Obsessive–compulsive disorder in children and adolescents

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Obsessive–compulsive disorder (OCD) is an extremely common form of child and adolescent psychopathology. Obsessive–compulsive disorder in children and adolescents has garnered a significant amount of attention from mental health practitioners and mental health researchers over the past decades. In order to provide a comprehensive account of this attention, the phenomenology, theoretical perspectives, empirical literature and interventions used to treat OCD in children and adolescents are reviewed in this paper. While by no means an exhaustive review, the information presented in this paper provides health and mental health professionals interested in OCD in children and adolescents with the knowledge required to enhance their understanding of this complicated form of child and adolescent psychopathology.

Keywords: anxiety, child and adolescent, mental health

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Over the past decade obsessive–compulsive disorder (OCD) in children and adolescents has received a considerable amount of empirical attention. Obsessive–compulsive disorder is a chronic and debilitating form of psychopathology that causes the afflicted individual a significant amount of distress (Robinson 1998). The obsessions and compulsions that characterize OCD interfere with cognitive and social development, which can lead to adaptational and functional impairments (American Psychiatric Association 2000). Obsessive–compulsive disorder rarely stands alone. Approximately two-thirds of children and adolescents with OCD have at least one other psychiatric diagnosis (March & Leonard 1996). Common concurrent psychiatric diagnoses include mood, tic, eating and pervasive developmental disorders (Hanna 1995, Grados et al. 1997). Children and adolescents afflicted with OCD are also extremely vulnerable to other anxiety disorders (Valleni-Basile et al. 1994). In fact, other anxiety disorders typically emerge before the diagnosis of OCD, which suggests a shared pathogenesis (Valleni-Basile et al. 1994).

Obsessive–compulsive disorder was once believed to be an extremely rare form of child and adolescent psychopathology. However, several recent epidemiological studies have begun to change this notion. Prevalence rates ranging from 1% in prepubertal children to 4% in adolescents are reported throughout the literature (Leonard et al. 2005, Merlo & Storch 2006, Moore et al. 2006). These prevalence rates suggest that OCD could be 2–20 times more common than previously thought (Waters & Barrett 2000).

Estimating the prevalence of OCD in children and adolescents is extremely difficult. Children and adolescents with OCD are often secretive about their symptoms and rarely present for treatment unless their symptoms are extreme or debilitating (Thomsen 1994, Valleni-Basile et al. 1994). Children and adolescents receiving treatment for other disorders will acknowledge the presence of OCD symptoms when asked directly (Rapoport et al. 2000). However, they seldom offer this information spontaneously. Further, children and adolescents with subclinical OCD are not included in these estimates. Subclinical OCD
is neglected throughout the empirical literature, but many researchers believe that it affects the developmental process in the same manner as clinical OCD (Farrell et al. 2006). While reported prevalence rates are high, they may actually underestimate the number of children and adolescents afflicted with OCD.

The information presented above suggests that OCD in children and adolescents is an important topic worthy of thorough consideration. Mental health professionals who work with children and adolescents need to possess a functional understanding of the disorder in order to intervene effectively (Thomsen 1996). Effective intervention is contingent upon the ability to recognize, interpret and react to the symptoms of OCD in children and adolescents. Empirical knowledge and the theoretical underpinnings that inform this knowledge are the foundations that facilitate this crucial ability.

The purpose of this paper is to provide a comprehensive review of relevant information pertaining to OCD in children and adolescents. An overview of the phenomenology of OCD in children and adolescents is provided at the outset. This overview is followed with a discussion of the theoretical perspectives on OCD in children and adolescents. After this discussion attention is paid to the empirical evidence that has amassed in support of these theoretical perspectives. A review of the intervention strategies devised to help children and adolescents with OCD is included. The paper will conclude with an examination of the implications of the information presented throughout.

Phenomenology

Symptoms

Obsessive–compulsive disorder is characterized by obsessions and compulsions that lead to significant distress and impairment. Although obsessions and compulsions are the defining characteristics of OCD, these symptoms are also present in a number of other psychiatric disorders (e.g. body dysmorphic disorder, Tourette’s syndrome, trichotillomania) (Maltby & Tolin 2003). How obsessions and compulsions manifest in children and adolescents afflicted with OCD is reviewed below.

Obsessions

Obsessions are repetitive, intrusive thoughts and images that lead to significant distress (American Psychiatric Association 2000). Obsessions are best viewed as a 'normal' experience (Barrett & Healy 2003). There is empirical evidence to support this notion. Several studies have found that nearly 90% of non-clinical individuals report occasional intrusive thoughts, images and impulses (Maltby & Tolin 2003). However, when obsessions become repetitive, uncontrollable and lead to significant functional impairments, they are considered pathological (American Psychiatric Association 2000).

Pathological obsessions dominate the afflicted individual’s thoughts. They are intrusive and often appear meaningless, inappropriate and irrelevant (Chowdhury et al. 2004). The most common obsessions experienced by children and adolescents involve thoughts about contamination, aggressive or violent images, and bodily concerns (Carter & Pollock 2000). Approximately one-fourth report sexual obsessions, one-fourth report religious obsessions and one-fourth obsess about special numbers, words, or colours (Riddle et al. 1990). Children and adolescents often attempt to suppress, resist or ignore obsessions. Strategies to control obsessions become more complex with increased age (Carter & Pollock 2000).

Compulsions

Compulsions are repetitive behaviours or mental activities that are used to diminish the anxiety, distress or tension caused by obsessions (American Psychiatric Association 2000). Compulsions are not inherently goal-directed or rewarding. Like obsessions, in moderation, compulsions can be viewed as adaptive. Compulsions can help individuals meet their basic survival needs (i.e. avoiding disease). However, when compulsions are excessive, rigid and leave little room for behavioural flexibility, they are considered pathological (American Psychiatric Association 2000).

Compulsions commonly reported by children and adolescents include washing, cleaning, checking and touching (Riddle et al. 1990, March & Leonard 1996). Other common compulsions experienced by children and adolescents include mental rituals, such as counting and repeating words or phrases, or ordering and arranging possessions (Carter & Pollock 2000). Some of these compulsions may involve repeating a behaviour on each side of the body until it feels or appears the same on both sides (e.g. retying shoelaces until the bows on each shoe match). Children may repeat compulsions until the behaviour or set of behaviours feels ‘just right’ (Pollock & Carter 1999).

Compulsions are not inherently goal-directed or rewarding (Carter & Pollock 2000). Even when they appear to be employed to neutralize obsessions, compulsions are typically not directly related to the obsessions in a meaningful way (e.g. neutralizing an obsession about germs by counting or ordering toys) (Carter & Pollock 2000). The most typical compulsions involve efforts to ensure security or hygiene (e.g. protective checking, cleaning or hoarding activities) (Carter & Pollock 2000).
Age and gender effects

The effects of age and gender on OCD in children and adolescent have been studied extensively. Several studies have reported OCD in children as young as 2 years of age, with a mean age of onset between 8 and 11 years (Penn et al. 1997, Chowdhury et al. 2004). Some studies suggest that on average, males have an earlier age of onset than females, with more males than females affected prepubertally (Hanna 1995, Geller et al. 1998, Zohar 1999). However, this age of onset gender discrepancy is not fully supported throughout the empirical literature (Riddle et al. 1990). At minimum, by the end of adolescence and young adulthood, prevalence rates for males and females are comparable (Carter & Pollock 2000).

Theoretical perspectives

Genetic and neurobiological factors both make a heavy contribution to the development and maintenance of OCD (Shafran 2001). Psychological and environmental factors also appear to be intimately involved (Henin & Kendall 1997). Recent theories of OCD openly encourage the integration of biological, psychological and environmental factors. The shift towards an integrated theoretical perspective is extremely important because until recently, ‘nature theories’ and ‘nurture theories’ were held in sometimes bitter opposition (Carter & Pollock 2000).

Biological theories

Biological theories of OCD assert that OCD is primarily caused by a constitutional vulnerability or predisposition to the disorder (Carter & Pollock 2000). Many biological theories of OCD hypothesize that abnormalities in serotonin metabolism and frontal-striatal circuitry operation are responsible for the creation of OCD symptomatology (Maltby & Tolin 2003). The serotonin hypothesis is predicated on the observation that individuals with OCD respond preferentially to selective serotonin reuptake inhibitors (SSRIs) as opposed to non-serotonergic medications or placebos (Thomsen 2000, Kaplan & Hollander 2003). Further, neuroimaging and neurosurgical evidence suggests that OCD is associated with hyperactive operation in frontal-striatal circuitry of the brain, which includes the orbitofrontal cortex, anterior cingulate cortex, caudate nucleus and thalamus (Saxena & Rauch 2000, Leonard et al. 2003).

Psychological theories

Behavioural theories

Behavioural theories of OCD assert that compulsions are a form of avoidance that serves to maintain obsessive fears through negative reinforcement (i.e. anxiety reduction) and by preventing opportunities for habituation to feared objects and situations (Maltby & Tolin 2003).

Cognitive theories

Cognitive theories assert that information processing plays a central role in the development and maintenance of obsessions (Rachman 1993). Cognitive theories of affective disorders in general suggest that individuals who experience heightened anxiety tend to distort and interpret events in a negative or catastrophic manner (Carter & Pollock 2000). Specifically, they tend to overestimate the probability and degree of external threat and underestimate the amount of internal resources available to help them cope with the perceived external threat (Rachman 1993). The interpretation of intrusive thoughts in individuals afflicted with OCD seems to be the distinctive feature differentiating normal intrusive thoughts from pathological obsessions (Maltby & Tolin 2003).

The precise role of cognitive mechanisms in the development and maintenance of OCD is not well understood. It has been hypothesized that children and adolescents develop pathological obsessions when concerns about harm and danger become linked to individuals or situations that they regularly encounter in their daily lives (Waters & Barrett 2000). Cognitive theorists believe that children and adolescents afflicted with OCD have experience what is called ‘thought-action fusion’, which is a diminished ability to delineate between reality and obscuring of mental processes (Rachman 1993). This information processing bias, which involves an inflated sense of responsibility, leads children and adolescents to obsess and engage in compulsive behaviours in order to prevent harm or eliminate danger (Chorpita et al. 1996, Barrett & Healy 2003).

For example, a child may obsess about harm befalling a parent if they do not perform a compulsive behaviour ‘just so’ and experience a sense of responsibility for the parent’s well-being. This style of cognitive processing gives rise to feelings of helplessness, which increases the child’s likelihood of rumination and self-blame. Any attempt to suppress the obsessions thoughts paradoxically enhances them. Thus, obsession suppression serves to perpetuate and maintain OCD symptomatology.

Environmental theories

Environmental theories of OCD tend to place a great deal of emphasis on the role of the family environment in the development and maintenance of OCD. This emphasis is logical because the vast majority of children, and some adolescents, spend a significant portion of their lives in the presence of family.

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One common hypothesis is that family environments dominated by elevated stress and anxiety levels place children and adolescents at risk for OCD (Krohne 1998). Environmental theorists who support this hypothesis believe that stress and anxiety laden family environments increase the likelihood that children and adolescents will learn to perceive that the world is an inherently dangerous place where caution constantly needs to be exercised. Further, parental overprotection and criticism for failures are also believed to be common in stress and anxiety laden family environments (Waters & Barrett 2000). Criticism and blame levied by parents for not taking adequate precautions against danger may lead to the development of harm avoidance behaviours, such as compulsions.

Numerous other hypotheses implicating the family environment have been postulated by environmental theorists. Significantly higher prevalence rates of OCD in immediate relatives have led to speculation that the modelling of avoidance, caution and fearfulness may predispose vulnerable children or adolescents to OCD (Henin & Kendall 1997). Similar to families of anxious children factors such as lack of warmth and expressed emotion (Hoover & Insel 1984), perceived lack of control over external events (Chorpita & Barlow 1998), and parent-child interactions characterized by the reinforcement of threat interpretation and avoidant plans of coping (Chorpita et al. 1996) are also hypothesized to be relevant to the exacerbation of OCD in children and adolescents.

Finally, some environmental theorists believe that the formation of attitude and styles of thought which develop during the formative years may also be important (Waters & Barrett 2000). These attitudes can originate from a variety of influential sources including family, school and the church, where strict moral codes exist. Certain codes for how to think and behave may engender a strong sense of responsibility and guilt, where fear of blame and punishment is high.

Integration of theories

As indicated earlier, ‘nature theories’ are no longer completely independent of ‘nurture theories’. Neurotransmitter and metabolic activities, behavioural reinforcement, maladaptive cognitions and information processing biases are all complementary ways to understand the development and maintenance of OCD (Maltby & Tolin 2003). Each variable has a direct influence on the other variables. There is no absolute or single direction of causality (e.g. biological irregularities cause dysfunctional behaviours).

Despite this important shift away from dichotomous theorizing a comprehensive biopsychosocial theory of OCD still does not exist. The lack of a comprehensive biopsychosocial theory of OCD directly impedes progress in understanding and treating this disorder. In the case of other established disorders (e.g. panic disorder), the development of comprehensive biopsychosocial theories has led to significant advances in conceptualization and treatment. Some theorists suggest that behaviour therapy in general may have reached an ‘efficacy ceiling’ that will only be penetrated by improved theories based on every line of psychopathology research (Franklin et al. 2003). In addition to potentially advancing the treatment of OCD, a comprehensive biopsychosocial theory could provide testable hypotheses that could help resolve the current controversies in OCD research, such as the heterogeneity problem and the relative placement of OCD in the spectrum of anxiety disorders (Maltby & Tolin 2003). In sum, a comprehensive biopsychosocial theory is essential in order to make theoretical, empirical and practice-based gains in relation to OCD in children and adolescents.

Literature review

Unfortunately, the vast majority of empirical support for both biological and psychological theories has been derived from studies of adults with OCD (Carter & Pollock 2000). In order to fully understand the course of OCD in childhood and adolescence, it is critical to examine OCD behaviours in the context of developmental shifts in biological systems and relevant psychosocial environments (Pollack & Carter 1999). The research on children and adolescents afflicted with OCD that has been conducted to date is reviewed below.

Biological factors

The biological basis of OCD in children and adolescents has been explored using a wide variety of methodologies. In an effort to determine whether OCD has a genetic component, researchers have examined concordance of the disorder in twins and prevalence of the disorder in family members. Another line of research has examined the neuroanatomical structures and neurochemical mechanisms that biological theorists believe contribute to the development and maintenance of OCD. Researchers have also begun to examine the neuroimmunological function of children and adolescents afflicted with OCD. The key findings that have emerged from each line of research are reviewed below.

Genetics

Although the empirical literature is somewhat inconsistent, there is a reasonable amount of evidence to suggest that
OCD has a genetic component. The preponderance of this evidence comes from twin and family studies. While there are few recent studies of concordance in monozygotic and dizygotic twins, recent meta-analytic studies have reported concordance rates of approximately 67% and 31% for monozygotic and dizygotic twins respectively (Waters & Barrett 2000). The relatively high concordance rate in monozygotic and dizygotic twins and supports the notion OCD has a genetic component. In further support of this notion, prevalence rates in the first degree relatives of children and adolescents afflicted with OCD are higher than the general population (Riddle et al. 1990). For example, one study revealed that 17% of parents with an OCD child or adolescent met the diagnostic criteria for OCD (Lenane et al. 1990). Specifically, fathers were nearly three times more likely to meet the diagnostic criteria for OCD than mothers (25% vs. 9%) (Lenane et al. 1990). Further, the prevalence rate of OCD in siblings was 5% (Lenane et al. 1990). Initially this value seems inconsequential. However, when this value was corrected to account for age of risk, the prevalence rate increased substantially to 35% (Lenane et al. 1990).

It should be noted that the findings presented by Lenane et al. (1990) do not preclude a parental modelling hypothesis because the symptoms were assessed at only one point in time and no investigation of past symptomatology was presented. It is possible that the OCD symptoms present in the children and adolescents may have been transmitted through the modelling of an anxious or avoidant coping style.

Neurobiology
Neuroimaging studies (e.g. magnetic resonance imaging, positron emission tomography) examining children and adolescents afflicted with OCD have consistently found increased activity of the frontal-striatal circuitry, the frontal-lobe and basal-ganglia in particular, suggesting that these neuroanatomical structures may be involved in the development and maintenance of OCD (Thomsen 1994, Chowdhury et al. 2004). Consistent with this, damage to and pathologic conditions associated with these regions have been related to the onset and exacerbation of OCD symptoms (Carter & Pollock 2000). In general, children and adolescents afflicted with OCD do not present with gross or clinically significant neurological pathology. However, the presence of 'soft signs', as well as a number of deficits that can be elucidated with neuropsychological testing, corroborates a biological basis of OCD (Thomsen 1994, Carter & Pollock 2000).

Clinical observations have repeatedly implicated the serotonergic and dopaminergic pathways in the development and maintenance of OCD (Carter & Pollock 2000). Furthermore, pharmacological studies have indicated a normalization of neurochemical function following symptom remission (Penn et al. 1997). To date, studies investigating these neurochemical pathways in children and adolescents are few, a promising line of research has demonstrated decreased serotonin synthesis in the ventral prefrontal cortex and caudate nucleus in an untreated pediatric population afflicted with OCD (Rosenberg & Keshavan 1998). Thus, serotonin appears to assist in the pharmacological relief of OCD, but whether it is involved in the pathophysiology of OCD is still unclear (Thomsen 1994).

Another recent line of research has begun to explore the association between neuroimmunological events and the onset and exacerbation of OCD symptoms (Leonard et al. 2001). These research developments are largely motivated by Sydenham's chorea, which is a neurological variant of rheumatic fever that is caused by streptococcal infection and affects the basal ganglia (Arnold & Richter 2001). The obsessive–compulsive symptoms that emerge during the active phase of this illness have been associated with other forms of childhood psychopathology (e.g. attention deficit hyperactivity disorder, tic disorders). Thus, a central question that needs to be addressed is the specificity of streptococcal infections in the development and maintenance of OCD (Thomsen & Leckman 2000).

Environmental factors
While knowledge concerning the biological factors that give rise to OCD has steadily increased over the past decade, there continues to be a relative paucity of research focusing on the associated environmental factors (Waters & Barrett 2000). One exception is research on the family environment. The family environment as a mechanism for the development and maintenance of OCD has been explored thoroughly. The key findings of this line of research are presented below.

Family environment
Higher than average prevalence rates of OCD in first degree relatives have led researchers to speculate about the mechanisms through which these relatives influence the development and maintenance of OCD (Barrett et al. 2002). Studies investigating the relationship between the family environment and OCD have been limited to case reports, clinical impressions and retrospective self-report (Waters & Barrett 2000). Each of these methodologies is not without significant flaws, the most critical being their sole reliance on the reported perceptions of the clinician or individual afflicted with OCD. Another important limitation is that the data generated by these studies cannot be
interpreted as causal because an association between ratings of the family environment and OCD does not indicate the direction of influence. However, despite these limitations, several methodologically sound studies investigating how the family environment might be associated with OCD in children and adolescents do exist.

One study investigated 128 families who had a child diagnosed with OCD or no clinical disorder (Hibbs et al. 1991). Parents were asked to give a 5-min speech describing their child. The dialogue was then coded for criticism and over-involvement. This study revealed that parents of children afflicted with OCD showed higher levels of criticism and over-involvement than the parents of children not afflicted with OCD. Another study examined adolescents' perceptions of their family environment using a self-report questionnaire (Valleni-Basile et al. 1995). Adolescents with OCD reported significantly less emotional support, warmth and closeness in their family compared with non-clinical controls. The results of these two studies provide preliminary evidence to suggest that family factors may be associated with the development and maintenance of OCD.

In addition to directly controlling the situations their children encounter and be emotionally withdrawn, there is evidence to suggest that parents of children afflicted with OCD may also try to protect their children by encouraging their avoidance of potentially difficult situations. Dadds et al. (1997) analysed the degree to which parents modelled, prompted and rewarded anxiety in their children during videotaped family discussions. The parents of anxious children were found to be more likely than parents of non-clinical children to reciprocate avoidant solutions and less likely to encourage pro-social solutions to ambiguous social situations. The question that arises from this research is whether families with children who are afflicted with OCD are different from families with children who have other anxiety problems in terms of family processes. This question was investigated in a recent study conducted by Barrett et al. (2002).

Barrett et al. (2002) sought to determine whether parent and child observed behaviour during family interactions differentiated families whose children were afflicted with OCD from other clinical and non-clinical groups. This study revealed strong support for this notion with OCD mothers, fathers and children being differentiated from their clinical and non-clinical counterparts on a number of behavioural dimensions. The findings of this study suggest that parents of children afflicted with OCD can be differentiated from parents of children in the other groups, as they were observed to engage in lower levels of positive behaviour during interactions with their children. Mothers and fathers in the OCD group used less positive problem solving, demonstrated less rewarding behaviour when their child exerted independence, and were less confident in their child's abilities than parents of non-clinical, anxious and externalizing children.

Interestingly, Barrett et al. (2002) also demonstrated that children afflicted with OCD could also be differentiated from children in the other groups. Obsessive-compulsive disorder children were different from other groups in that they were the least confident, the least likely to use positive problem solving and showed the less warmth in their interactions. These findings have important implications for understanding the maintenance of OCD symptoms. If children with OCD are not encouraged to problem solve, this could help to explain their reliance on compulsive behaviours as a coping mechanism.

**Intervention**

The treatment of child and adolescent OCD has received considerable attention in the literature (Lewin et al. 2005). Comorbid disorders often complicate the treatment of OCD in children and adolescents, as well as the evaluation of treatment effectiveness (Thomsen 1996). However, consistent with an integrative theoretical approach, both psychosocial and pharmacological interventions have both shown a promising ability to reduce OCD symptomatology (Leonard et al. 2005). Because of the side effects of psychotropic medication and interest in promoting self-efficacy and adaptive coping strategies, the expert consensus is to begin with psychosocial intervention before considering pharmacological intervention (Carter & Pollock 2000).

**Psychosocial intervention**

**Behavioural intervention**

Exposure and ritual prevention (ERP) is a behavioural intervention with a proven ability to reduce OCD symptomatology in children and adolescents. Exposure and ritual prevention consists of gradual, prolonged exposure to fear eliciting stimuli or situations, combined with strict abstinence from compulsive behaviour (Maltby & Tolin 2003). Although response inhibition initially increases anxiety, in the absence of compulsive behaviour, habituation and fear extinction are aided (Leonard et al. 2005). Typically, a graduated hierarchy of fearful stimuli is introduced, enabling the child or adolescent to increase skill in anxiety management (Lewin et al. 2005).

Another behavioural intervention often used to reduce OCD symptomatology in children and adolescents is anxiety management training (AMT). Anxiety management training involves teaching children and adolescents...
slow, diaphragmatic breathing; and progressive muscle relaxation techniques. Anxiety management training alone is not an effective treatment for OCD in children and adolescents. Because of the fact that AMT is designed to reduce exposure to anxiety, it may interfere with the core process of other behaviour intervention such as ERP (i.e. evoking anxiety to allow for habituation and cognitive change to occur) (Maltby & Tolin 2003). Most children and adolescents are able to tolerate the distress of ERP, and therefore do not require AMT (Franklin et al. 2003). However, some children and adolescents may be so anxious that they are unable to tolerate even mild exposure. Anxiety management training may be a useful adjunct to ERP in such cases.

Cognitive intervention
The distinction between 'behavioural' and 'cognitive' interventions is somewhat arbitrary. During behavioural interventions such as ERP, children and adolescents are routinely assisted in changing inaccurate beliefs about feared stimuli and situations. Similarly, cognitive interventions often involve direct behavioural suggestions to reduce avoidant behaviour.

When treating OCD using cognitive interventions the specific goal is to teach children and adolescents to identify, accept and correct their dysfunctional beliefs about feared stimuli and situations (Barrett et al. 2004). Information gathering, cognitive restructuring, skills building and homework assignments are integrated components of cognitive interventions (Lewin et al. 2005). Only very recently have 'pure' cognitive interventions for OCD in children and adolescents been empirically tested. Findings from studies to date demonstrate good outcome and maintenance of treatment gains (Thomsen 1996, Riddle 1998, Leonard et al. 2005, Lewin et al. 2005).

Family intervention
Obsessive-compulsive disorder in children and adolescents often has a profound negative impact on the lives of other family members. What distinguishes OCD families from other families of the mentally ill is the inextricable way that they are brought into the illness (Cooper 1996). Obsessive-compulsive disorder symptoms are all encompassing and the compulsions involve family members. The term 'family accommodation' is often used to refer to family responses that are directly (e.g. participation in or assistance with the rituals) or indirectly (e.g. modification in the family's lifestyle around the symptoms) part of the child or adolescent's OCD symptomatology (Waters & Barrett 2000). It is important to acknowledge the dynamic impact OCD in children and adolescents has on families.

Effective interventions address this important consideration (Waters & Barrett 2000).

Because of the dynamic impact OCD in children and adolescents has on families, families should be involved in psychosocial interventions whenever possible (Calvocersi et al. 1995). Studies show that psychosocial interventions that involve families lead to increased treatment efficacy (Piacentini et al. 1994, March 1995). In some cases, family intervention alone may be sufficient to elicit reductions in compulsive behaviours, such as instructing parents not to respond to excessive reassurance seeking (Freeman et al. 2003).

Pharmacological intervention
Studies suggest that psychotropic medication can be introduced to supplement psychosocial interventions (Grados & Riddle 2001). However, psychotropic medications should never be used as the sole form of intervention (Thomsen 2002). Selective serotonin reuptake inhibitors are the pharmacological intervention of choice for OCD (Thomsen 1996, 2002, Leonard et al. 2005, Lewin et al. 2005). Effective SSRIs include clomipramine (Anafranil), fluoxetine (Prozac), sertraline (Zoloft) and fluvoxamine (Luvox). These SSRIs have demonstrated effectiveness in adolescents and older children, although less is known about their efficacy in pre-schoolers and younger school-aged children (Thomsen 2002). The side effect profile observed in children and adolescents is consistent with that observed in adults and may include weight gain, hyperactivity and gastrointestinal distress.

If the child or adolescent does not respond to augmentation with a particular SSRI or only has a partial response, alternative SSRIs, benzodiazepines or both can be used (Thomsen 1996). The timely introduction of pharmacological intervention in children and adolescents afflicted with OCD may be crucial in obtaining a therapeutic response in treatment (Grados et al. 1997). Education of the family regarding pharmacotherapy should include an extensive discussion of the psychotropic medications available, potential side effects of these psychotropic medications and a realistic assessment of potential outcomes.

Implications
The information on OCD in children and adolescents presented throughout this paper has implications for individuals in the community at large, mental health practitioners and mental health researchers. First, the information on the prevalence rate and phenomenology of OCD in children and adolescents has the potential to increase awareness among individuals in the community. As indi-
cated earlier, until recently, OCD in children and adolescents was believed to be an extremely rare disorder. The information presented in this paper dispels that notion. An increased awareness could help parents and other adults who spend time with children and adolescents recognize when a child or adolescent is suffering with pathological obsession and compulsion. This recognition could lead to early intervention.

Second, the theoretical perspectives and empirical literature presented and discussed could be used to educate mental health practitioners who work with children and adolescents about OCD in this population. This information could be particularly useful to mental health professionals with limited practical experience. Understanding why disorders exist and what researchers have learned about disorders is incredibly important. Without this understanding it is incredibly difficult to provide meaningful care to children and adolescents who present for treatment. However, with this understanding there are virtually no limits to the positive impact mental health professionals can have on the daily lives of children and adolescents who present for treatment.

Third, all of the information could be used to help mental health researchers identify knowledge gaps and develop appropriate research strategies. Without a comprehensive understanding of the research that has been conducted to date, it is impossible for researchers to develop interesting and applicable research questions. Without interesting and applicable research questions, it is impossible for researcher to develop appropriate research strategies. All of the information presented throughout this paper could be used to overcome these barriers and could ultimately be used as a springboard for future research on OCD in children and adolescents.

Conclusion

Obsessive–compulsive disorder is an extremely common form of child and adolescent psychopathology. It is characterized by obsessions and compulsions that cause significant distress. Various theories have been proposed in an effort to explain OCD in children and adolescents. Biological and environmental factors both contribute to the development and maintenance of OCD. The empirical literature supports this notion. Fortunately, there are numerous effective ways to treat children and adolescents afflicted with OCD. Regardless of whether a child or adolescent is treated using psychosocial or pharmacological methods, most agree that it is important to actively involve the family in this process. There are many outstanding questions and unresolved issues. The lack of a comprehensive biopsychosocial theory tops this list.

However, the continued efforts of dedicated mental health practitioners and mental health researchers should ensure that these questions and issues are eliminated in the not too distant future.

References


