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The Concept of ADHD

This opening chapter in Section 1 provides basic background knowledge of the concept of ADHD by highlighting several important and often controversial areas, beginning with differences in approaches to diagnosis of the disorder. Changes in terminology over time point to varying attitudes regarding the nature of ADHD. There is an examination of the multi-factorial causes as well as the variation in prevalence figures for the disorder. Coexisting social, emotional and educational difficulties often experienced by children with ADHD and the long-term prognosis are discussed. The chapter concludes by looking at medical, educational and social interventions used with individuals with ADHD, as well as listing some alternative and complementary interventions.

The 'Myth or Fact?' sheets (see Figures 1.1 and 1.2, also available as downloadable materials) offer a good starting point for the reader wishing to know more about the background of ADHD. Some of the following subsections are examined in greater detail in subsequent chapters.

Diagnosis

ADHD is a medical disorder and diagnosis is made by a qualified medical clinician (paediatrician or child psychiatrist) using one of two sets of diagnostic criteria currently in use. Traditionally in Europe and the UK the *International Classification of Diseases* (ICD-10), which refers to 'hyperkinetic disorder' (HKD) rather than ADHD, had been the preferred classification system (WHO, 1990). In recent years there has been more use of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) which is widely followed in the USA, Australia and other countries (APA, 2000). In the DSM-IV system the behavioural characteristics associated with ADHD do not represent three primary symptoms but two, with hyperactivity forming a single symptom group with impulsivity. This system is capable of identifying three main subtypes of ADHD (the first subtype is thought to be more common in girls than boys and the other two subtypes are more common in boys than girls):

ADHD: Myth or Fact?

1. ADHD is a medical disorder.

2. ADHD is an invention of modern western culture.

3. ADHD is genetic.

4. ADHD is simply caused by poor or inadequate parenting.

5. At least one child in a mainstream classroom will have ADHD.

6. More boys than girls are diagnosed with ADHD.

7. A child cannot have ADHD as well as another condition or disorder.

8. ADHD is a childhood disorder which disappears by puberty.

9. Unless you receive a diagnosis as a child, you cannot have ADHD as an adult.

10. The use of medication can be effective in treating ADHD.

Figure 1.1 ADHD: Myth or Fact? (Sheet 1)

ADHD: Myth or Fact?

1. **Fact.** Diagnosis is made by a qualified medical clinician whose assessment includes detailed information from parents and other professionals including teachers.

2. **Myth.** ADHD may have existed in some form or another since at least as far back as the nineteenth century.

3. **Fact.** In approximately 70 per cent of cases the disorder is inherited from a parent or other relative.

4. **Myth.** This lacks supportive evidence. It is believed that ADHD is caused primarily by neurological dysfunction.

5. **Fact.** Between 1 and 5 percent of school-aged children may have ADHD.

6. **Fact.** Estimates for the boy:girl gender ratio vary between 9:1 and 4:1.

7. **Myth.** Approximately 60 to 70 per cent of children with ADHD have comorbid or coexisting conditions of various types.

8. **Myth.** Around 70 to 80 per cent of children continue to exhibit significant deficits in attention and impulsivity compared to their adolescent peers. Between 30 and 70 per cent of people carry some or all of the ADHD traits into adulthood.

9. **Myth.** Although there cannot be an adult onset of ADHD, quite commonly the diagnosis is not made until adulthood. Adults with ADHD often have a history of under-achievement, low self-esteem and relationship problems.

10. **Fact.** When used as part of a multi-modal, multi-professional approach, medication is highly effective in reducing the core symptoms of ADHD in 80–95 per cent of cases.

Figure 1.2 ADHD: Myth or Fact? (Sheet 2)

- the predominantly inattentive type (often known as ADD);
- the predominantly hyperactive–impulsive type;
- the combined type.

The main difference between diagnoses made using ICD-10 criteria and DSM-IV criteria is that ICD-10 focuses on extreme levels of hyperactivity and does not have a non-hyperactive subtype. The differences between the two sets of criteria mean that ICD-10 have been repeatedly shown to select a smaller group of children with more severe symptoms than those selected using DSM-IV. Munden and Arcelus (1999) are among those who advocate the use of DSM-IV criteria: firstly, to identify more children who may have significant impairment but do not satisfy ICD-10 criteria, but who could benefit from treatment and intervention. Secondly, the majority of international research is being carried out on patients who fulfil DSM-IV criteria and if UK clinicians wish to utilise evidence from such research they will have to apply it to the same clinical population.

A rigorous assessment is based on the child's past medical history, educational history, family history, physical examination and information from other professionals, including teachers and educational psychologists. Approaches used include observation of the child, both in the clinic setting and the school environment; in-depth interviews with the child, parents and teachers; aptitude testing and physiological and neurological testing; and the completion of behavioural rating scales. Symptoms emerge more clearly between the ages of 6 and 9 years. Findings from the school survey undertaken as part of the research show that the highest percentage of individuals was diagnosed in the 5–9 year age group. The four target students included in the six case studies who had received formal diagnoses of ADHD by the end of the research period were diagnosed as follows:

- David was diagnosed at the age of 4 years 4 months.
- Edward was diagnosed at the age of approximately 5 years.
- Carl was diagnosed at the age of 6 years 9 months.
- Adam was diagnosed at the age of 8 years 8 months.

History

ADHD may have existed in some form or another since at least as far back as the nineteenth century. One of the first professional reports of the disorder was probably in 1902 in *The Lancet* by George Still, a British paediatrician.

In the 1930s, behavioural disturbances were related to brain injury and in 1937 stimulant medication (amphetamine) was first used to treat a group of behaviourally disordered children. It was in the 1950s and 1960s that the term 'minimal brain dysfunction' was used, with the disorder no longer ascribed to brain damage but focusing more on brain mechanisms. Methylphenidate (Ritalin), introduced in 1957, began to be more widely used, particularly in the USA. During the 1960s the 'hyperactive child syndrome' became a popular label. Research in the 1970s suggested that attention and not hyperactivity was the key feature in this disorder and led to the establishment of 'attention deficit disorder' (ADD) as a category in the third edition of the

Diagnostic and Statistical Manual of Mental Disorders (DSM-III) published by the American Psychiatric Association (APA) in 1980. There have since been several reformulations of DSM, with the category of attention deficit hyperactivity disorder (ADHD) first used in 1987 and redefined in 1994, with a further text revision in 2000 (DSM-IV TR) (APA, 2000). The various name changes that the disorder has undergone over the years reflect changing conceptualisations of the nature of the condition.

In Sweden and other Scandinavian countries the term 'DAMP' (deficits in attention, motor control and perception) has frequently been used as a diagnosis. DAMP is a combination of ADHD and DCD (developmental coordination disorder, present in 50 per cent of ADHD cases). Sometimes the combined expression ADHD/DAMP is used (Gillberg, 2002).

Causes

Although there is no one single 'cause' of ADHD, it is believed that the disorder is caused primarily by neurological dysfunction. Research studies have found particularly low levels of activity in the neurotransmitters in the frontal lobes of the brain which control impulses and regulate the direction of attention. This means that children with ADHD often experience problems in inhibiting or delaying a behavioural response. The causes of this particular brain dysfunction in most cases appear to be genetic, with approximately 70 per cent of cases being inherited. Most children diagnosed with ADHD have a close relative (usually male) affected to some degree by the same problem. In studies of identical twins, both have ADHD in almost 90 per cent of cases, and siblings carry a 30–40 per cent risk of inheriting the disorder. Environmental factors such as brain disease, brain injury or toxin exposure may be the cause of 20–30 per cent of cases (Cooper and Bilton, 2002). Other suggested risk factors for ADHD include pregnancy and delivery complications, prematurity leading to low birth weight and foetal exposure to alcohol and cigarettes.

When seeking to explain the multi-factorial causes of ADHD, reference is often made to the interrelationship between *nature* and *nurture*. The concept is described by many as a bio-psycho-social disorder. This means it may be viewed as 'a problem which has a biological element, but that interacts with psychosocial factors in the individual's social, cultural and physical environment' (Cooper, 2006: 255). Biological factors include genetic influences and brain functions, psychological factors include cognitive and emotional processes and social factors include parental child-rearing practices and classroom management (BPS, 2000).

Prevalence

Although figures vary according to where and when studies are carried out and the diagnostic criteria used, it appears that ADHD is present throughout the world. It occurs across social and cultural boundaries and in all ethnic groups. International estimates of prevalence rates vary, and include suggestions of between 3 and 6 per cent of children and young people (Cooper, 2006). American data collected in 2003 suggests prevalence rates of between 5 and 8 per cent in children aged 4 to 17 years old (Goldstein, 2006). One interesting theory put forward for national differences in countries such as North America and Australia is that 'in past centuries, the more impulsive risk takers were more likely to emigrate or become involved in antisocial activity that would have led to their transportation. This group would probably

have had a higher incidence of ADHD, which would have been inherited by subsequent generations' (Kewley, 2005: 13).

In the UK it is difficult to ascertain accurate national prevalence figures. The breakdown of SEN figures provided in government statistics does not include a discrete category for ADHD. Taylor and Hemsley (1995) suggest that 0.5–1 per cent of children in the UK have ADHD or hyperkinetic disorder (HKD). It was recently reported that there were 4,539 children and young people diagnosed with ADHD known to NHS services in Scotland. This is approximately 0.6 per cent of the school-aged population (NHS Quality Improvement Scotland, 2008). Government guidance for schools in Northern Ireland refers to ADHD occurring in 1–3 per cent of the population (Department of Education, 2005). Figures published by the National Institute for Health and Clinical Excellence (NICE) state that:

> It has been estimated that approximately 1% of school-aged children (about 69,000 6–16 year olds in England and 4,200 in Wales) meet the diagnostic criteria for HKD (i.e. severe combined-type ADHD). The estimated prevalence of all ADHD is considerably higher, around 5% of school-aged children (345,000 in England and 21,000 in Wales). (2000: 3)

On average, this means that in a mainstream class of 30 children it is likely that at least one child will have ADHD. Distribution is not even, with some schools having a disproportionate number of students displaying ADHD-type characteristics. The average local prevalence rate in several local authorities where school surveys have been carried out was found to be approximately 0.5 per cent of each school population (Wheeler, 2007). In 151 out of 256 schools that responded to the ADHD survey there were 413 individuals reported as being formally diagnosed with ADHD. This represents 0.53 per cent of the total school population, i.e. 5.3 students per 1,000. It can be seen in the breakdown by age shown in Figure 1.3 that the highest proportion of diagnosed students was in the 7–11 years age group – this concurs with suggestions that the disorder is considered to be more prevalent in the age range 6–11 years with a reduction in prevalence with socio-emotional maturation.

Estimates of gender differences vary. Boys generally tend to outnumber girls, although there is a possibility of an under-representation of girls in estimated figures. It is believed that boys are more likely to be identified because they are likely to be more overtly aggressive and therefore to be noticed to have difficulties. Male-to-female ratios range from 4:1 to 9:1, depending on the setting (i.e. general population or clinics) (APA, 2000). These estimates depend significantly on which ADHD subtypes are included. Boys may outnumber girls by 4:1 in the hyperactive–impulsive/mixed type groups, but boys and girls are represented in about equal numbers in the

Age	Number of students	Percentage
4–5 years	17	4%
5–7 years	50	12%
7–11 years	152	37%
11–14 years	129	31%
14–16 years	54	13%
17–19 years	0	0
Not known	11	3%
Total	**413**	**100%**

Figure 1.3 Diagnosed ADHD students by age

non-hyperactive (mainly inattentive) type (Cooper and O'Regan, 2001). The school survey findings showed a boy:girl ratio of 9:1.

Coexisting problems

Most studies suggest that approximately 60 to 70 per cent of children and young people with ADHD have comorbid or coexisting conditions of various types. These coexisting conditions may add to the significant social, emotional and educational problems experienced by a child with ADHD. They may include disruptive behaviour disorders such as oppositional defiant disorder (ODD) and conduct disorder (CD); learning difficulties, dyslexia, speech and language disorders, dyspraxia and dyscalculia; depression and anxiety; obsessive compulsive disorder (OCD), tics and Tourette's syndrome. There are also suggestions of comorbidity with autistic spectrum disorders (ASD) including Asperger's syndrome. Other problems common in children with ADHD include poor self-esteem; fine motor control and handwriting difficulties; self-regulation of emotion; sense of time, time management and organisational problems; sleep difficulties; over-sensitivity; and problems with relationships. Over 50 per cent of children with ADHD display emotional problems and the same number display social skills problems (Cooper and Bilton, 2002).

In the school survey 70 per cent of diagnosed students were reported as having other special educational needs (SEN). Responses to the question regarding the description of other SEN confirm that there is evidence of comorbidity in individuals with ADHD, and in some cases multiple comorbidity. The highest number of students experienced emotional and behavioural difficulties (EBD), with the second highest proportion reported as experiencing general learning difficulties. Coexisting difficulties, including those experienced by the six target students in the case study research, fall into three categories: *cognitive difficulties* which may impede learning; *affective difficulties* which are more concerned with social, emotional and behavioural problems; and *other difficulties*. These are discussed in greater detail in Chapter 7.

Prognosis

Individuals with ADHD may experience difficulties with the transition from primary to secondary school, with increased emphasis placed on their abilities to be self-organised and autonomous, both in their learning and social behaviour. They may also have problems with the narrowing of the curriculum in the secondary school setting where more use is made of abstract and analytical learning approaches (BPS, 2000). Those students who display ADHD characteristics may be more likely than their non-ADHD peers to be excluded from school for behaviour reasons (Cooper and O'Regan, 2001).

For many years it was assumed that ADHD disappears at puberty and that children with ADHD would 'outgrow' behaviour difficulties associated with the disorder upon reaching adolescence or early adulthood. Longitudinal investigations show that 70 to 80 per cent of children continue to exhibit significant deficits in attention and impulsivity compared to their adolescent peers (DuPaul and Stoner, 2003). There is a need for more individualised treatments to take account of differing characteristics displayed by adolescents. Diagnosing ADHD in the teenage years is difficult because the core symptoms are often overshadowed by other coexisting conditions such as ODD and CD. Teenagers are often unwilling to cooperate with management strategies including medication (Kewley, 2005).

There are suggestions that between 30 and 70 per cent of those who have been diagnosed in childhood carry some or all of the ADHD traits into adulthood (Cooper, 2006), although the majority no longer meet the formal DSM diagnosis criteria for the disorder. The frequency and intensity of their symptoms decline. There is a lessening of impulsive behaviours, although the learning and organisational problems may persist. Green and Chee (1997) claim that adult ADHD was first recognised when paediatricians became aware that some of the parents of children in their care had the same symptoms as their children. Those in whom the condition persists into adulthood are likely to suffer from anti-social, self-destructive tendencies and experience difficulties with emotional and social problems, unemployment, criminality and substance abuse, other mental illnesses and increased accident rates. Only a few specialist clinics for adults with ADHD currently exist. If their ADHD is adequately treated, it should be possible for them to find a career and lifestyle in which they flourish. Features of ADHD such as creativity and high energy levels can be advantageous in adult working life.

Interventions

The heterogeneity in characteristics and symptoms displayed by students diagnosed with ADHD and the variability of their response to treatment means that it is often difficult to decide on the most effective interventions for each individual. There are several types of intervention currently used to treat individuals with ADHD who may experience difficulties in both the cognitive and affective domains. 'Research … indicates that a multimodal treatment protocol is more effective that unimodal treatment in addressing the myriad of difficulties associated with this disorder' (DuPaul and Weyandt, 2006: 342).

Medical interventions

Stimulant medications have been found to have positive effects on attention span, impulse control, academic performance and social relationships. By affecting the balance of noradrenaline and dopamine in the brain, the aim of medication is to control symptoms so that the child is more receptive to other forms of non-medical interventions. Medication '… can be seen to provide a "window of opportunity" for the child to benefit from teaching–learning experiences provided by teachers, parents and others' (Alban-Metcalfe and Alban-Metcalfe, 2001: 89). Chapter 2 provides a more comprehensive discussion regarding the use of medication in managing ADHD.

Educational interventions

Many of the educational and environmental interventions and classroom management strategies already in place in some schools may be differentially appropriate for students who display ADHD characteristics. There have been specific suggestions for classroom strategies for use with students diagnosed with ADHD. Some of these are identified in the references at the end of this book. One of the most important features is the 'need for curriculum implementation and organizational arrangements that are more geared to pupil learning styles' (Cooper, 2005: 133). Educational interventions specifically aimed at adolescents may need to focus more on homework, organisation, test preparation and test taking, note taking, reading comprehension, memorising, classroom participation and conduct (Robin, 1998). The findings from the case study research have identified settings and contexts which may lead to higher attainment in students with ADHD. The focus in Section 2 of this book is on the identification of interventions and strategies for use in the classroom.

Physical exercise in school

There have been suggestions that physical exercise increases dopamine levels in the brain, thus having a similar effect to that achieved by the taking of stimulant medication (Ratey, 2004). In a recent study, the 'on-task' behaviour of students with EBD in a mainstream secondary school showed improvements following Physical Education (PE) lessons (Medcalf et al., 2006). The inclusion of periods of structured physical activity at regular intervals throughout the school day could produce positive outcomes for students with ADHD (Cooper, 2005).

Nurture groups

Recently in some local authorities nurture groups have been set up in mainstream schools as an early intervention for children with social and emotional difficulties (Bennathan and Boxall, 2000). There is evidence that some individuals with ADHD may benefit from this type of setting, which combines the features of a caring, homely environment with those of a standard classroom and where the emphasis is on emotionally supportive and empathic relationships between adults and children. There is a predictable daily routine, which includes a holistic curriculum, intensive interaction, free play periods and periods of structured physical activity (Cooper, 2004). A typical nurture group consists of 10–12 students, a teacher and a teaching assistant. The students remain on the roll of a mainstream class, spending curriculum time in this class when not attending the nurture group. The students are usually reintegrated full-time into their mainstream classes after a period of between two and four terms.

Social interventions

Children and young people with ADHD often have poor social skills, finding difficulty in initiating and maintaining friendships. They appear unaware of how their behaviour affects other people and may, for example, try to join in a game without asking permission. They do not follow the rules of good conversation, are likely to interrupt others and are more likely than their non-ADHD peers to react aggressively. Consequently they may suffer from peer-rejection or isolation (DuPaul and Stoner, 2003). There is a need for the teaching of basic social interaction skills to individuals with ADHD. This may be accomplished at home by parents, in school and through voluntary agencies. Antshel (2005) suggests pre-school training in social skills for students with ADHD alongside typically developing peers in order to help foster improved social functioning from an early age.

Alternative/complementary interventions

Alternative and complementary treatments are often used in children with ADHD, but reported effectiveness is variable. Many interventions are controversial, have minimal or no established efficacy for children with ADHD and lack sufficient research evidence (DuPaul and Stoner, 2003). There is not room here to discuss the relative merits or otherwise of suggested treatments. The following list has been compiled with reference to several sources, some of which are listed in the suggestions for further reading:

- amino acid supplementation;
- brain gym;
- chiropractics;

- cognitive behaviour therapy;
- developmental optometry – eye exercises;
- diet – includes the adverse effects of food additives, food intolerance, deficiencies, allergies, the Feingold diet and dietary supplements, including fish oil;
- herbal or natural medicines;
- holistic approaches including acupuncture, aromatherapy, colour therapy, homeopathy, osteopathy, reflexology;
- multivitamins and zinc;
- play therapy and outdoor play in green places;
- tinted lenses;
- yoga.

Points to remember

- Diagnosis of ADHD is made by a medical clinician.
- ADHD is not a modern disorder.
- There is no one single 'cause' of ADHD. It is considered to be a bio-psycho-social disorder.
- It is estimated that between 1 and 5 per cent of school-aged children in the UK may have ADHD.
- Approximately 60 to 70 per cent of children with ADHD have comorbid or coexisting conditions of various types.
- ADHD is not simply a childhood disorder. It can persist into adulthood in some form or another.
- A multi-modal, multi-professional treatment approach should include a combination of medical, psychological, social and educational interventions.

Questions for reflection and discussion

1. What specifically are you hoping to learn from reading this book?
2. Have you or any members of your school received any training in ADHD?
3. Do you believe a diagnosis of ADHD is a help or a hindrance:
   (a) to the student?
   (b) to the parents?
   (c) to the school?
4. If 1–5 per cent of students have ADHD how many in your school or class are likely to have it?
5. What aspects of schools might present difficulties for students with ADHD?

Remember: 'Myth or Fact?' sheets (Figures 1.1 and 1.2) are also available from www.sagepub.co.uk/wheeler