

Challenges in ADHD care for ethnic minority children: A review of the current literature

Transcultural Psychiatry
2020, Vol. 57(3) 468–483
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DOI: 10.1177/1363461520902885
journals.sagepub.com/home/tps



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Abstract

While attention deficit hyperactivity disorder (ADHD) has been extensively studied in the past decades, the role of social and cultural practices in its assessment, diagnosis, and treatment has been often overlooked. This selective review provides an overview of research that explores social and cultural influences on help-seeking behavior in ethnic minority children with ADHD. Studies were selected that address cultural diversity in three areas of ADHD help-seeking: problem recognition, access to mental health services, and treatment. Special attention was given to studies of treatment selection and adherence in minority groups. Findings suggested that cultural disparities in ADHD care among ethnic minority children occur in the early stages of problem recognition, through service selection, and in the quality of treatment. Ethnic minority children were less likely than their nonminority counterparts to be diagnosed with ADHD and its comorbid conditions and less likely to be prescribed and adhere to stimulant drug treatment. These differences reflect cultural diversity in norms and attitudes towards mental health issues (e.g., fear of social stigma) as well as limited access to qualified health care. Paradoxically, cultural, racial, and language bias may also lead to the overidentification of ethnic minority children as disabled and to higher ratings of ADHD symptoms. This review highlights the importance of sociocultural factors in understanding developmental psychopathology and help-seeking behavior. In addition, it further supports calls for increasing cultural competence in communications during clinical assessment, diagnosis, and treatment in minority communities. Clinical, theoretical, and methodological considerations for future research are discussed.

Keywords

ADHD, culture, ethnic minorities, service utilization, treatment adherence

Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders of childhood, with an estimated worldwide prevalence of 7.2% in children and youth under 18 (Thomas, Sanders, Doust, Beller, & Glasziou, 2015). Wide variations in the diagnosis and treatment rates of ADHD across cultures have questioned the validity of the diagnosis and, therefore, its universal applicability. While some have argued that cross-national variations in estimated prevalence of ADHD mainly reflect methodological differences (i.e., the application of different diagnostic and impairment criteria, diverse informant sources; see Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007), others have suggested that ADHD is a matter of social judgment and does not have the same clinical and cultural meaning across contexts

(Amaral, 2007; Hinshaw & Scheffler, 2015; Timimi & Taylor, 2004). Based on a case study of Portugal, where ADHD is still undergoing definition and validation, Filipe (2016) suggests that the making of the diagnosis is a situated process, whereby ADHD is shaped by both global standards and local, culturally specific forms of knowledge and experience.

ADHD diagnosis and treatment rates among ethnic minorities are a longstanding area of concern. “Ethnic minorities” refers to people whose ethnic origins, religion, language, or culture differs from that of the

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majority of the population (Bhopal, 2004). This definition covers a wide range of people and groups living in different social and political situations such as historical national minorities, migrants and migrant workers, refugees and asylum seekers. Cross-cultural studies in the United States have shown that ethnic minority children are assessed and treated at a much lower rate than their nonminority counterparts for ADHD symptoms (Morgan, Staff, Hillemeier, Farkas, & Maczuga, 2013; Ray et al., 2006). European studies have also reported lower rates of ADHD diagnosis and treatment among immigrant children as compared to nonimmigrants (Arat, Ostberg, Burström, & Hjern, 2018; Knopf, Hölling, Huss, & Schlack, 2012; Schlack, Hölling, Kurth, & Huss, 2007; Wittkamp et al., 2010). Similar findings on ethnic disparities in ADHD care have been documented in Muslim and Druze Arab minority children in Israel (Farbstein, Mansbach-Kleinfeld, Auerbach, Ponizovsky, & Apter, 2014; Mahajna, Sharkia, Shorbaji, & Zelnik, 2016; Ornoy, Ovadia, Rivkin, Milshtein, & Barlev, 2016). Of the studies reviewed, only one addressed ADHD prevalence among refugee children. This Swedish study found a large overlap between ADHD and posttraumatic stress disorder (PTSD) with approximately 90% of children diagnosed with ADHD meeting criteria for PTSD. A higher prevalence of ADHD was also evident in refugee children and adolescents whose parents had experienced trauma (Daud & Rydelius, 2009).

Despite growing concerns about the underdiagnosis and undertreatment of ADHD among certain minority groups (Coker et al., 2016), some studies suggest that minority children are overdiagnosed with neurodevelopmental disorders and disabilities, and are disproportionately represented in special education (Froehlich et al., 2007; Sullivan & Bal, 2013). For example, a recent nation-wide Finnish study found that children of immigrant parents were diagnosed with ADHD more often than those whose parents were born in Finland (Lehti, Chuda, Suominen, Gisser, & Sourander, 2016). Higher risk of ADHD was attributed to increased exposure to environmental risk factors and to cultural, linguistic, and racial biases. Some have argued that minority children experience systemic forms of prejudice resulting in their abilities and behaviors being unjustifiably characterized as problematic and atypical (Hays, Prosek, & McLeod, 2010; C. O'Connor & Fernandez, 2006), as well as being segregated into special education (Blanchett, 2006; D. K. Reid & Knight, 2006).

Ethnic diversity in the diagnosis and treatment of ADHD is multifactorial and it may be difficult to isolate cultural factors related to ethnicity (e.g., cultural norms of behavior, attitudes towards mental health issues, fear of social stigma) from factors related to

the underutilization of mental health services among ethnic minorities (Olaniyan et al., 2007). Nonetheless, it is possible to identify specific types of problems that can adversely affect clinical outcomes for minorities. Several models have been developed to determine how, where, and when individuals receive help for mental disorders (e.g., Pescosolido, 1992; Pescosolido, Wright, Alegria, & Vera, 1998; Power, Eiraldi, Clarke, Mazzuca, & Krain, 2005). Central to these models is the assumption that when faced with a mental health concern, individuals must accept the idea that they have a problem, weigh the "pros" and "cons" of different approaches to the problem, and decide whether they are willing to seek help. Finally, individuals must select and then access the type of service they think they need (Veroff, Kulka, & Donovan, 1981). One of the most influential models of service utilization is the behavioral model of health service use (Andersen, 1995), which postulates that the use of health services is a function of the predisposition to use services (socio-demographic characteristics), factors that enable or impede their use (e.g., income, employment status, social support), and need indicating the illness level (e.g., symptom perception, self-perceived health, disease severity, chronic disease; Andersen, 1995). The behavioral model of service use has been revised and expanded to include social and cultural practices and attitudes in help-seeking (Cauce et al., 2002; Eiraldi, Mazzuca, Clarke, & Power, 2006; Fernandez-Mayoralas, Rodriguez, & Rojo, 2000). These studies demonstrated the effects of culture and context across the mental health help-seeking pathway of ethnic minority children and adolescents, including problem definition and identification, decision to seek help, and choice of treatment providers.

The aim of this review is to provide an overview of the research that has explored social and cultural influences on help-seeking behavior in ethnic minority children with ADHD. Based on the help-seeking model developed by Andersen (1995), we present a model of ADHD care that begins with problem recognition, moves to service access, and ends with treatment. Special concern is given to variables predicting treatment selection and adherence in ethnic minorities. These three steps in the help-seeking pathway serve as the organizing framework for examining what we know about the role of culture in this process. While previous research has been limited to African American and Hispanic children (Morgan et al., 2013), our aim is to expand it to culturally related patterns of ADHD care in other minority groups, both in and outside the United States. Identifying predictors of ADHD care may help researchers and clinicians to improve identification and treatment for ADHD among children of ethnic minority background and maximize the utility of

resources and effectiveness of interventions to reduce the service gap (Eiraldi et al., 2006).

Method

To locate studies for this review, we searched PsycINFO, Entrez-PubMed, and PsycARTICLES databases. The search consisted of the following key terms or key term combinations: ADHD, minority, ethnicity, immigrant, refugees, culture, treatment, medication, health service, adherence, and compliance. These search terms narrowed the list of relevant articles to those describing the role of culture and its impact on the assessment, diagnosis, and treatment of ADHD in minority children. Grey literature focusing on ethnicity and ADHD, such as unpublished dissertations and reports (e.g., Bryant, 2005; Holm-Hansen, 2006; Moon, 2012, 2016), was also included. We also incorporated data from qualitative studies based on focus groups (Guevara et al., 2005) and in-depth interviews (AlAzzam & Daack-Hirsch, 2015; Din-Mond Young, 2012) exploring minorities' attitudes towards ADHD, as well as previous review articles (see e.g., Eiraldi et al., 2006; Miller, Nigg, & Miller, 2009).

Results

While not claiming to be exhaustive, this review seeks to summarize current literature on the role of sociocultural factors in ADHD care among children from an ethnic minority background.

The framework presented here follows a three-step model of mental service utilization: problem recognition, access to mental health services, and treatment. Table 1 (see below) presents ADHD studies that included at least one group of ethnic minority children in their sample.

Cultural factors in problems recognition

Problem recognition is the first step in the help-seeking process. The following section examines the influence of culturally relevant factors such as norms, beliefs, and values on the way members of various cultural groups view and respond to problematic behavior in children.

Problem identification. Behavior considered problematic and requiring medical attention in one culture may be perceived as the typical normal behavior of an active child in another. In some contexts, children may display disruptive behavior that is considered by adults to be unacceptable; however, parents from different cultures often have varying thresholds for differentiating normal from abnormal child behavior (Parens & Johnson, 2009; Roberts, Alegria, Roberts, & Chen, 2005).

Studies suggest that African American parents have a different perception of ADHD than Caucasian American parents, the latter involving lower thresholds for problem recognition and treatment seeking.

Moreover, African American parents were less likely than Caucasian parents to involve the school in the problem-identification process and expressed fewer concerns about ADHD-related school difficulties (Bussing, Gary, Mills, & Garvan, 2003; Miller et al., 2009).

Cultural factors may be linked to differences in the explanations offered for odd or undesirable behavior. Differences in the definition of behavioral problems may also lead to different rates of reporting symptoms of ADHD. In a study with parents of children with learning disabilities or emotional problems, Bussing, Schoenberg, Rogers, et al. (1998) demonstrated that African American parents were more likely to refer to their child's condition as a behavior problem or as an inherent characteristic implying that the child was "bad," whereas most Caucasian parents referred to it as a medical syndrome. Moreover, African American parents were found to be less informed about ADHD than Caucasian parents, and more likely to attribute ADHD to other causes such as excessive dietary sugar (Bussing, Schoenberg, & Perwien, 1998; Bussing et al., 2012). Variations in the interpretation of behavior are found not only among parents from different cultural backgrounds, but also among school personnel and health care providers.

Attitudes of teachers might be of particular importance for children with ADHD, considering that difficulties at school are the most frequent reason for their initial referral for diagnostic evaluation (Mueller, Fuermaier, Koerts, & Tucha, 2012). Epstein et al. (1998) found that teachers tend to rate African American children higher on ADHD and conduct-related symptoms, which may reflect either actual behavioral differences or rating biases. This is the case, for instance, of a study conducted by de Ramirez and Shapiro (2005) where Hispanic and White teachers were asked to rate hyperactive-inattentive behaviors in White and Hispanic children. Results showed that Hispanic teachers reported higher mean scores on the Hyperactivity-Impulsivity Scale than White teachers, but only on the ratings of the Hispanic students and not the White students. These findings suggest that teachers' perception of deviance may be partially mediated by cultural values more than ethnicity.

Furthermore, mental health professionals may be biased towards interpreting child behavior based on ethnicity, reducing opportunities to be referred to ADHD care. For example, mental health providers tended to associate the behavior of African American

Table 1. ADHD in ethnic minority children: A summary of reported studies.

Source	Location	Minority population	Main outcomes
AlAzzam and Daack-Hirsch (2015)	US	Arab mothers	Mothers' perceptions of childhood ADHD
Arat et al. (2018)	Sweden	European immigrants, non-European immigrants or a mixture	Medication use
Arnold et al. (2003)	US	African American and Hispanic	Treatment attendance, stimulant response Final medication dose Parent and teacher reports Parent training attendance
Baker, Arnold, and Meagher (2011)	US	African American and Hispanic	Enrollment and attendance in a parent training prevention program for conduct problems
Bauermeister et al. (2003)	US	Hispanic	Extent of stimulant and psychosocial treatment for ADHD
Bussing, Schoenberg, and Perwien (1998)	US	African American	Parental knowledge and information about ADHD
Bussing, Schoenberg, Rogers, Zima, and Angus (1998)	US	African American	Parents' knowledge Social support seeking help
Bussing et al. (2003)	US	African American	Parental support networks Receipt of mental health treatment
Bussing et al. (2012)	US	African American	Parents' and adolescents' perception and knowledge about ADHD Cues to action Information sources
Coker et al. (2016)	US	African American Hispanic	Parent-reported ADHD diagnosis and medication use
Cummings, Ji, Allen, Lally, and Druss (2017)	US	African American Hispanic	ADHD treatment quality
Daud and Rydelius (2009)	Sweden	Refugee children from Iraq, Egypt, Morocco, and Syria	ADHD prevalence PTSD prevalence Conduct disorder prevalence
De Ramírez and Shapiro (2005)	US	Hispanic	Teacher reports of children behavioral problems
DosReis et al. (2003)	US	African American Hispanic	Parental perceptions and satisfaction with stimulant medication
Epstein, March, Conners, and Jackson (1998)	US	African American	Teacher reports of children behavioral problems
Farbstein et al. (2014)	Israel	Druze Muslim Arab	ADHD prevalence Comorbidity rates MPH use Help-seeking patterns
Ghosh, Holman, and Preen (2017)	Western Australia	Children born in Africa, Asia, Middle East, or South America	Stimulant use for ADHD
Hazel-Fernandez, Klorman, Wallace, and Cook (2006)	US	African American	Impact of methylphenidate on task performance
Ji, Druss, Lally, and Cummings (2018)	US	African American and Hispanic	Stimulant use for ADHD

(continued)

Table 1. Continued.

Source	Location	Minority population	Main outcomes
Jones et al. (2010)	US	African American and Hispanic	Benefit received from treatments for ADHD (as measured by parent and child behavior)
Knopf et al. (2012)	Germany	Immigrant families (not specified)	ADHD prevalence determinants and spectrum of ADHD medication
Lehti et al. (2016)	Finland	Children of immigrants born in sub-Saharan Africa, Latin America, North Africa, and Middle East	ADHD prevalence
Lipkin, Cozen, Thompson, and Mostofsky (2005)	US	African American	Effects of age, race, and insurance type on stimulant dosage for ADHD
Mahajna et al. (2016)	Israel	Arab children	ADHD subtype Comorbidity rates
McConeghy (2016)	US	African American and Hispanic	Sustained release (SR) versus immediate release (IR) stimulant prescription for ADHD
Morgan et al. (2013)	US	African American and Hispanic	ADHD diagnosis
MTA Cooperative Group (1999)	US	African American and Hispanic	Efficacy of behavioral and medication treatment for ADHD
E. O'Connor, Rodriguez, Cappella, Morris, and McClowry (2012)	US	African American and Hispanic	Efficacy of intervention program to reduce child disruptive behavior
Olaniyan et al. (2007)	US	African American	Parents' perceptions of childhood behavior problems and ADHD
Ornøy et al. (2016)	Israel	Muslim Arab	ADHD prevalence
Perry, Hatton, and Kendall (2005)	US	Hispanic families	Parents' experience of ADHD
Pham, Carlson, and Kosciulek (2010)	US	African American and Hispanic	Parental knowledge and beliefs about ADHD
M. J. Reid, Webster-Stratton, and Beauchaine (2002)	US	African American, Hispanic, and Asian	Effectiveness of parent training intervention
R. Reid et al. (1998)	US	African American	Teacher reports on ADHD-related symptoms
Saloner, Fullerton, and McGuire (2013)	US	African American and Hispanic	Treatment with long-acting medication for ADHD
Schlack et al. (2007)	Germany	Immigrant families (not specified)	ADHD diagnosis
Schmitz and Velez (2003)	US	Hispanic	Maternal assessments of children's ADHD symptoms
Schneider and Eisenberg (2006)	US	African American and Hispanic	ADHD diagnosis
Tamayo et al. (2008)	US	Hispanic	Response to atomoxetine
Van den Ban et al. (2015)	the Netherlands	Children of Moroccan, Turkish, and Surinamese background	Medication use
Visser et al. (2014)	US	African American and Hispanic	ADHD diagnosis and treatment
Wittkamp et al. (2010)	the Netherlands	Turkish and Moroccan immigrants (first and second generation)	Psychotropic drugs prescriptions

Note. ADHD: attention-deficit/hyperactivity disorder; MPH: methylphenidate.

adolescents to criminal orientations, whereas negative behavior among White adolescents was attributed to mental health problems. Consequently, minority adolescents, particularly those from an African American background, were more likely to be referred for restrictive measures and service placements, rather than community-based interventions (Slade, 2004).

Fear of stigmatization. Stigma surrounding the ADHD diagnosis is one of the major mechanisms causing cultural differences in its recognition (Ghanizadeh & Jafari, 2010; Perry et al., 2005; Taylor & Leitman, 2003). In a qualitative study, Olaniyan et al. (2007) found evidence of racial concerns about the stigma of ADHD diagnosis among African American participants. While some believed that a diagnosis of ADHD is associated with a lifetime label, others viewed its medicalization as a form of social control with historical roots. Similarly, a recent phenomenological study with a group of Arab mothers identified their sense of stigma as a barrier to seeking mental health help for their children with ADHD (AlAzzam & Daack-Hirsch, 2015). Pressures from family and friends to refrain from seeking treatment, fears that the diagnosis may jeopardize future employment or the ability to serve in the military, concerns that parental skills will be questioned, and fear of the unknown are other factors described by patients and families that may impact the diagnosis and treatment of ADHD (Bailey & Ofoemezie, 2013). In addition to these factors, public discrimination and racial stigmatization towards minorities may also contribute to the observed ethnic health disparities (Taylor & Leitman, 2003). Kendall and Hatton (2002) have emphasized the need to address racism as a primary source of health disparity. Using ADHD research as an example for how racism invades health care decisions, they suggest that learning and behavioral problems that often are viewed as medical problems in nonminority children are more likely to be stereotypically viewed as being the result of poor parenting, lower IQ, use of substances, violence, or poverty in African American children. Such harmful differences in the way that ADHD symptoms are recognized and interpreted by families, practitioners, and scholars may further increase parental stress and contribute to delays in accurate diagnosis and treatment.

Limited knowledge about ADHD. Parents' limited knowledge about ADHD may also explain cultural diversity in problem recognition. Knowledge about ADHD includes various aspects of information about the disorder, including etiology, symptoms, treatment possibilities, and expected outcomes. Although an American study suggested that ethnic minority parents,

particularly African American and Hispanic families, appear just as knowledgeable about ADHD and its treatment as Caucasian parents (Pham et al., 2010), there are still gaps in accessing information among minority groups. Research suggests that Hispanic and African American parents are less likely than Caucasian parents to endorse causes consistent with biopsychosocial beliefs about mental illness and are therefore less likely to accept biopsychosocial mental health services (Bussing et al., 2003; Bussing et al., 2012). Hispanic and African American parents also believed that stimulants would lead to drug abuse and preferred counselling to medication (dosReis et al., 2003).

Access to mental health services

After a problem has been recognized, the next step is seeking help. According to Srebnik, Cauce, and Baydar (1996), any social, economic, or environmental pressures that occur at the level of family, community, or society can act as barriers or facilitators to help-seeking behavior. The following section describes cultural barriers to mental health services, including socioeconomic status, referral rates, and cultural appropriateness of provided care.

Financial barriers to mental health care. Lower socioeconomic status, which is disproportionately represented in ethnic minority families, is associated with greater barriers to receiving services for mental health conditions. There are several ways in which socioeconomic status mediates mental health utilization. First, lower socioeconomic status influences access to mental health services by increasing the likelihood of individuals and families lacking insurance coverage (Kataoka, Zhang, & Wells, 2002). Pastor and Reuben (2005) reported a significantly wide and long-standing gap in the rate of ADHD diagnosis based on the type of health insurance coverage: those with Medicaid insurance are most likely to be diagnosed with ADHD, followed by those with private insurance coverage, while those without insurance ended at a distant third. Second, low-income neighborhoods often have a higher representation of ethnic minorities, as well as a higher representation of people with mental illness. These communities also tend to be underserved, with limited access to mental health care and with potentially higher mental health concerns found among their residents (Chow, Jaffee, & Snowden, 2003). In addition to economic and geographic constraints, low socioeconomic status has other indirect impacts on limited access to health care. Individuals living in poverty may have reduced resources of time and energy to utilize available services (Hobfoll, 1998); they have less time to attend

treatment, more limited means of transportation, and fewer emotional resources to address the needs of other family members (Pumariega, Glover, Holzer, & Nguyen, 1998).

Shortage of culturally appropriate services. One of the major causes for underutilization of ADHD care among minority communities is the lack of cultural competence in existing services for children presenting with mental health issues. First, language and communication difficulties between clients and providers may hinder accurate identification of ADHD-related symptoms while preventing parents and children from fully understanding the diagnosis and treatment plan (Bailey, Jaquez-Gutierrez, & Madhoo, 2014; Visser et al., 2014). Second, the shortage of mental health providers from diverse ethnic background may limit their ability to reflect the culture or values system of families from minority communities (Din-Mond Young, 2012). In traditional collectivist cultures (S. Singh, Lundy, Vidal, & Caridad, 2011), for example, where interpersonal reliance and interdependency are more highly valued, concepts such as “lacking boundaries,” “dependent personality,” or “enmeshment” may be inappropriately used by counsellors from the mainstream Western culture (Chung, 2008). Similarly, when counsellors overstress the necessity of independence and separation from parents as a developmental goal, this can undermine a sense of relatedness among minorities and have a negative impact on family relationships (Calzada, Huang, Anicama, Fernandez, & Brotman, 2012). Finally, alternative approaches to mental health care (e.g., religious or spiritual healing) that may be endorsed by ethnic minority communities are rarely incorporated into Western mental health approaches (Holm-Hansen, 2006).

Studies of parenting interventions indicate their underutilization and demonstrate lower levels of engagement and compliance in ethnic minority families than in Caucasian families, partly due to the cultural insensitivity of these intervention programs (McCabe, 2002; Reyno & McGrath, 2006). Increasing attention is being paid, however, to cultural sensitivity in, and access to, those programs by addressing cultural beliefs (e.g., perceptions of parenting skills) and values (e.g., interdependence) that affect parenting or receptivity to interventions, by widening ethnic diversity in programs and consultants, and by addressing language and other instrumental barriers (Butler & Titus, 2015). Results from these studies provide preliminary support for adapting parenting interventions (Baker et al., 2011; E. O'Connor et al., 2012), although the benefits of adapted parent training interventions over nonadapted training remain unclear (McCabe & Yeh, 2009).

Barriers to accurate diagnosis. ADHD and its comorbid conditions are more frequently diagnosed in Western societies than in other cultural settings and ethnic communities (Polanczyk et al., 2007). Previous studies showed that African American children with ADHD had a narrower pattern of psychiatric comorbidity and dysfunction than that observed in White children (Morgan et al., 2013; Schneider & Eisenberg, 2006). Likewise, a recent Israeli cross-cultural study revealed lower rates of ADHD comorbid disorders in the Arab community when compared with their Jewish peers (Mahajna et al., 2016).

However, cultural diversity in ADHD prevalence should be carefully interpreted, as it may reflect differences in definition of the condition, different diagnostic schemes, or cultural insensitivity of instruments. Given that the formulation of the diagnosis is based on inventory, cut-off scores and on White middle-class reference samples, other ethnic groups are at disadvantage in the diagnostic assessment of ADHD (Schmitz & Velez, 2003). Importantly, the diagnosis of ADHD relies heavily on clinical observation and the use of standard questionnaires and checklists that are highly vulnerable to clinician and informant biases (Serra-Pinheiro, Mattos, & Regalla, 2008). R. Reid et al. (1998), who addressed the validity of teacher ratings using versions of the ADHD Rating Scale, found higher teacher ratings of all ADHD symptoms in African American than in Caucasian children. The authors proposed that a halo effect may account for high ratings of African Americans, such that raters are more likely to endorse all symptoms in African Americans (evidenced by low unique variance in the African American group).

Cultural diversity in treatment variables

In addition to cultural diversity in service selection and quality of provided care, research shows that cultural factors play a critical role in predicting treatment prescription, adherence, and outcomes.

Prescription of stimulants. Stimulant medication is often considered a first-line treatment for children with ADHD and is used by approximately 80% of the children with ADHD diagnosis (Visser et al., 2015). Data from the National Survey of Children's Health 2003–2011 showed that medication rates were lower in ethnic minority children as compared with White children, and that minority ethnicity is associated with shorter duration of medication use (Visser et al., 2014). Low socioeconomic status, limited access to health services, and differences in health insurance coverage, as discussed earlier in this review, may partially account for these differences (Hudson, Miller, & Kirby, 2007; Radigan, Lannon, Roohan, & Gesten, 2005).

For example, a study that examined effects of age, race, and insurance on the dose of prescribed stimulants, found that child's race and insurance type were both associated with specific patterns of stimulant dosage, with higher dosing seen in Medicaid-insured non-African American children and in privately insured African American children (Lipkin et al., 2005). Despite scarcity of data, there is also preliminary evidence for ethnic differences in the type of prescribed stimulants. While several studies failed to find ethnic disparities in immediate or slow-release stimulant prescription (McConeghy, 2016; Saloner et al., 2013), a recent study of Arab and Jewish children in Israel has shown that while Arab children consumed cheaper immediate-release stimulants, Jewish patients were more likely to use the more expensive long-acting stimulants (Mahajna et al., 2016). Given that long-acting medications are associated with better treatment adherence and persistence in comparison to short-acting medications (both stimulants and nonstimulants), differences in the type of medication prescribed may partially account for ethnic diversity in adherence.

Treatment adherence. Treatment adherence is defined by the World Health Organization as "the degree to which the person's behavior corresponds with the agreed recommendations from a health care provider" (Dobbels, van Damme-Lombaert, Vanhaecke, & De Geest, 2005). Several studies in this field have concluded that after consulting a mental health care service, ethnic minority children were less likely to use ADHD-related medications after their diagnosis and had a higher drop-out rate from psychological or psychopharmacological treatment (e.g., Coker et al., 2016; dosReis et al., 2003; Ghosh et al., 2017; Ji et al., 2018; Morgan et al., 2013). For instance, Cummings et al. (2017) have recently reported that African American and Hispanic youth (6–12 years) were more likely than White youth to receive combined treatment for ADHD but were also more likely to discontinue medication and disengage from treatment (Cummings et al., 2017). Differences in prescription rate or cost do not seem to be associated with differences in effectiveness of ADHD medication (Multimodal Treatment Study of Children with ADHD; MTA Cooperative Group, 1999; Tamayo et al., 2008), but rather with negative cultural view of treatment outcomes or side effects (van den Ban et al., 2015; Visser et al., 2014). Bauermeister et al.'s (2003) study of Puerto Rican children with ADHD found that certain behaviors in medicated children were viewed negatively in the Puerto Rican culture (e.g., "not being themselves" when under medication or not standing up for themselves and gaining respect when bothered by others).

Treatment outcomes. Although the role of culture in healthcare access has been extensively studied, little attention has been paid to the specific moderating effects of culture on treatment outcomes. Existing research supports the effectiveness of pharmacological treatment for ADHD in minority children (Hazel-Fernandez et al., 2006; MTA Cooperative Group, 1999; Tamayo et al., 2008). Despite existing evidence for ethnic diversity in treatment outcomes, Winsberg and Comings (1999) found a higher incidence of 10-repeat allele of the dopamine transporter gene in African American children who were not responsive to methylphenidate treatment, raising a question of possible lower stimulant response rate in African Americans; caution should be applied when attributing such results to ethnic-related differences in physiologic response to pharmacological treatment. Conversely, because teacher and parent ratings are usually used as a treatment outcome measure, reporters' assessment of improvement may reflect cultural biases. In the MTA study (MTA Cooperative Group, 1999), for instance, parents of Hispanic children reported less improvement after treatment than Caucasian and African American parents, although Hispanic children were receiving lower doses of medication at the conclusion of the study. Given that medication titration was partially based on parent ratings of child behavior and side effects, these results suggest that Hispanic parents may have reported fewer positive effects or more side effects as medication doses increased (Arnold et al., 2003). Likewise, a tendency towards rating African American children for ADHD and conduct symptoms was hypothesized to reflect teachers' failure in seeing real improvement in their African American students (Epstein et al., 1998). Added together, these findings suggest that minority children can benefit from medication. Negative parental attitudes regarding medication and cultural differences in the evaluation of outcomes, however, may act as a barrier to medication use among ethnic minorities (Eiraldi & Diaz, 2010).

Nonpharmacological treatment. The literature suggests that ethnic minority parents tend to favor behavioral interventions more than Caucasian parents as their preferred method of treatment for ADHD (Pham et al., 2010). However, information about the outcomes of nonpharmacological treatments for ADHD (e.g., psychosocial treatment, parent training) among ethnic minority children is still limited. The largest treatment outcome study of children with ADHD is the MTA study (MTA Cooperative Group, 1999) that compared medication management, intensive behavioral treatment, combined medication management and intensive behavioral treatment, and community care for a large and diverse sample of children with ADHD.

Arnold et al. (2003) reported differences between socioeconomic and cultural groups in the efficacy and necessity of behavioral treatment. Specifically, most middle-class Caucasians without combined comorbid anxiety and disruptive behavior disorder and especially without significant parent-child problems, required only carefully managed stimulant medication and did not gain appreciably from addition of behavioral treatment. Conversely, children of low socioeconomic status, or with comorbid anxiety and disruptive behavior disorder, especially those of ethnic minority background, benefited from the addition of behavioral treatment. A more recent study by Jones et al. (2010) did not find a correlation between ethnic differences and benefits from treatments for ADHD as measured by parent and child behavior. Likewise, M. J. Reid et al. (2002) found that parent training for ADHD was equally effective across ethnoracial groups (i.e., Caucasian, African American, Hispanic, and Asian mothers).

Discussion

While ADHD has been extensively studied in the past decades, research on ethnic minority children and adolescents with ADHD is still limited. The aim of this review was to describe social and cultural influences on ADHD care in ethnic minority children, based on the help-seeking model developed by Andersen (1995). A model of help-seeking behavior for ADHD would not only help identifying factors that facilitate or impede access to services but could also inform policy and program development aimed at closing the treatment gap for ethnic minority groups.

The current review shows that ethnicity plays a critical role in every phase of the help-seeking process, affecting both the availability and quality of ADHD care for minority children. We found that cultural disparities in ADHD diagnosis and treatment occur for minority children from the problem recognition phase to service selection as well as treatment quality and adherence. An important finding from our review is that ethnic minority children are often rated as having more ADHD symptoms than nonminority children, yet less often diagnosed and medically treated. One possible explanation is that cultural, racial, and language biases may be leading to the overidentification of ethnic minority children as disabled, who are, in turn, disproportionately overrepresented in special education (e.g., Artiles, 2003; Harry, Arnaiz, Klingner, & Sturges, 2008). In her ethnographic study of 48 mothers of children with psychiatric disorders (primarily ADHD and autism), Blum (2011, 2015) revealed how the diagnosis of these disorders intersects with social class, race, and gender, resulting in overdiagnosis in children of color. More specifically, boys and young men of color were

disproportionately diagnosed with what she terms “invisible disabilities” and assigned to special education, although they were much less likely to receive psychopharmaceutical drug treatments than White children. Another explanation for overidentification of ADHD among ethnic minority children is that existing assessment tools (e.g., the Child Behavior Checklist; Lambert, Rowan, Lyubansky, & Russ, 2002) do not adequately capture ADHD manifestation in ethnic minorities. Alternatively, it is possible that ethnic minority children have increased risk for ADHD-related behaviors due to high exposure to etiological risk agents (Breslau & Chilcoat, 2000; DuPaul et al., 1998; Epstein et al., 2005), which increase the risk of ADHD either directly or through gene-environment interactions (van der Meer et al., 2017). Further research is needed to assess the extent to which these etiological risks play a role in producing elevated rates of ADHD symptoms among ethnic minority children.

Several clinical, theoretical, and methodological considerations for ADHD care among ethnic minority children arise from this review. First, this review suggests that parents’ interpretation of ADHD problems may play an important role in low rates of help-seeking and stimulant medication use among ethnic minorities. Judgments as to whether ADHD is a valid neurodevelopmental disorder requiring medical management or not can affect the parental decision of seeking medical help or the acceptance of medical advice and treatment following an evaluation. Other factors may be responsible for avoiding or delaying help-seeking for ADHD, including limited knowledge about ADHD (Bussing et al., 2003; Pham et al., 2010), fear of stigmatization (Olaniyan et al., 2007), mistrust in the school and/or health care systems (Bailey et al., 2014), and higher threshold for behavioral tolerance before seeking assessment. The moderating effects of cultural factors on the acceptance and tolerance of children’s behavior may be crucial not only in analyzing help-seeking behavior in minority groups but also in understanding developmental pathways of ADHD. Attention should be paid to how parents and teachers’ degree of tolerance of children externalizing behavior exacerbates or modulates developmental processes of ADHD and comorbidity in different ethnic groups. For example, cultural suppression of aggression may lead parents and teachers to have a lower threshold (or tolerance) for hyperactive behavior and therefore increased likelihood of reporting hyperactive and disruptive behaviors (Mann et al., 1992). Such findings speak to the need for culturally sensitive interventions with families and communities that address gaps in knowledge about ADHD symptoms and in available care, as well as stress management and problem-solving that ensure the timely diagnosis and treatment of ADHD.

(Shata, Abu-Nazel, Fahmy, & El-Dawaiaty, 2014). Furthermore, it is important that teachers and educational authorities build strong and trusting relationships with parents that allow relevant information on the child's functioning to be shared as well as any concerns about symptoms or level of impairment (Hamed, Kauer, & Stevens, 2015).

Second, this review points out to the scarcity of research on the role of ethnicity in treatment outcomes. Available data support the notion that minority children benefit from medication as much as nonminority children (Eiraldi & Diaz, 2010). Nevertheless, the effects of ethnicity on type of prescribed stimulants, dose-response, side effects, and treatment adherence require further exploration. Important, yet often neglected, predictors of service utilization and treatment adherence are children's attitudes and characteristics, which include poor performance in school, nonengagement in extracurricular activities, and aggressive behaviors. Research suggests that risk factors like deviant behaviors and troubled child-parent relations are more likely to lead to service use, rather than a diagnosis of ADHD (Bird et al., 2008).

Third, our findings provide additional support to calls for increasing cultural competence in communications during clinical assessment, diagnosis, and treatment of minority communities (Waite, 2015). In the context of ADHD more specifically, there is a need for professionals to develop a wider understanding of cultural variations in ADHD, as well as local knowledge of explanatory models of illness and behavior, stigma experiences, family relationships, child raising practices, and developmental issues (Kagitcibasi, 2005; Kleinman, 1988). One approach to improving cultural competence is using a preliminary qualitative phase in order to explore patients' needs and expectations from services, and use these to culturally adapt interventions (Jordans, Tol, & Komproe, 2011).

Finally, research about nonpharmacological ADHD treatments, which may be used either as complements or as alternatives to medication therapy, is currently limited. It is also worth understanding how medication continuity and adherence may be influenced by use of nonmedication therapies and behavioral interventions.

Limitations

While aiming to present an up-to-date review of studies in the field of ADHD diagnosis and treatment among ethnic minorities that includes publications from different databases, this review is limited by its nonexhaustive literature search. In addition, ADHD prevalence rates, service utilization, and treatment outcomes reported in those studies were measured by many different parameters, making comparisons across studies

difficult. It has been suggested that ethnic differences in prevalence rates may be most likely to emerge when ADHD is defined by rating scales and by symptom criteria only, rather than when full DSM-IV criteria were applied (Zwirs et al., 2007). Moreover, in most studies, adherence was limited to compliance with and discontinuation of treatment in controlled settings. The inclusion of real-world observational trials may provide a better understanding of treatment adherence in naturalistic settings (Treuer, Méndez, Montgomery, & Wu, 2016).

Most of the studies identified for the current review were conducted in the US. Given international differences in medical care systems and practice patterns, our findings should be carefully interpreted in non-U.S. contexts (Matza, Paramore, & Prasad, 2005). It is likely, however, that sociocultural barriers to ADHD care identified in U.S. studies may be similar to those in other countries, although they may not be recognized to the same extent. For example, a large European study identified differences in the availability of ADHD care across the six countries involved (Hodgkins et al., 2013). While in the Netherlands all patients had private insurance, in the UK, where ADHD treatment is free under the National Health Service, only 2.7% had private insurance. Such discrepancies in the availability of ADHD care across countries may influence ADHD management and treatment decisions for patients. Medical and school-based professionals should ensure that their efforts to reduce ethnic disparities in ADHD diagnosis and treatment also extend to groups other than American ethnic minorities. In particular, information about ADHD among immigrants and refugees is of significant importance in the context of the current great influx of migrants to Europe (Lethi et al., 2016). For instance, it would be important to understand how symptoms of ADHD (e.g., impulsivity, novelty seeking) interact with the decision to migrate and how they are affected by the process of migration.

Another limitation of many studies included in this review is that socioeconomic effects are often confounded with ethnicity, raising doubts as to what alternative explanations could be provided. In several studies, ethnic differences were no longer significant after controlling for socioeconomic status (Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009), while in others, ethnic differences in ADHD ratings remained after controlling for socioeconomic status (Arnold et al., 2003; DuPaul et al., 1998). Research suggests that ethnicity and socioeconomic status, although related, have distinct effects on health outcomes (Williams, Mohammed, Leavell, & Collins, 2010). Ethnicity may still matter for ADHD after socioeconomic status is considered due to several reasons such

as discrimination, exposure to adversity (poverty, abuse, and traumatic stress), and psychosocial stressors that vary by ethnicity and have been shown to influence multiple indicators of physical and mental health later in life (Shonkoff, Boyce, & McEwen, 2009). Further research is needed to examine the psychosocial and physiological pathways through which early life socioeconomic status and other forms of adversity contribute to ADHD disparities (Williams, Priest, & Anderson, 2016). Since little is currently known about cultural variation in ADHD subtypes (predominantly hyperactive-impulsive type; predominantly inattentive type; and combined type), this review concerns all ADHD subtypes. Previous data on ADHD and ethnicity usually failed to isolate the types described in the DSM-IV (Miller et al., 2009). However, we underscore the need to study how cultural factors interact with prevalence and diagnosis of different ADHD subtypes.

Finally, together with efforts to reduce ethnic inequality in ADHD care, attention should be paid to the social and ethical risks involved in the extension of DSM norms into the developing world. Based on research in transcultural psychiatry (Kirmayer, 2006), several authors (I. Singh, Filipe, Bard, Bergey, & Baker, 2013; Watters, 2010) have argued that the globalization of ADHD is a significant ethical problem, in that these norms impose a distinctly Western construction of normality on local populations in the name of science. Among other harms, globalizing DSM diagnoses encourages pharmaceutical companies to peddle psychotropic drugs and diagnoses to a potentially huge and novel global population (Bergey, Filipe, Conrad, & Singh, 2018). Moreover, biomedical models in some low-resource settings may exacerbate inequality and stigma in that they locate dysfunction and disorder in the individual and allow surrounding sociopolitical conditions that impact upon mental and physical well-being to be ignored (Farmer, 2004). Fausett (2004) suggested that overtly devaluing minority groups might be a consequence of modern ideals of autonomy and independence, which are widely perceived to be limited in people suffering from mental illnesses (Fabrega, 1990). Thus, framing the standardization of global diagnostic methods of ADHD as a strictly methodological problem assumes universal validity of the diagnosis, and neglects the ethical dimensions of relative harms and benefits of globalization outlined above.

Conclusion

While previous models of help-seeking behavior have been criticized for not recognizing the importance of social and cultural practices, our review proposes an expansion of the mental health help-seeking model by

acknowledging the influence of sociocultural factors in ADHD help-seeking and by adapting the model for children of ethnic minority background. Considered together, the findings presented in this review suggest that social and cultural factors are present in every phase of the help-seeking process, affecting availability and quality of ADHD care for ethnic minority children. Often, these studies did not distinguish between the effect of cultural factors related to ethnicity (e.g., negative attitudes towards mental health issues) and socioeconomic factors related to underutilization of mental health services among ethnic minorities. Based on previous literature, there is a reason to assume that ADHD treatment is effective in minority children. Therefore, interventions aimed at enhancing treatment adherence among minority families are of primary importance. This review underscores the need to develop culturally sensitive interventions, incorporating clients' ethnic, linguistic, and cultural background into service. More rigorous research is needed to examine the relative contribution of these variables on all levels of ADHD care for ethnic minorities.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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