Globalisation and Cognitive Enhancement: Emerging Social and Ethical Challenges for ADHD Clinicians

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Abstract:

Globalization of ADHD and the rise of cognitive enhancement have raised fresh concerns about the validity of ADHD diagnosis and the ethics of stimulant drug treatment. We review the literature on these two emerging phenomena, with a focus on the corresponding social, scientific and ethical debates over the universality of ADHD and the use of stimulant drug treatments in a global population of children and adolescents. Drawing on this literature, we reflect on the importance of ethically informed, ecologically sensitive clinical practices in relation to ADHD diagnosis and treatment.

Introduction

The ethics of ADHD begin with a fundamental question: is ADHD a valid disorder?

ADHD is often framed by its critics as an example of 'medicalization' – defined as a process in which a previously non-medical problem comes to be seen as medical [1, 2]. Three kinds of arguments have been developed around ADHD and medicalization. Some analyses see ADHD as a product of medicalization and call it a 'social construction.' In practice this has led to a logical confusion: because all disorders are to some extent constructed, these disorders cannot be seen as 'real' [3]. A second argument about ADHD and medicalization runs parallel with debates over the etiology of ADHD. Here a dichotomous formulation is frequently set up between social and environmental causes on the one hand, and biological causes on the other. There is an implicit assumption that environmental and biological causes, and the related social and medical models of illness, are opposing etiological models; or, at least, that one model, rightly or wrongly, has more explanatory power than the other [4, 5, 6].

These contentions relate to the third kind of argument made about ADHD, one that recognizes the interaction of biology and the environment in ADHD diagnosis. An increasing number of developmentalists and social scientists admit to a common ground position in which ADHD is a heterogeneous condition with interacting and intersecting biological and environmental dimensions [7, 8, 9, 10]. However, there remains an important ethical concern about ADHD being over-diagnosed and about stimulant drugs being overused. In this light, ADHD may be an example of 'bad medicalization' [11]: the assumption that the phenomenon under observation is a *medical* phenomenon that requires medical treatment, is wrong and has harmful consequences. However, there is also concern in the literature that ADHD is under-diagnosed and under-treated. In this analysis, recognition of the medical nature of problems previously treated non-medically – e.g. with physical punishment or confinement of behaviorally disinhibited children – might be considered a form of 'good medicalization' [11].

Such complexities demonstrate clearly that the social and ethical problematics of ADHD do not easily reduce to a single target. There is growing awareness across disciplines of the necessity to theorise the biological and environmental dimensions of children's behavioral capacities when investigating factors that contribute to child mental health outcomes across the lifespan [12, 13, 14]. However, two recent developments have raised fresh concerns about the validity of ADHD diagnosis and the ethics of stimulant drug treatment: globalisation of ADHD, and the rise of cognitive enhancement using stimulant drugs. In this article we review the literature on the globalisation of ADHD and cognitive enhancement, drawing out the corresponding social, scientific and ethical debates over the universality of the disorder and the capacity for ADHD diagnosis and drug treatments to positively address mental health needs in a global population of children. We use these cases to reflect on the importance of ethically informed, ecologically sensitive clinical practice with regard to ADHD.

Globalisation of ADHD

The core symptoms of inattention, hyperactivity and impulsiveness, as outlined in DSM-5 [15], are part of the normal spectrum of behaviours in children and, as is the case for most other mental disorders, diagnosis of ADHD relies on subjective reports and clinical judgment [16]. The lack of a 'bright line' that demarcates normal child behaviours from ADHD has long been a cause of concerns that ADHD is over-diagnosed. Until quite recently, this concern was focused in and on the United States, where the proliferation of ADHD diagnosis and drug treatments among children and adolescents regularly makes national headlines [17]. A recent report from the US Centres for Disease Control (CDC), based on parent-report data, suggests that the lifetime prevalence of ADHD diagnosis among US 3-17 year olds is approximately 11% and that ADHD diagnosis in the US increased by 21.8% between 2003-2007 [16].

In the past few years, research on the global dimensions of ADHD diagnosis and use of stimulant drug treatments has shown definitively that ADHD is no longer a uniquely US phenomenon; rather, ADHD diagnoses and the use of ADHD medications have risen sharply in many parts of the world [18]. A series of cross-national reports indicates wide variation in reported prevalence estimates, with relatively higher prevalence of ADHD in South American countries (e.g. Columbia 20.4%) [19, 20] as compared to much of Europe and the UK (e.g. Spain: 3.1% - 6.8%; and 2%-5% respectively) [21, 22, 23, 24]. Within-country prevalence estimates also frequently vary; e.g. 2.4% - 9.9% in Australia [25, 26].

With respect to ADHD medications, increases in OECD countries' (other than the US) expenditure over the past decade exceeds the rate of increase in the US [10]. In developing world nations increases in annual spending on ADHD medications exceeded 20% over the past decade [18]. The Netherlands, Sweden and Norway have all seen significant increases in use of stimulants [27, 28]. By contrast, US growth in stimulant drug use has been slowing over the past decade, with an annual growth rate of 3.4% between 1996 and 2008 [29]. The US still consumes 66% of the world's methylphenidate, but the US proportion of global use has been dropping over the years; in 2007, the US proportion of global use was 83% [30, 28].

The evidence of global variation in ADHD diagnosis has resurrected the question of the validity of the diagnosis and, therefore, its universal applicability. Some have argued that variation in ADHD prevalence estimates is evidence that ADHD diagnosis is a matter of social judgment and therefore ADHD cannot be said to be an objective, universal disorder [31]. However, a widely-cited meta-analysis [23] has found that methodological differences (application of different diagnostic criteria, diverse informant sources, and application of the impairment criterion) rather than what is termed 'cultural' differences in epidemiological studies account for most of the cross-national variation in prevalence estimates of ADHD. When these methodological differences are taken into account, it is estimated that approximately 5% of the global population of school children meet criteria for ADHD.

The calculation of a global estimate of ADHD prevalence has motivated debate within psychiatry and in bioethics. In an editorial commentary published in *The American Journal of Psychiatry*, Moffitt & Melchior [32] argue that the discovery that diagnostic methods rather than 'culture' explain global variation in prevalence estimates shows definitively that ADHD is not a 'social construction' [32]. Amaral [33] in a response to Moffitt & Melchior, points out that consistency in geographic prevalence does not mean necessarily that the phenomenon is interpreted the same way around the world. In a related analysis, bioethicists Parens & Johnson [8] similarly argue that diagnostic thresholds are "not inscribed in nature" and point out that "two reasonable and widely used diagnostic systems, DSM IV and ICD 10, draw [diagnostic thresholds] at different places" [8]. Finally, if diagnostic criteria are themselves a product of social and cultural processes, then the assumption that it is possible to separate 'method' from 'culture' is a mistake, with potentially harmful consequences. Bass et al [34] note that "uncritical application of standard diagnostic criteria (such as the DSM) cross-culturally might yield misleading or erroneous results where such criteria are locally inappropriate" [34 pg 918].

Concerns about globalisation of diagnosis are more broadly reflected in a popular book by the journalist Ethan Watters, entitled, *Crazy Like Us: The Globalization of the American Psyche* [35]. Watters argues that extension of DSM norms into the developing world is a significant ethical problem, in that these norms impose a distinctly American construction of normality on local populations in the name of science. The book echoes, and draws upon, a substantive body of work in transcultural psychiatry [36] and global pharmaceuticalization [37, 38] to critique the universalistic assumptions of DSM and to show that, among other harms, globalizing DSM diagnoses creates an open invitation to pharmaceutical companies to peddle psychotropic drugs and diagnoses to a potentially huge and novel global population.

A similar tension underlies the emerging debate over the NIMH Grand Challenges in Mental Health Initiative [39], created after two special issues in the *Lancet* called attention to the urgent problems of untreated mental illness, barriers to mental health services, stigma and violence towards people with mental illness in the developing world [40, 41]. The global mental health movement, which is backed by the United Nations and the World Health Organisation, is seen by critics as a powerful, politically and economically motivated effort to universalize Western psychiatric categories [42, 43]. The potential harms identified in this approach are both social and ethical; for example, Farmer has proposed that biomedical models in some low-resource settings potentially disregard or exacerbate "structural violence" in that they locate dysfunction and disorder in the individual and allow surrounding socio-political conditions that impact upon mental and physical wellbeing to be ignored [44].

Canino & Alegria [45] usefully frame the debate arising from the globalisation of ADHD by outlining the contrast between a 'relativistic view' of ADHD and a 'universalistic' view. Relativists hold that 'culture' shapes development to an extent that a diagnosis cannot and should not be considered to represent

universal or natural phenomena. However, if the diagnosis entails cultural sensitivity, and carefully distinguishes between internal and external dysfunctions [6, 46] it may be meaningfully applied to manage and treat an individual's suffering. The universalistic perspective claims that psychiatric disorders are universal, but that the manifestation of symptoms as well as the onset of symptoms can be influenced by cultural factors [47].

A drawback of this framing is the lack of differentiation around the concept of 'culture.' We prefer the less ambiguous concept of an ecological system [48] when conceptualizing the various factors that may shape the manifestation and onset of symptoms. The ecological system incorporates the individual, relational and social, as well as the broader political and cultural aspects that structure and shape child development. We emphasize this tiered, structured system in this review; and we limit our use of 'culture' to refer to a shared system of beliefs and practices. When referring to country-level analyses, we use 'nation.'

The question of universalism may have a significant impact on the scientific direction and on the perceived ethics of future ADHD research in a global context. From the universalistic perspective, the key to valid research on ADHD global prevalence is methodological standardization: Polancyzk & Jensen [24] state that until "**common**, in-depth diagnostic methods and similar sampling frames" [our emphasis] are utilized as part of large international studies, it will be impossible to provide an accurate estimate of global prevalence of ADHD [24 pg248]. However, framing the standardisation of global diagnostic methods of ADHD as a strictly methodological problem assumes universal validity of the diagnosis. It also neglects the ethical dimensions of relative harms and benefits of globalisation outlined above.

Global Diagnosis, Equity and Access to Treatments

The strong critique of globalisation of ADHD diagnosis and treatments is not easily reconciled with what many researchers believe is a critical problem of *under* –diagnosis and *under*-treatment of ADHD. There is ample evidence that children suffer as a consequence of unmet mental health needs [49, 50] which may reflect global and local inequities in access to mental health services and appropriate treatments. Such inequities violate basic principles in global health ethics, such as the universal human right to health [51].

The majority of research on variation in ADHD diagnosis and treatment has taken place in the US. Here, geographic variation, poverty, gender and race/ethnicity are significantly associated with rates of ADHD diagnosis and use of stimulant drug treatments. ADHD diagnosis rates are lower in the West and higher in the Southern part of the US; and medication use is also generally higher in the South [52, 29]. There are concerns over-diagnosis and overuse of ADHD treatments particularly among White adolescents in affluent communities [53, 29]; however, the picture among ethnic minorities and relatively less affluent children is more complex. Poor children are more likely to meet criteria for ADHD diagnosis, but they are also less likely to receive stimulant drug treatment than relatively wealthier diagnosed children [54, 16]. Children in Medicaid

programs have higher unmet mental health needs; and are less likely to receive treatment that meets quality of care standards [55, 56]. Children without health insurance are less likely to receive a diagnosis of ADHD [57].

Diagnosis and treatment rates among US ethnic minorities are a longstanding area of concern. Insurance provider data [53] indicates that rates of ADHD diagnosis among ethnic minorities are rising: Diagnoses among African-American children increased by 70% between 2001 – 2010 (from 2.6% of all Black children 5-11 years old to 4.1 percent). Diagnosis rates among Hispanic children increased by 60% in the same period, from 1.7% - 2.5% of all Hispanic children [53]. Overall, however, US ethnic minority children are less likely than US White children to receive a diagnosis of ADHD [57]. Hispanic children have the lowest rates of ADHD diagnosis among US children [16], while African-American children are almost as likely to be diagnosed with ADHD and treated with stimulant medication as White children [58]. Of US children diagnosed with ADHD, ethnic minorities are less likely to be treated with medication for the disorder [57].

With respect to social and cultural factors, stigma is a significant barrier to diagnosis and treatment among US White and ethnic minority populations, a source of suffering for parents, caregivers and children, and a possible motivation for the proliferation of reductive and simplistic models of mental illness in the media and other areas of public life [59, 60, 61]. Mothers are particularly at risk of 'courtesy stigma,' which can be understood as negative associations, such as anger and blame, conferred upon a person who closely associates with a diagnosed individual. Experience of courtesy stigma is likely to be a factor in mothers' own mental and emotional health; in their communication with children and with others about a child's diagnosis, and in their willingness to promote compliance with ADHD treatments [62, 63].

From a global perspective, the social conditions and consequences of ADHD diagnosis and treatment are relatively poorly understood. A diverse set of local studies by social scientists is emerging, which indicate that public stigma is associated in complex ways with ADHD services and treatments in the UK and in some EU countries [64, 65]. In some of these cases public stigma is related to negative public perceptions of children and adults with ADHD [66, 67]; controversy over whether or not ADHD is a 'real' disorder [68]; distrust in drug treatments; and concerns about medicalised education and child rearing [69]. In some countries, parent-group and patient activism has been organized to help redefine ADHD as a valid condition or to have it recognised as a 'cognitive disability' that requires public provision of health and social assistance to children and families [70].

Comparative and cross-national research [5, 70, 66] has revealed both overlapping and divergent representations of ADHD among children, parents, teachers, and the public. These representations result in different approaches to managing ADHD, including resistance to psychiatric labels and medication. Italy, France, Argentina and notably Brazil have historically emphasized psychoanalytic approaches to child mental health, and an anti-biological

psychiatry critique remains strong [71, 72]. Other culturally situated dimensions of ADHD services and treatments are not well understood. For example, traditional beliefs are likely to play a role in parents' access to mental health services for children: A study conducted in Goa, India finds that parents resist a biomedical explanatory framework for children's behaviour and that religious interventions for ADHD are common [73]. This corroborates evidence from research among ADHD clinicians in Ghana, where parents frequently consult traditional healers alongside psychiatrists to manage difficult behaviors in children (Broer, Kraaken & Singh, unpublished data).

Better Diagnosis in a Global Context

In the midst of much theoretical, social and ethical debate, clinicians play an important role in helping families and children to balance the uncertainties around ADHD with an informed understanding of a child's needs, capacities and options, given the broader social ecology the child inhabits. In this review, we refer to the clinical challenge of managing this balance as 'ecologically sensitive' clinical practice.

Finer-grained analyses of clinical practices indicate that clinical diagnosis and treatment practices in ADHD vary considerably. In the US, rates of ADHD diagnosis and rates of stimulant drug treatment have been shown to vary widely by age and type of medical professional, and by the number of diagnosing professionals in an area [52, 74]. Medical professionals frequently do not adhere to best practice guidelines for treatment and follow up of ADHD [75]. Individual physicians have reported using drug treatment as a quick-fix solution for children in low-resource settings, on the basis that treatment is better than doing nothing to address the child's suffering [76]. Many children with ADHD report a lack of a trusting relationship with their doctor, whom they perceive as overly focused on pragmatic concerns such as side-effect checks and repeat prescriptions [77, 78].

Commenting on the debate over increasing ADHD diagnosis and treatment, Froehlich suggests that what is needed is not *less* use of drug treatments, but "better diagnosis" [79]. What would constitute 'better diagnosis' in a global context? One approach to better diagnosis is to modify existing diagnostic instruments so that they are more sensitive to social and cultural factors; e.g. ethnic and racial differences in language, comfort with interviewers, and perceptions of behavior [80]. However, such adjustments are likely to be insufficient in themselves.

The present review suggests that the epidemiological goal of consistency in diagnostic criteria and methods [24] must be considered alongside the challenge of ecologically sensitive practices. It may be that a combination of universalistic and relativistic perspectives ideally inhere in 'better' diagnosis [45]. It is increasingly clear that elements of 'culture': e.g. history, family, food, and particular kinds of social relations and networks play an important role in gene-environment interactions that contribute to ADHD etiology [81]. Better diagnosis from an ecological point of view would encourage specification of such

environmental factors and their impact on ADHD prevention, identification, treatment and outcomes.

First-person accounts that provide an understanding of local explanatory models of illness and behavior, stigma experiences, child behavioral norms, and manifestations of distress and suffering in the broader socio-political context are also needed to help ensure ecologically sensitive assessments and treatments [82, 83, 84]. To lower the threat of structural violence, such as the possibility of individualising or socio-political uses of diagnosis; to break the stigmatizing link between ADHD diagnosis and drug treatment; and to increase the possibility that a diverse group of global families will accept effective interventions, a major funding commitment should be made to develop non-drug treatment options in partnership with medical professionals and relevant stakeholders in national settings.

In the context of global challenges related to ADHD, the goal of 'consistent' diagnosis may turn out to be incompatible with the goal of 'better' diagnosis across local and national ecologies. A more sustainable approach may require integration of global mental health strategies and goals with sensitive cultivation of local mental health-related resources around diagnostic and treatment practices. Given the controversies surrounding ADHD, medical professionals need to be particularly aware of systemic challenges to the dual aims of better diagnosis and more effective use of stimulant drug treatments within local ecologies. In the next section of this review, we consider the rise of cognitive enhancement as one such a challenge, which has grown up largely around the use of stimulant drugs in the US context, but which increasingly reflects the shifting boundaries in ADHD diagnosis and treatment in a global context.

Diagnostic practices and diversion of stimulants for cognitive enhancement

Cognitive enhancement (CE) is defined as the use of substances or devices (e.g. stimulant drugs) to improve cognitive and/or behavioural functioning and performance where cognitive and/or behavioural functioning is not judged to be impaired [85]. ADHD drugs, including methylphenidate and its compounds, as well as amphetamine products, such as Adderall, are among the most common drugs used for CE purposes.

The effectiveness of stimulant drugs for CE purposes in healthy subjects currently lacks firm empirical validation and studies suggest that stimulants have an unreliable and small effect on cognition, with some findings demonstrating impaired performance [86, 87]. A meta-analysis of 19 randomised controlled trials found significant effects of methylphenidate on longterm memory consolidation but no effects were found on attention, mood or executive functions [88]. Methylphenidate appears to be more effective as a cognitive enhancer in subjects with lower baseline performance on some cognitive tests and in those who reported more impulsiveness [89]. However, available findings often have methodological limitations and null results tend not to be published. Despite the lack of objective data confirming CE benefits, respondents have been shown to experience and believe the drugs to be effective [90, 91]. In line with

these findings, some suggest that the primary effect of cognitive enhancers is not cognitive but rather affective and motivational [92].

While concerns about CE becoming the norm among university students may be over-estimated and over-hyped, [93], CE practices are nevertheless a relevant concern. Prevalence estimates of non-prescription stimulant use from the US range from 5%-35%, while among members of US fraternities and sororities the proportion of CE users may be even higher [89]. Less data is available on CE in Europe, although studies of CE among student populations are increasing. Available figures suggest that prevalence is considerably lower than in the US, ranging from 0.78% to 6% [94,95, 86]. Nevertheless in light of the US problem, some European governments have begun to consider CE as part of health policy deliberations. The UK Parliament has requested guidance on minimizing the risks of diversion and misuse of stimulants in UK universities [96]; and the Italian Bioethics Commission recently issued a report on neuroenhancement which will guide the government's position and activities related to CE [97].

A nation's medical supply of stimulants can be a primary source of stimulants for CE purposes. A preliminary estimate indicates that in 2008 approximately 30% of the US medical supply of stimulants was diverted for non-medical purposes [98]. University health clinics in the US have been criticized for failing to perform adequate assessments before prescribing stimulant drugs [99, 100]. Some US universities have put measures in effect to minimize ADHD diagnoses in campus mental health clinics and to track the flow of prescription drugs on campus [101]. A recent review, however, found no evidence of an association between increased prescribing and prevalence of diversion and misuse [102].

Students also feign symptoms of ADHD in order to obtain a prescription. Research suggests that none of the currently used symptom checklists, neurocognitive tests and symptom validity tests have proved effective in discerning feigners from those who have the disorder [103]. On certain US campuses, drugs like Adderall and Ritalin are offered to other students by those who have prescriptions; one early study found that one-fifth of young people reported giving, selling or being forced to share their prescription medications [104, 105]. A more recent survey showed that by the end of college, over 60% of students have been offered prescription stimulants, and 31% had used them primarily for study-related purposes. Furthermore, overuse of a legitimate prescription increases during college [106], and studies show that up to 25% of students misuse their prescription medication to get high [103].

Physical harms of stimulant drug use in healthy populations are still largely unknown. The addictive potential of stimulants in healthy subjects may be higher than in diagnosed children; and polypharmacy, including off-label drug use, may be more likely in young people taking stimulants for CE purposes, with unknown effects [98]. Students use stimulants for recreational purposes as well as for their studies [107]. On the other hand, numerous surveys have highlighted a significant correlation between CE use and self-reported attention problems [108], which may suggest that there is unmet medical need in certain student populations.

The link between ADHD medications and CE points to the shifting boundaries of diagnostic validity, and, to some observers, indicates the futility of efforts to make universal distinctions between normality and abnormality [8]. Some ethicists have argued that CE is a legitimate, even desirable human aim [109, 110]; and the aim of oversight should be to ensure safety and responsible use [111]. The American Academy of Neurologists reached a similar conclusion, albeit for different reasons, and has declared their members justified in prescribing CEs to healthy patients upon request [112].

While channelling access to cognitive enhancers through the health care system could be a reasonable and safe route in terms of minimizing adverse effects, reports have highlighted the concern that this incorporation of lifestyle interventions would put extra pressure on the already overburdened mental health services sector [113, 114). Others have argued that while there may be sound ethical reasons for clinicians to become gatekeepers to CE drugs for adults, these reasons should not be automatically extended to young people, even if CE does become the norm and many young people come to desire and pursue stimulant drugs for cognitive enhancement [115]. In their most recent position paper, the American Academy of Neurology argues that it is not justified to prescribe cognitive enhancers to children and adolescents without a diagnosis of a disorder [116]. Systematic investigation of ethical harms or benefits, physical side effects, dosing practices, motivations for use, and expectations of use among healthy adolescent CE users has not been conducted.

If the use of stimulant drugs for CE purposes continues to increase, it will be necessary for professional societies whose members are involved in matters related to diagnosis and treatment of ADHD to take a position on cognitive enhancement, which may then inform (or be informed by) state or national guidelines and policies. In the near term, ecologically sensitive diagnostic practices can attend to identification and management of the local and national drivers of CE in diverse communities of adolescents. Medical professionals who prescribe stimulants should use the clinical setting as a space to help individuals and families to reflect on local social and performance norms as part of an ADHD evaluation, to support informed decision-making around stimulant drug and other treatments, and to ensure adequate record-keeping and tracking of stimulant drug prescriptions.

Conclusion

Globalisation of ADHD and the rise of cognitive enhancement have inspired fresh concerns about the validity of ADHD diagnosis and the intended aims of stimulant drug treatments. The challenge for medical professionals, researchers and other relevant stakeholders is to balance genuine efforts to promote global child mental health and wellbeing with curiosity and respect for diverse approaches to child development across local and national settings. Integrating this balance into the development and application of robust set(s) of diagnostic criteria and guidelines for ethical use of treatments is difficult but not impossible. It will require an extensive investigation of ecological systems,

including local child development practices, expectations and beliefs; and an explication of individual, social and structural factors that shape pathways to ADHD diagnosis and treatments, for purposes of treatment and for enhancement (to the extent that these can be distinguished).

Given accumulating evidence that historical and ecological factors may also contribute to epigenetic mechanisms underlying mental illness pathways, research in these areas should be systematically integrated with developing research on biomarkers for ADHD and genetically related disorders. There is increasing focus on the need for early intervention and prevention approaches in ADHD [117]. Investigation and observation of the potential social and ethical harms and benefits of these approaches, particularly in a global context, should be integrated with ongoing scientific research and policy agendas [118, 119, 12]. Finally, we note that research on global ADHD in the ecological framework proposed here necessarily requires multi-disciplinary collaborations between scientists and researchers with requisite skills in ecologically-sensitive research (e.g. anthropologists, sociologists and empirical bioethicists).

Compliance with Ethics Guidelines

Conflict of Interest

Ilina Singh - none
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Human and Animal Rights and Informed Consent

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** Of major importance

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