

Cross-Cultural Issues in ADHD Research

Introduction

Attention-Deficit/Hyperactivity Disorder is the most common child psychiatric disorder in Europe and the United States of America, affecting 3 – 10% of primary school children. The disorder consists of a persistent pattern of inattentiveness, impulsiveness and/or hyperactivity that is inconsistent with the child's developmental level. The disorder is generally more prevalent in males (American Psychiatric Association, 2000).

DSM-IV (American Psychiatric Association, 2000) identifies three subtypes of the disorder, namely: ADHD predominantly inattentive type (ADHD-PI) if six (or more) symptoms of inattention (but fewer than six symptoms of hyperactivity-impulsiveness) have persisted for at least 6 months; ADHD predominantly Hyperactive-Impulsive Type (ADHD-HI), if six (or more) symptoms of hyperactivity-impulsiveness (but fewer than six symptoms of inattention) have persisted for at least 6 months; and ADHD combined type (ADHD-C), if at least six symptoms of inattention and at least six symptoms of hyperactivity-impulsiveness have persisted for at least 6 months.

ADHD is found to be as prevalent on the African continent as in Western countries (Meyer, 1998; Meyer, Eilertsen, Sundet, Tshifularo, & Sagvolden, 2004). The predominant Western approach to understanding mental disorders is based on a biomedical perspective that regards primary syndromes as universal and similar across diverse human cultures. A basic question is to what degree behaviour and its disturbances are affected by culture.

The inability to inhibit behavioural responses leads to risk taking behaviour like drug and alcohol abuse, tobacco smoking premarital and promiscuous sex, driving anger and traffic offences, accident proneness, compulsive buying and tattooing and body piercing (Barkley, 2004; Barkley, Fischer, Smallish, & Fletcher, 2004; Carroll, Riffenburgh, Roberts, & Myhre, 2002; Fillmore & Rush, 2002; Kahn, Kaplowitz, Goodman, & Emans, 2002; Lam, 2002; Molina, Bukstein, & Lynch, 2002; Roberts & Tanner, Jr., 2000; Tercyak, Lerman, & Audrain, 2002).

A high incidence of crime, substance abuse, and especially the very high rate of HIV infection in South Africa, and its possible relationship to ADHD, necessitated an investigation into the prevalence and neuro-psychological manifestations of the disorder.

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Ethnic groups of the Limpopo Province

The Republic of South Africa has one of the most complex and diversified population mixes in the world, a rich mosaic of distinctive minorities. This is underscored by the fact that not one of South Africa's major languages is spoken by a majority of all the people. South Africa has eleven official languages, seven of which are spoken in the Limpopo Province: Northern Sotho (Sepedi), Xitsonga, Tshivenda, Setswana, Isindebele, Afrikaans and English.

The Northern Sotho form the largest group (52,7%) they are part of the Sotho group, who are found mainly in Lesotho and Botswana, and are found scattered throughout the Province and include various tribes. The Tsonga, who are also known as Shangaan and are related to the Tsonga of Mozambique, form the second largest group (22,6%) and are found in the eastern part of the province. Their language is known as Xitsonga. The Venda (15,5%) are a largely homogenous people, living in the northern part of the province, bordering Zimbabwe. Their language is Tshivenda and they are related to the Shona of Zimbabwe. The main white groups are the English (0,4%) and Afrikaans (2,2%). The Tswana (1,4%) and North Ndebele (1,5%) are not regarded as indigenous to the province but are resident in considerable numbers. The Tswana are closely related to the Northern Sotho, and are bonded with them in language and customs. The North Ndebele have been identified as one of the Nguni groups, which include the Zulu, Xhosa, and Swazi people. In the Limpopo Province they are mainly concentrated in the districts of Polokwane, Bakenberg, and Mokopane. Their language is known as Isindebele. The Bolobedu are not considered a separate ethnic group, but a tribe under the Rain Queen, Modjadji, which is believed to have rain making powers and is treated with high respect by the political leaders of South Africa. The Bolobedu, a group of about one million people, are found in about 150 villages around Modjadji's Kloof. Their language, Khelovedu, is not recognized as one of South Africa's 11 official languages (Nxumalo, 2000; Rammala, 2003).

The ADHD project

The study consisted of two parts: (a) an epidemiological study and (b) a neuropsychological investigation. The epidemiological survey was conducted among North Sotho, Tsonga, Venda, Tswana, Afrikaans and English primary school children. The Northern Sotho, Tsonga, Venda, Tswana, North Ndebele, Afrikaans and Bolobedu children participated in the neuropsychological investigation. The North Ndebele and Bolobedu were excluded from the epidemiological survey because of lack of reliable translation facilities for the rating scale used.

Epidemiological survey

The aim of the study was to explore the prevalences of ADHD symptoms as measured by the Disruptive Behavior Disorder (DBD) scales as a function of language/ethnic group, gender, and ADHD subtype in the Limpopo Province of South Africa.

Method

The subjects came from the general population of primary school children in the Limpopo Province. The schools were situated in fairly typical

urban, semi-urban and rural parts of the province. The schools that participated were situated in the areas where the selected ethnic groups are indigenous. The teachers of the children spoke the same language as their pupils. The final sample consisted of 6032 children aged 6 – 15 years.

The DBD is based on information obtained from parents and/or teachers, and assesses the presence and degree of ADHD symptoms (inattention and hyperactivity/impulsiveness), plus Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) as formulated in DSM-IV (Pelham, Gnay, Greenslade, & Milich, 1992; Pillow, Pelham, Jr., Hoza, Molina, & Stultz, 1998) in primary school children. The scale was translated into the various indigenous languages. Norms were established for the population groups of the Limpopo Province. Mean scores on inattentiveness and hyperactivity/impulsiveness showed no significant between-group differences. The cultural differences were therefore, so small that there was no need for separate norms for the different cultural/ethnic groups (Meyer et al., 2004).

Results

Applying cut-offs based on the DBD, the results showed prevalence rates for ADHD, inattentive, hyperactive/impulsive, and combined subtypes very similar to those obtained when applying DSM-IV criteria to US and European research findings (Swanson et al., 1998). This applies to the total prevalence as well as prevalences within gender groups (Table 1).

ADHD Subtypes

	No ADHD		Inattentive		Hyperactive/ Impulsive		Combined		Total
	N	%	N	%	N	%	N	%	N
Boys	2936	93.1	120	3.8	43	1.4	55	1.7	3154
Girls	2767	96.1	79	2.7	18	0.6	14	0.5	2878
Total	5703	94.5	199	3.3	61	1.0	69	1.1	6032

Table 1. Prevalences of ADHD subtypes by gender (adapted from Meyer et al., 2004)

Neuropsychological investigation

Referral practices and assessment procedures are neither well developed nor standardised in developed countries like South Africa (Meyer & Aase, 2003). Assessment of and research on ADHD, could be improved with standardised tests reliably differentiating between children with and without ADHD symptoms.

Several factors must be taken into account when selecting tests, as most tests are standardised in Western countries. They must be simple, inexpensive, and easy to transport to and to use in remote rural areas without the convenience of Western settings. They also should preferably be non-verbal, or be limited to a minimum of verbal instructions. There should be no cultural bias.

The problems addressed were:

Are ADHD symptoms related to neuropsychological deficiencies?

Are there gender differences?

Are the results obtained the same across cultures?

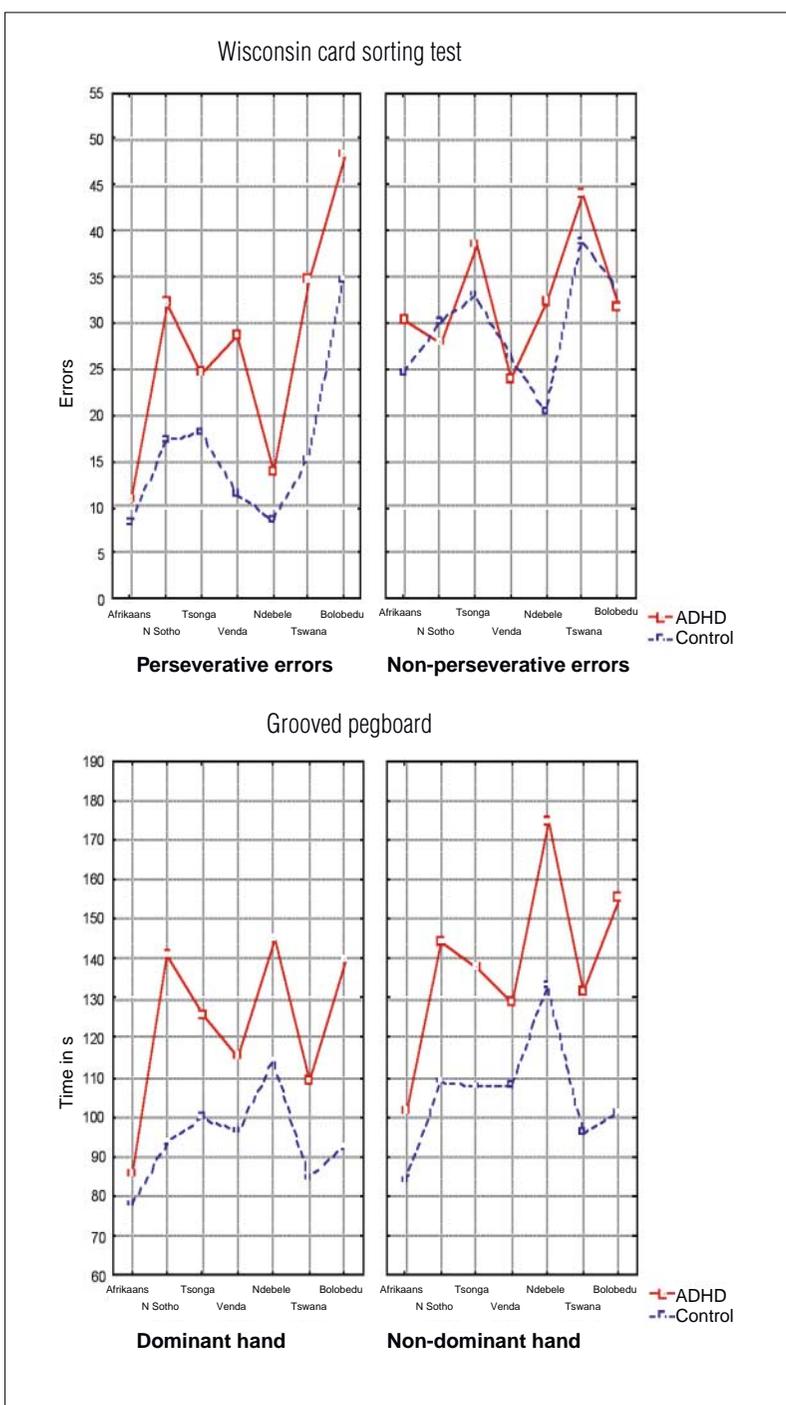


Figure 1. Testresults of the different ethnic groups

Method

Children in the Limpopo Province (Afrikaans, Northern Sotho, Venda, Tsonga, Tswana, North Ndebele and Bolobedu) were recruited from a primary school based population, aged 6 – 13. The 528 children were recruited following screening for ADHD of the general population of primary school children representative of all socio-economic levels. The instrument used for screening was the DBD rating scale, which was standardised for the population groups of the Limpopo Province. Only teachers’ ratings were used for the screening as parents’ ratings could not

be obtained. Teachers' ratings are usually regarded as an accurate measure of assessment (American Academy of Pediatrics, 2004). The children meeting the criteria for inclusion into the ADHD group were selected for further testing. They were matched for gender, age, and ethnic group with children who did not meet the inclusion criteria, obtained from the screening process. Children were divided into an ADHD group and a control group without ADHD symptoms.

The tests selected were the Tower of London and the Wisconsin Card Sorting Test (behavioural planning) and two tests to measure manual motor skills, the Grooved Pegboard and the Maze Coordination Task. Group differences on test performance were analysed using analysis of variance. The results were analysed with a 2 x 2 x 7 (clinical x gender x ethnic group) ANOVA for independent samples.

Results

Although all the tests distinguished between children with ADHD and a non-ADHD control group, there was a marked effect of ethnicity. On most tests the Afrikaans group showed the best performance, although this was not always the case. On the tests that measured behavioural planning, the North Ndebeles' performance was on par with that of the Afrikaans group. The Bolobedu performed significantly poorer than the other groups.

The results on the motor tests showed that the performance of the Afrikaans group was again better than the other groups, although their performance did not differ significantly from that of the Tswana. Surprisingly, the North Ndebele, who had significantly higher scores than the other indigenous groups on the behaviour planning tasks, were the poorest performers. Figure 1 shows the results on two of the tasks: The perseverative errors of the WCST and the Grooved Pegboard.

It therefore seems that although the tests were non-verbal, they are sensitive to ethnic and cultural factors, which are difficult to explain. One factor that most certainly plays a role is that of education. The Afrikaans group has benefited in the past from the policy of Apartheid, when more money and resources were spent on white children. After ten years of democracy, the effect is still noticeable. Also, all Afrikaans children had attended pre-primary school, while this is rarely the case with the rural black children. Other possible explanations may be the fact that the Afrikaans children came from urban towns, while most of the indigenous groups came from semi-urban and rural areas. The Bolobedu, who performed poorest on most tests, were only found in remote, rural areas.

Conclusion

From the two studies it follows that the prevalence and sex ratios of ADHD in the Limpopo Province of South Africa are very similar to those reported in Western countries, which suggests that ADHD is caused by the same fundamental neurobiological processes, probably caused by genetic factors expressed independently of cultural differences. However, cultural differences do affect the performance on neuropsychological measures. The reason may be that cultural factors are important determinants of child rearing practices which may affect the brain's organization of cognition. There is therefore a need for assessment methods that are

culturally valid for different ethnic groups. Thus, systematic research to identify and develop and/or adapt the neuropsychological instruments required to assess ADHD symptomatology is greatly needed.

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