little available data. Cost-benefit studies thus do not recommend genetic diagnoses in underdeveloped settings. Instead, local approaches should be enhanced. One limitation of research on the genetics of mental health is that it seeks biological causes for mental illnesses. However, the etiology of most mental health disorders is multifactorial, limiting the predictive value of genetic tests. Still, understanding the genetic origins of the biological pathways that lead to mental illness is important to diagnosis and therapy. Other problems discussed are enhancement of the informed consent process and counseling, protection of the right to know and not to know, and how the geneticization of disease is related to stigma.

Keywords: Mental health, psychiatry, genetics, ethical and social issues.

RESUMEN

Objetivo. Este artículo reflexiona sobre temas éticos y sociales de investigación genética en salud mental. **Método.** Se realizó revisión narrativa mediante búsqueda en bases de datos: Medline, Scopus and Scielo (se revisaron 87 artículos). Las palabras claves se definieron con amplitud para mayor número de publicaciones relevantes. Los datos fueron resumidos de acuerdo con el tema. **Resultados.** Se identificaron los siguientes temas en la aplicación de herramientas genéticas y genómicas en trastornos de salud mental: problemas de diagnóstico, procedimientos de consentimiento informado apropiados, protección de confidencialidad, información a participantes de resultados, balance de riesgos y beneficios, equidad y acceso, comercialización de genotipos y pruebas prenatales. **Discusión y conclusión.** A pesar de promesas, todavía debe realizarse mucha investigación genética en salud mental para lograr relevancia clínica y valor predictivo, con mayor deficiencia en países en desarrollo. Los estudios de costo-beneficio no recomiendan realizar diagnóstico genético para enfermedades mentales cuando existen pocos datos. Se necesita mejorar soluciones locales para abordar la salud mental. Una limitación es que la genética busca causas biológicas, pero la etiología de muchos trastornos mentales es multifactorial, disminuyendo el valor predictivo de pruebas genéticas. Sin embargo, encontrar el origen genético de caminos biológicos que conducen a enfermedad mental es muy importante para diagnóstico y terapia. Otros problemas consisten en encontrar métodos para mejorar el proceso de consentimiento informado y asesoría genética, la discusión si se debe preservar el derecho a saber o el derecho a no saber y el cómo la genetización de la enfermedad mental se relaciona con estigma.

Palabras clave: Salud Mental, psiquiatría, genética, temas éticos y sociales.

INTRODUCTION

Mental health is a major public health concern. According to the World Health Organization, an estimated one out of eight people in the world has a mental illness; research is needed to identify new treatments and improve existing ones, as well as to reduce stigma and increase access to quality mental health care (World Health Organization, 2019).

Mental illnesses are difficult to study because it is not possible to perform invasive investigations of the brain. When physiological differences can be measured, it is often impossible to distinguish between causes and effects. Genetic research may offer hope in understanding the causes of mental illnesses by finding the specific genes involved and the pathological processes that lead to their development (Geschwind & Flint, 2015). Once the genetic basis is known, individuals can be diagnosed and treatment interventions performed earlier, rather than waiting for symptoms to appear, by which time they are often acute.

Molecular genetic variants have been found to be associated with mental illnesses including bipolar disorder, autism spectrum disorders, attention deficit hyperactivity disorder, anxiety disorders, major depression, and schizophrenia (Bray & O'Donovan, 2018; Akingbuwa et al., 2022). Genome-wide association studies have also identified genes associated with schizophrenia (Gejman, Sanders, & Kendler, 2011). However, there are various challenges reflected in the heterogeneity and polygenicity of these illnesses and the difficulty in connecting multiple levels of molecular, cellular, and circuit functions to complex human behavior that is also influenced by psychosocial factors (Geschwind & Flint, 2015). The etiology of most mental health disorders is multifactorial (Insel & Collins, 2003), caused by the involvement of multiple genes, environmental influences, and epigenetic factors (patterns of DNA methylation and histone modification). Environmental factors, such as poverty, adverse childhood experiences, lack of employment, lack of social relationships, and stress, increase susceptibility to mental disorders (Hughes et al., 2016; Venkatapuram, 2010; Knifton & Inglis, 2020; Nelson et al., 2020). In Latin America, low socioeconomic status and lack of schooling are related to symptoms of depression, suicide attempts, and mood and anxiety disorders (Peñaranda, 2013).

The multifactorial nature of mental illness limits the predictive value of genetic tests. In addition, most existing data are from people with European genetic origins: there is little data about other populations. Genetic studies try to understand the biological and heritable components of mental illness using twin and familial analyses, linkage analyses, and variant association scans. The field also focuses on the development of clinical applications such as pharmacogenetic and diagnostic tests, as well as susceptibility genotyping. Many mental health disorders (including schizophrenic, bipolar, depression, anxiety, obsessive compulsive, and eating disorders) are not entirely genetically determined, so genetic testing cannot establish, confirm, or refine a diagnosis, but it is recommended for childhood neurodevelopmental disorders such as autism and intellectual disability (Finucane, Ledbetter, & Vorstman, 2021).

Genetic research on mental health raises various social and ethical issues that will be presented here.

METHOD

A narrative review was undertaken with searches in three databases: Medline, Scopus, and Scielo. Only peer-reviewed journal articles in English and Spanish were included. Keywords were defined broadly to capture as many relevant publications as possible: ethical issues, social issues, genetics research on mental health, and psychiatric genetics research. Data were summarized according to the issue. No statistical analysis was performed.

RESULTS

1. Problems with diagnosis

Diagnosis of mental illness, like that of any other medical condition, constitutes the foundation for intervention or treatment, identifying the individuals in need of that intervention or treatment. The problem is that there are no underlying physical changes, so there are no laboratory tests to confirm or rule out a diagnosis. Genetic tests may find genetic causes of subtypes of mental disorders, but many disorders have multifactorial causes, such as multiple genes, epigenetic factors, and the environment. Many major mental illnesses, including schizophrenia, bipolar disorder, obsessive compulsive disorder, major depression, anxiety disorders, autism, and attention deficit hyperactivity are polygenic; they are explained by combinations of interacting factors such as rare and common single nucleotide polymorphisms, copy number variations, and large chromosomal rearrangements (Demkow & Wolańczyk, 2017). Genome-wide association studies have identified common biological pathways to disease (Network and Pathway Analysis Subgroup of Psychiatric Genomics Consortium, 2015). The use of next-generation sequencing such as whole exome and genome sequencing, multiplexed single-nucleotide polymorphisms, microarray-based comparative genomic hybridization, and RNA sequencing, has identified thousands of sequence variants related to mental health, but it is not possible to link these findings with the complex traits of individual illnesses, which precludes pre-symptomatic testing (Frebourg, 2014). There are also only a few clinically useful gene-response associations that can be used to guide the choice of psychotropic medication (Kose & Cetin, 2018). However, genetic tests may help in understanding the biochemical processes involved in the development of mental illness, which could be useful for developing specific drug treatments.

Mental illnesses are currently classified by symptoms and observed clinical phenotypes (Cuthbert & Insel, 2013), as outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).

2. Informed consent procedures

Proper informed consent requires disclosure to participants of relevant information, including risks, benefits, and alternatives, their right to make decisions, and the voluntary nature of their participation. There are differences of opinion about mental health patients' ability to provide informed consent, but it should be acknowledged that having a mental health disorder does not automatically mean a reduction in the ability to consent, and this ability may change over time (Knoppers et al., 2002; Palmer et al., 2013). Since informed consent is a process, greater emphasis must be given on sufficient dialogue and patience with mental health patients, with repetition of the information to be sure they understand it.

Genetic research has identified mutations and variant associations related to mental health disorders. These findings are complemented by the availability of clinical genetic testing for diagnosis, detection of carrier status, and the ability to predict the development of disease. However, the low predictive ability of genotyping for most mental health disorders may affect proper informed consent, since many patients have problems understanding test results of a probabilistic nature. The complex inheritance of mental disorders, which is influenced by cognitive, affective, and cultural factors (Zipkin et al., 2014), provides less pertinent information about risks than single-gene Mendelian disorders. It is thus recommended that genetic counseling be provided by well-trained professionals. Genetic counseling promotes informed choices by helping patients to interpret the chance of disease occurrence or recurrence, and by helping them to understand inheritance, testing, prevention, and adaptation to risks with respect to the condition being tested (Abacan et al., 2019). When children are involved, the information must be carefully transmitted by professionals using good judgment to balance the best interests of the child with parental preferences (Arribas-Ayllon, Sarangi, & Clarke, 2009). It is recommended that informed assent be obtained from children aged 12-18, so that they are involved in the decision. However, those with neuro-developmental disorders may have impaired cognitive functioning that makes them less able to provide assent (Mezinska et al., 2021). Most ethics codes state that refusal to participate should be respected, but if a child does not agree to participate, the validity of their reasons should be explored (Hiriscau et al., 2016). Unless there are possibilities for treatment, there is no obligation for children to undergo predictive testing, including for diseases that develop in adulthood. Many mental disorders lack preventive measures or effective therapies, considerations that argue against the imposition of genetic testing.

There are special ethical issues regarding informed consent for genetic testing related to mental illness (Hoop, 2008): genetic information may predict a person's future health, knowing genotypes related to mental health may have psychosocial consequences, and the information may affect relatives or population groups. The results of genetic testing can exacerbate stereotypes and potentially stigmatize members of a particular population or racial or ethnic group. Consenting to have samples taken for genetic research also raises concerns about biobanks or storage repositories that might make future use of samples. Research on genetic variation and its association with mental disorders requires large samples of biospecimens linked to clinical and phenotypic information, which complicates the informed consent procedures at the moment samples are taken.

An important aspect of informed consent for patients with mental illness is their ability to make decisions. There is often a need to assess this ability by evaluating their understanding of information, their appreciation of its relevance to their personal situation, their ability to reason about the information, and their ability to express a clear and consistent choice (Dunn et al., 2006). For some mental illnesses, some authors have argued for taking the reasonableness of choices into account (Marson et al., 1995). A greater risk calls for a greater level of understanding (Dunn & Misra, 2009). Effort must be made to have research subjects participate in moments when they are clearheaded.

Good instruments for the measurement of decisional capacity with empirical support are the MacArthur Competence Assessment Tools for Clinical Research and Treatment and the Competency to Consent to Treatment Inventory, which have been validated for patients with dementia (Dunn & Misra, 2009). Many patients with mental illness can make decisions, and there is no association between decision-making capacity and specific diagnoses, but impairments in cognitive abilities may affect decisional capacity (Dunn & Misra, 2009). One limitation of current instruments is that there is no predetermined cutoff above which sufficient capacity can be said to exist. Capacity is considered a continuum or sliding scale; an element of subjectivity is accepted in capacity assessment, depending on the risk-benefit ratio of the decision to be made (Dunn & Misra, 2009).

When there is no decisional capacity, substituted judgment may be ethically acceptable (Shore et al., 1993); in this case, the research subject's consent can be provided by proxy (Karlawish et al., 2002). The use of substituted judgment in research on mental illness raises ethical questions, since decisions about whether to accept potential risks and unknown benefits are made without knowing the subject's preferences, and use of the process depends on policies and review by research ethics committees (Dunn & Misra, 2009).

3. Protection of confidential data

Professional confidentiality is an obligation in psychiatric practice: information provided by the patient must not be revealed to others unless there is consent. The rights to privacy and confidentiality as a type of disability right, including for mental illness, has been advocated by the United Nations (1991, 2006), the World Health Organization (2005), and the Council of Europe (1950). Due to the sensitive nature of genetic information about predisposition to mental health disorders, patients have the right to prevent stigmatization or discrimination by keeping this information confidential. However, most countries allow disclosure of information without consent if required by law (for example, by court order) or for the protection of others and/or the patient (for example, when there is a risk of suicide or homicide). In many cases the potential for suicide or homicide may be unclear, which makes decisions about breaking confidentiality difficult (Kelly, 2017). Although genetic testing for suicide may have significant benefits, there are concerns about stigma, access to insurance and employment, and increased anxiety and depression (Kious et al., 2021).

Confidential information on mental health may also affect family members. However, susceptibility genetic testing for most mental health disorders provides little information about risks to relatives. Genetic information may also be relevant to groups other than families. Some people from racial and ethnic minority groups have said they do not want to participate in genetic research on mental illness because of the danger of stigmatization and because such studies are culturally objectionable (Harmon, 2010). Population-based studies must therefore balance benefits with risks of stigmatization and discrimination (Knoppers & Chadwick, 2005). Private data must be safeguarded with provisions regarding data flow and security vulnerabilities.

With respect to biospecimens and related private information, identifiable information should be protected with measures such as data encryption, coding, establishing limited or varying levels of access to data by those associated with the collection, use of nondisclosure agreements, or use of an honest broker system (McGuire & Beskow, 2010).

4. Providing participants with research results

Ethical guidelines, such as those of the Council for International Organizations of Medical Sciences (CIOMS), require providing participants with research results. Although these results can benefit participants in mental health research, there are possible legal, social, and psychological risks to consider. In general, researchers are more willing to share the results of genomic research, including unsolicited and secondary findings—when these are reliable and clinically relevant—than other types of results that are less reliable and lack clinical relevance (Vears et al., 2021). Given that much genetic testing related to mental illness has little clinical relevance, the tendency is not to share results unless requested; if no treatment or preventative measures are available the information may be a burden. Such tests may provide only the information that there is little genetic predisposition to developing a specific mental illness. Many researchers are in favor of sharing results when there are medical interventions available or when the findings are clinically relevant, but not when there are genetic variants of uncertain significance, such as with schizophrenia (Kostick et al., 2020). The reasons in favor of sharing results are related to the duty to warn, improving participants' quality of life, and facilitating opportunities for early intervention. The reasons against sharing them are related to the mixing of research with clinical care, the potential for burdening patients with unexpected information, and burdening researchers who lack appropriate resources to support sharing results (Kostick et al., 2020).

In research using big data from heterogeneous sources (e.g., genetic studies, online data, social media profiles, electronic health records, mobile health applications, medical blogs, web networks, and screening tests), it is unclear when to share data with clinicians, when it is ethically or legally required to alert people about potential harm, or when to share individual research results (Ienca et al., 2018). The interpretation of research findings may be difficult, given the polygenic nature of mental illnesses and the role of environmental factors, and the cost of sharing individual results may be high when it is necessary to take large samples to detect genomic effects that contribute only minimally to overall risk (Sullivan et al., 2018).

5. Risk-benefit balance

The ethical principles of beneficence and non-maleficence dictate that the personal and social benefits of genetic research on mental health must be maximized and the risks minimized. In order to devise proper ethical safeguards, it is necessary to gather data on the risks and benefits of such research and its clinical application.

The benefits of genetic testing may include its use in devising medical and preventive measures to reduce the impact of illness and biological side effects, as well as providing relief from uncertainty, satisfaction of curiosity, alleviation of guilt, a basis for greater family support, and the ability to make better life plans (Wade, 2019). Among the risks are psychological distress arising from fear of the consequences of mental illness and the possibility of stigmatization and discrimination. A positive result on a genetic test may lead to psychological distress, including anxiety, embarrassment, depression, disrupted relationships, hopelessness, and uncertainty in the face of unclear results (Wade, 2019).

The prediction of neurological disorders such as Huntington's disease, for example, has been found to be associated with a risk of depression and suicide (Meiser & Dunn, 2000). However, there are no consistent findings of psychological distress; it depends on many factors, such as the condition being tested for, the reason for testing, the social context, and the psychology of the individual being tested (Parens & Appelbaum, 2019). It has been found that learning about positive test results for the APOE4gene, associated with a predisposition to Alzheimer's disease, does not lead to elevated anxiety and depression levels, but does lead to behavioral changes concerning insurance and preventive measures; it also produces some psychological stress and lesser performance in memory testing (Bemelmans et al., 2016). Pregnant women receiving prenatal genetic testing of uncertain significance for genetic variants for mental illness show anxiety both during pregnancy and after giving birth, and they perceive their children as vulnerable, even when they do not show signs of the condition being tested for (Werner-Lin, Mccoyd, & Bernhardt, 2019). There are no systematic reviews that report quantitative evidence of statistically significant, severe, and sustained negative psychosocial consequences following genetic testing for mental health disorders, but some recipients of genetic risk information may experience a significant impact (Wade, 2019). Since mental illness affects emotions, cognition, and behavior, patients may be more susceptible to psychosocial effects than somatic diseases (Hoop, 2008). The illness itself, depending on the particular disorder, may produce anxiety, hallucinations, or mood swings affecting the quality of life.

The Nuffield Council (1998) has recommended that research must also consider social circumstances, and that children should not be tested for carrier status or for mental conditions that develop in adulthood, since this information would profoundly affect them and those around them. Testing children also denies them the possibility of making their own choice in adulthood, and there are additional problems for adopted children.

Stigma is defined as a social process characterized by labeling, stereotyping, and separation or isolation influenced by prejudices, leading to the rejection practices of status loss and discrimination, all occurring in the context of power (Link & Phelan, 2001). Connecting race or ancestry to mental health genetic information may be stigmatizing (de Vries, Landouré, & Wonkam, 2020). Stigma is produced mainly as a result of social misunderstandings about the behavior of people with mental illness, which places them at a disadvantage and affects their social inclusion. People with mental illness may also turn against themselves, accept these social prejudices, and lose their confidence, and the idea that genes cause the illness may exacerbate self-stigmatizing negative attitudes such as blame, prognostic pessimism, and shame (Rüsch, Angermeyer, & Corrigan, 2005).

Social discrimination against people with mental disorders has been documented in employment and health insurance. Mentally ill people have difficulty in finding jobs because employers discriminate against them in hiring, and there are cases of mentally ill people being refused insurance coverage or having to pay higher premiums (Sharac et al., 2010). In education, elementary and junior high school children with mental illness often suffer bullying, isolation, and social rejection (Humphrey & Hebron, 2015; Schulte-Körne, 2016; Husky et al., 2020). Laws may protect people with mental illness, but some may not seek redress because of the associated stigma (Cummings, Lucas, & Druss, 2013).

6. Equity and access issues

The principle of justice applied to health care seeks to achieve equity and reduce discrimination. Justice requires consideration of the potential social harms that may occur with participation of individuals and groups in clinical and research activities. The World Health Organization (2021) has defined equity in health as the absence of unfair, avoidable, and remediable differences in health among groups of people, whether these groups are defined socially, economically, demographically, geographically, or by other dimensions of inequality. In many health care systems around the world, access to mental health care is hampered by avoidable inequitable distribution of resources owing to injustices that drive the social determinants of health. There is often discrimination in access to diagnosis and treatment, or mental illness is not considered a priority in systems of health care. Stigmatization often creates barriers to access and quality care. People with mental illness have reported stigmatization by health care providers in the form of being devalued, dismissed, or dehumanized, excluded from decisions, being the object of subtle coercive treatment, being made to wait excessively for help, being given insufficient information, and being sent to prison or institutions without treatment (Clarke, Dusome, & Hughes, 2007; Barney et al., 2009; Knaak, Mantler, & Szeto, 2017; Hamilton et al., 2016; Thornicroft, Rose, & Mehta, 2010; Nyblade et al., 2019; Bhugra, Tribe, & Poulter, 2022). The emphasis on pharmaceutical interventions and required genetic testing have increased the cost of mental health care. The situation has been especially difficult for developing countries with fewer resources, including a sufficient number of psychiatrists. In addition, most data come from developed countries, and it is difficult for less developed countries to be included in genetic research. Different cultural, historical, and geographical contexts must therefore be considered to develop trust and engage underrepresented populations in genomic research (Atutornu et al., 2022).

7. Commercialization of genotyping

Concerns have been raised about the growth of commercial genetic testing marketed directly to consumers without a doctor's order. This service is not regulated in most jurisdictions since it is considered a "laboratory developed test." Since the results of genetic testing for mental diseases are not easy to understand, this practice may harm consumers. The tests results may be misleading, deceptive in marketing (such as promising a diagnosis or cure, sometimes with celebrity endorsements), or with little practical use (Kutz, 2010). Furthermore, the tests may provide results only for a subset of variants and miss the disease causing gene, they often provide no genetic counseling, and genetic privacy may be compromised. Companies often convince consumers to sequence their genomes and grant the company access to their complete genetic data, yet they provide only partial results that are not always accurate (Rodrigues, 2020). These companies are then in possession of resources of interest to researchers. The transfer of data and samples across international borders also raises questions related to data security, privacy, and governance of biobank procedures (Mezinska et al., 2021). This situation calls for regulation of direct-to-consumer genetic testing.

8. Prenatal testing

Some scholars have questioned whether prenatal genetic testing for susceptibility to mental disorders is morally justified, since discrimination and stereotyping may lead to eugenic practices. The ease of embryo elimination hinders the social goal of promoting equality for individuals with disadvantages (Chipman, 2006). Francis Galton (1901) was the first to propose a program of eugenic birth control to reduce undesirable genetic traits. His ideas were pursued by the eugenics movement of the early 1900s, which in many countries targeted psychiatric patients and others considered "genetically inferior" for forced sterilization and death, including in the United States, Germany, and Scandinavia, and especially under the Nazi program of "racial hygiene" (Broberg & Roll-Hansen, 2005). Today, eugenic decisions are made by individuals rather than the state, but there are social pressures favoring the eugenic mentality.

DISCUSSION AND CONCLUSION

The difficulties in mental health care of assigning a symptom to a specific diagnostic category are further complicated by factors such as the ability of patients to consistently verbalize their experience and the perceptive capacity of health professionals who must contend with the problem of subjectivity (Demkow & Wolańczyk, 2017). The difficulty of diagnosis has the additional risk of errors or conscious abuse in the application of diagnostic categories, which may result in patients' loss of freedom, overtreatment with drugs, labeling with a mental health disorder, or facing social or legal disadvantages. Diagnosis is also limited by social context, since people with mental health problems are generally identified when they transgress the culturally dependent social norms of verbal limits and acceptable behavior. There are social factors that complicate the problem, such as pressure from relatives to hospitalize a problematic family member, the political use of the mental health system against dissidents, and abuse in criminal proceedings that use diagnoses to argue for increased or reduced responsibility or punishment (Hartvigsson, 2023). One of the reasons it is important to find biological or genetic pathways that are involved in mental illness is to have a more objective system of diagnosis.

With respect to informed consent, decision making may be enhanced with educational interventions (Moser et al., 2006; Jeste et al., 2009; Palmer et al., 2008) such as repetition of information in different modalities (e.g., multimedia, presentation software, group discussions, interactive questions). To facilitate the engagement of research participants, community-based participatory research, which focuses on community needs, may help by informing researchers about questions to address the needs of those communities and avoid harm (Smikowski et al., 2009). Informed consent procedures must incorporate better communication to promote trust and respect the autonomy of research participants.

Some authors have argued that there is a right "not to know" for genetic testing for mental illness, since knowing may not add to quality of life but reduce it: people may lose hope and self-esteem and others may treat them as already ill, conditioning their personal choices and affecting their autonomy (Andorno, 2004). However, this view has been criticized as negatively affecting the interests of patients and family members in making their own testing and lifestyle decisions. Following this reasoning, individuals should not keep the results of genetic tests private, but should share the information with family members, following a family-based rather than individual model to manage informed consent and confidentiality in genetic testing (Parker & Lucassen, 2004). The potential benefits of genetic and diagnostic information and the fact that there are marked differences in preferences and interests among individuals suggest that there should be no right "not to know" in mental illness (Bortolotti & Widdows, 2011).

There is a need to improve genetic counseling. The benefits of genetic counseling do not depend entirely on the use of genetic testing: there are other considerations. Counselors should operate under a holistic and interactive view, discussing both genetic and environmental factors that contribute to the condition examined, addressing not only emergent feelings of guilt or fear, but also the emotional consequences of the exchange of information (Austin, 2020). The counseling strategy is enhanced when it is based on psychotherapeutically oriented information exchange, including family history, patient perspectives on the causes of mental illness, discussion of the role of genes and the environment, personal vulnerability factors, protective factors, the effectiveness of medication, self-management strategies to reduce the impact of mental illness, and considerations of sleep behavior, nutrition, exercise, and social and spiritual support (Austin, 2020). Mental health genetic counseling can help patients accept their illness at a deeper level and integrate it more fully into their sense of self in a way that helps them to feel empowered (Semaka & Austin, 2019).

The discovery of genes associated with mental illness has given rise to a tendency to define it as largely or entirely due to genetics. This perspective, which has been termed "geneticization" or genetic essentialism (Arribas-Ayllon, 2016), underestimates the array of social circumstances that affect mental health, and it may prompt stigmatization and discrimination by employers or health insurance companies. Clinicians also tend to favor pharmaceutical drug treatment rather than psychotherapy for disorders attributed to biogenetic causes, and patients may be blamed if they are not proactive in preventing the onset of the disorder (Lebowitz & Ahn, 2014). Iatrogenic effects of psychiatric drugs may cause harm (Evans, 1980; van Draanen et al., 2022), and there is a dependence on the pharmaceutical industry that neglects social and preventive measures (Ortiz-Hernández, López-Moreno, & Borges, 2007). Psychosocial therapeutic interventions have been shown to complement treatment in schizophrenia, improving social functioning and helping with adherence to medication (LeVine, 2012; Westermann et al., 2015). The issue has a cultural component that must be considered. For example, in some African cultures, mental illness is understood as caused by external factors such as the influence of ancestors or bewitchment, instead of the dominant individualistic view of the human body, with an emphasis on its intrinsic genetic and biological traits in Northern-Western cultures (Kamaara, Kong, & Campbell, 2020).

The lack of certainty associated with susceptibility genotyping due to the multifactorial nature of mental disorders must be considered alongside the risks of stigmatization or discrimination. But educating the public about genetics and genomics may help to avoid prejudice. For some, the genetic character of mental disorders has the potential to reduce stigma, since it assigns no responsibility to social factors; for others it may increase stigma, since it will mean that people with mental illness are "defective" and may be viewed negatively by others. It has been suggested that the genetic influence on mental illness may decrease punitive attitudes absolving people of responsibility, but it has also been found that it increases social distance from family members because of stigma (Phelan, 2002). Other studies show that geneticization of mental illness exacerbates social distance and discrimination for schizophrenia because of public perception of the immutability, dangerousness, and unpredictability of this disorder (Bennett, Thirlaway, & Murray, 2008; Lee at al., 2014), but not for affective disorders like depression or bipolar disorder. The belief in childhood adversity provokes lower acceptance of persons with depression (Schomerus, Matschinger, & Angermeyer, 2014). Clinicians may show less empathy, understanding, and patience when treating mental disorders as biogenetic (Lebowitz & Ahn, 2014).

Achieving greater objectivity in diagnosis is one reason why it is important to find genetic origins and biological pathways that are involved in mental illness, but despite promising advances, there is still much genetic research to be done to achieve clinical relevance and predictive value. In developing countries there is little data available, and so cost-benefit studies do not recommend genetic diagnosis in these settings. Local approaches need to be enhanced to deal with mental health care. The scarcity of resources demands that policymakers set ethical priorities that strengthen community resources and find local solutions to meet mental health needs (Saxena et al., 2007; deVries et al., 2020).

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Conflicts of Interest

The author declares no conflict of interest.

Declaration

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