The Relationship between Mindfulness and Obsessive Compulsive

Symptoms in a Community Sample

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This thesis is dedicated to Jacob and Phoebe.

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Glossary of Abbreviations

CBT   - *Cognitive behaviour therapy*

DOCS   - *Dimensional Obsessive-Compulsive Scale*

ERP   - *Exposure and response prevention*

FFMQ   - *Five Facet Mindfulness Questionnaire*

FFMQaware   - *FFMQ subscale measuring acting with awareness, mindfulness facet*

FFMQdescribe   - *FFMQ subscale measuring the ability to describe / having vocabulary to label experiences, mindfulness facet.*

FFMQobserve   - *FFMQ subscale measuring ability to observe a range of experiences, mindfulness facet*

FFMQnonjudge   - *FFMQ subscale measuring nonjudging of inner experience, mindfulness facet*

FFMQnonreact   - *FFMQ subscale measuring nonreactivity to inner experience, mindfulness facet*

FFMQtotal   - *FFMQ whole scale score*

GAD-7   - *Generalized Anxiety Disorder Brief Scale*

MBCT   - *Mindfulness based cognitive therapy*

MBSR   - *Mindfulness based stress reduction*

MBT   - *Mindfulness based therapy*

NICE   - *National Institute for Health and Clinical Excellence*

OCCWG   - *Obsessive Compulsive Cognitions Working Group*

OC Symptoms   - *Obsessive compulsive symptoms*

OCD   - *Obsessive compulsive disorder*

PHQ-9   - *Patient Health Questionnaire – Brief Scale (Depression Scale)*

SMQ   - *Southampton Mindfulness Questionnaire*

SMQtotal   - *SMQ whole scale score*

SSRIs   - *Selective serotonin reuptake inhibitors*

Abstract

Background

Obsessive Compulsive Disorder (OCD) is a complex, heterogeneous condition which can result in many psychological, behavioural and emotional difficulties, negatively impacting on quality of life. Current recommended treatments are not well tolerated and/or have limited success, for some service users. Therefore, other therapeutic options have been explored. Although the burgeoning experimental and clinical research has demonstrated promising outcomes for mindfulness-based interventions, a relationship between mindfulness and obsessive-compulsive symptoms, has yet to be established.

Method

The relationship between mindfulness and obsessive-compulsive (OC) symptoms was investigated in a community sample ($N = 164$) using an internet-based survey containing self-report measures of mindfulness and OCD. Participants were recruited through word of mouth, web-site research pages, and snowball sampling. The potential roles of age, prior mindfulness experience, anxiety and depression were also investigated.

Results

A significant negative relationship was found between mindfulness and OC symptoms. Anxiety and depression were positively and significantly associated with OC symptoms, and were found to mediate the relationship between mindfulness and OC symptoms. A significant negative relationship was found between age and OC symptoms. Age was found to be significantly positively associated with mindfulness. A *non-judging* approach to inner experiences demonstrated the greatest negative association

with OC symptoms, compared with other facets of mindfulness. The mindfulness facet of *observing* made a small positive predictive contribution towards OC scores, in a mindfulness multi-facet – OC symptom regression model.

Conclusions

The results from this study offer support for mindfulness-based interventions for OCD. Although most mindfulness facets were associated with reduced OC symptoms, *observing* was associated with increased OC symptom level. Clinicians using mindfulness-based OCD treatments should therefore be aware of, and review the suitability of the specific mindfulness components contained within any mindfulness-based intervention programme.

Introduction

Overview

A growing number of clinicians, researchers and service users, have reported that currently recommended treatments for OCD are not well tolerated and/or have limited success for some people (Murphy & Perera-Delcourt, 2014; Hyman & Dufrene, 2008; Foa et al., 2005; Simpson, Huppert, Petkova, Foa & Liebowitz, 2006; Stanley & Turner, 1995; Antony et al., 2007; Freeston et al., 1997; Abramowitz, Taylor & McKay, 2005; National Institute for Health and Clinical Excellence [NICE], 2006; Purdon, 2007). This has led to the application of therapeutic interventions such as mindfulness-based approaches, to the treatment of OCD, despite a fairly limited evidence-base.

Case studies, small clinical trials, and experimental studies have provided some support for the effectiveness of mindfulness-based interventions in treating OCD (e.g Biegel, Shapiro, Brown & Schubert, 2009; Singh, Wahler, Winton & Adkins, 2004; Wilkinson-Tough, Bocci, Thorne & Herlihy, 2010). However, study design has limited the ability to isolate the specific role of mindfulness in the observed improvements in OCD symptoms, following treatment. Therefore, the present study asks the more fundamental question about the relationship between mindfulness and obsessive-compulsive symptoms (OC symptoms), to provide further understanding about the role of mindfulness in the treatment outcomes reported in OCD studies.

The introductory chapter defines and describes OCD, and explores the impact on sufferers, and on society. Theoretical models of the aetiology and maintenance of OCD are examined, as well as recommended treatments for OCD. Mindfulness is introduced and

defined, followed by a critical appraisal of the research linking OCD and mindfulness. The study's rationale, aims and hypotheses are also presented.

Obsessive Compulsive Disorder – Definition and Characteristics

A Brief History of Obsessive Compulsive Disorder

Obsessions and compulsions have been observed and described throughout history (OCD-UK, 2014; Rachman & De Silva, 2009). In the first century A.D., Plutarch, a Greek priest, writer and historian, referred to those afflicted by life-interfering superstitions as having "emotion growing out of deluded reasoning", and where superstition "turns an ordinary evil into something fatal" (Loomis, 1951, p 373).

Compulsive washing, contamination fears, and life-interfering religious pre-occupations have been formally recorded in clinical settings since the 17th century (MacDonald, 1981). The terminology of obsession can also be traced back to a similar time period, defining a pre-occupation with particular non-religious thoughts (Harper, 2014).

Freud (1894) conceptualised obsessions as originating from a defensive psychological mechanism. He suggested that unwanted aspects of the self (e.g. socially or morally unacceptable thoughts or behaviours), were unconsciously split away and suppressed, only to reappear as obsessions/compulsions in an uncontrolled, inconsistent and interfering way, when the system was in distress. These psycho-analytically informed conceptualisations of OCD and treatment approaches have not been supported by theory or practice driven research, and are not currently recommended as treatment for people with OCD (National Institute for Health and Clinical Excellence [NICE], 2006).

Tuke (1894) defined obsessive compulsive symptoms as a distinct psychiatric condition caused by neurological deficiencies. Expanding on this model a decade later, Janet (Pitman, 1984) attributed the aetiology of OCD to underperforming higher order cognitive functions involving attention, planning, prioritising, initiating, adapting and emotion-regulation; thought to prevent the effective processing of thoughts, observations and attributions. These ideas are consistent with current neurological and metacognitive understanding of the mechanisms of OCD. Within the last century, OCD has come to be understood within a wide range of aetiologies and models, with cognitive-behavioural explanations taking dominance. These are described later in this chapter.

Current Definition of Obsessive Compulsive Disorder

Many people experience unacceptable and intrusive thoughts, and ritualised behaviours from time to time (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). As many as 80 – 99 % of the healthy population report experiencing obsessions (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984; Freeston, Ladouceur, Thibodeau, & Gagnon, 1991), and 55 % experience compulsions (Muris, Merckelbach & Clavan, 1997). However with increased intensity, frequency, associated distress and disruption to everyday life, these thoughts and behaviours become more problematic, and approach a more clinical experience for some people (Rachman & de Silva, 1978), whereby OCD may be diagnosed.

OCD is recognised as a mental health disorder by current classification systems (American Psychiatric Association [APA], 2013b; World Health Organisation [WHO], 2010; NICE, 2006). The World Health Organisation (2010) currently defines OCD as a neurotic stress-related and somatoform disorder. The APA recently created the category of OCD-based disorders (APA, 2013a), and repositioned OCD within this category from anxiety-

related conditions (APA, 2009), along with other re-categorised or newly isolated conditions with overlapping symptom characteristics (e.g. hoarding, body dysmorphic disorder, tic disorders).

Obsessive Compulsive Disorder is characterised by repeated obsessions and/or compulsions, which are understood by the sufferer to be self-generated, but involuntary and unwanted, excessive, intrusive, life-interfering and out of character (APA, 2013b; WHO, 2010; NICE, 2006). For a clinical diagnosis to be considered, the obsessions and/or compulsions would normally be time consuming for the individual (more than one hour per day), and interfere with social, occupational and other functioning (APA, 2013b). The symptoms should not be explained by any other pre-existing condition, or influence (e.g. substance misuse) (APA, 2013b; NICE, 2006).

Characteristics of Obsessive Compulsive Disorder

The core features of OCD include, generally, an internal or external event which triggers the obsessive thought (e.g. seeing a knife triggers repeated thoughts about stabbing someone). This causes distress or discomfort which the individual seeks to reduce by using cognitive (thought manipulation, distraction, mental rituals) and/or behavioural (seeking reassurance from others, avoidance, compulsive/compensatory activity) coping strategies (Rachman & de Silva, 2009).

Obsessions can include intrusive ideas, thoughts, images or intentions, which evoke discomfort, anxiety or fear, and are incongruent with a person's usual beliefs about themselves or the world (APA, 2013b; Rachman & de Silva, 2009). The types of obsessions experienced vary greatly between people, although common categories (or sub-types) exist

which include in order of prevalence, thoughts and fears about: contamination, being harmed and keeping safe, order or symmetry, body or physical symptoms, religious and spiritual beliefs, sexual thoughts, and thoughts/fears about committing harm towards others (Foa et al., 1995).

Compulsions are physical or mental acts that are repetitive, excessive, not generally useful or enjoyable, are employed in order to reduce anxiety or distress, and are difficult to modify or extinguish (WHO, 2010; APA, 2013b; Rachman & de Silva, 2009). Compulsions, particularly mental acts such as counting rituals or mental recitations, may not always be obvious to an external observer (NICE, 2006). Compulsions may be performed to reduce or counteract an obsession or the distress caused by an obsession; or they may be initiated without any obvious preceding event or trigger (Rachman & de Silva, 2009).

In a U.K. based population study, people were found to be almost twice as likely to experience obsessions, than compulsions (ONS, 2000). Common categories of compulsion (or sub-types) include, in order of prevalence: checking, cleaning/washing, repetitive acts, mental compulsions, ordering, and counting (Foa et al., 1995). Hoarding, originally conceptualised as an OCD sub-type (APA, 2009), has recently been reclassified as a distinct condition, based on findings from genetic and neuroimaging studies (e.g. Murphy, Timpano, Wheaton, Greenberg & Miguel, 2010) and has been categorised within OCD-related conditions (APA, 2013b),

With a range of unique sub-types with non-overlapping features and co-morbidity patterns (Mataix-Cols, Conceircao do Rosario-Campos & Leckman, 2005; Murphy et al., 2010) OCD is a heterogeneous condition, which has been traditionally difficult to define and

measure in epidemiological, experimental and clinical studies, possibly accounting for

discrepancies in prevalence, and treatment successes reported (Taylor, Abramowitz, &

McKay, 2007; Mataix-Cols et al., 2005). This heterogeneity in symptoms is also thought to

reduce the effectiveness of manualised treatment approaches favoured for use with other

mental health conditions which have more consistent presentations (Mataix-Cols et al., 2005;

Chamberlain, Blackwell, Fineberg, Robbins & Shahakian, 2005).

Prevalence and Course of OCD

Obsessive Compulsive Disorder is one of the less prevalent mental health conditions

in communities, with a 1% median global prevalence rate (Eaton et al., 2008). Twelve

month prevalence rates range from 1% to 1.2% of the US adult population (Kessler et al.,

2005b; Ruscio, Stein, Chiu & Kessler, 2010) and from 0.1% to 2.3% of the European adult

population (Wittchen & Jacobi, 2005). Lifetime prevalence rates range from 1.6% to 2.3%

of the US adult population (Kessler et al., 2005a; Ruscio et al., 2010). The distribution

across genders is equal for children and adolescents, however by adulthood there is greater

prevalence in women than men with a European ratio of 1.5 (Wittchen & Jacobi, 2005), and

U.K. ratio of 1.44 (Torres et al., 2006).

OCD is a condition which can first appear in childhood, and is characterised by

marked increases in prevalence during middle to late adolescence (Heyman et al., 2001).

Prevalence peaks in the younger adult range, with a decline in prevalence across the adult

lifespan (Torres et al., 2006; Ruscio et al., 2010).   OCD has traditionally been seen as a

chronic condition, which has little hope for improvement without treatment (Kellner, 2010).

However, results from a recently published community cohort study ($N = 591$, Switzerland)

found a steady rate of remission in OCD (not associated with treatment), across the adult

lifespan, with approximately two thirds of previously diagnosed adults, symptom-free for at least 3 years by the age of 50 (Fineberg et al., 2013). OCD sufferers with long-standing and more severe symptoms, and who sought treatment, were however, less likely to experience remission (Fineberg et al., 2013).

Impact of Obsessive Compulsive Disorder

Obsessive Compulsive Disorder has a significant impact on quality of life (Torres et al., 2006; NICE, 2006; ONS, 2000; Koran, 2000). Nearly two thirds of people with recently occurring OCD have reported severe (maximum) levels of impairment in social, work and domestic activities, as well as relationships (Ruscio et al., 2010). Impairments in these activities are reported as almost three times more likely for OCD sufferers than for those with anxiety disorders (Torres et al., 2006); and ten times more likely than for the non-clinical population (Torres et al., 2006).

Twice as many people with OCD compared with people with anxiety disorders, gave maximum severe ratings for their symptoms, and felt the need to seek treatment (Torres et al., 2006; Kessler et al., 2005b). OCD-sufferers were more likely to receive psychological treatment (39.8%) than those with anxiety disorders (22.7%) (Torres et al., 2006), and experience lengthy delays in treatment (between 10 to 15 years) (NICE, 2006) due to shame and embarrassment, and under-diagnosis once presenting for treatment (Heyman et al., 2006; Veale & Roberts, 2014; Hyman & Pedrick, 2005). Associated economic costs of OCD include days lost from work, social benefits, lower waged employment (Torres et al., 2006; Koran, 2000), and disengagement from employment (ONS, 2000; Koran, 2000)

People with OCD are twice more likely than people with anxiety disorders and ten times more likely than the non-clinical population, to have attempted suicide during their lifetime (26% of OCD sufferers), with comorbid depression not considered a contributory factor (Torres et al., 2006).

OCD-related interference with important early life experiences and developmental stages, is reported to have contributed to delays in life skills development and increased life impoverishment (missed or avoided opportunities or experiences). OCD sufferers have reported significant concerns about not feeling normal or fitting in, and failing at life (Murphy & Perera-Delcourt, 2014). Families can experience OCD-related distress, when feeling pressured into providing excessive reassurance or making behavioural/lifestyle adaptations (Veale & Roberts, 2014; Heyman et al., 2006; Koran, 2000; Rachman & de Silva, 2009).   Depression and anxiety in family members has been associated with having to meet these demands (Amir, Freshman & Foa, 2000; Koran, 2000).

Co-morbidity with Other Conditions

OCD is associated with a wide range of comorbid mental health conditions (Murphy et al., 2010), including agoraphobia, panic disorder, social phobia, PTSD, specific phobias, alcohol misuse, separation anxiety, and oppositional-defiant disorder (Torres et al., 2006; Ruscio et al., 2010; Kessler et al., 2005b).   A U.S. population study found that 90 % of those with diagnosable OCD symptoms, also presented with another lifetime mental health disorder (Ruscio et al., 2010).

Anxiety and depression are two of the more prevalent comorbid conditions (WHO, 2010; APA, 2013b; NICE, 2006; Murphy et al., 2010; Kessler et al., 2005b; Torres et al.,

2006). A UK-population prevalence study found 62 % of OCD sufferers simultaneously experienced another anxiety disorder compared with comorbidity levels for those diagnosed with other anxiety disorders at 9.8 % (Torres et al., 2006).   An international comparison study found the comorbid pattern of OCD with lifetime depression ranged from 12.4 % to 60.3 %, and 30.3 % to 69.6 % with anxiety disorders (Horwath & Weissman, 2000), and comorbid generalised anxiety disorder has been found in 30% of OCD sufferers in a more recent study (Pallanti, Grassi, Sarrecchia, Cantisani & Pellegrini, 2011). Additionally, a positive association has been found between both anxiety and depression, and OCD symptom level (Nestadt et al., 2001). An epidemiological study found that comorbid anxiety disorders predated OCD in 80 % of cases, and around 45 % of cases of comorbid depression predated OCD (Ruscio et al., 2010). A recent review (Pallanti et al., 2011) found that most comorbid cases of depression followed OCD onset, suggesting a connection with prolonged disability and distress from the illness. Although an earlier study found that having comorbid depression did not alter behavioural treatment outcomes for OCD patients, (Stanley & Turner, 1995), more recent clinical and review studies (Overbeek, Schruers, Vermetten & Griez, 2002; Steketee, Chambless & Tran, 2001; Pallanti et al., 2011), have found that comorbid depression and anxiety disorders increased treatment resistance in OCD and led to a poorer prognosis.

Obsessive Compulsive Disorder – Aetiological Models and Associated Treatments

Up until the mid 1960s, Obsessive Compulsive Disorder was considered one of the more difficult mental health conditions to treat successfully. Since that time, advances and evolution in psychotherapeutic techniques have greatly improved the outcomes for OCD treatment, with theoretically informed treatment finding greater success (Antony, Purdon &

Summerfeldt, 2007). More recent advances in pharmacotherapy have also improved

treatment outcomes for OCD (Kellner, 2010). The following section will critically review

the empirically supported aetiological models for OCD development and maintenance, along

with any associated treatments.

Socio-cultural Model of OCD

Familial studies have demonstrated a familial link in OCD development, separate

from purely genetic factors, suggesting a social/environmental effect on OCD development

(Pauls, 2010), although non-shared specific experiences are thought to play more of a role

than shared family environment (Pauls et al., 2014).

Cross cultural studies (Horwath & Weissman, 2000; Fontenelle, Mendlowica,

Marques & Versiani, 2004) have suggested that cultural influences also play a role. An

epidemiological study found that whilst prevalence rates, comorbidity patterns and age of

onset for OCD were cross-culturally similar, illness presentation differed. Obsessions-only

were more prevalent in the U.S., Canada, Puerto Rico and New Zealand; an equal

representation of obsessions and compulsions in Germany and Taiwan; and Koreans

demonstrated more compulsion-only presentations (Horwath & Weissman, 2000).

Differences in OCD sub-type prevalence have been observed across cultures, with higher

proportions of religious obsessions in the Middle East, attributed to high levels of cultural

engagement in religious rituals, and a higher proportion of aggression-based obsessions in

Brasil, attributed to an increasing cultural preoccupation with avoiding violence (Fontenelle

et al., 2004).

This aetiological understanding has implications for risk identification (familial history), diagnosis (cultural differences) and treatment considerations (familial involvement, cultural considerations). Some family-based OCD therapies have been developed (Tolin & Steketee, 2007), with demonstrated improvements in outcomes over similar individual-based programmes.

Developmental Model of OCD

A longitudinal cohort study (Grisham et al., 2011) representing a cross section of the community ($N =$ 972, New Zealand), and periodically monitored for health and behaviour, found no significant link between adult diagnosis of OCD and prenatal or neonatal problems, childhood intelligence or general temperament, or losing a parent through death, separation or divorce. Significant links were found, however, with childhood patterns of using internalised psychological coping strategies, having higher negative emotionality, having experienced social isolation, frequent changes in address, and having experienced sexual and/or physical abuse. Additionally, for OC symptoms at sub-clinical levels, strong associations were found with pre and post natal difficulties, childhood motor skills difficulties, lower childhood intelligence, difficult and passive temperaments, conduct problems, hyperactivity, emotionality, and loss of parent (Grisham et al., 2011).

These findings (Grisham et al., 2011) suggest that certain developmental and life experiences play a role in OC symptom, and OCD development. However, the developmental model does not clarify causality, it does not account for the link between specific developmental deficits and experiences and the appearance of symptoms in only some people, nor explain the variety of manifestations of obsessions and compulsions. Although knowledge about the wide range of associated experiences and developmental

deficits may assist with OCD risk identification, it does not logically lead to specific treatment interventions.

Biological Model of OCD

The biological model conceptualises OCD as a neurological disorder (Tolin & Steketee, 2007), with genetic, neuroimaging and pharmacological studies supporting the role of biological predisposition or vulnerability (Hyman & Pedrick, 2005; Pauls, 2010; Chamberlain et al., 2005).

A biometric genetic analysis of obsessional and neurotic symptoms in identical and fraternal twins, examining for the differences in effect which would suggest the influence of genetics above environmental factors, found a moderately high genetic component to OC traits (heritability estimate of 44%) and OC symptoms (heritability estimate of 47%) (Clifford, Murray & Fulker, 1984). More recent twin study reviews have supported these findings (Chamberlain et al., 2005; Eaton, 2008; Miguel et al., 2005) with rates ranging from 45% to 65% for children, and 27% to 47% for adults, accounting for genetic contribution to OCD familial pattern. A recent meta-analysis of twin studies found that inheritability of OCD accounted for around 40% of the illness presentation with around 51% attributed to non-shared environmental factors (Pauls et al., 2014). Specific adverse biological and experiential events such as sex-specific hormonal influences, pregnancy and birth characteristics, psychosocial stressors and post-infection immune-based responses, are thought to result in epigenetic changes associated with OC symptom development (Miguel et al., 2005; Pauls et al., 2014). Burgeoning research has located potential susceptible genes in the catecholamine modulation and glutamate pathways, as well as the dopamine and serotonin systems (Miguel et al., 2005; Pauls et al., 2014).

The successful use of selective serotonin reuptake inhibitors (SSRIs) in the treatment of OCD, had originally led biological theorists to implicate the neurotransmitter serotonin (involved in mood, impulse control and aggression) in the development/maintenance of OCD (Hyman & Pedrick, 2005; Rachman & De Silva, 2009). However, as $40-60\%$ of those with OCD are not helped by SSRIs, and SSRIs are used to successfully treat other mental health conditions (Rachman & De Silva, 2009; Hyman & Pedrick, 2005), the specific role of serotonin in OCD currently remains unclear (Chamberlain et al., 2005). More recent biological theories based on the findings from genetic studies as detailed previously in this section, suggest the complex involvement of a range of neural systems and neurochemical pathways, which contribute to the development of the range of observed dimensions and symptom characteristics of OCD (Pauls, 2014).

Neuroimaging studies have supported the more complex neurological explanations for OCD. Differences in specific brain structures and neurological patterns have been observed between people with OCD and people without OCD (Tolin & Steketee, 2007; Schwartz, 1996). Sustained changes in neural pathway metabolism have also been observed following pharmacological (clomipramine and SSRIs), and behaviour therapy OCD interventions (Chamberlain et al., 2005). Key regions identified in OCD functioning include the orbital cortex (thought/response amalgamation, threat assessment/response); the thalamus (sensory amalgamation); the cingulate gyrus (attention/task focus, danger signalling); and the caudate nucleus (thought processing, filtering and prioritising) (Hyman & Pedrick, 2005; Chamberlain et al., 2005). In addition, the basal ganglia (procedural learning and habit formation), amygdala (emotional learning and memory filtering), and hippocampus (remembering experienced events) (Menzies et al., 2008), are thought to further reinforce OCD patterns by inhibiting new information and new experiences from changing firmly held

beliefs and ideas.

An increased understanding and investigation into the role of complex and broader neural systems rather than discrete regions, has demonstrated a consistent pattern of orbito-frontal and basal ganglia regional abnormalities in those with OCD (Chamberlain et al., 2005; Menzies et al., 2008), as well as the emerging identification of specific OCD sub-types through neurological mapping (e.g. compulsive washing and checking) (Chamberlain et al., 2005). These areas differ from healthy populations, as well as from those with other types of anxiety disorder (Chamberlain et al., 2005).

Findings from neurocognitive studies support biological evidence, with reduced cognitive flexibility and reduced capacity for cognitive and behavioural inhibition in OCD sufferers, consistent with the role of lateral orbitofrontal loop dysfunction. Associated deficits include difficulty with: memory strategies, attentional switching, rule and response, selective attentional bias, and directed forgetting (Chamberlain et al., 2005; Chamberlain, Fineberg, Blackwell, Robbins & Sahakian, 2006; Greisberg & McKay, 2003; Menzies et al., 2008). These difficulties are thought to contribute to impaired learning from feedback, hesitation in correcting errors, reluctance to relinquish redundant strategies, ineffective filtering of relevant/irrelevant information, poor novel solution formation, impeded memory recall, cognitive rigidity in processing and decision-making, and increased self-doubt (Griesberg & McKay, 2003). Consistent with this model, Ladouceur et al. (2000) found that an OCD sample used significantly more unsuccessful perseverant intrusive thought management strategies, than those with anxiety and a non-clinical sample.

Pharmacotherapy for OCD, is consistent with the biological understanding of the aetiology of OCD, and SSRIs (Serotonin Reuptake Inhibitors) are a currently recommended treatment for OCD (NICE, 2006; Kellner, 2010).   From 40% to 60% of OCD sufferers have reported reduced symptoms with full course SSRI treatments (Kellner, 2010; Chamberlain et al., 2005). Ease of treatment as well as stabilisation of comorbid conditions enabling better access to psychological therapies, are considered a benefit of this type of treatment (Van Niekerk, 2009; Rachman & De Silva, 2009).

However, 40% to 60% of SSRI users have reported little or no symptom improvement (Kellner, 2010) with delays in symptom reduction, treatment adherence issues, high levels of relapse, and unpleasant side effects cited as common complaints (Rachman & De Silva, 2009; Eddy, Dutra, Bradley & Westen, 2004). Other medications such as Clomipramine and anti-psychotics have also been used, but have lower risk benefit ratio and less tolerable side effects than SSRIs (Rachman & De Silva, 2009; Stanley & Turner, 1995; NICE, 2006; Kellner, 2010; Eddy et al., 2004).

The role of biological vulnerability and predisposition is therefore empirically supported, with successful treatment based on biological manipulation (SSRIs), identified genetic links, and specific mapped neurological dysfunctions consistent with identified OCD-related cognitive mechanisms as well as identified sub-types. However, the model does not fully describe OCD development and course, such as only partial genetic contribution, spontaneous remission, or reduced OCD prevalence with chronological age. Nor does the model inform other methods of treatment which may modify or rectify the neurological dysfunction associated with OCD symptoms, especially as pharmacological treatments are beneficial for only around half of OCD sufferers.

Behavioural Model of OCD

In the last half century, psychological models have attempted to understand OCD within a behavioural context, involving acquired or learned responses to experiences. Mowrer (1951) was one of the earlier theorists to conceptualise OCD in this way, developing a two-factor model of conditioning, which combined a classically learned association between a stimulus and a response, with drive appeasement motivationally-based operant conditioning. In the case of OCD, it was suggested that an unpleasant originating event elicited fear, disgust and anxiety about what might happen. Avoidance or performance of rituals reduced unpleasant feelings and anxieties, leading to distress relief and an increase in pleasant experiences in the short-term, reinforcing this behavioural/response cycle, but contributing to long-term anxiety.

Exposure and Response Prevention (ERP) was first developed in the mid 1960s (Meyer, 1966) based on Mowrer's (1951) behavioural model, and was the first psychological therapy to demonstrate a sustained improvement in OC symptoms for a larger number of sufferers (Houghton, Saxon, Bradburn, Ricketts & Hardy, 2010). ERP aimed to reduce the association between avoidance/ritual performance and short-term relief, by building a tolerance to the obsessive thought or compulsion through non-active exposure to the triggering stimulus, habituating the person to these events, and reducing the need for compensatory and other compulsive activities (OC symptoms) (Rowa, Antony & Swinson, 2007; Tolin & Steketee, 2007). In doing so, this technique provided an opportunity to disprove fears (Meyer, 1966) resulting in a more sustained reduction in associated anxiety (Rowa et al., 2007; Tolin & Steketee, 2007).

ERP is currently recommended as a treatment for OCD (NICE 2006) with review and research papers finding clinically significant symptom reductions in 50% (Fisher & Wells, 2005b), 55% (Simpson et al., 2006), and 60% (Whittal, Thordarson & McLean, 2005), of OCD patients referred for ERP treatment. Clinical trials have found 80-90% of treatment completers reporting 30% or greater symptom reduction (Abramowitz, 2006; Stanley & Turner, 1995).

However, full remission is rare and there is an issue with tolerability of this form of treatment, with high treatment refusal, non-completion and non-responding being an issue (Abramowitz, 2006; Kichuk & Austad, 2010; Freeston et al., 1997; Stanley & Turner, 1995; Foa et al., 2005; Purdon, 2007; Abramowitz, 2006; NICE, 2006). It has been suggested that treatment refusal, non-completion, and non-responding can account for up to 50% of treatment participants not being helped by ERP (Foa et al., 2005; Purdon, 2007; Abramowitz, 2006; Stanley & Turner, 1995). There is also concern that the behavioural focus prevents generalised learning and application across a greater range of situations and associated cognitions (Van Niekerk, 2009).

There have been theoretical and practical improvements gained from understanding OCD within the context of the behavioural model. However, limitations in formulating the full range of OCD presentations, the presence of OCD without obvious or logical causal events, as well as limitations in the success, acceptability and generalisability of ERP, has led to the search for an expanded conceptualisation of psychological aetiology.

Cognitive-Behavioural Model of OCD

During the 1970s, OCD began to be conceptualised within the emerging cognitive-

behavioural (Beck, 1976) framework. Carr (1974) hypothesised that obsessions developed

from overestimating the probability of, and negative consequences for, feared outcomes. It

was thought that compulsions were enacted to reduce the perceived probability of

occurrence, with reduced anxiety reinforcing this erroneous perception.

McFall and Wollersheim (1979) suggested that unrealistic beliefs about the self,

fuelled inaccurate estimations about the likelihood and consequences of events. These

beliefs included self-perfectionism, concerns about punishment, a heightened sense of

responsibility and need for control, low tolerance for uncertainty, and fears about the

prophetic and contributory nature of thoughts about catastrophic events (predating current

theories involving thought action fusion). However, this model was criticised for failing to

explain the origins of these negative self-beliefs (Salkovskis, 1985).

Salkovskis (1985) observed the high prevalence of unacceptable intrusive thoughts,

urges and images amongst the overall population (Rachman & de Silva, 1978; Salkovskis &

Harrison, 1984), as well as the lack of difference in content, mood congruence and content

meaningfulness of these thoughts, images and urges; between people with and without OCD.

Compared with non-OCD sufferers, people with OCD were found to observe their

obsessions as less acceptable, more in need of resistance, more in conflict with their core

beliefs and ideals, and more provoking of a response or reaction (Rachman & de Silva,

1978).

From these observations, it was hypothesised (Salkovskis, 1985) that ego-dystonic

thoughts, inconsistent with an individual's beliefs about themselves, enacted cognitive

schemata which appraised the thought using unrealistic beliefs about responsibility and

blame, and about the power of the thought itself. Neutralising or equalising activities such as compulsive checking, creating compensatory good thoughts, or seeking reassurance (alleviating responsibility), reduced feelings of distress and self-blame. This provided only short-term relief, and resulted in erroneous belief confirmation and long term anxiety.

A heightened sense of responsibility was thought to be the key to explaining the link between negative intrusive thought appraisals and OC symptoms, and not to other conditions such as anxiety (through frustration) and depression (through despair) (Salkovskis, 1985; Salkovskis et al., 2000).   An intrusive thoughts beliefs study ($N = 129$ heterogeneous medical patients) (Freeston, Ladouceur, Gagnon, & Thibodeau, 1993) supported this conceptualisation, confirming the importance of beliefs about responsibility, threat estimation and intolerance to uncertainty, in OC symptom development. Rachman (1993) hypothesised that an inflated sense of responsibility was a by-product of the over-interpretation of meaning and significance of intrusive thoughts (Rachman, 1993; 1997). Supporting this theory, a scale development study measured responsibility contexts and themes, and found a more subtle role for responsibility in the interpretation of intrusive thoughts (Rachman, Thordarson, Shafran, & Woody, 1995). The role for responsibility was linked to situation, was varied across participants ($N = 291$ university students), and was not always associated with OC symptoms. Instead, the cognitive error of thought action fusion (thoughts being equivalent to events/actions) was found to be more consistent and important in OC symptom development, leading the way towards metacognitive theories about OCD.

In response to an expanding number of individual cognitive behavioural theories for OCD development, as well as the expanding number of measures developed to capture these, an international group of OCD theorists and contributors agreed to consolidate their

approaches to OCD, to review the body of research, and to reach theoretical and empirical

consensus. The result of this was the development of a comprehensive OCD model and

measurement strategy (Obsessive Compulsive Cognitions Working Group [OCCWG],

1997). Key cognitive mechanisms in obsession and compulsion development were identified

(OCCWG, 1997) and included: hyper-responsibility, thought-action-fusion, over-importance

of the consequences of thoughts, high need for thought control, overestimation of threat

probability and severity, low tolerance to uncertainty, and perfectionism (OCCWG, 1997).

An extensive review of empirical evidence has supported the association between these key

beliefs (associated appraisals) and OC symptoms (Taylor et al., 2007). Some theoretical

support criteria remain unsatisfied however, such as the inability for factor analysis to cluster

beliefs measures scores, according to the hypothesised key beliefs in OCD

development/maintenance (Taylor et al., 2007), confirming the need for continued research.

Cognitive Behavioural Therapy (CBT) emerged from cognitive behavioural theory,

and is used on both the behavioural and cognitive elements of OCD. Unlike ERP, it has the

benefit of being able to treat obsessions, and compulsions which are not observable and/or

have no behavioural element (Purdon, 2007). CBT is currently recommended as a treatment

for OCD (NICE 2006)

CBT identifies unhelpful and irrational self-beliefs and psychological/experiential

triggering events, as well as their associated emotional and behavioural responses. Psycho-

education, therapist role modelling, thought challenging, behavioural/thought experiments,

and imaginal exposure are used to find ways to modify these thoughts and responses to

incorporate more realistic and manageable ways of thinking and responding (Rachman & De

Silva, 2009; Salkovskis, 2007; Purdon, 2007; Taylor et al., 2007).

Intervention and review studies have demonstrated similar success rates for CBT compared with ERP and pharmacotherapy, ranging from 44% to 77% of treatment completers demonstrating clinically significant improvement (Houghton et al., 2010; Fisher & Wells, 2005b; Whittal et al., 2005; Freeston et al., 1997).

There has been some reported improvement in treatment tolerability for CBT, compared with ERP, with a treatment outcomes review reporting 10% of those receiving CBT not completing their treatment, compared with 19% of people receiving ERP (Abramowitz et al., 2005). However, when treatment acceptance, positive treatment response, as well as completion are considered, full participation rates for CBT have been found to be comparable to ERP participation levels (50%) (Freeston et al., 1997).

CBT treatment therefore appears to provide equitable treatment outcomes, and equal to better tolerability when compared with ERP and pharmacological therapy, although distinct comparison against ERP is difficult due to the behavioural content in CBT (NICE, 2006; Abramowitz et al., 2005). However, CBT is limited by its greater time and resource demands in treatment delivery (NICE, 2006), and reduced effectiveness when key beliefs are resistant to modification (e.g. participant devaluation of external information, thought-focusing reinforces thought potency).

As currently recommended (NICE, 2006) psychological/pharmacological treatments rarely achieve symptom elimination (Eddy et al., 2004; Foa et al., 2005; Abramowitz et al., 2005), and benefit only around half of OCD sufferers, continued search for alternative OCD models and therapeutic options is warranted. NICE (2006) have acknowledged these

limitations, and recommended the consideration of alternative therapeutic approaches, although they have not actively sought to broaden their recommended OCD treatment list (NICE, 2014).

The aetiological models presented so far, have provided part explanations for OCD development/maintenance. The aetiology of key dysfunctional beliefs has not been fully explained by cognitive-behavioural models, and the strong neurobiological evidence regarding neurological and neurocognitive deficits has not been integrated into a psychological explanation. Therefore, a unifying theory (the metacognitive model) which seeks to explore the connection between biological/neurological vulnerability patterns and dysfunctional key beliefs, has more recently been investigated, in an effort to provide a more comprehensive explanation for OCD development (Taylor et al., 2007), and lead to more theoretically/operationally relevant and successful treatments.

Metacognitive Model of OCD

The metacognitive model of OCD was developed to improve understanding about the different ways that people can process thoughts, images and urges, and as such, form the cognitive errors (key dysfunctional beliefs) implicated in OCD development and maintenance. Informed by the self-regulatory executive function (S-REF) model of emotional problems (Wells & Matthews, 1996), the metacognitive explanation for OCD suggests that heightened scanning for intrusive thoughts due to heightened threat perception and increased distress, increases the detection, importance and impact of intrusive thoughts (Wells & Matthews, 1996). A natural susceptibility to this form of information processing error was considered a contributor to these metacognitive errors (Myers & Wells, 2005), with the implicated processing errors consistent with the neurological regions which have

been identified in OCD neuroimaging studies (e.g. Chamberlain et al., 2005; Menzies et al.,

2008) including thought/response amalgamation, threat assessment/response, attention/task

focus, danger signalling; and thought processing, filtering and prioritising (see previous

Biological Models section). The specific neurocognitive impairments commonly observed

in patients with OCD, particularly in the executive functions of memory strategies,

attentional switching, rule and response, selective attentional bias, and directed forgetting

(Chamberlain et al., 2005; Chamberlain et al., 2006; Greisberg & McKay, 2003; Menzies et

al., 2008), are also consistent with the processing errors identified in the metacognitive

theory of OCD development.

Initially, a metacognitive (superordinate) belief about the need to control thoughts,

was considered key to OCD development (Clark & Purdon,1993). Further investigation

(Purdon & Clark, 1999) revealed that OCD sufferers have a general preoccupation with their

stream of conscious thoughts, and with heightened focus and sensitivity to content. It was

suggested that the ways in which an individual observes, prioritises and manages their own

thoughts (metacognition), contributes to the formation of ordinary beliefs and appraisals

(about the self and the environment), leading to the cognitive errors observed in OCD

(Purdon & Clark, 1999; Cucchi et al., 2012).

Supporting the metacognitive model for OCD, OCD sufferers have been found to

have a greater tendency to think about their thinking, compared with non-clinical

populations, those with generalised anxiety disorder, or other emotional disorders

(Cartwright-Hatton & Wells, 1997) and other anxiety disorders (Janeck, Calamari, Riemann

& Heffelfinger, 2003). The belief that thoughts should be controlled, and have prophetic

qualities, is also more likely for OCD sufferers (Cartwright-Hatton & Wells, 1997; Irak &

Tosun, 2008). People with OCD are more likely to engage in strategies designed to actively

respond to the thought, acknowledging its importance; compared with anxiety patients and

non-clinical subjects, who are more likely to use distraction, thought replacement and other

dismissive techniques, indicating that the power and meaning of the thought is less important

for non-OCD sufferers (Ladouceur et al., 2000). These findings demonstrate consistency

with the neurocognitive dysfunctions found for OCD sufferers including impaired learning

from feedback, reluctance to relinquish redundant strategies, ineffective filtering of

relevant/irrelevant information, rigidity in processing and decision-making, and increased

self-doubt (Griesberg & McKay, 2003).

The metacognitive beliefs implicated in OCD include thought action fusion, thought

event fusion (thinking something means something has happened), the belief that distress

cannot be tolerated, the belief that distress confirms increased danger, the belief that a

thought which is ego-dystonic (contrary to beliefs about the self) needs action, and the belief

that all thoughts must be controlled (Purdon & Clark, 1999). Some of these metacognitive

beliefs replicate dysfunctional cognitive beliefs proposed in the cognitive-behavioural model,

although the CBT model did not conceptualise such beliefs to be part of a higher order

cognitive system of information management.

As higher order processes, metacognitive beliefs are considered less directly

identifiable by the individual, although directly impacting on thought appraisal, and of more

direct association with OC symptoms, than their cognitive belief by-products (Purdon &

Clark, 1999). Results from cross sectional studies ($N = 200$, Gwilliam, Wells & Cartwright-

Hatton, 2004; $N = 104$, Myers & Wells, 2005) comparing a wide range of cognitive,

metacognitive and OC symptom measures, have confirmed this hypothesis. Controllability

of thoughts, and perception about competence in cognitive management, were found to provide the more direct link to OC symptoms than cognitive beliefs such as heightened sense of responsibility for thoughts (Myers & Wells, 2005). Non-clinical ($n = 269$) and OCD ($n = 57$) samples have further confirmed the importance of metacognitive processes in OC symptoms in a cross sectional study (Solem, Myers, Fisher, Vogel & Wells, 2010). Fusion beliefs (thought-action, thought-event, thought-object), beliefs about the need to perform rituals, and a difficulty with threat and response determination were key metacognitive contributors, although threat response was less important for OCD sufferers.

According to the metacognitive model, neutralising strategies which provide short-term relief, increase preoccupation with a thought thereby confirming the thought's importance (Purdon & Clark, 1999), eventually leading the metacognitive system to prioritise internal information over external information. This issue is thought to explain OCD resilience to treatments involving behavioural and cognitive evidence gathering/testing techniques, compared with other conditions (Purdon & Clark, 1999), as erroneous beliefs resist testing against external evidence (Fisher & Wells, 2008). Empirical evidence has found that using no effortful response served to be a better mechanism for reducing the rate of unwanted thoughts, than more active cognitive strategies (Freeston et al., 1991).

Specific metacognitive profiles have been associated with OCD sub-types, explaining the aetiology of various forms of OCD (heterogeneity) in a way that other psychological models have been less able to achieve (Wells & Papageorgiou, 1998; Irak & Tosun, 2008), and consistent with specific patterns identified in neuroimaging studies (Chamberlain et al., 2005). A study comparing responses on metacognitions and OC symptom scales, found distinct metacognitive patterns for various OCD sub-types (Wells & Papageorgiou, 1998) (N

= 105 university students). Believing that worry was helpful was associated with checking, the addition of concerns about the inability to control thoughts was associated with harm-based obsessions. Dressing and grooming compulsions were exclusively associated with self-conscious beliefs.

Metacognitive Therapies, directly targeting the management of metacognitive knowledge and processes, are thought to provide a more global change than traditional CBT approaches which focus on modifying thoughts/behaviours related to specific obsessional thoughts and compulsions (metacognitive by-products) (Didonna, 2009).

Brief exposure and response prevention behavioural experiments, specifically challenging metacognitive beliefs, combined with metacognitive educational elements were found to decrease distress, neutralising urges and erroneous metacognitive beliefs about the power of one's own thoughts, for all eight OCD patients exposed to this treatment (Fisher & Wells, 2005a). In the same study (Fisher & Well, 2005a), those OCD patients provided with traditional ERP were found to have increased distress, increased desires to neutralise and stronger metacognitive convictions.

In another clinical study using metacognitive-based therapy (psycho-education, metacognitive alternatives generation, adaptive coping, detached mindfulness) for OCD ($N =$ 4) results demonstrated high acceptability to treatment; and substantial reduction in OC symptoms, distress and unhelpful metacognitions for study participants (Fisher & Wells, 2008). A clinically significant reduction in OC symptoms was also achieved for all six OCD patients who participated in a treatment study in Iran, using the same metacognitive therapy regime (Andouz, Dolatshahi, Moshtagh, & Dadkhah, 2012). However, with small sample

sizes, replication of these studies is warranted as treatment responses may have been specific

to individual participants or interventions.

In Summary – the Metacognitive model is able to recognise and integrate biological

susceptibility and neurological deficits in general information management, as well as learnt

responses to experiences in the internal and external world. This model can explain the

formation and maintenance of obsessions and compulsions, as well as provide theory-based

treatment recommendations for both. Unlike some other models, it can account for the

variation in responses to the same situation, and can account for symptom heterogeneity,

with various combinations of metacognitive errors leading to specific symptoms (Wells &

Papageorgiou, 1998; Irak & Tosun, 2008). Plasticity of metacognitive processes

demonstrated in treatment interventions, also concur with changes found in neuroimaging

studies. Treatments which are informed by this model, therefore warrant further

investigation. The breadth of metacognitions implicated in the development and

maintenance of OCD do not clearly inform a treatment regime, although improvement in

overall metacognitive management, using techniques such as mindfulness, would

theoretically lead to a reduction in many of the metacognitive errors implicated in OCD.

Mindfulness

The trend towards the use of mindfulness, a more adaptive metacognitive approach

towards internal and external experiences (Didonna, 2009), in treating OCD, coincides with

the increased understanding of the metacognitive mechanisms in OCD development,

maintenance and treatment. Mindfulness involves being in the present moment, reducing

attention to the past and what might have been, or the future and worried about possibilities

(Childs, 2007; Bishop et al., 2004; Shapiro, Carlson, Astin & Freedman, 2006). This

grounded perspective is seen as an essential element to managing OCD, which is characterised by excessive attention to catastrophised past events, and worried-about future events (Didonna, 2009).

Mindfulness – A Definition

Mindfulness theories and definitions have evolved over the last two decades, with the more prevalent concepts describing mindfulness as staying in the present moment and intentionally and without judgement, attending to our thoughts, actions and experiences (Shapiro et al., 2006; Kabat-Zinn, 2003).

Mindfulness is thought to encourage observance that we are separate to and more than the events that we experience (Shapiro et al., 2006), which increases our capacity to notice and change automatic and habitual ways of thinking, responding and being, and being receptive to fresh perspectives (Kabat-Zinn, 2003; Baer et al., 2008; Williams, Teasdale, Segal & Kabat-Zinn, 2007; Bishop et al., 2004; Shapiro et al., 2006; Childs, 2007; Martin, 1997; Wells, 2005).   Non-questioning, trusting in self, patience and curiosity, being and not doing, are all considered to be important mindful qualities (Kabat-Zinn, 2003; Kostanski & Hassed, 2008). Observation, nonjudgemental and nonactive awareness and acceptance of cognition, emotion and sensation have also been included in mindfulness definitions (Fairfax, 2008; Childs, 2007; Martin, 1997; Bishop et al., 2004; Shapiro et al., 2006).

The many ways of conceptualising mindfulness have at times led to difficulties when assimilating and comparing results of scientific and clinical studies (Chiesa & Malinowski, 2011; Kostanski & Hassed, 2008). In an attempt to bring more clarity and consensus to understanding mindfulness, a mindfulness measure based on the exploratory factor analysis

of a range of contemporary mindfulness measures, was developed (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006). It was able to identify the key underlying dimensions of mindfulness which were: <u>nonreactivity to inner experience</u>, which describes an ability to dispassionately reflect on thoughts and feelings without the need or urge for action; <u>observing</u>, which describes the ability to notice and attend to a wide range of internal and external experiences; <u>acting with awareness</u>, which describes the ability to attend to activities purposefully and not be distracted; <u>describing</u>, which incorporates the ability to find words for feelings, beliefs, opinions, expectations, and experiences; and <u>nonjudging of inner experience</u>, which includes the ability to avoid self-criticism with regard to emotional responses, feelings, thoughts, images and ideas (Baer et al., 2008). Of the five identified facets, only observing has demonstrated some inconsistency in capturing a clear mindfulness construct across all samples used in scale development and validation studies. This difference was attributed to a possible ambiguity of this concept across participant samples, with mindful participants (meditators) more accurately interpreting the mindful definition of observing as detached and neutral whole observation, whereas non-mindful participants potentially defined observing as a hyper-vigilant process which could contribute to the confirmation of erroneous beliefs (Baer et a., 2006).

Debate exists amongst theorists and practitioners as to whether mindfulness is a way of being or a way of thinking; whether it exists as a dispositional pre-cognitive personality function (or trait) or can be purposefully engaged as a conscious metacognitive process (state). Following the discovery of higher levels of mindfulness in older aged study participants, other researchers have suggested that mindfulness develops naturally with age, and may be an extension of the developmental process (Splevins, Smith & Simpson, 2009).

There is also a lack of consensus about how mindfulness should be practiced - whether it must strictly adhere to its eastern meditative roots or can be applied in other non-meditative contexts; whether only the pure element of mindful practice can be considered mindfulness or integrative therapies which have developed from mindfulness can be included within the mindfulness definition (Kostanski & Hassed, 2008; Chiesa & Malinowski, 2011; Didonna, 2009; Baer & Krietemeyer, 2006). Some theorists and practitioners hold that mindfulness is anti-therapy, in respect to the definition of therapy being to actively improve something. Within this understanding, mindfulness is seen as a way of being which may result in more adaptive ways of thinking, seeing, and doing which reduce the likelihood of disorders or symptoms, but is not the aim of mindfulness (Kostanski & Hassed, 2008; Langer & Moldoveanu, 2000). Some authors have suggested that the benefits of mindfulness can only be achieved with disciplined and continued long-term practice (Kabat-Zinn, 2003; Hyman & Dufrene, 2008), and others have reported benefits with short-term exposure, in a range of non-static practice environments (Kostanski & Hassed, 2008), and as part of multi-component therapies (Chiesa & Malinowski, 2011; Kostanski & Hassed, 2008).

Mindfulness-Based Therapies

Mindfulness appears in therapeutic practice in many different forms, from more traditional Buddhist meditation, to Buddhist meditation-informed MBSR – Mindfulness Based Stress Reduction (Kabat-Zinn, 2003) to a more active metacognitive reprocessing activity MBCT – Mindfulness-based Cognitive Therapy (Williams et al., 2007). It has been incorporated into integrative therapies such as ACT – Acceptance and Commitment Therapy (Luoma, Hayes & Walser, 2007) which includes other elements designed to re-evaluate the self and what is important and focus on committed action; as well as DBT – Dialectical

Behaviour Therapy (Swales & Heard, 2009) which aims to modify the cycle of long-term ineffective coping strategies which impede current functioning of personality.

The use of mindfulness-based therapies has increased over the last two decades (Baer, 2006; Metcalf & Dimidjian, 2014), and mindfulness-based interventions have been established as an effective evidence-based treatment for many mental health conditions, including anxiety and depression (Baer et al., 2006; Hofmann, Sawyer, Witt & Oh, 2010; Metcalf & Dimidjian, 2014). In theory, mindfulness is more acceptable to patients, as it encourages non-reactivity to thoughts rather than the thoughts/beliefs challenging approaches of ERP and CBT (Didonna, 2009). This has been demonstrated in clinical settings, with high rates of completion (92%) for patients with anxiety disorders; meta-analysis results confirming better participation and retention rates when compared with CBT (16% versus 22% drop-outs respectively) (Khoury et al., 2013), as well as good durability of effect/technique usage for up to 3 months post treatment (83%) (Kabat-Zinn et al., 1992). Mindfulness-based therapy can be delivered effectively in individual or group format, and for heterogeneous client groups (Kabat-Zinn, 2003), as it can theoretically work effectively without modification or tailoring, focusing on improving higher order management of internal and external experiences. As mindfulness operates at a general metacognitive level, it would therefore seem to be theoretically suitable for application in the treatment of heterogeneous conditions such as OCD (with its range of sub-types) (Didonna, 2009).

Mindfulness-Based Approaches to Treating OCD

The metacognitive model of OCD hypothesises that with decreased vigilance and reactivity to intrusive thoughts, thoughts are perceived as less important, meaningful, or powerful; and obsessions or compulsions are less likely to result (Purdon & Clark, 1999;

Fairfax, 2008). A decrease in the importance of internal over external information is thought

to follow (Fairfax, 2008), diminishing unhelpful reinforcing thought cycles (Purdon & Clark,

1999). Attention/reactivity to intrusive thoughts, and prioritising of internal events, are both

considered to play specific and crucial roles in OCD development and maintenance

(Chamberlain et al., 2005; Chamberlain et al., 2006; Greisberg & McKay, 2003; Menzies et

al., 2008).

Mindfulness is thought to enable this metacognitive work by supporting people to

observe their cognitions from a superordinate and detached level. In reducing their cognitive

and behavioural responses to their intrusive thoughts, urges, feelings and compulsions (Wells

& Matthews, 1996; Purdon & Clark, 1999; Fairfax, 2008; Di donna, 2009), mindfulness

practitioners are thought to have improved metacognitive awareness. The result of this

improvement, is an enhanced neutral observance (acceptance) (Child, 2007; Didonna, 2009),

increased thought disengagement, and a reduction in the association between thought and

metacognitive error (e.g. thoughts are the same as actions, thoughts need to be controlled),

breaking the habitual cycles of neutralising and avoidance, and thought potency

reinforcement (Didonna, 2009). The aim of mindfulness is therefore not to actively work on

symptom reduction, however, symptom reduction may be achieved as a result of intrusive

thoughts demanding less attention and cognitive resources (Hyman & Dufrene, 2008;

Didonna, 2009; Halifax, 2008). Validity results from mindfulness scale development studies

(Baer et al., 2006) have supported the theoretical role of metacognitive processing in OCD

development and maintenance, with a strong negative correlation being found between most

mindfulness facets and two of the key psychological factors implicated in OC symptom

development (Rachman & de Silva, 2009) - thought suppression and experiential avoidance.

The Evidence for a Relationship Between Mindfulness and OCD

A systematic search (Aveyard, 2010) for literature exploring the relationship between mindfulness and obsessive compulsive symptoms (and OCD), was undertaken. A wide range of published research was considered for review, as the research question focuses on the relationship between mindfulness and OCD, rather than the effectiveness of mindfulness-based interventions alone. Only studies describing or identifying mindfulness in distinction to other therapeutic components, were included in the review, as integrative interventions were considered less able to provide evidence about the specific relationship between mindfulness and OC symptoms. The search strategy with inclusion and exclusion criteria is detailed in Appendix A with flow diagram in Appendix B. A total of 14 studies were identified, and these will be critically reviewed.

The research studies included: three analogue experimental studies (Marcks & Woods, 2005; Najmi, Riemann, & Wegner, 2009; Wahl, Huelle, Zurowski & Kordon, 2013); three experimental studies (Hanstede, Didron, & Nyklicek, 2008; Franco, Manas, Cangas, Moreno and Gallego, 2010; Cludius et al., 2015), two clinical trials (Biegel et al., 2009; Musavi Madani, Kananifar, Atashpour, & Bin Habil, 2013); three case studies/series (Patel, Carmody & Simpson, 2007; Singh et al., 2004; Wilkinson-Tough et al., 2010), two qualitative studies (Hertenstein et al., 2012; Fairfax, Easey, Fletcher & Barfield, 2014); and one review paper (Hale, Strauss & Taylor, 2012).

OCD and Mindfulness – Analogue Experimental Studies

Analogue experimental studies provide the opportunity to examine the effect of applying simple interventions on representational psychological symptoms, reducing the risk of potential harm from using untested treatments in clinical situations, and limiting the

influence of other factors in the outcome.

As response styles towards intrusive thoughts are thought to contribute to OCD development (Salkovskis, 1989; Rachman & de Silva, 2009; Taylor et al., 2007; Purdon & Clark, 1999), examination of naturally occurring urges to either suppress or accept an upsetting purposefully generated personal intrusive thought, were examined (Marcks & Woods, 2005). Acceptance was defined as the ability to experience thoughts without cognitive or emotional reaction or appraisal, which is consistent with current mindfulness definitions (Kabat-Zinn, 2003; Baer et al., 2008).   The study (Marcks & Woods, 2005) using a non-clinical sample ($N = 103$ university students), found a relationship between a greater urge to suppress, and higher frequency of thought occurrence. More acceptance was associated with reduced occurrence of the associated thought, as well as lower scores on obsessive compulsive, depression and anxiety measures; than for the suppress group.

The second phase of the study (Marcks & Woods, 2005) sought to clarify causality, and examined whether greater attempts to suppress led to increased frequency of intrusive thoughts. The same participants, randomly instructed to manage intrusive thoughts with either thought suppression or acceptance (simple mindfulness exercises) for 5 minutes, demonstrated no difference between groups in thought frequency at completion, suggesting acceptance does not result in reduced intrusive thought frequency. However, a five minute intervention may have been insufficient to enable a demonstration of the benefits of a transformation in thought management strategies. Differences in psychological symptoms were however observed between groups, with depression, anxiety and obsessive-compulsive scores significantly reduced in the acceptance strategy group, but not the suppression group. Although no reduction in intrusive thought frequency followed the acceptance-based strategy

(Marcks & Woods, 2005), mindfulness-based techniques do not aim to reduce frequency of thoughts, only to encourage a psychologically healthier response towards thoughts, which is what appears to have been achieved in the study.

Marcks and Woods (2005) demonstrated that even a small mindfulness intervention could result in psychological benefits for non-clinical samples, including reduction in OC symptom levels. Burns, Formea, Keortge and Sternberger (1995) have supported the relevance of using non-clinical samples to advance our knowledge about OCD and related constructs. A continuity model of illness presentation was proposed, based on a review of the research (Burns et al., 1995) where OC symptoms were found to occur at a range of levels across the community. It was suggested that inferences about clinical populations could be made based on the results of community samples, as high levels of high scoring participants who met diagnostic criteria for OCD have been found in community samples.

In a similar study (Najmi et al., 2009) clinical ($n = 20$) and non-clinical ($n = 20$) participants were instructed to manage their naturally occurring intrusive thoughts with two, five-minute blocks of suppression, acceptance or focussed-distraction interventions. The order of using these interventions was randomly assigned, and each condition was separated by at least 3 days, to allow for delayed effects, improving the ability to isolate the separate effects of each condition. The results found that level of distress, and frequency of intrusive thoughts increased post-suppression, and decreased post-acceptance, for OCD patients, but not for non-clinical participants. No change in OCD symptoms were observed following any condition, for either group. The observed effect on frequency of intrusive thoughts in the Najmi et al. (2009) study compared with no change found in Marcks and Woods (2005) study, may have demonstrated the benefits of greater intervention time. However, the non-

clinical participant frequency outcomes were the same as for Marcks and Woods (2005). It is possible that intrusive thoughts which had become obsessive, demonstrated a greater benefit from the acceptance intervention.

The difference between studies, in effect on psychological symptoms (including OCD) for non-clinical participants, may be explained by non-clinical participant differences between studies. Non-clinical participants in the Najmi et al. (2009) study recorded very low baseline psychological symptom scores, compared with Marcks and Woods (2005) study, whose non-clinical participants demonstrated a wider and more representative spread in scores, potentially allowing better detection of effect, as well as adding to the clinical applicability as an analogue study (Burns et al., 1995). The lack of change in OCD score for clinical (OCD) participants (Najmi et al., 2009) may be explained by the short duration of the interventions, as well as the treatment resistance of OCD (Taylor et al., 2007). However, encouragingly, the short duration appeared sufficient for the acceptance-based strategy to result in both reduced frequency and distress.

A further study (Wahl et al., 2013) ($N = 30$) sought to examine the impact of mindfulness (acceptance) on levels of anxiety as well as on the urge to neutralise, considered to play an important role in the OCD self-perpetuating cycle (Salkovskis, 1985; Rachman, Shafran, Mitchell, Trant & Teachman, 1996). OCD patients listened to self-recorded loops of their targeted most bothersome obsessive thought, and followed randomly assigned conditions of either mindfulness based or distraction based visual instructions, during an experimental middle phase. Compared with the distraction condition, a more significant reduction in anxiety and urge to neutralise was found for those following mindfulness-based instructions. Although mindfulness-based instructions encouraged greater exposure to the

intrusive thought than distraction, there were no differences between group compliance (tolerability), and all mindfulness-based strategies were found to be helpful, but not all distraction instructions (Wahl et al., 2013). The authors cautioned that focussed attention rather than a mindfulness approach per se, could have led to intrusive thought habituation and therefore anxiety reduction. However, the exposure to the obsessive thought via voice recording, was the same for both conditions (regardless of strategy used), suggesting the specific nature of the interventions played more of a role than general habituation.

Findings from the analogue studies generally supported a beneficial effect of mindfulness-based intrusive thought management strategies, compared with other strategies. Although effect on intrusive thought frequency were mixed, the main aim of mindfulness appeared consistently satisfied, in terms of improved psychological well-being, a reduction in distress following very brief intervention, and a good tolerability and perceived usefulness. The mixed findings for OCD symptom levels leave the question of a relationship with mindfulness unclear.

Generalisability of these findings to clinical/real-world scenarios is limited, due to external and ecological validity issues. Experimental conditions are more simplified and participants have less complex conditions and life situations, compared with real-world settings and interventions. Experimentally constructed or elicited symptoms may not reflect real-life symptom presentation in terms of related-affect and impact on daily life, making generalisation or inferences about clinical situations difficult. Therefore experimental studies offering more comprehensive mindfulness-based interventions on overall symptom reduction, were of interest, and are reviewed below.

OCD and Mindfulness – Experimental Studies

Hanstede et al. (2008) examined the impact of a mindfulness-based group intervention, on OC symptoms. The programme was specifically developed for their study, and was comprised of mindfulness meditation and instruction on mindful ways of being. To better isolate the role of mindfulness in symptom improvement, changes in the mechanisms of mindfulness - thought action fusion and letting go, were tracked. Non-clinical volunteers (N = 17 university students) who presented with at least one OCD symptom, were provided with a written article on mindfulness, and were anonymously and sequentially assigned to either the control waiting list group, or the intervention group (8 weekly 1 hour sessions). This allowed for the observation of non-intervention-based changes in the non-treatment group, however provision of another type of therapy intervention rather than waiting list condition, may have further excluded general clinical/clinician/group effect. Post-completion comparison of results demonstrated a significant increase in mindfulness scores and "letting go" scores, as well as a significant decrease in thought action fusion, and OC symptoms for the treatment group compared with the waiting list group. Results demonstrated the value of a group mindfulness-based programme on OC symptom reduction and reduction in an associated meta-cognitive error. Increased mindfulness scores across the life of the programme, suggested that mindfulness was the active ingredient in the change in OC symptoms. The study also suggested that mindfulness-based practice, rather than knowledge, was important, as no significant change was found in the waiting list group, who had access to mindfulness literature.

Franco et al. (2010) examined the effectiveness of a mindfulness group programme (designed specifically for their study), on broad-ranging psychological symptom reduction, in a sample of secondary teachers (N = 68, no drop-outs). Participants were randomly

assigned to either the mindfulness intervention (mindfulness meditation, metacognitive exercises) or control group (psycho-motor therapy group using music and games) for 10 weekly 1.5 hour sessions. Group activity types (talking, exercises) were scheduled to parallel one another between groups, to increase confidence that observed changes were due to mindfulness rather than general therapy/group effects. However, as a specific therapist was used for each condition, therapist effect could not be eliminated. Pre to post completion symptom score comparisons demonstrated significantly less OC symptoms (according to the OC subscale on the SCL-90-R) [1] for the mindfulness group compared to the control group, as well as a significant reduction in scores across time (4 month follow-up) compared with no significant change across time for the control group (Franco et al., 2010).

An online experimental study (Cludius et al., 2015) investigating the effectiveness of a self-help mindfulness-based programme, randomly provided participants who were former OCD patients (*N = 87, n = 49* completers) with electronic versions of either a 15 page mindfulness self-help manual which included a mindfulness definition and 10 mindfulness-based exercises; or a 3 page progressive muscle relaxation manual, with description and exercises. An accompanying audio file with verbal instructions was also provided for each participant. Examination of before and after OCD, depression, and psychiatric symptom measures, found that the self-taught mindfulness-based intervention was no better at improving symptoms, than self-taught progressive muscle relaxation training. The authors suggested that their findings contributed towards the evidence on the effectiveness of mindfulness for OCD as a self-help strategy, but not towards the evidence on the effectiveness of mindfulness in treating OCD in general, nor the effectiveness of therapist led mindfulness interventions, due to the poor participation levels and treatment

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[1] The OC subscale on the SCL-90-R correlates strongly with the Y-BOCS (Goodman et al., 1989), and is a sensitive measure of treatment effect, (Grabill et al., 2008).

fidelity/consistency issues in their study. Hanstede et al. (2011) had previously demonstrated that the provision of mindfulness information alone did not lead to any noticeable changes in OCD scores, whereas a direct therapist-guided mindfulness therapeutic intervention did lead to changes in the same participant group.

The findings from both therapist-led experimental studies (Hanstede et al., 2008; Franco et al., 2010) supported the use of mindfulness-based group intervention to aid in OC symptom reduction, as well as the potential health promotional role in preventing clinical levels of symptom development. Although the specific involvement or mechanisms of mindfulness were not clear from the Franco et al. (2010) study, they were able to control for therapy and group effect, by offering a non-mindfulness-based alternative. Hanstede et al. (2008) could however, provide more support for the contribution of mindfulness as the active ingredient of change as well as the role of the metacognitive error of thought-action-fusion in OC symptomology, by tracking the levels of both throughout the course of the intervention.

As author-created programmes (Hanstede et al., 2008; Franco et al., 2010), the replicability and generalisability of results to further research and clinical applications remains difficult. Recruitment and participant bias were potential issues for both studies, as participants recruited from the same professional/student communities may be more likely to discuss their treatment experiences and conditions between sessions, and be less representational of the general population, and importantly, of clinical populations. However, participants scoring at clinical levels were not excluded from either study, apart from Hanstede et al. (2008) excluding at severe levels. The range of OC scores in these studies allow assumptions to be made about clinical populations (Burns et al., 1995), supporting an association between OCD and mindfulness.

The next section considers the role of mindfulness in OC symptoms, specifically in clinical populations. Clinical trials attempt to produce findings that can be replicated and generalised to real-world applications through controlled, isolatable and consistent interventions in clinical settings.

OCD and Mindfulness – Clinical Trials

The effectiveness of an MBSR group programme (e.g., Kabat-Zinn et al., 1992) on the mental health of a clinically heterogeneous adolescent population was examined (Biegel et al., 2009), using a modified programme which included adolescent specific psycho-educational components and reduced time commitments. This was thought to improve adolescent acceptability, however may have reduced generalisability and replication of the study. Randomly assigned participants ($N = 102$) received either treatment as usual (TAU) which included group/individual therapy and/or pharmacotherapy, or TAU and the MBSR programme. The same therapists were used across treatment conditions, to minimise therapist effect as an extraneous variable. Pre to post-completion to 3 month follow-up symptom score comparisons (which included non-completers to improve ecological validity) demonstrated significant improvements in OC symptom levels (according to the OC subscale on the SCL-90-R) for the MBSR+TAU group compared with the TAU group.

Results from Biegal et al. (2009) provided further support for the role of mindfulness in OC symptom reduction (for adolescents), however the increased therapeutic time provided in the MBSR+TAU group could equally have accounted for any therapeutic effect. Self-reported measures of mindful participation were not found to be associated with reduced OC symptoms, although the authors acknowledged that using self-reflective activity measures

may have produced less reliable and accurate results, with participant bias an additional factor. Pre, post and follow-up mindfulness measures may have been a better method to monitor the association between mindfulness and OC symptom changes.

Only one clinical trial specifically involving adult OCD patients ($N = 24$) was located in the literature search. An Iranian study (Musavi Madani et al., 2013) compared the changes in OCD symptoms for randomly assigned all-female groups of OCD patients, receiving either mindfulness skills training (not described) plus medication, versus a medication-only control group. As the control group received no psychological treatment, therapy/therapist/group effects cannot be discounted from the outcomes of this study. Results from the study supported the role of mindfulness in OC symptom reduction, as significant improvements in OCD symptoms were found for the mindfulness group, compared with the control group. However, several methodological issues such as absence of equitable control condition, undefined mindfulness intervention, and possible cultural/gender differences, make replication and generalisability difficult.

OCD and Mindfulness – Case Studies / Case Series

Case studies can provide detailed information about the delivery of a therapeutic programme, including client experiences and clinician reflections. Ethical and professional considerations require that interventions adapt to client therapeutic needs, improving ecological validity, but reducing the capacity to isolate treatment effects. Small participant numbers also prevent generalisation to the population.

Patel et al. (2007) provided a weekly 1.2 hour-long, modified, Mindfulness-Based Stress Reduction (MBSR) individual programme (Kabat-Zinn et al., 1992), which included

OCD psycho-education and problem solving elements, to a 25 year old man with a range of treatment resistant obsessions and compulsions. Post-treatment comparisons (week 8) found clinically significant and sustained increases in mindfulness skills, and reduction in OC symptoms, demonstrating an association between mindfulness and OC symptom changes. Client qualitative feedback at 3 months follow-up reported improved quality of life, a more adaptive approach to unwanted intrusive thoughts, and continued successful use of mindfulness to manage his OC symptoms, further supporting the active role of mindfulness in OCD treatment. This individual case demonstrated the success of mindfulness-based treatment on previously treatment resistant OC symptoms, although the intervention was modified to include non-mindfulness components, and therapist effect cannot be eliminated. There was a potential for bias with the treatment outcome evaluator having knowledge of the treatment intervention.

Singh et al. (2004) delivered a tailored mindfulness-based programme, to a 25 year old unemployed woman who was experiencing long-term treatment resistant cleaning and germ-related obsessions, and was requiring greater durations of in-patient treatment. The 12 weekly hour long sessions included mindfulness-based meditation, coping strategies, and strengths-based solutions. Pre and post-treatment comparisons demonstrated a marked reduction on OC symptoms, with no reported OC symptoms post-completion, as well as improved quality of life and functioning (employed, no further hospital admissions, no medication) sustained up to 2 year follow-up. This was an important finding, as symptom elimination is rare in OCD treatment (Eddy et al., 2004), however as with Patel et al. (2007), replication and generalisability are difficult due to the modified intervention, possible therapist/therapy effect, and the small sample size.

Wilkinson-Tough et al. (2010) examined the effectiveness of a modified mindfulness-based individual programme (cognitive and meditative mindfulness exercises and psycho-education on mindfulness) on five OCD patients. An ABC case series design was used to improve isolation of treatment effects, and therefore increase construct validity. The therapist remained constant however, so therapist effect was difficult to dismiss. Treatment involved baseline measurement and 2 week intrusive-thought monitoring, a relaxation therapy and thought action fusion score stabilisation phase, then 6 week intervention phase. Two participants did not complete due to job relocation for one, and intolerance to treatment/ thought exposure, for the other non-completer.

A clinically significant reduction in OC symptoms, associated with the mindful phase, was found for all completers ($n = 3$), with sustained reduction at follow-up for all but one participant who had ceased using mindfulness at treatment ending. An improvement in mindfulness scores was associated with participation in the mindfulness component for all completers, supporting the role of mindfulness in OC symptom changes.

Mindfulness-based intervention again appears to have contributed to OC symptom reduction for OCD sufferers, with an increase in mindfulness being associated with these changes. However, small sample size, non-mindfulness-based components, and possible therapist effect all limit generalisability. The therapist was not blind to interventions leading to potential bias, although external review was provided to monitor bias in intervention provision. Usefully, the non-mindful therapeutic component reduced the issue of general therapeutic effect.

OCD and Mindfulness – Qualitative Studies

Qualitative studies provide a depth of information on individual experiences with psychological phenomenon and interventions. Qualitative studies can also gauge the perceived contribution of mindfulness to symptom changes, in mindfulness interventions. For this reason, qualitative studies have been reviewed.

Fairfax et al. (2014) conducted an audit of post-OCD group participants, to study their experiences in a multi-component treatment programme, which included a mindfulness element. Thematic analysis of structured interviews, and descriptive statistics were examined from the $n = 15$ (38% of programme completers), who agreed to participate in the follow-up study (potentially participation bias). An external researcher was used to gather and analyse data, to reduce potential practitioner bias, however, their analysis was not reviewed, which could have reduced bias further.

Mindfulness was found to be the most remembered technique from the group (Fairfax et al., 2014), with 80% of the participants reporting mindfulness as being helpful. An inability to understand mindfulness technique, was cited as the main reason for experiencing difficulties, with authors suggesting that greater time and space for learning mindfulness may reduce difficulties with acceptability and application (Fairfax et al., 2014).

Another qualitative study (Hertenstein et al., 2012) examining the responses of mindfulness-based group participants, used a semi-structured interview approach, which allowed more opportunity for unprompted qualitative contributions, compared with Fairfax et al.'s (2014) more structured approach. The MBCT programme for OCD, contained a high mindfulness content with some psycho-education and CBT components. Data from multi-

researcher reviewed qualitative content analysis and self-developed questionnaires, were examined (Hertenstein et al., 2012). Twelve of the 16 treatment completers participated in the review, and reported that the most beneficial treatment component was a mindfulness-based 3 minute breathing space, which enabled a break from automatic responding, an increased willingness to tolerate distress and unpleasant thoughts, being more calm, living more in the here and now, and leading to a better mood. Interestingly, some participants felt that their OCD specifically interfered with their capacity to use mindfulness, despite their eagerness to use this technique. The authors recommended promoting the 3 minute breathing space based on the popularity among their sample, although global recommendations should be cautioned with such a small sample size, and durability of the approach was not examined (Hertenstein et al., 2012).

OCD and Mindfulness – Research Reviews

One paper reviewing the extant literature on mindfulness-based OCD interventions was located (Hale et al., 2012). The study examined a selection of some of the papers that have been reviewed in the present study (Patel et al., 2007; Singh et al., 2004; Wilkinson-Tough et al., 2010; Hanstede et al., 2008), as the search strategy was limited to including "therapy" only interventions. The main aim of the review was to compare the effectiveness of treating OCD with mindfulness-based versus CBT-based approaches (Houghton et al., 2010), using clinical significance comparisons (Jacobson & Truax, 1991). Examining tolerability of mindfulness as an intervention, was also included in the aims, due to tolerance issues with other modalities in treating OCD.

The CBT benchmarking study (Houghton et al., 2010) sourced to provide data for the CBT versus mindfulness-based comparisons, had utilised studies which measured OCD

symptoms using the Y-BOCS (Steketee, Frost & Bogart, 1996), but not other OCD

measures. Hale et al. (2012) were therefore limited to including only mindfulness-based

OCD treatment studies using the same measure, in their analysis. This eliminated the

mindfulness study with the largest sample size ($N = 17$) (Hanstede et al., 2008), leaving a

sample of only $n = 7$ intention to treat sample (ITT), ($n = 5$ completers), with which to

compare against the $n = 37$ (ITT) Houghton et al. (2010) self-generated sample, as well as

their $n = 423$ benchmarking sample (Houghton et al., 2010).

Clinical significance calculations for the Y-BOCs scores reported in all reviewed

studies, were based on normative data (Steketee et al.,1996). Based on rates of clinically

significant outcomes, Hale et al. (2012) found comparable levels of improvement and

participation, between mindfulness-based interventions and CBT-based interventions.

However, these comparisons were made using vastly different pooled sample sizes, leaving

the mindfulness studies more susceptible to being influenced by idiosyncratic differences in

participants and programme delivery, reducing the generalisability of this finding. Due to

this limitation, as well as the wide variety of mindfulness-based interventions used in the

mindfulness sample, the authors recommended further research using greater sample sizes,

as well as specific analysis of mindfulness mechanisms implicated in OC symptom change

(Hale et al., 2012).

Rationale for the Current Study

Obsessive Compulsive Disorder is a condition which results in significant disruption

to daily living for many sufferers and family members, as well as many years of suffering

due to delays in receiving treatment, and limitations in current treatment effectiveness. For

this reason, continued investigation into the factors contributing to the development,

maintenance and treatment of OCD is warranted.

Consistent with the metacognitive model of OCD development and maintenance, mindfulness is attracting increasing interest as an intervention to prevent or reduce the development of OC symptoms, by improving metacognitive function. It is thought to do so by encouraging a neutral / non-reactive approach to stream of conscious thoughts; rather than a reactive, interpretative, and judgemental processing of them, which is inherent in OCD-based responses (Purdon & Clark, 1999).

The small number of studies investigating the effect of mindfulness-based interventions on OC symptoms, which have been reviewed in this chapter (e.g. Hanstede et al., 2008; Franco et al., 2010; Biegel et al., 2009; Patel et al., 2007; Singh et al., 2004), have demonstrated a consistent theme of increased mindfulness accompanying a decrease in OC symptoms. However, the methodological limitations of the reviewed research, present a difficulty in isolating mindfulness as the active ingredient of change separate to other variables such as general therapist/therapy or group effect. The varied formats of the mindfulness-based interventions used in the reviewed studies, contribute to the difficulty in making inferences about the fundamental relationship between mindfulness and OC symptoms. Therefore, a study examining the relationship between mindfulness and OC symptoms was considered a useful addition to the developing evidence base, with a negative relationship between mindfulness and OC symptoms, expected to be found.

OCD has high levels of comorbidity with other mental health conditions, particularly anxiety and depression (Murphy et al., 2010; Kessler et al., 2005b; Torres et al., 2006; Pallanti et al., 2011); and a positive relationship has been found between OCD and both

anxiety and depression (Nestadt et al., 2001). Importantly, the presence of anxiety as well as depression, have been found to negatively impact on treatment outcomes and illness prognosis for OCD (Overbeek et al., 2002; Steketee et al., 2001; Pallanti et al., 2011). Therefore, any potential OCD treatments need to consider the impact of and compatibility with treating anxiety and depression. For this reason, the roles of anxiety and depression, in the relationship between mindfulness and OC symptoms, were examined in this study. The evidence-based use of mindfulness in treating depression and anxiety, has demonstrated that mindfulness is an appropriate application for these two highly comorbid conditions, which suggests a negative association between mindfulness and both anxiety and depression (Baer, 2006; Hofmann et al., 2010; Metcalf & Dimidjian, 2014).

Recent findings have informed a proposed age-related contribution towards the development of mindfulness, with age being positively associated with mindfulness (Splevins et al., 2009). Examining the role of age in mindfulness, and in the relationship between mindfulness and OC symptoms, was therefore considered useful in building a more detailed picture of the implications for OCD prevention and treatment, particularly given the pattern of steady spontaneous remission of OCD symptoms (Fineberg et al., 2013) and decreasing OCD prevalence (Torres et al., 2006; Ruscio et al., 2010), across the adult lifespan.

Although an age-related role in mindfulness skills acquisition has been proposed, the mechanisms of this development have not been clearly defined (Splevins et al., 2009). Observed improvements in mindfulness skills, along with OC symptoms, have been attributed to the mindfulness training/therapy provided in intervention studies (e.g. Patel et al., 2007; Wilkinson-Tough et al., 2010; Hanstede et al., 2008) although many uncontrolled

factors may have coincided with the measured changes in mindfulness and OC symptoms found in these studies. It was therefore considered useful to explore the role of prior mindfulness experience in current mindfulness skill level, as well as in OC symptom development, by examining the relationship between prior mindfulness experience and current mindfulness and OC symptoms scores.

This study has examined the phenomenon of mindfulness, identifying the existence of theoretically and clinically broad definitions of this concept's content and application. Therefore, a more comprehensive investigation into the relationship between mindfulness and OC symptoms required consideration of the key underlying dimensions of mindfulness (Baer et al., 2006). Validity results from mindfulness scale development literature (Baer et al., 2006) found a strong negative correlation between thought suppression and experiential avoidance – implicated in OCD development and maintenance (Rachman & de Silva, 2009) and in decreasing order of effect size; a non-judging approach, acting with awareness / non-reactivity to internal experiences, and describing; with observing being positively correlated for non-meditating participants (Baer et al., 2006). Although these findings might have suggested the existence of a similar relationship between mindfulness facets and OCD, the whole spectrum of OC symptoms includes a very complex and heterogeneous combination of cognitions and behaviours, and metacognitive theory of OCD does not conclusively lead to the hypothesis that any particular facet of mindfulness would be more important in OC symptomology. Therefore, a full exploration of the relationship between mindfulness facets and OC symptoms was considered useful for the purposes of understanding the complex phenomena of both mindfulness and OCD, where no specific relationship was assumed prior to analysis.

Research Aims

1. The main aim of this study was to explore the relationship between mindfulness and obsessive compulsive symptoms in a community sample. The relationship between specific mindfulness facets and OC symptoms was also explored.

2. The roles of anxiety and depression, in the relationship between mindfulness and OC symptoms, were examined.

3. Variables such as age and prior mindfulness experience; in their role with OC symptoms and mindfulness, were also investigated.

Research Hypotheses and Associated Questions

Study hypotheses were based on the theoretical, empirical and clinical evidence reported in this study, with key findings summarised in *Rationale for the Current Study* (previous section).

1. Mindfulness will be negatively associated with OC symptoms.

2.1. Anxiety / depression symptoms will be positively associated with OC symptoms.

2.2. Anxiety / depression symptoms will be negatively associated with mindfulness.

2.3 The roles of both anxiety and depression, in the relationship between mindfulness and OC symptoms, will be explored.

3.1. Age will be negatively associated with OC symptoms.

3.2. Age will be positively associated with mindfulness.

3.3 The role of age, in the relationship between mindfulness and OC symptoms, will be explored.

4.1.   Prior mindfulness experience will be negatively associated with OC symptoms

4.2.   Prior mindfulness experience will be positively associated with mindfulness.

4.3   The role of prior mindfulness experience, in the relationship between mindfulness

      and OC symptoms, will be explored.

5.1.   Increased mindfulness will predict decreased OC symptoms.

5.2.   Prior mindfulness experience and increasing age will negatively predict OC

      symptoms, when added to a predictive model

5.3.   Anxiety and depression will positively predict OC symptoms, when added to a

      predictive model.

6.   The roles of specific mindfulness facets in predicting OC symptoms will be explored.

Methodology

Epistemological Position

The epistemological position refers to the conceptual viewpoint taken by the researcher on how something is understood or known to exist (Barker et al., 2008). When attempting to understand the world, researchers may consider a number of different philosophical views, which influence the methods of study and interpretations made from results.

Psychological research can be conceptualised within two main philosophical positions. The positivist (realist) position takes the view that all that can be known about the world is that which can be observed or objectively measured. From these observations, the truth about existence and associated hypotheses are confirmed, and an objective and consistent understanding is obtained (Barker et al., 2008; Fox et al., 2007; Saks & Allsop, 2007). Critics of this approach argue that by reducing and quantifying information for ease of observation and measurement, the richness and diversity of experiences is lost, and meaning and motivation are more difficult to determine. This is seen as detrimental to the field of human science, as the aim of research is to develop a better understanding of human phenomena (Barker et al., 2008).

Critical realism represents a modern variation of positivism, and acknowledges that irregularities and inconsistencies can occur in real-world settings. Whilst not ignoring its deductive and reductive roots, critical realism emphasises the importance of consensus and coherence, of self-observation, of repeated investigation of phenomena across time, settings, and investigators; to provide more confident evidence for the existence of something (Barker et al., 2008; Alvesson & Skoldberg, 2009). It acknowledges the influence of social and

cultural settings and contexts, but does not consider these fixed entities which determine or prescribe the outcomes or choices of people (Cruikshank, 2012; Alvesson & Skoldberg, 2009).

The second main epistemological position, Constructionism/Constructivism (post-modernism), moves beyond the idea of there being a reality, and focuses on the importance of interpretation. This approach identifies the involvement and influence of the observer. It does not seek to find macro levels of understanding, or global constructs, but instead values the discovery of individual and unique observations (Barker et al., 2008; Saks & Allsop, 2007; Fox et al., 2007). Critics suggest that although this approach provides rich information about individual and local experiences, the understanding gained is difficult to generalise across a larger scale and range of settings (Barker et al., 2008; Alvesson & Skoldberg, 2007). The complex and diverse nature of the information gathered using this approach, whilst helping to understand psychological matters in depth, does not allow prediction, prevention, or planning responses to psychological issues which can be confidently applied across a wider group of people, contexts and communities.

The present study sought to gather information about participants, using pre-defined and therefore more generalisable ways of understanding psychological phenomena (standardised measures), as well as to predict behaviour based on a sample representing the population. The advantage of using standardised measures was that psychological phenomenon could be more consistently collected across participants and situations, enabling better comparison, as well as generalisation of findings across a larger scale. It also enabled a better position to make predictions about human behaviour and responses, which was one of the aims of the study. The main approach of this study could therefore be viewed

as positivist (Saks & Allsop, 2007; Williams, 2000; Fox et al., 2007; Barker et al., 2008; Ryan, 2006).

It could be argued, however, that self-administered self-report surveys are not completely objective measures, and involve self-observation rather than third party determination. Although the parameters of measure are predetermined, validated and tested for reliability, the snowball recruitment strategy, the way in which the measures were completed (less controlled setting as an online study), the individual variation in self-determined magnitude of each item on a scale, the ways in which participants interpreted the constructs of OC symptoms and mindfulness, and the interpretation of final results made by the researcher, were all subject to individual, phenomenological and social influences (Saks & Allsop, 2007). It could also be argued that the construction of the measures themselves, involved a constructionist/constructivist approach, as although the psychological measures are reduced and quantified, they are based on a range of understandings and interpretations of meaning and magnitude.

Therefore, given the methodological and philosophical approach of measuring, generalising and predicting, but with observance to the nature of self-report measures and individual observations and interpretations, the main empirical position of the present study can be described as critical realism (Alvesson & Skoldberg, 2009).

Research Design

This internet-based study utilised a cross-sectional correlational design, with a convenience sampling self-report method (including snowball sampling) to attract a wide range of participants, with potentially a broad range of OCD scores. Cross-sectional web-

based survey designs have the advantage of collecting more data and collecting data in a

more naturalistic setting, thereby facilitating greater ecological validity of findings. This

type of design is also useful for reaching a broader range of participants when limited

resources are available, albeit at the expense of capturing individual context and meaning.

With less researcher involvement, the potential for researcher bias is also reduced, although

with less to no control over all of the possible factors contributing to a psychological

phenomenon under investigation, this type of study design reduces the ability to attribute

causality, or confidently attribute the range of scores in an outcome variable exclusively to

one or a set of isolated independent variables. However, for the purposes of the research

question of this study, which was to determine the nature of the relationship between OCD

and mindfulness, the research method selected was best able to meet this need (Field, 2013;

Saks & Allsop, 2007).

Participants

Sample

The study recruited from a community sample, to limit the risks associated with

unsupervised participation (online study) by participants from a more vulnerable clinical

population, whilst at the same time obtaining information which can be applicable to both

non-clinical and clinical populations according the continuity model of OCD (Taylor,

Abramowitz, & McKay, 2007; Burns et al., 1997).

A sample size of between 91 and 643 participants was sought, to meet the

requirements for achieving a minimal power of 80% for an anticipated low to medium effect

size at the 95% significance level, based on multiple regression analysis and 5 predictor

variables (FFMQ whole scale score). To enable the inclusion of the FFMQ subscales in the

analysis (9 predictor variables), a sample size of between 113 and 788 participants was

required. These sample size requirements were completed using an online power calculator

(Soper, 2013).

Recruitment

A convenience sampling method (including snowball sampling) was employed.

Associates, friends and contacts of the researcher were informed about the study using the

internet social media community, snowball sampling via email and word of mouth, using

standard wording about the study (Appendix C). This recruitment method was selected as

the most practical way of generating a high enough number of responses with which to

achieve acceptable statistical power and hence, increase the ability to make more confident

general inferences from the study results, within resource and manpower limitations. OCD,

mindfulness, and mental-health related websites were contacted in order to access people

who may be looking to participate in this type of study, and also as a way of accessing a

broader range of non-researcher associated participants with a range of levels of the

psychological phenomena being measured. Standard wording was again used (Appendix C).

Websites which agreed to post the study recruitment advertisement, either free of charge or

for an advertising/membership donation or fee (covered by university research funding)

were, www.ocdaction.org.uk, www.anxiety.org.uk, www.ocfoundation.org,

www.rethink,org, www.mindfulexperience.org, www.psychology.org.au, and

www.mentalhealthforum.net.

Inclusion and Exclusion Criteria

Participants who were 18 years of age and above, and not currently receiving

treatment for mental health disorders and/or alcohol and drug abuse/dependence, were

eligible to participate. Although there was no formal method to verify or cross-reference

eligibility, a best effort at screening out ineligible participants was made in the survey design, by incorporating inclusion and exclusion criteria. Participants were required to press a button to agree to the inclusion conditions, before the e-survey would allow participants to continue on to the first of the questionnaires.

Provisions were made for withdrawal from the survey at any time, and details were provided for contacting the researcher with feedback, as well as contact details for various mental health support organisations and options.

Measures

The on-line survey commenced with a demographics questionnaire, constructed by this study's author. Following this, standardised psychological measures relevant to the study (approved by authors for research use at no cost) were reproduced electronically on the e-survey.

The first questionnaire requested demographic information for the purposes of understanding the representation of those who participated (see Appendix I). This included date of birth (to assist in the identification of a particular data-set should a participant request withdrawal from the study post-submission), gender, highest level of education, occupational status, country of residence, past experience of mindfulness training/therapy combined with subjective perception on how their mindfulness skills changed as a result of this experience, and finally age.

The remainder of the e-survey used validated self-report measures, with selection based on compatibility with the metacognitive conceptualisation of OCD, as well as ethical

consideration in avoiding replication and hence unnecessary participant fatigue. The two

mindfulness measures selected were designed to measure trait-like general tendencies (Baer,

Walsh & Lykins, 2009). Further details about these measures are provided below.

Southamptom Mindfulness Questionnaire - SMQ (Chadwick et al., 2008)

The SMQ is a 16 item questionnaire scored on a 7 point Likert scale with response

options ranging from 0 – strongly disagree to 6 – strongly agree. (See Appendix D) It is

reported to have very good internal consistency ($\alpha = .89$) and strong correlation with other

mindfulness measures (Chadwick et al., 2008). It has been found to differentiate between

meditators and non-meditators, an activity thought to improve mindfulness, and can be used

equally effectively for clinical (psychosis) ($\alpha = .82$) and non-clinical ($\alpha = .89$) groups

(Chadwick et al., 2008).

The SMQ was designed to measure dispositional mindfulness responses within the

context of distressing thoughts and images, which are theorised to be a precursor to OC

symptom development (Wells & Matthews, 1996; Purdon & Clark, 1999) and therefore was

considered a contextually relevant measure for this study.

Five Facets Mindfulness Questionnaire - FFMQ (Baer et al., 2006)

The FFMQ is a 39 item questionnaire scored on a 5 point Likert scale with response

options ranging from 1 – never or very rarely true, to 5 – very often or always true

(Appendix E).   It is a general dispositional mindfulness measure, designed to provide scores

on five facets of mindfulness using five subscales, with total scale score not considered as

strong a measure of mindfulness (Baer et al., 20063; Baer et al., 2008). The five subscales

(facets of mindfulness) included ***observing*** the range of internal and external experiences;

describing or having vocabulary for the range of internal and external experiences; *acting with awareness* and attending purposefully; *nonjudging of inner experience* and *nonreactivity to inner experience*. The FFMQ has reported good to very good internal consistency across studies and across the facets ranging from $\alpha = .72$ to $\alpha = .92$ in non-clinical samples (Baer et al., 2006; Baer et al., 2008), and $\alpha = .77$ and to $\alpha = .93$ in clinical (depression) samples (Williams, Dalgleish, Karl and Kuyken, 2014), and has also been found to differentiate between meditators and non-meditators (Baer et al., 2008).

The FFMQ was used in this study, as it has combined many of the current mindfulness definitions and items from more recent scales used to measure mindfulness, and has been constructed using only strongly represented mindful constructs. It is also a widely used mindfulness measure, and so including this measure was considered useful for any future cross-study comparison purposes. As mindfulness is broadly defined, investigating the relationship between mindfulness and OC symptoms by examining the individual facets of mindfulness, was also considered useful.

A potential limitation of the FFMQ, is that Baer et al. (2006, Baer et al., 2008) were not able to produce a consistent number of facets across different populations, with non-meditating samples confirming four of the five facets (observing not loading strongly) and meditators loading strongly for all five facets. A recent study (Williams et al., 2014) also observed this inconsistency, with the suggestion that the factor of observing not be included when measuring mindfulness for non-meditators. Authors have suggested that observing must not translate into a mindfulness construct for people without meditation experience (e.g. Baer et al., 2006; Williams et al., 2014). This inconsistency was kept in mind when interpreting the findings in the present study.

Dimensional Obsessive-Compulsive Scale – DOCS (Abramowitz et al., 2010).

The DOCS is a 20 item questionnaire divided into four parts, each of which represent a specific OC dimension (contamination, responsibility for harm/injury/bad luck, unacceptable thoughts, and symmetry). Each part contains five items which measure time spent on each dimension, avoidance of situations, associated distress, disruption to daily life, and strength of thought/urge, and are scored on a 5 point Likert scale with response options corresponding to each item (see Appendix F). A cut-off score of 18 was reported as determining clinical levels of OCD (at 78% accuracy), and 21 (at 70% accuracy) distinguishing OCD clinical levels from other anxiety disorders (Abramowitz et al., 2010).

The DOCS has excellent internal consistency (from $\alpha = .90$ to $\alpha = .93$ total scores) for OCD samples, other clinical and non-clinical samples, and very good to excellent internal consistency for each dimensions in all samples (from $\alpha = .83$ to $\alpha = .96$) (Abramowitz et al., 2010). However, as not all sub-scales performed consistently well across samples in convergent validity testing, and were not as strong diagnostic measures as the whole scale score (Abramowitz et al., 2010), it was decided that the DOCS whole score, and not subscale scores, would be used in the present study.

The DOCS was developed to address some of the limitations of previous OCD scales, by providing for a more even measurement of obsessions and compulsions, and including a wide range of OCD symptoms. It also measures associated distress and avoidance behaviours, and importantly, unlike other OCD measures including the popularly used Y-BOCS-SR (Steketee et al., 1996) does not include items about hoarding, which has recently been reclassified as a separate mental health condition (Abramowitz et al., 2010; APA, 2013a). The DOCS was also designed to reflect the continuum model of OCD by measuring

frequency and severity in a graduated format (Abramowitz et al., 2010), and was therefore

consistent with the conceptualisation of OCD taken by the present study. Although a

relatively new measure of OC symptoms, the DOCS was selected over the more established

and popularly used self-report OCD measure, the Y-BOCS-SR (Steketee et al., 1996), due to

criticisms over the Y-BOCS-SR's propensity for OCD over-identification in normal

populations (Grabill et al., 2008; Fisher & Wells, 2005a), compared with the accuracy of the

DOCS.

Generalized Anxiety Disorder Brief Scale - GAD-7 (Spitzer, Kroenke, Williams, &

Lowe, 2006).

Anxiety was measured using the GAD-7 which lists the most prominent diagnostic

features of the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV (APA,

2009) to assess for probable cases of generalised anxiety disorder as well as symptom

severity (Lowe et al., 2008). It is a 7 item questionnaire scored on a 4 point Likert scale with

response options ranging from 0 – not at all, to 3 – nearly every day (See Appendix G).

Some versions of this scale contain a separate item to measure impairment on activities of

daily living from - not at all difficult, to - extremely difficult, and therefore for ease for

comparison with other studies, this item was included in the present study. Diagnostic

definitions for the GAD-7 total scores are as follows: 0 - 4 = minimum anxiety, 5 - 9 = mild

anxiety, 10 - 14 = moderate anxiety, 15 - 21 = severe anxiety (Spitzer et al., 2006).

The GAD-7 has very good ($\alpha = .89$) (Lowe et al., 2008) to excellent ($\alpha = .92$) (Spitzer

et al., 2006) internal consistency for both clinical (GAD) and non-clinical populations. It

was selected due to its brevity given the number of items already in the survey, whilst

maintaining a strong sensitivity to detect clinical samples and strong correlation ($r = .72$)

(Spitzer et al., 2006) with the much longer popularly used anxiety measure, the Beck

Anxiety Inventory – BAI (Beck, Epstein, Brown, & Steer, 1988).

Patient Health Questionnaire – Brief Scale - PHQ-9 (Kroenke, Spitzer, & Williams, 2001).

Depression was measured using the Patient Health Questionnaire 9-item depression

module (PHQ-9). This scale is based on the 9 key diagnostic criteria for depressive disorders

(APA, 2009), and can assess for probable clinical cases as well as symptom severity (See

Appendix H).   The 9 items are scored on a 4 point Likert scale with response options

ranging from 0 – not at all, to 3 – nearly every day.   It also contains a separate item to

measure impairment on activities of daily living from - not at all difficult, to - extremely

difficult. Diagnostic definitions for the PHQ-9 total scores are as follows: 0 - 4 = minimum

depression, 5 - 9 = mild depression, 10 - 14 = moderate depression, 15 - 19 = moderately-

severe depression, 20 - 27 = severe depression (Kroenke et al., 2001).

The PHQ-9 has very good internal consistency (from $\alpha = .86$ to $\alpha = .89$) (Kroenke et

al., 2001) for clinical (depression) and non-clinical samples. With 9 items, it was also

selected for its brevity, in minimising the number of total items on the e-survey, and

therefore participant burden. It has good sensitivity and specificity (Kroenke et al., 2001),

and good correlations to other much longer depression scales e.g. the Beck Depression

Inventory – II - BDI-II (Beck, Steer & Brown, 1996)   (from $r = .72$ to $r = .73$ for depressed

patients; Titov et al., 2011).

Research Procedure

The online study methodology was selected due to the potential advantages of

accessing a greater number and diversity of potential respondents, maximising time available

from the researcher. Other advantages included locating more elusive populations, greater

privacy allowing for more response openness, reduced completion errors due to forced

choice responses and completion progression requirements, and reduced research-related

costs (Rhodes, Bowie & Hergenrather, 2003).   As a reliable form of data gathering for the

purposes of this study, OCD symptoms and beliefs have been found to be equally

measurable by paper and internet versions of the same scale, with level of computer

experience/knowledge not associated with results (Coles, Cook & Blake, 2007).

Limitations associated with this methodology were considered and these included the

possible reduced representativeness of samples if relying on computer-literate or internet-

accessing participants, the small number of sites and social networks (although other

methodologies can have the same issues), the inability to calculate response rate, and having

less active and noticeable ways of attracting participants compared with face to face or

targeted postal methods (Rhodes et al., 2003).   A comprehensive meta-analysis comparing

person-to-person versus internet based results on a wide range of psychological constructs,

has however dispelled many criticisms raised about internet-based study, including the

finding of comparable results, comparable range of age, gender, socio-economic status, and

comparable rates of genuine attempts at participation (Gosling, Vazire, Srivastava, & John,

2004). The advantages were therefore considered to outweigh limitations for the purposes of

this study.

Reliability of the constructed e-survey was considered and efforts made to improve

this in a pre-test phase. Five associates of the researcher were opportunistically approached,

to complete the e-survey. Feedback was provided regarding ease of understanding, face

validity, burden of completion and other self-generated information. Feedback was reviewed and modifications to the survey were made where appropriate and possible (e.g. the wording of standardised measures items could not be altered).

Participants were sought using the recruitment methods described previously. Advertisements and information emails directed interested potential participants to the study's online-survey website, hosted by the University of Essex Moodle System, with responses accessible only to the researcher and the university IT department (for technical assistance purposes).

The online-survey website contained information about the online-survey as well as the questionnaires as described above. Specifically, it commenced with a participant information sheet, a consent form to be completed before survey commencement, and an author created demographic questionnaire. This was followed by the DOCS, the FFMQ, the SMQ, the GAD-7, the PHQ-9, and finally, an end of survey page with further information including relevant contact information for support organisations (see Appendix I for the author created elements). The information sheet included a summary of the study, eligibility criteria, information about the researcher, participation details and instructions, right to withdraw details, data usage and confidentiality details, potential risk information, completion estimation time (approx.. 15-20 minutes), and researcher contact details. Wording for information and consent pages was informed by the guidance provided by the National Research and Ethics Service [NRES] (2011), as well as University of Essex ethics in Research guidance (2013b). The survey host used a protective system to prevent multiple submissions, however several participants contacted the researcher and said that this prevented several members of the household from participating. This restriction was

subsequently removed from the survey, and therefore, the data were screened for situations of potential repeat submissions (by the same individual). Access to the online-survey was closed to potential participants, once data analysis commenced.

Ethical Considerations

Approval to carry out the research was obtained from the Faculty of Health and Human Sciences Ethics committee at the University of Essex, on 16/01/2014 (Appendix J). Approval of amendments was secured on 3/03/2014 (Appendix K). Ethical considerations for the study were informed by the University of Essex Research Governance Guidelines (2013a), and British Psychological Society guidelines for ethical practice in psychological research online (2007).

Informed Consent / Right to Withdraw

Informed consent and right to withdraw procedures were based on University of Essex, Research Governance Participant Information and Consent guidelines (2013b).

The Participant Information Sheet (see Appendix I) provided full details of the study with which to make a participation decision (as detailed above). Participants were specifically informed that they had the right to withdraw from the study at any time, either by leaving the survey site (data would not be saved or collected), or by contacting the researcher if they had changed their mind once they had submitted their data, leading up to the analysis phase of the study.

A consent form followed the participant information form and preceded the questionnaires. Participants were required to check a box confirming that they had read and

understood the information page, had met the inclusion criteria, and agreed to participate in the study. Unless this item was checked, access to the e-survey was not possible.

Confidentiality, Anonymity and Data Storage

The e-survey utilised the University-based Moodle system to host the study, as this site was bound by the same ethical obligations to confidentiality and security as the researcher. The stored data-set was password protected and anonymised to provide better security and reduce risk. Personally identifiable information was not requested, and dates of birth were removed from the data set once the e-survey closed, analysis had commenced and therefore the opportunity for withdrawal of data from the study had ended. The demographic data collected was limited to that which increased the understanding about those who participated in the study, to establish their population representation. There were no paper copies of the data as this was an online survey. The data was backed up on a University of Essex server, and will be retained for 6 years following thesis submission.

In order to protect researcher details, the researcher's privacy settings were set on the highest possible level on social media sites, and personal details were not included in personal profiles. Direct contact or linking with the researcher was not necessary for participation. Clicking on the link contained within the advertisement, redirected the participant to the survey site, preserving participant confidentiality from the researcher and other social network users.

Support Provisions

The inclusion/exclusion criteria aimed to reduce the risk of potentially vulnerable people from participating in the study. However, some people may have had clinical levels

of OCD or other symptomology without having been diagnosed or having access to support services, or may have found participation distressing for other reasons. Due to the anonymity of the survey, it was not possible to contact any participant whose responses may have indicated a high level of distress or clinical levels on the various psychological scales. For the above reasons, the contact details of relevant support sites were provided at the end of the survey, as well as the contact details of the researcher at the beginning and end of the survey, in an effort to provide assistance to those who may have been psychologically affected whilst completing the e-survey.

Data Analysis

Data were analysed using IBM SPSS Statistics (Version 19) software. The relationship between OC symptoms, mindfulness, anxiety, depression, age and prior mindfulness experience, were examined using correlation analysis. The strength of mindfulness, anxiety, depression, and age, in predicting OC symptoms, were examined using regression analysis. The mediating roles of anxiety and depression, in the relationship between mindfulness and OC symptoms were examined using mediation analysis. The relative strengths of individual facets of mindfulness in predicting OC symptoms were explored using regression analysis. Individual responses were visually scanned for missing data, inconsistencies, illogical and repetitive entries (within and between participants). There was no missing data, which possibly reflected genuine attempts at participation, as well as the forced completion structure of the survey, which did not allow continuation onto consecutive pages without thorough completion of items on each page.

Dissemination

Results and conclusions from the study have been published in this doctoral

dissertation. Other peer-reviewed publications will be considered based on those which have already published OCD and mindfulness related studies. Some of the web-sites who offered to list information about the study with a link to the e-survey, have requested a summary of findings.

Results

This chapter reports on the results of data exploration, including descriptive statistics and tests for the assumptions required for correlation and regression analyses. It will also report on the outcomes of the correlation and regression analyses with reference to the study hypotheses.

The Sample

Statistical analyses included the data from all one hundred and sixty four study participants, as no cases demonstrated missing or obviously invalid data. Descriptive statistics were determined for continuous demographic data, and categorical data was explored through cross tabulation.

Due to the methodology of this study, the response rate to this survey was unknown, as snowball sampling and word-of-mouth recruitment did not allow for the tracking of people who were informed about the study, but chose not to participate. The study included thirty three male (20.1%) and one hundred and thirty one female (79.9%) participants. As an internet-based study, the world-wide distribution of participants was of interest, and participants listed their residency from a variety of countries. The majority of participants were residents of the United Kingdom ($n = 129$, 78.7%), with Australia ($n = 15$, 9.1%) and then the U.S.A. ($n = 10$, 6.1%) as the next most frequent countries of residency. Those participants resident in other countries who made up the remaining proportion ($n = 9$, 5.5%), were located in South Africa ($n = 2$), Germany ($n = 2$), and one participant each from the Isle of Man, Canada, Singapore, Turkey and Malaysia. One participant (0.6%) elected not to disclose their country of residency.

Other demographic details are listed in Tables 1 through 4, with means, standard deviations and minimum and maximum scores reported for continuous demographic data, and frequencies (with percentages) reported for categorical data. Due to the large gender imbalance (see Table 1) in the sample, details have been separated according to gender, to allow for any differences in demographic representation to be observed.

Visibly noticeable differences in degree and higher qualifications were observed with a proportionally higher percentage of female participants educated to this level, compared with male participants. There were proportionally higher numbers of men in full-time employment and self-employment, compared with women, whose highest proportion were full-time employment, followed by high numbers in part-time employment compared with men. Very few men reported any experience with mindfulness-based training or therapy, compared with one third of women with such experience, and almost a quarter of women reported having prior mindful experience associated with somewhat to greatly improved mindfulness skills.

Table 1

Gender by Age Characteristics for Study Participants

Gender	Age (Years)				
	n	*%*	*M*	*SD*	*Range*
Male	33	20.1	44.24	14.76	19-74
Female	131	79.9	36.13	12.21	18-71
Total	164	100.0	37.76	13.13	18-74

Table 2

Gender by Education Characteristics for Study Participants

	Gender		
	Male (%)	Female (%)	Total (%)
Education	(*n* = 33)	(*n* = 131)	(*N* = 164)
Mid to Late Secondary School	2 (6.1%)	3 (2.3%)	5 (3.0%)
Completed Secondary School	8 (24.2%)	22 (16.8%)	30 (18.3%)
Certificate/Diploma	5 (15.2%)	13 (9.9%)	18 (11.0%)
Bachelors Degree	8 (24.2%)	29 (22.1%)	37 (22.6%)
Post Graduate Certificate / Diploma	2 (6.1%)	21 (16.0%)	23 (14.0%)
Masters	4 (12.1%)	15 (11.5%)	19 (11.6%)
Doctorate	4 (12.1%)	28 (21.4%)	32 (19.5%)

Table 3

Gender by Occupation Characteristics for Study Participants

	Gender		
	Male (%)	Female (%)	Total (%)
Occupation	(*n* = 33)	(*n* = 131)	(*N* = 164)
Full-time Employment	18 (54.5%)	57 (43.5%)	75 (45.7%)
Part-time Employment	1 (3.0%)	30 (22.9%)	31 (18.9%)
Casual Employment	0 (0%)	1 (0.8%)	1 (0.6%)
Self-employed	8 (24.2%)	10 (7.6%)	18 (11.0%)
Student	2 (6.1%)	16 (12.2%)	18 (11.0%)
Home Duties	0 (0%)	2 (1.5%)	2 (1.2%)
Unemployed	0 (0%)	7 (5.3%)	7 (4.3%)
Retired	4 (12.1%)	7 (5.3%)	11 6.7%)
Other – unspecified	0 (0%)	1 (0.8%)	1 (0.6%)

Table 4

Gender by Mindfulness Experience for Study Participants

Mindfulness Experience	Gender		
	Male (%) (*n* = 33)	Female (%) (*n* = 131)	Total (%) (*N* = 164)
No mindfulness experience	31 (93.9%)	83 (63.4%)	114 (69.5%)
Prior mindfulness experience and mindfulness skills have			
- Greatly worsened	0 (0%)	0 (0%)	0 (0%)
- Somewhat worsened	0 (0%)	3 (2.3%)	3 (1.8%)
- No change	0 (0%)	8 (6.1%)	8 (4.9%)
- Somewhat improved	2 (6.1%)	34 (26.0%)	36 (22.0%)
- Greatly improved	0 (0%)	3 (2.3%)	3 (1.8%)

Descriptive Statistics of Study Variables

Level of obsessive compulsive symptomology (OC symptoms) was measured using the Dimensional Obsessive-Compulsive Scale [DOCS] (Abramowitz et al., 2010).

General dispositional mindfulness was measured using the Five Facets Mindfulness Questionnaire [FFMQ] (Baer et al., 2006) (subscales and scale total score). The five subscales (facets of mindfulness) include ***observing*** the range of internal and external experiences; ***describing*** or having vocabulary for the range of internal and external experiences; acting with ***awareness*** and attending purposefully; ***nonjudging*** of inner experience, and ***nonreactivity*** to inner experience. For the remainder of the study, the whole scale score will be known as FFMQtotal, and subscales will be referred to as FFMQobserve, FFMQdescribe, FFMQaware, FFMQnonjudge and FFMQnonreact. Development and validation studies did not use FFMQtotal score (Baer et al., 2006; Baer et al., 2008), however, the viability of using a total score for this study was examined.

Dispositional mindfulness associated with distressing thoughts and images was measured using the Southamptom Mindfulness Questionnaire [SMQ] (Chadwick et al., 2008). Anxiety was measured using the Generalized Anxiety Disorder Brief Scale [GAD-7] (Spitzer et al., 2006), and depression using the Patient Health Questionnaire – Brief Scale [PHQ-9] (Kroenke et al., 2001). Reverse scored items on the FFMQ and SMQ were recoded prior to generating scale totals.

Cronbach's alpha score for each scale/subscale was explored to assess internal consistency based on the study sample. Means, standard deviations, and minimum/maximum scores were calculated for each scale and subscale. These have been reported in Table 5, along with results from reference populations published in scale development articles.

Internal Consistency of the Scales

Results in Table 5 indicated that all scales and subscales demonstrated a good to excellent level of reliability, with Cronbach's alpha scores all exceeding $\alpha = .80$ (Field, 2009). The strength of item correlation with scale and subscale score was examined to identify any items which were not contributing to the overall scale measurement, for this sample. All of the items in each scale and subscale correlated above the minimum of r = .30 for item inclusion (Field, 2009), apart from every item in the FFMQobserve subscale, lending support to the suggestion that this subscale may be measuring a different dimension than the other subscales, especially for non-meditating samples (Baer et al., 2006; Williams et al., 2014). Removal of each item provided for only minimal change in FFMQtotal score however, and the Cronbach's alpha score for the FFMQtotal scale was very strong suggesting that use of the FFMQtotal score would be appropriate.

Table 5

Mean Scores, Standard Deviations, Minimum and Maximum, and Alpha Scores for All Psychological Measures

Measure	N	M	SD	Min	Max	Cronbach's Alpha
Obsessive Compulsive Symptoms (DOCS) - Total	164	12.12	13.40	0	68	.96
Normal population[a]		*11.93*	*9.87*			
Clinical - Other Anxiety[a]		*16.75*	*13.14*			
Clinical – OCD[a]		*30.06*	*15.49*			
Mindfulness (SMQ) - Total	164	52.86	20.17	6	96	.94
Meditator[b]		*57.4*	*14.3*			
Non-meditators[b]		*48.5*	*15.2*			
Clinical – Psychosis[b]		*37.2*	*15.87*			
Mindfulness (FFMQ) –						
- Observe Subscale	164	25.06	5.93	9	38	.83
- Describe Subscale	164	28.01	6.89	10	40	.92
- Aware Subscale	164	25.10	6.01	10	40	.90
- Nonjudge Subscale	164	26.95	8.55	8	40	.94
- Nonreact Subscale	164	21.22	5.36	7	34	.83
- Total	164	126.34	21.72	55	182	.92
- *Meditators – Observe*[c]		*31.96*	*4.16*			
- *Meditators – Describe*[c]		*31.84*	*5.30*			
- *Meditators – Aware*[c]		*28.08*	*5.10*			
- *Meditators – Nonjudge*[c]		*32.44*	*5.63*			
- *Meditators – Nonreact*[c]		*25.70*	*4.01*			
- *Community - Observe*[c]		*24.32*	*5.48*			
- *Community - Describe*[c]		*24.63*	*7.06*			
- *Community – Aware*[c]		*24.57*	*6.57*			
- *Community – Nonjudge*[c]		*23.85*	*7.33*			
- *Community – Nonreact*[c]		*19.53*	*4.88*			
Anxiety (GAD-7) – Total	164	6.81	6.28			.95
Depression (PHQ -9) - Total	164	6.17	6.44			.92

Note. a. Sourced from Abramowitz et al. (2010) b. Sourced from Chadwick et al. (2008) c. Sourced from Baer et al. (2008)

GAD-7 / PHQ-9 scores of 5-9 = mild anxiety/depression (Spitzer et al., 2006; Kroenke et al., 2001)

Study Sample OCD Characteristics

Abramowitz et al. (2010) reported that the best balance between specificity and sensitivity was reached when using the cut-off score of 18 to determine clinical levels of OCD (at 78% accuracy), and 21 (at 70% accuracy) to distinguish OCD clinical levels from other anxiety disorders. Using these cut-offs, the present study found that 39 (23.8%) participants reported clinical levels of OCD (according to the DOCS), and 33 (20.1%) participants reported suffering from OCD-related symptoms clearly differentiated from other anxiety disorders, a much higher proportion when compared with contemporary reports on the population prevalence of people with clinical levels OC symptoms (0.1 - 2.3%) (Kessler et al., 2005b; Ruscio et al., 2010; Wittchen & Jacobi, 2005; Torres et al., 2006; Eaton et al., 2008). This may have reflected the nature of recruitment in this study as some organisations with an interest in OCD and anxiety-related conditions were approached to advertise for participants, potentially attracting participants with higher levels of OC symptomology. The mean DOCS score however, was only slightly higher than that reported for the normal population (see Table 5) in the scale development literature (Abramowitz et al., 2010), suggesting that the sample used in the present study has similar overall OC severity, to the normal scale reference population.

Testing of Assumptions

In order to examine the associations between the variables in this study, correlation and regression analyses were used. Assumption tests for linearity, normality, homogeneity of variance and independence were examined, to determine the appropriateness of using parametric tests for these analyses. Parametric tests were

preferred as they have greater detection sensitivity, reducing the possibility of type II

errors (false negatives) (Field, 2013).

Statistical tests for skewness, kurtosis and normality (e.g. Kolmogorov-Smirnov

test) were not used for testing assumptions in the present study, due to the large sample

size ($N = 164$), as these tests have the tendency to be overly sensitive and reject

potentially acceptable data with larger sample sizes (Field, 2013). Therefore, as

recommended (Field, 2013) data were visually inspected using histograms and normal

probability (P-P) plots (Appendix L) for assessing normal distribution, scatterplots to

determine linearity and homogeneity of variance (Appendix M), and box plots to identify

outliers. Independence was inferred as data was collected individually from participants,

using separate measures, and did not include repeated measures.

Visual inspection found mindfulness measures (including sub-scales) to be

normally distributed, however, the symptom measures of OCD, anxiety and depression

all demonstrated positive skew and positive kurtosis. These patterns of distribution are

considered a natural phenomenon of symptoms measures in general (Arndt, Davis, Miller

& Andreason, 1993), and were observed in the normative data for each of the specific

symptom measures used in this study (Spitzer et al., 2006; Kroenke et al., 2001;

Abramowitz et al., 2010). Due to this consistency with normative data, as well as a

concern about limiting the ability to make estimations about the population; OC

symptom, anxiety and depression variables were not transformed.

Box plots identified outliers on some variables, but these were not extreme or

isolated, and consistent with the distribution of the specific variables. These cases were

therefore not removed. Scatterplots indicated linear relationships in all variables when compared against the OCD measure, and the pattern of data-point spread indicated an even dispersal (homogeneity of variance).

In summary, the main violation of assumptions were for non-normal distribution of OC, anxiety and depression scores, however, the distribution patterns were similar to normative data for each scale, and the central limit theorem suggests that the sample size for this study ($N = 164$) approaches normal distribution for parameter estimates (Field, 2013). Therefore, parametric tests were used, to enable a higher sensitivity to detect significance, although, non-parametric test equivalents, which are not affected by violations of assumptions, were used as a precaution, and cross-references made between results.

Given the violations of normal distribution, bootstrap analyses (percentile) based on 1,000 bootstrap samples, p < .05 unless otherwise stated, were also conducted to examine the maximum and minimum confidence intervals (reported in square brackets) of correlation co-efficient, as bootstrap confidence intervals remain robust when the sampling distribution is not normal (Field, 2013). Any evidence of a change in direction of relationship between the confidence intervals boundaries was evidence of possible zero correlation (no effect) and therefore suggested a genuine effect was not occurring (Field, 2013).

Spearman's rho (non-parametric) and Pearson product-moment (parametric) correlation coefficients were calculated to examine the strength of relationships between

variables, for all examinations of association. Comparisons of results demonstrated little

difference in strength of relationship or significance of correlation, apart from the

relationship between OC symptoms and FFMQobserve in hypothesis 1. This was

subsequently adjusted following examination of bootstrap confidence intervals,

establishing all results as comparable. Therefore, Pearson's product-moment correlation

coefficients will be reported from now on, along with percentile bootstrap confidence

intervals (based on 1,000 comparisons, p < .05) for the pearson's correlation coefficient.

Non-parametric results for analysis of hypothesis 1 have been reported in Appendix N for

comparison, given the initial discrepancies in FFMQobserve results.

Hypothesis 1

Mindfulness will be negatively associated with OC symptoms.

As there has been no previous published research examining the actual

relationship between these two variables, the direction of relationship was not dictated

when conducting analyses, and two-tailed tests were therefore used.

Statistically significant negative relationships were found between OC symptoms

(DOCS) and all mindfulness measure variables apart from FFMQobserve, including

SMQ $r = -.665$, CI[-.746, -.571], $p < .001$; FFMQtotal $r = -.600$, CI[-.692, -.489], $p <$

.001; FFMQdescribe $r = -.450$, CI[-.595, -.277], $p < .001$; FFMQaware $r = -.451$, CI[-

.567, -.331], $p < .001$; FFMQnonjudge $r = -.702$, CI[-.764, -.629], $p < .001$; and

FFMQnonreact $r = -.413$ CI[-.546, -.265], $p < .001$ (see Table 6).

FFMQobserve was found to be statistically significantly positively correlated with OC symptoms, $r = .168$, CI[-.029, .343], $p = .032$, however, the bootstrapped confidence interval range crossed over zero correlation, meaning the potential for no association between FFMQobserve and OC symptoms for some samples, and suggesting that a genuine effect had not been found in this study (Field, 2013).

There was a large effect size for OC symptoms and overall mindfulness (SMQ, FFMQtotal), with a non-judgemental approach (FFMQnonjudge) demonstrating the strongest effect size of all mindfulness variables. There was a medium effect size for OC symptoms and FFMQdescribe, FFMQaware and FFMQnonreact.

The coefficient of determination (R^2) (Field, 2013) was calculated for the variables with higher correlations, and demonstrated that the percentage of variability shared between OC symptoms and the mindfulness variables was: 44.2% with SMQ, 36% with FFMQtotal, and 49% with FFMQnonjudge. A non-judging approach could therefore explain nearly half of the variability in OC symptom scores.

These results indicated that there was a negative relationship between mindfulness and OC symptoms. There were also negative relationships between OC symptoms, and the facets of mindfulness including: describing internal and external experiences, acting with awareness, nonjudging of inner experience and nonreactivity to inner experience. Nonjudging of inner experience (FFMQnonjudge) could explain the most variability in OC symptoms, when compared with other mindfulness facets, or whole scores.

Table 6

Correlation Coefficients for OC Symptoms (DOCS), Mindfulness Measures FFMQtotal, FFMQobserve, FFMQdescribe, FFMQaware,

FFMQnonjudge, FFMQnonreact, and SMQ; Anxiety (GAD-7) and Depression (PHQ-9)

Variables	1	2	3	4	5	6	7	8	9	10
1. DOCS	-									
2. FFMQtotal	-.600***	-								
3. FFMQobserve	.168*	.320***	-							
4. FFMQdescribe	-.450***	.728***	.103	-						
5. FFMQaware	-.451***	.716***	-.010	.391***	-					
6. FFMQnonjudge	-.702***	.758***	-.133	.412***	.569***	-				
7. FFMQnonreact	-.413***	.752***	.281***	.457***	.380***	.455***	-			
8. SMQ	-.665***	.749***	-.028	.411***	.511***	.802***	.687***	-		
9. GAD-7	.731***	-.658***	.107	-.458***	-.598***	-.672***	-.453***	-.671***	-	
10. PHQ-9	.700***	-.625***	.143	-.415***	-.648***	-.660***	-.380***	-.611***	.805***	-

Note. *** $p<.001$, ** $p<.01$, * $p<.05$, (2-tailed)
Pearson's product-moment correlation co-efficient

Observing the range of internal and external experiences was the only mindfulness facet,

not to be associated with OC symptoms.

Hypothesis 2.1

Anxiety / depression symptoms will be positively associated with OC symptoms.

Hypothesis 2.2

Anxiety / depression symptoms will be negatively associated with mindfulness.

A two-tailed test enabled the detection of the multi-directional relationships of

both hypotheses. Statistically significant positive relationships were found between OC

symptoms (DOCS) and anxiety (GAD-7) $r = .731$, CI[.662, .794], $p < .001$, and OC

symptoms and depression (PHQ-9) $r = .700$, CI[.604, .786], $p < .001$, both with large

effect sizes (Table 6).   Statistically significant negative relationships were found between

anxiety and mindfulness SMQ $r = -.671$, CI[-.756, -.563], $p < .001$; FFMQtotal $r = -.658$,

CI[-.748, -.555], $p < .001$, and depression and mindfulness SMQ $r = -.611$, CI[-.711, -

.493], $p < .001$; FFMQtotal $r = -.625$, CI[-.713, -.530], $p < .001$, all with large effect sizes

(see Table 6).

The coefficient of determination (R^2), demonstrated equal to higher percentages

of variability shared between OC symptoms and anxiety (53.4%) as well as OC

symptoms and depression (49%), when compared with the shared variances reported with

mindfulness variables in the previous section.

These results indicated a positive relationship between OC symptoms and both anxiety and depression. The results also indicated that there was a negative relationship between mindfulness and both anxiety and depression. Anxiety and depression were able to account for equal to higher percentages of shared variance with OC symptoms, compared with mindfulness variables.

Hypothesis 2.3

The association between OC symptoms and mindfulness, controlling for anxiety and depression, was examined using partial correlations; to determine the contributory nature of these comorbid conditions on the OCD and mindfulness relationship. The results, including percentile bootstrap confidence intervals based on 1,000 comparisons, $(p < .05)$ for the Pearson's correlation coefficient (negligible difference with non-parametric results), are reported below.

A statistically significant negative correlation continued to exist between OC symptoms and mindfulness as measured by the SMQtotal $r = -.346$, CI[-.477, -.207], $p < .001$, and mindfulness as measured by the FFMQtotal $r = -.232$, CI[-.360, -.100], $p < .001$, when controlling for anxiety. The effect size of the correlation between OC symptoms and mindfulness using the SMQtotal reduced from large to medium, and the effect size reduced from large to small for FFMQtotal. The shared variance between OC symptoms and mindfulness reduced to 12% (SMQtotal) and 5% (FFMQtotal).

A statistically significant negative correlation continued to exist between OC symptoms and mindfulness as measured by the SMQtotal $r = -.420$, CI[-.545, -.285], $p <$ .001, and mindfulness as measured by the FFMQtotal $r = -.291$, CI[-.424, -.157], $p <$ .001, when controlling for depression. The effect size of the correlation between OC symptoms and mindfulness when using the SMQtotal score reduced from large to medium, and from large to small for the FFMQtotal. The shared variance between OC symptoms and mindfulness reduced to 18% (SMQtotal) and 8% (FFMQtotal), with a smaller reduction in shared variance effected onto SMQtotal score. These findings suggested that depression and to a greater extent anxiety, contributed to the relationship between OC symptoms and mindfulness.

When controlling for the combined contribution of anxiety and depression, the correlation between OC symptom scores and mindfulness (SMQ) $r = -.318$, CI[-.471, -.158], $p < .001$ remained significant, although reduced in effect size (medium) with a reduced shared variance with OC symptoms (10%). The relationship between OC symptoms and mindfulness (FFMQ) $r = -.184$, CI[-.322, -.035], $p = .019$ was less significant with a minimal effect size of only 3% shared variance. These findings suggested that mindfulness as measured by the SMQ was less effected by anxiety and depression, than was the FFMQtotal score. The three quarters reduction in size of shared variance with OC symptoms when controlling for anxiety and depression, confirmed the inclusion of these variables in regression equation modelling for OC symptoms. The differences in impact on mindfulness scales suggested that the FFMQ scale may have been measuring constructs with greater similarly to the anxiety and depression scales, than was the SMQ scale.

As the SMQ score appeared to have less shared variance with the anxiety and depression measures, compared with FFMQtotal, as well as measuring mindfulness within the context of OC symptoms, compared with the more general FFMQ dispositional measure, the SMQ was selected for regression equation modelling with respect to OC symptom predictors (see Hypotheses 5.1 – 5.3). This also avoided the issue of multicollinearity that using two scales measuring the same psychological construct would have produced.

These results indicated that controlling for anxiety and depression, both separately and together, did not alter the negative relationship between mindfulness and OC symptoms. However, reductions in effect size and amounts of shared variance with OC symptoms were observed, indicating that anxiety and depression were contributing towards the relationship between mindfulness and OC symptoms.

Hypothesis 3.1

Age will be negatively associated with OC symptoms.

Hypothesis 3.2

Age will be positively associated with mindfulness.

A two-tailed test enabled the detection of the multi-directional relationships of both hypotheses, as well as accounting for limitations in the age-related mindfulness development theory, which was based on results from an older-adult sample (Splevins et al., 2009) and not representative of the age-spread in the sample in the present study.

Statistically significant positive relationships were found between age and the

mindfulness measures SMQ, FFMQtotal, FFMQaware, and FFMQnonjudge (see Table

7). Medium effect sizes were found for mindfulness SMQ, a non-judging stance

(FFMQnonjudge) and mindful awareness (FFMQaware), and a small effect size for

FFMQtotal. A statistically significant negative relationship was found between age and

OC symptoms, with medium effect size. Other relationships were not significant (see

Table 7).

Table 7

Correlation Coefficients for Age, with Mindfulness Measures SMQ, FFMQtotal,
FFMQobserve, FFMQdescribe, FFMQaware, FFMQnonjudge, FFMQnonreact, and OC
Symptoms (DOCS)

Variables	Age	
SMQ	.300***	[.172, .409]
FFMQtotal	.245**	[.092, .390]
FFMQobserve	-.033	[-.192, .135]
FFMQdescribe	.040	[-.123, .196]
FFMQaware	.298***	[.160, .421]
FFMQnonjudge	.337***	[.203, .457]
FFMQnonreact	.107	[-.058, .260]
DOCS	-.334***	[-.436, -.211]

Note. *** p<.001, ** p<.01, * p<.05, (2-tailed)
Pearson's product-moment correlation co-efficient
Percentile correlation coefficient confidence intervals based on 1,000 comparisons, p<.05, are reported in square brackets

Hypothesis 3.3

Partial correlations were performed, re-examining the relationship between OC symptoms and mindfulness, controlling for age (see Table 8). Controlling for age of participant did not appear to make noticeable differences in the relationship between OC symptoms, and any mindfulness whole or factor score; suggesting little shared association. The strength of association between age and OC symptoms, however, supported the inclusion of age in regression modelling for OC symptoms.

These results indicated that there was a positive relationship between mindfulness (SMQ and FFMQtotal), the mindfulness facets of acting with awareness, and nonjudging of inner experience; and age. The results also indicated that there was a negative relationship between age and OC symptoms. Although demonstrating medium direct effect on OC symptomology, age did not appear to be contributing towards the relationship between mindfulness and OC symptoms.

Table 8

Partial Correlation Coefficients for DOCS, and Mindfulness Measures FFMQtotal, FFMQobserve, FFMQdescribe, FFMQaware, FFMQnonjudge, FFMQnonreact, SMQ, Controlling for Age

Variables	1	2	3	4	5	6	7	8
1. DOCS	-							
	-							
	-							
2. FFMQtotal	-.567***	-						
	[-.662, -.454]	-						
	-.600***	-						
3. FFMQobserve	.166*	.338***	-					
	[-.018, .343]	[.180, .487]	-					
	.168*	.320***	-					
4. FFMQdescribe	-.464***	.742***	.104	-				
	[-.622, -.287]	[.648, .810]	[-.072, .280]	-				
	-.450***	.728***	.103	-				
5. FFMQaware	-.391***	.694***	.000	.397***	-			
	[-.517, -.248]	[.608, .767]	[-.171, .162]	[.248, .517]	-			
	-.451***	.716***	-.010	.391***	-			
6. FFMQnonjudge	-.664***	.740***	-.129	.424***	.521***	-		
	[-.735, -.581]	[.669, .801]	[-.291, .050]	[.298, .538]	[.415, .624]	-		
	-.702***	.758***	-.133	.412***	.569***	-		
7. FFMQnonreact	-.403***	.753***	.286***	.455***	.367***	.448***	-	
	[-.530, -.254]	[.683, .809]	[.105, .432]	[.327, .570]	[.219, .497]	[.316, .570]	-	
	-.413***	.752***	.281***	.457***	.380***	.455***	-	
8. SMQ	-.629***	.731***	-.019	.419***	.463***	.781***	.691***	-
	[-.710, -.530]	[.650, .801]	[-.204, .154]	[.280, .536]	[.341, .568]	[.694, .849]	[.585, .778]	-
	-.665***	.749***	-.028	.411***	.511***	.802***	.687***	-

Note. *** $p<.001$, ** $p<.01$, * $p<.05$, (2-tailed)
Pearson's product-moment correlation co-efficient with Age controlled.
Percentile correlation coefficient confidence intervals based on 1,000 comparisons, p<.05, are reported in square brackets
Pearson's product-moment correlation co-efficient without Age controlled.

Hypothesis 4.1

Prior mindfulness experience will be negatively associated with OC symptoms.

Hypothesis 4.2

Prior mindfulness experience will be positively associated with mindfulness.

A point-biserial correlation analysis was performed to examine the relationship between mindfulness experience (prior training and/or therapy versus none), and current mindfulness (SMQtotal, FFMQtotal and FFMQfacets) as well as OC symptoms (see Table 9).

A statistically significant negative relationship was found between prior mindfulness experience and mindful awareness FFMQaware r_{pb} = -.219, CI[-.372, -.078], $p < .01$, and a positive relationship was found between prior mindfulness experience and mindfully observing FFMQobserve r_{pb} = .172, CI[.012, .327], $p < .05$, both with small effect sizes. There were no significant relationships with any other mindfulness factor or whole score, or with level of OC symptoms.

Hypothesis 4.3

Given the limited associations found between prior mindfulness experience and current mindfulness score, as well as no association found with OC symptoms, the role of prior mindfulness experience in the relationship between mindfulness and OC symptoms, was not examined. Prior mindfulness experience was also not included in an OC symptoms predictive model (regression analysis), especially given the lack of association with OC symptoms, and bootstrapped confidence intervals suggesting no genuine relationship.

Table 9

Correlation Coefficients for Prior Mindfulness Experience with Mindfulness Measures SMQ, FFMQtotal, FFMQobserve, FFMQdescribe, FFMQaware, FFMQnonjudge, FFMQnonreact, and OC Symptoms (DOCS)

Variables	Prior Mindfulness Experience	
SMQ	-.092	[-.240, .070]
FFMQtotal	-.063	[-.223, .111]
FFMQobserve	.172[*]	[.012, .327]
FFMQdescribe	.028	[-.113, .186]
FFMQaware	-.219[**]	[-.372, -.078]
FFMQnonjudge	-.131	[-.292, .029]
FFMQnonreact	-.030	[-.179, .129]
DOCS	-.092	[-.240, .070]

Note. *** $p<.001$, ** $p<.01$, * $p<.05$, (2-tailed)
Pearson's product-moment point biserial correlation co-efficient
Percentile correlation coefficient confidence intervals based on 1,000 comparisons, $p<.05$, are reported in square brackets

These results indicated that there was a small positive relationship between prior mindfulness experience and mindfully observing, and small negative relationship with mindful awareness. There was no relationship between mindfulness experience and OC symptoms.

Hypothesis 5.1

Increased mindfulness will predict decreased OC symptoms.

Regression analysis was performed to examine the extent to which level of OC symptoms could be predicted from level of mindfulness, using a best fit linear model to represent the relationship between the predictor and outcomes variable. Although in regression analyses, the predictor variables are treated as independent variables, and the outcome as the dependent variable, this process does not infer causality.

In addition to the assumptions required for correlation analysis, added assumptions for regression analysis were examined following generation of the regression model. A higher than tolerated number of outlier residuals were identified, although the effect of these on the model was not significant (*Mahalanobis max* = 5.397 [upper limit = 10.828], $p < .001$, *Cooks max* = 0.261 [upper limit = 1.0], dfBeta values between ± 1). Residual terms were found to be independent (*Durbin-Watson* = 2.156, *p* < .001) and z-scores for predictors vs. z-scores for residuals graphs indicated linearity but not homoscedasticity. Histogram and normal probability (P-P) plots indicated non-normal distribution. As two assumptions were not met, homoscedasticity and normal distribution of residuals (see Appendix O for assumption testing results), percentile bootstrap sampling results (based on 1,000 comparisons, $p < .05$), were conducted as part of the analysis (as they are not reliant on assumptions of normality or homoscedasticity), to provide more robust significance tests, confidence intervals and more accurate population estimates for predictor b values (Field, 2013).

Simple regression analysis demonstrated that the regression model, and therefore as the only variable, mindfulness (SMQ total score), contributed to 44.3% ($R^2 = .443$, Adjusted $R^2 = .439$) of the variance in OC symptoms (DOCS) (see Table 10). The model was statistically a significantly better predictor than the mean SMQtotal score $F(1, 162) = 128.76$, $p < .001$. The adjusted R^2 suggests that the model would only lose 0.4% of its predictive power, if applied to the population. Mindfulness (SMQ total score) was found to be a statistically significant predictor for OC symptom level, $b = -.442$ CI[-.545, -.340], $\beta = -.665$, $t = -11.347$, $p = .001$. The confidence interval range for the unstandardised regression coefficients did not cross zero, supporting the accuracy of the

strength of prediction and of a genuine negative relationship between mindfulness score

and OC symptoms in the population.

Table 10

Simple Regression Analysis Predicting OC Symptoms from Mindfulness

	b	*SE B*	*β*	*t*	*p*
Constant	35.491	3.232		16.107	.001
SMQtotal	-.442	.052	-.665	-11.347	.001
	[-.545, -.340]				

Note. $R^2 = .44 (p < .001)$
Percentile regression coefficient confidence intervals based on 1,000 bootstrap comparisons at p<.05, are reported in square brackets

These results indicated that OC symptoms could be predicted from mindfulness (SMQ)

score, with a negative relationship existing between the two variables.

Hypothesis 5.2

Prior mindfulness experience and increasing age will negatively predict OC

symptoms, when added to a predictive model.

Hypothesis 5.3

Anxiety and depression will positively predict OC symptoms, when added to a

predictive model.

Although an analysis of the predictive contribution made by prior mindfulness

experience to OC symptoms was planned for this study; prior mindfulness experience

was not subsequently included in the following regression analysis, given the lack of

relationship to OC symptoms found in the earlier correlation analysis (hypothesis 4.1).

Hierarchical regression was selected as the preferred method of multiple regression analysis, to allow for greater control of order entry. Variables were added to the model created for hypothesis 5.1.

Results from assumption testing for multiple regression for this model, found that some residuals were identified as outliers, although at tolerable levels and not influential to the model (*Mahalanobis max* = 18.601, upper limit = 18.467, $p < .001$; *Cooks max* = 0.154, upper limit = 1.0;, *dfBeta* values between ± 1). Residual terms were found to be uncorrelated (*Durbin-Watson* = 2.224, $p < .001$), there was no multicollinearity (*VIF* score max = 3.356, upper limit = 10; *Tolerance* > 0.2), and no predictor to predictor correlation greater than $r = .9$. There was a more normal distribution pattern of residuals, and better confidence about homoscedasticity (see Appendix P for assumption testing results). Therefore, bootstrap sampling results were not used on this occasion.

Age was added at step 2, due to its smaller relationship with OC symptoms, compared with anxiety/depression, so that a potential weak contribution could be detected before other potentially stronger predictors were added. As equally prevalent comorbid conditions, both with high positive correlations with OC symptoms (this study), anxiety and depression were simultaneously entered at step 3.

The addition of age to the regression model accounted for a further 2% ($R^2 = .463$, Adjusted $R^2 = .456$, $\Delta R^2 = .020$) of the variability in OC symptoms (DOCS), resulting in a statistically significant change, *F change* $(1, 161) = 5.928$, $p < .05$. The adjusted R^2 suggested that the model would only lose 0.7% of its predictive power, if applied to the population. The updated model continued to be statistically a significantly better

predictor than the mean value of predictors scores $F(2, 161) = 69.302, p < .001$.

Mindfulness (SMQ total score) continued to be a statistically significant predictor for OC

symptom level in Step 2 of the model, and age was also found to be a statistically

significant predictor (see Table 11). With a higher *t-test* and standardised regression co-

efficient (β) value and smaller significance value than age, mindfulness was found to

make a greater contribution to the model, as well as having a stronger unique association

with OC symptoms (SMQ $r_{part} = -.592$, age $r_{part} = -.141$).

At step 3, anxiety (GAD-7) and depression (PHQ-9) accounted for an additional

15% ($R^2 = .616$, Adjusted $R^2 = .606$, $\Delta R^2 = .153$) of the variance in OC symptoms

(DOCS), resulting in significant change, *F change* $(2, 159) = 31.700, p < .001$. The

adjusted R^2 suggested that the model would only lose 1% of its predictive power, if

applied to the population. The updated model continued to be statistically a significantly

better predictor of OC symptom scores, than the mean predictor scores $F(4, 159) =$

$63.716, p < .001$ and accounted for 62% of variance in OC symptom scores.

Mindfulness (SMQtotal) continued to be a statistically significant predictor for

OC symptoms. Age was no longer a significant predictor (see Table 11) and

demonstrated regression coefficient confidence intervals which included zero, indicating

the potential for no contribution towards the model. Anxiety (GAD-7) and depression

(PHQ-9) were statistically significant contributors to the model, although mindfulness

continued to make the greater contribution to the model, having the highest *t-test* value

and smallest significance value compared with the other predictors (although smaller

standardized regression co-efficient (β) value compared with anxiety). According to *t-*

test and probability scores, anxiety was making the next greatest contribution, followed

by depression (see Table 11). Part correlations found that Mindfulness (SMQ) (r_{part} = -.204) continued to have the highest unique association with OC symptoms, followed by anxiety (r_{part} = .175), depression (r_{part} = .148) and age (r_{part} = -.051) in order of strength of unique contribution.

The model demonstrated a negative relationship between mindfulness and OC symptoms, and positive relationship between anxiety and depression, and OC symptoms.

Table 11

Hierarchical Regression Analyses Predicting OC Symptoms from Mindfulness, Age, Anxiety and Depression

	b	SE B	β	t	p
Step 1					
Constant	35.491	2.203		16.107	.000
	[31.140, 39.842]				
SMQtotal	-.442	.039	-.665	-11.347	.000
	[-.519, -.365]				
Step 2					
Constant	39.619	2.754		14.384	.000
	[34.180, 45.059]				
SMQtotal	-.413	.040	-.621	-10.225	.000
	[-.492, -.333]				
Age	-.151	.062	-.147	-2.435	.016
	[-.273, -.028]				
Step 3					
Constant	16.121	3.790		4.254	.000
	[8.636, 23.606]				
SMQtotal	-.185	.045	-.279	-4.141	.000
	[-.274, -.097]				
Age	-.056	.054	-.055	-1.038	.301
	[-.162, .051]				
GAD-7	.685	.192	.321	3.563	.000
	[.305, 1.064]				
PHQ-9	.527	.175	.253	3.008	.003
	[.181, .873]				

Note. R^2 = .62(p < .001) at Step 3. Regression coefficient confidence intervals, p<.05, are reported in square brackets

The results from regression analysis indicated that adding age, anxiety and depression to mindfulness in the predictive model, strengthened the model's ability to predict OC symptoms, with the model being able to account for almost two thirds of the variance in OC symptom scores. Mindfulness (SMQ) was found to provide the largest predictive role (negative relationship to OC symptoms), followed by anxiety and depression (both with positive relationships to OC symptoms), with age not making a consistent contribution once anxiety and depression were added to the model.

Hypothesis 5.3 - Additional Analyses

As the contributions made by anxiety and depression towards predicting OC symptoms were significant, and partial correlations indicated a high level of involvement in the shared variance between mindfulness and OC symptoms (Hypothesis 3), further analysis was conducted to identify their possible role in the relationship between mindfulness and OC symptoms.

Although highly correlated with one another, separate mediation analyses were conducted for anxiety and depression as mediators, due to their different comorbidity patterns and predicted mechanisms in OCD development. Anxiety has been found to precede OCD in the majority of occasions (Ruscio et al., 2010), whereas, depression has been found to more often occur following OCD development, and is seen as a psychological response to the presence of the condition (Pallanti et al., 2011).

Mediation analyses were performed using the PROCESS tool, which is an SPSS add-on feature (Hayes, 2014). The mediation analyses determined the predictive strength of the predictor variable mindfulness (SMQ) for the outcome variable (OC symptoms

[DOCS]), via the mediating variables (anxiety [GAD-7] and then depression [PHQ-9] in a separate analysis) (Indirect Effect). This value was determined by separately calculating the predictive strength of predictor to mediator, predictor to outcome variable (known as the Total Effect), and the combined predictive strengths of predictor directly to outcome and mediator directly to outcome (Direct Effect). Following this, any mediating effect of the mediator variable (anxiety or depression) on this relationship could be identified.

Given the potential issues around normal distribution for the DOCS scores, bias corrected and accelerated (BCa) bootstrap confidence intervals based on 1,000 comparisons (p < .05) were used for this analysis. Effect sizes were quantified and compared using the kappa-squared (K^2) score which provided a ratio of indirect effect over maximum potential indirect effect, where $K^2 = .01$ represented a small effect, $K^2 = .09$ represented a medium effect, and $K^2 = .25$ a large effect (Preacher & Kelley, 2011).

The Total Effect model replicated the Hypothesis 6 simple regression model. Mindfulness (SMQ) contributed to 44.3% ($R^2 = .443$) of the variance in OC symptoms, and the model was statistically a significantly better predictor than the mean SMQ total score $F(1, 162) = 128.76$, $p < .001$. Mindfulness was found to be a statistically significant predictor for OC symptom level, $b = -0.44$, 95% BCaCI[-0.52, -0.37], $t = -11.35$, $p < .001$.

The Direct Effect of mindfulness and anxiety produced a model which explained 59% ($R^2 = .590$) of the variance in OC symptoms, and the model was statistically a significantly better predictor than mean predictor scores $F(2, 161) = 115.86$, $p < .001$.

Mindfulness continued to be a statistically significant predictor for OC symptom level, b = -0.21, 95% BCaCI[-0.30, -0.12], t = -4.69, p < .001, when taking into consideration the contribution of anxiety to the model. Anxiety was also found to be a statistically significant predictor for OC symptom level, b = 1.10, 95% BCaCI[0.82, 1.39], t = 7.60, p < .001. There was a statistically significant Indirect Effect between mindfulness and OC symptoms through anxiety, b = -0.23 95% BCaCI[-0.32, -0.16], which represented a large effect size at 35% of the maximum value a mediating value could have been for this study K^2 = .346, 95% BCa CI [.269, .424], and as the confidence intervals did not cross zero, this is likely to be a genuine effect (see Figure 1). The relationship between mindfulness and OC symptoms, was therefore found to be mediated by anxiety.

b = -0.21, p < .001 ⟶ Anxiety ⟶ b = 1.10, p < .001

Mindfulness ⟶ OC Symptoms

Direct effect, b = -0.21, p < .001
Indirect effect, b = -0.23, 95% BCaCI [-0.32, -0.16]
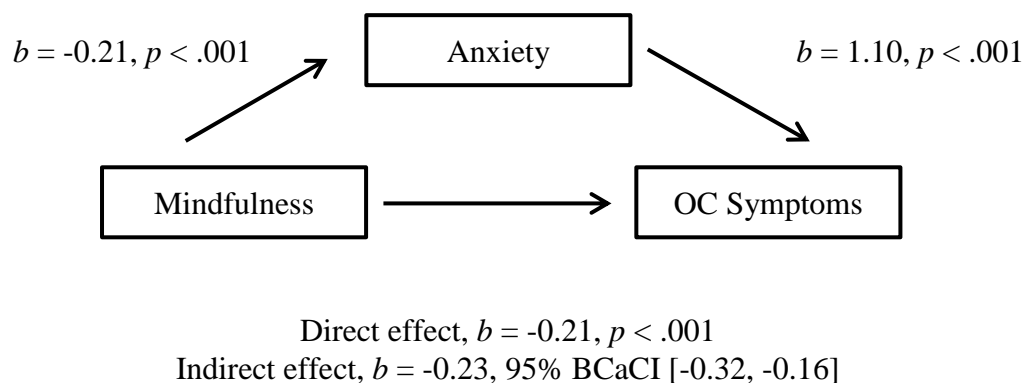
Figure 1. Mediation of Anxiety on Mindfulness and OC Symptoms

The Direct Effect of mindfulness and depression produced a model which explained 58% (R^2 = .580) of the variance in OC symptoms, and the model was statistically a significantly better predictor than the mean predictor scores $F(2, 161)$ = 111.29, p < .001. Mindfulness was found to continue to be a statistically significant predictor for OC symptom level, b = -0.25 95% BCaCI[-0.34, -0.17], t = -5.88, p < .001,

when taking into consideration the contribution of depression to the model. Depression

was also found to be a statistically significant predictor for OC symptom level, $b = 0.97$

95% BCaCI[0.71, 1.24], $t = 7.26$, $p < .001$. There was a statistically significant Indirect

Effect between mindfulness and OC symptoms through depression, $b = -0.19$ 95%

BCaCI[-0.27, -0.12], which represented a large effect size at 30% of the maximum value

a mediating value could have been for this study $K^2 = .304$, 95% BCaCI [.214, .388], and

as the confidence intervals did not cross zero, this is likely to be a genuine effect (see

Figure 2). The relationship between mindfulness and OC symptoms, was therefore

mediated by depression.

$b = -0.20, p < .001$ → Depression → $b = 0.97, p < .001$

Mindfulness → OC Symptoms

Direct effect, $b = -0.25, p < .001$
Indirect effect, $b = -0.19$, 95% BCaCI [-0.27, -0.12]
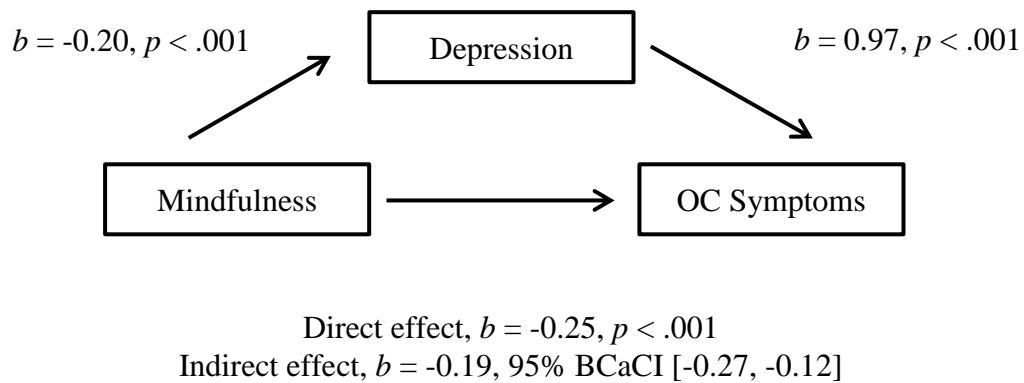
Figure 2. Mediation of Depression on Mindfulness and OC Symptoms

The results from separate mediation analyses, indicated that both anxiety and

depression mediated the relationship between mindfulness (SMQ) and OC symptoms.

Hypothesis 6

An exploratory analysis was conducted to determine the predictive model for OC symptoms based on separate mindfulness facets (Baer, 2006). Standard (simultaneous) regression was selected to provide equal treatment of each facet in predictive model building.

Results from assumption testing for multiple regression for this model, found that some residuals were identified as outliers, although at tolerable levels and not influential to the model (*Mahalanobis max* = 15.876, upper limit = 20.515, $p < .001$; *Cooks max* = 0.262, upper limit = 1.0;, *dfBeta* values between ± 1). Residual terms were found to be uncorrelated (*Durbin-Watson* = 2.270, $p < .001$), there was no multicollinearity (*VIF* score max = 1.635, upper limit = 10; *Tolerance* > 0.2), and no predictor to predictor correlation greater than $r = .9$. However, a non-normal distribution pattern of residuals was found (see Appendix Q). Therefore, percentile bootstrap sampling results (based on 1,000 comparisons, $p < .05$), were conducted as part of the analysis to provide more robust significance tests, confidence intervals and population estimates for each predictor's b value.

Standard regression analysis showed that a regression model containing all FFMQ facets, contributed to 55% ($R^2 = .545$, Adjusted $R^2 = .530$) of the variance in OC symptoms (DOCS), accounting for more variance than the mindfulness whole score (SMQ) alone (44%) reported previously in this chapter (hypothesis 5.1). The model was statistically a significantly better predictor than mean predictor scores $F(5, 158) = 37.785$, $p < .001$. With a higher *t-test* value, higher standardized regression co-efficient (β) and smaller significance value than the other predictors in the model, FFMQnonjudge was

found to make the greatest contribution to the regression prediction model.

FFMQobserve made the next largest contribution according to t-test probability, although

it demonstrated a smaller standardised regression co-efficient than the factor with the

next highest standardized regression co-efficient (β), FFMQdescribe. Percentile

bootstrap analysis (based on 1,000 bootstrap comparisons, p < .05) had found confidence

intervals for FFMQdescribe crossing zero, suggesting that for some samples there was no

contribution to predicting OC symptoms. This was also found for FFMQnonreact, and

FFMQaware, suggesting that these facets did not make consistent contributions to the

prediction model for OC symptoms (see Table 12).

Part correlations were examined to determine the unique relationship of each

predictor with the outcome variable (OC symptoms). FFMQnonjudge (r_{part} = -.399) was

found to have the highest unique association, with FFMQdescribe (r_{part} = -.151) as the

next strongest, followed by FFMQobserve (r_{part} = .134), FFMQnonreact (r_{part} = .-.091)

and FFMQaware (r_{part} = -.023) in order of strength of unique contribution. Unlike the

other mindfulness facets which provided for a negative association and regression

coefficient, FFMQobserve was found to have a positive association with OC symptoms

and a positive regression coefficient.

The results from this analysis suggested that FFMQnonjudge made the strongest

predictive contribution towards OC symptoms, of all the mindfulness facets (Baer et al.,

2006), with more non-judgement of inner experiences, associated with less OC

symptoms.   Surprisingly, given the correlation patterns found in hypothesis 1, an

increase in the ability to observe the full range of internal and external experiences

(FFMQobserve) was the only other significant OC symptom predictor variable (in a positive direction), although not with great predictive strength.

Table 12

Standard Regression Analyses Predicting OC Symptoms from FFMQobserve, FFMQdescribe, FFMQaware, FFMQnonjudge, and FFMQnonreact

	b	SE B	β	t	p
Constant	44.090	4.800		9.393	.001
	[34.082, 53.065]				
FFMQobserve	.332	.150	.147	2.499	.035
	[.049, .629]				
FFMQdescribe	-.347	.189	-.179	-2.816	.066
	[-.697, .035]				
FFMQaware	-.064	.152	-.029	-0.427	.684
	[-.347, .253]				
FFMQnonjudge	-.845	.117	-.539	-7.430	.001
	[-1.089, -.643]				
FFMQnonreact	-.292	.199	-.117	-1.700	.143
	[-.683, .075]				

Note. $R^2 = .55 (p < .001)$
Percentile regression coefficient confidence intervals based on 1,000 bootstrap comparisons at p<.05, are reported in square brackets

Part correlations suggested high levels of shared variance between the other mindfulness facets which may have limited their contribution towards predicting OC symptoms in the regression model. Given the large range in regression co-efficient scores provided by the bootstrapped confidence intervals for this model, caution is recommended when making inferences about the population based on the results from this study.

Summary of Results

The relationship between mindfulness and obsessive-compulsive symptoms was investigated in a community sample ($N = 164$) using an internet-based survey. Participants were recruited through word of mouth, relevant OCD/Anxiety-based/Mental Health support web-site research recruitment pages, and snowball sampling methods.

The majority of participants reported no prior mindfulness training or therapy (70%). Of the 30% who did have prior mindfulness experience (training or therapy), 6% reported that they found their mindfulness skills had somewhat worsened following their mindfulness training/therapy, 16% reported no change, and 78% reported a somewhat to great improvement. Clinical levels of OC symptoms were reported by 24% of participants, with 20% of participants having OC symptoms clearly differentiated from other anxiety disorders. This is a high representation of clinical levels of OC symptomology, compared with the prevalence rates reported in contemporary epidemiological studies of community samples (1-2.3%) (Eaton et al., 2008; Kessler et al., 2005b; Ruscio et al., 2010; Wittchen & Jacobi, 2005).

All measures were found to have good to excellent internal consistency. Based on these results, as well as the item correlation results, FFMQtotal score was used in this study, although this scale was not developed for total score use (Baer, 2006). FFMQobserve demonstrated low correlation with the whole scale score (FFMQ) compared with other FFMQ facets in the FFMQ, as has been observed in other community samples (Baer et al., 2006; Baer et al., 2008), however inclusion of this subscale did not effect FFMQtotal score measurement accuracy.

Supporting hypothesis 1, a statistically significant negative relationship was found between mindfulness (SMQ, FFMQtotal, FFMQdescribe, FFMQaware, FFMQnonjudge and FFMQnonreact), and OC symptoms. There was a statistically significant positive correlation between FFMQobserve and OC symptoms, which was not predicted by the hypothesis, however bootstrapped confidence intervals demonstrated no association occurring for some samples, suggesting that a genuine relationship was not found in this study. Large effects were demonstrated for SMQ and FFMQ total, with FFMQnonjudge demonstrating the largest effect, and the remaining FFMQfacets (excluding FFMQobserve) with medium effect sizes. Both mindfulness total scores accounted for a large percentage of the variability in OC symptoms score (SMQ – 44%, FFMQ – 36%), and at 49% a non-judging approach (FFMQnonjudge) could account for nearly half of the variability in OC symptom scores.

Supporting hypothesis 2.1, a statistically significant positive relationship was found between anxiety and depression, and OC symptoms, both with large effect sizes. Anxiety accounted for 53% of the variance in OC score and depression for 49%, suggesting an equally to stronger association with OC symptoms than mindfulness. Supporting hypothesis 2.2, a statistically significant negative relationship was found between anxiety and depression, and mindfulness (SMQ, FFMQtotal).

The contribution of anxiety and depression towards the relationship between mindfulness and OC symptoms was investigated (hypothesis 2.3). Controlling for anxiety, depression and a combination of the two, mindfulness continued to have a statistically significant negative relationship with OC symptoms, with anxiety accounting for more of the shared variance with OC symptoms than depression. Comparison of the reduction in

effect sizes resulting from controlling for anxiety and depression, indicated that the SMQ

was able to continue capturing more of the measure of mindfulness uniquely from the

influence of anxiety and depression, than was the FFMQ total score. The SMQ was

therefore selected as the representative mindfulness total score, for analyses requiring only

one mindfulness measure.

Supporting hypothesis 3.1, there was a statistically significant negative relationship

between age and OC symptoms (medium effect size). Supporting hypothesis 3.2, a

statistically significant positive relationship was found between age of participant and

mindfulness total score (SMQ – medium effect size, FFMQ – small effect size). No

hypothesis was made about mindfulness facets, however FFMQaware (medium effect size)

and FFMQnonjudge (medium effect size) were also found to have a statistically significant

positive relationship with age.   Controlling for age (hypothesis 3.3), there were no

differences in the relationships between OC symptoms and mindfulness whole or factor

scores, suggesting that these relationships were unrelated to the relationship between age

and OC symptoms.

Hypothesis 4.1 was not supported, as no relationship was found between prior

mindfulness experience, and OC symptoms. Partially supporting hypothesis 4.2, a

statistically significant positive relationship was found between prior mindfulness

experience and FFMQobserve, although a negative relationship was found with

FFMQaware, and no other statistically significant relationships were found. With no

association being found between prior mindfulness experience and OC symptom level, the

role of prior mindfulness experience in the relationship between mindfulness and OC

symptoms (hypothesis 4.3) was not examined. Prior mindfulness experience was also not

included in regression analysis, as results from correlations demonstrated no association with OC symptoms.

A regression model with mindfulness (SMQtotal score) predicting OC symptom score (negative coefficient), was statistically significantly better than using mean predictor score, with 44% of the variance in OC symptoms explained by this model, supporting hypothesis 5.1.

Adding age to the mindfulness-OC symptoms prediction model did not reduce the significant contribution made by mindfulness, with age (negative coefficient) also making a statistically significant but weaker contribution, adding a further 2% to the variance in OC symptoms explained by the model. The addition of anxiety and depression to the model contributed another 15% to the variance in OC symptoms explained by the model, and resulted in age no longer being a significant predictor, possibly due to the relatively stronger contributions made by anxiety and depression. The final model (mindfulness, age, anxiety and depression) accounted for 62% of the variance in OC symptoms, with increased mindfulness, decreased anxiety and decreased depression predictive of decreased OC symptoms. Mindfulness continued to be the strongest predictor of OC symptoms, in the model, followed by anxiety and then depression. These findings supported hypothesis 5.3, with anxiety and depression positively predicting OC symptoms, but hypothesis 5.2 was not supported, as age did not make a significant contribution to the predicting of OC symptoms once anxiety and depression were added to the model.

Based on the interactive roles of anxiety and depression demonstrated in the findings from partial and part correlations, as well as high comorbidity rates of these two

conditions, the mediating roles of anxiety and depression in the relationship between

mindfulness and OC symptoms, were examined (hypothesis 5.3 – additional analyses).

Separate mediation analyses found that the relationship between mindfulness (SMQ) and

OC symptoms was mediated by anxiety (with a large effect size of 35%) and depression

(with a large effect size of 30%).

With the aim of understanding the relationship between mindfulness and OC

symptoms better, exploratory regression analysis of the mindfulness facets and OC

symptoms was undertaken (hypothesis 6). All FFMQ facets together accounted for 55%

variance in OC symptoms, when simultaneously added to a regression model, providing a

stronger predictive model than a simple model containing only the single mindfulness total

measure (SMQ – 44% variance). This finding suggested that a stronger prediction resulted

from using the combination of individual sub-scales of the FFMQ, than using the single

SMQ total score. The strongest contributing mindfulness facet was a non-judging

approach towards inner experience, with a negative relationship to OC symptoms. The

ability to observe the full range of internal and external experiences, with positive

relationship to OC symptoms, was the next strongest mindfulness facet, although with

much smaller contribution towards the predictive model. The other mindfulness facets of

describing a range of internal and external experiences; acting with awareness and

attending purposefully, and non-reactivity to inner experience; did not make a statistically

significant contribution to the model. The range of bootstrapped unstandardized regression

coefficient confidence intervals was very large, suggesting caution when making inferences

about the population, based on the findings from this analysis.

Discussion

This chapter presents the findings from this study with reference to the hypotheses specified in the introduction, and includes a discussion on the theoretical implications of the results, alongside findings from past research. It provides a critique of the research methodology and outcomes, and considers the impact of strengths and limitations on the interpretation of results. In the final section, the implications for future clinical practice and academic research are considered, and a final conclusion is provided.

Theoretical Implications and Comparison to Past Research

Mindfulness and OC Symptoms

Hypothesis 1: Based on metacognitive theory of OC symptom development and maintenance (Purdon & Clark, 1999) and intervention-based evidence (e.g. Hanstede et al., 2008; Franco et al., 2010; Biegel et al., 2009), it was hypothesised that there would be a negative relationship between dispositional mindfulness and OC symptoms.

The relationship between mindfulness, measured using the SMQ, the FFMQ (total score) as well as mindfulness facets using the FFMQ subscales of FFMQobserve (observing the range of internal and external experiences), FFMQdescribe (describing or having vocabulary for the range of internal and external experiences), FFMQaware (acting with awareness and attending purposefully), FFMQnonjudge (nonjudging of inner experience) and FFMQnonreact (nonreactivity to inner experience); and OC symptoms (measured using the DOCS), were examined. Results indicated that the hypothesis was supported in this study, as statistically significant negative correlations were found between the mindfulness variables and OC symptoms. The exception to this was for the

FFMQobserve subscale, demonstrating no genuine relationship with OC symptoms.

The finding of a negative relationship between mindfulness and OC symptoms was consistent with the outcomes reported in intervention-based studies (e.g. Hanstede et al., 2008; Franco et al., 2010; Biegel et al., 2009; Patel et al., 2007; Singh et al., 2004; Wilkinson-Tough et al., 2010), where an association between mindfulness and OC symptom level has been proposed based on observed reductions in OC symptoms in conjunction with mindfulness-based interventions. Particular intervention studies have also reported increasing mindfulness scores associated with decreasing OC symptoms (e.g. Hanstede et al., 2008; Wilkinson-Tough et al., 2010).

The finding of a negative relationship between mindfulness and OC symptoms, has supported the metacognitive model of OCD where it has been proposed that the more adaptive processing of internal and external experiences (facilitated by mindfulness), reduces the opportunity for excessive or non-neutral processing of stream of conscious thoughts, considered central to OC symptom development and maintenance (Purdon & Clark, 1999).

Both mindfulness measures (total scores) demonstrated large effect sizes in their relationship with OC symptoms, and accounted for a large percentage of the variability in OC symptoms score (SMQ – 44%, FFMQ – 36%), suggesting the importance of mindfulness in OC symptomology. The larger percentage in variability in OC symptoms, accounted for by the SMQ mindfulness measure, may be understood within the context of the measure. Unlike the FFMQ, which is a general dispositional mindfulness measure, the SMQ measures mindfulness within the context of distressing thoughts or images, which

have been proposed precursors to OC symptom development (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984), and therefore, the SMQ may promote responses from participants, with OC symptoms in mind.

The largest effect size of all the mindfulness measures (including total scores), was found for the mindfulness facet of a non-judging approach to inner experiences (FFMQnonjudge), accounting for nearly half (49%) of the variability in OC symptom scores. This outcome was consistent with findings from incremental validity testing of the FFMQ scale (Baer et al., 2006). Baer et al. (2006) found that a non-judging approach was the highest correlating mindfulness facet not only with general psychological symptoms and neuroticism, but also with specific OC-related behaviours such as thought suppression - implicated in OC symptom development (Marcks & Woods, 2005), and experiential avoidance - a contributor to OC symptom development (Rachman & de Silva, 2009). The importance of non-judging has equally been found when studying other psychological conditions, where compared with other mindfulness facets, non-judging was the most strongly associated mindfulness facet in reduced anxiety, depression and stress-related symptomology (Cash & Whittingham, 2010).

The finding that observing the range of internal and external experiences (FFMQobserve) was the only mindfulness facet not to be associated with OC symptoms, is not surprising given the results published in mindfulness scale (FFMQ) development and validation studies (Baer et al., 2006; Baer et al., 2008). Items within the observe subscale have been found to load onto the mindfulness facet of observing for meditating samples, but not for non-meditating samples (Baer et al., 2006; Baer et al., 2008). It has been suggested that observing is a construct which is more accurately defined within a mindful

context, by people with more mindfulness training/experience (meditators), however, it may be interpreted as a more hyper-vigilant activity leading to a non-neutral pre-occupation with internal and external experiences, for non-mindfully-trained people (Baer et al., 2006; Baer et al., 2008; Williams et al., 2014). A hyper-vigilant approach towards attending to experiences has been implicated in the development of OCD, according to the meta-cognitive model (Purdon & Clark, 1999). Given the range of interpretations which can be made for items within the observe facet depending on mindfulness experience, and the range of mindfulness-based experiences reported by the participants in this study, the inconsistent results for this facet which have been found in this study, are understandable.

Findings from the present study concur with interpretations made in prior intervention studies regarding the role of mindfulness in reduced OC symptomology, and a non-judging approach to inner experiences has been highlighted as being particularly important in this association.

The Roles of Anxiety and Depression

Hypothesis 2.1: It was hypothesised that there would be a positive relationship between OC symptoms and anxiety/depression symptoms, based on comorbidity prevalence (Murphy et al., 2010; Kessler et al., 2005b; Torres et al., 2006) as well as previous correlational studies (Nestadt et al., 2001).

Hypothesis 2.2: A negative relationship was expected between anxiety/depression and mindfulness, given the evidence-based use of mindfulness in treating depression and anxiety (Baer, 2006; Hofmann et al., 2010; Metcalf & Dimidjian, 2014).

These hypotheses were supported in this study. Anxiety (as measured by the GAD-

7) and depression (as measured by the PHQ-9) were found to be significantly positively correlated with OC symptoms. Both anxiety and depression demonstrated large effect sizes in their relationship with OC symptoms, and accounted for a large percentage of variability in OC symptom scores (anxiety – 53%, depression – 49%) of equal or greater magnitude than the mindfulness measures, suggesting an important role in OC symptomology. These findings are understandable when considering the high levels of comorbidity between OCD and anxiety/depression (WHO, 2010; APA, 2013b; NICE, 2006; Murphy et al., 2010; Kessler et al., 2005b; Torres et al., 2006; Pallanti et al., 2011). Supporting the metacognitive model of OCD, psychological distress (e.g. manifested in anxiety and depression) is thought to contribute towards OC symptom development and maintenance, according to the S-REF model of emotional problems (Wells & Matthews, 1996), with distress leading to heightened attention towards internal and external experiences (Purdon & Clark, 1999).

Anxiety and depression were both found to be significantly negatively correlated with mindfulness (SMQ, FFMQ total), both with large effect sizes, supporting the therapeutic role of mindfulness in managing anxiety and depression (Baer, 2006; Metcalf & Dimidjian, 2014). These findings were also consistent with previous cross-sectional correlational studies, with mindfulness being negatively (although moderately) associated with anxiety for clinical and non-clinical (university students) samples (Roemer et al., 2009), as well as negatively, although weakly, associated with depression in a non-clinical (university students) sample (Jimenez, Niles and Park, 2010).

Hypothesis 2.3: The roles of both anxiety and depression, in the relationship between mindfulness and OC symptoms, were to be explored.

The relationship between mindfulness and OC symptoms was examined, controlling for anxiety and depression (partial correlations). Controlling for anxiety demonstrated a greater shared variance with mindfulness and OC symptoms, than controlling for depression. This result can be understood given the higher level of shared symptomology between anxiety and OCD, compared with depression (WHO, 2010).

When controlling for the combined contributions of anxiety and depression, mindfulness continued to have a statistically significant negative relationship with OC symptoms, although with reduced effect size, falling from large to medium for the SMQ, and from large to small for the FFMQtotal. Shared variance with OC symptoms was also affected (SMQ from 44% to 10%, FFMQtotal from 36% to 3%). The SMQ score appeared to have less shared variance with the anxiety and depression measures than the FFMQtotal measure. As the SMQ also provided a more contextually relevant measure of OC symptoms, it was selected as the preferred whole scale mindfulness measure for OC symptom predictive modelling. The findings for hypothesis 2.3 suggested that anxiety and depression play an important role in OC symptomology, confirming the suitability of its inclusion in a predictive model.

The Role of Age

Hypothesis 3.1: It was hypothesised that age would be negatively associated with OC symptoms, given age-based symptom remission patterns (Fineberg et al., 2013), and symptom prevalence patterns (Torres et al., 2006; Ruscio et al., 2010).

Hypothesis 3.2: A developmental model of mindfulness skills acquisition has been proposed (Splevins et al., 2009), and therefore it was hypothesised that age would be positively associated with mindfulness.

Hypothesis 3.3: The role of age, in the relationship between mindfulness and OC symptoms, was to be explored.

Results indicated that hypotheses 3.1 and 3.2 were supported in this sample. Statistically significant positive relationships of medium effect size were found between age of participant; and mindfulness (SMQ), mindful awareness, and a non-judging approach; and with a small effect size with mindfulness (FFMQ total). A relationship between age of participants and mindfulness was not found for other facets of mindfulness (being mindfully observant, describing experiences or being non-reactive). The results from this sample, therefore generally supported the theory proposing a developmental contribution towards mindfulness acquisition, and were consistent with the finding that older participants have greater baseline mindfulness (Splevins et al., 2009), although the relationships found for specific mindfulness facets differed from those found in Splevins et al. (2009) study, where mindful observing and awareness were found to be heightened in their older adult sample, but not other mindfulness facets.

Splevins et al. (2009) have suggested , as an explanation for the elevated baseline mindfulness scores found in their older sample, that older adults experience feelings of increased vulnerability with increasing age, and so their capacity to observe and be aware increases, as a means to increase vigilance and feelings of improved personal safety. Although this explanation accounts for the specific improvements in mindfulness facets observed in their study (Splevins et al., 2009), this assumed process would seem contradictory to the neutral approach towards the management of internal and external experiences, defined by mindfulness.

Shapiro et al. (2006) have suggested in their model of mindfulness, that mindfulness acquisition involves the increasing ability to perceive the same or existing information, in new ways, and in ways separate from the self, which promotes learning and flexibility of approach. They have described this as a developmental process which improves naturally over time, and is a more mindful reasoning for observed increases in attending to external or internal experiences, than that proposed by Splevins et al. (2009). The finding of a positive relationship between a nonjudging approach and increasing age, reported in this study, supports the theory of there being an improved neutral observance and processing as part of any developmentally linked increase in mindfulness, as opposed to a response to a heightened sense of vulnerability or threat.

Age was found to correlate negatively with OC symptoms (medium effect size) in this study, which is consistent with epidemiological findings of reduced OCD symptomology across age range (Torres et al., 2006; Ruscio et al., 2010), as well as remission patterns of reduced OC symptomology across the adult lifespan (Fineberg et al., 2013). It has been suggested that the decline in OCD symptoms with age may be the result of delayed maturation of neural pathways implicated in OCD development, or the development of superseding neural pathways which reverse OC symptomology (Fineberg et al., 2013). Age-related reduction in OC symptoms may also be as a result of corresponding increases in mindfulness, although, no significant contribution was found to be made by age towards the relationship between mindfulness and OC symptoms in this study, suggesting that these relationships were independent of age of participant (*Hypothesis 3.3*). The medium effect size of the relationships between age and both mindfulness and OC symptoms, supported the inclusion of age in OC symptom prediction modelling however.

The Role of Prior Mindfulness Experience

Hypothesis 4.1: Findings from mindfulness-based OCD intervention studies have attributed observed reductions in OC symptoms, to an increased expertise in mindfulness (e.g. Patel et al., 2007; Wilkinson-Tough et al., 2010; Hanstede et al., 2008). It was therefore hypothesised that prior mindfulness experience would be negatively associated with OC symptoms.

Hypothesis 4.2: It was hypothesised that prior mindfulness experiences would be positively associated with mindfulness skills, based on the proposed developmental model of mindfulness skills acquisition (Splevins et al., 2009), as well as the reported improved mindfulness scores associated with mindfulness training/therapy found in intervention studies (e.g. Patel et al., 2007; Wilkinson-Tough et al., 2010; Hanstede et al., 2008).

Hypothesis 4.3: The role of prior mindfulness experience, in the relationship between mindfulness and OC symptoms, was to be explored.

Results from this study provided little support for hypotheses 4.1. A statistically significant positive relationship was found between prior mindfulness experience and the mindfulness facet of observing, however the mindfulness facet of awareness had a statistically significant negative association with prior mindfulness experience, and no other significant relationships were found for any other mindfulness measure or with OC symptoms, therefore hypothesis 4.2 was not supported.

Prior mindfulness experience (mindfulness therapy and/or training) did not therefore appear to be as important in mindfulness acquisition in this sample, as was age of participant. This finding was surprising given the more direct opportunities for skills development provided by participation in training or therapy, versus the incidental learning

opportunities provided from life experience, if experience is the active ingredient in increasing mindfulness across age. However, as only 30% of respondents in this study reported having had prior mindfulness experience, and only 27% of the sample reported having had a useful mindfulness experience, it may have been that the imbalance in comparison group sizes was too great to detect a genuine relationship. It may also be that the single general question on mindfulness training/therapy/experiences, provided in this study, allowed the inclusion of self-directed and/or poorly facilitated versions of mindfulness experiences. A free text response option included on the online survey, to gather more detail about individual mindfulness experiences, could have enabled a better understanding about the quality, range, duration and depth of the prior mindfulness experiences reported by participants in this study. Therefore, inferences made about the effectiveness of prior mindfulness experience in developing mindfulness skills, based on the outcomes from this study, should be considered cautiously.

The lack of association found between prior mindfulness experience and OC symptoms was also surprising, given the measured increases in mindfulness which were associated with mindfulness-based interventions and with reduction in OC symptoms, reported in intervention studies (Patel et al., 2007; Wilkinson-Tough et al., 2010; Hanstede et al., 2008). However, it may be again, that the uneven group sizes used in the statistical analysis, would have required a greater effect size to enable detection of an association. Given these potential statistical limitations, as well as the previously mentioned issue with the broad definition of prior mindfulness experience used in this study, caution is recommended with making generalisations about the association between prior mindfulness experience and OC symptoms, based on the results from this study. With no association found between prior mindfulness experience and OC symptoms, the role of prior

mindfulness experience in the relationship between current mindfulness and OC symptoms (*Hypothesis 4.3*) was not explored.

OC Symptom Regression Modelling

Hypothesis 5.1: The metacognitive explanation for OC symptom development, as well as findings from intervention studies (as detailed in hypothesis 1), informed the hypothesis that a regression model of OC symptoms would predict an increase in OC symptoms associated with decreased mindfulness.

This hypothesis was supported, with the regression model finding that mindfulness was a significant and negative predictor of OC symptom score. The model accounted for 44% of the variance in OC symptom scores, providing further support for the relationship between mindfulness and OC symptoms.

Hypothesis 5.2: A decreasing OCD prevalence (Torres et al., 2006; Ruscio et al., 2010) and increasing remission of OC symptoms (Fineberg et al., 2013) across the adult lifespan, led to the hypothesis that age of participant would negatively predict OC symptoms score. As an association between prior mindfulness experience and OC symptoms was not established for this sample (hypothesis 4.1), prior mindfulness experience was not included as a predictor variable in OC symptom regression modelling, although it had been initially hypothesised to make a contribution.

Hypothesis 5.3: OCD comorbidity findings (WHO, 2010; APA, 2013b; NICE, 2006; Murphy et al., 2010; Kessler et al., 2005b; Torres et al., 2006) and previous correlational findings (Nestadt et al., 2001) informed the hypothesis that anxiety and

depression would positively predict OC symptoms, when added to a predictive model.

Adding age of participant to the mindfulness/OC symptom regression model resulted in the addition of a further 2% in shared variance with OC symptoms, with age being a significant negative predictor, and mindfulness remaining a significant negative predictor. The further addition of anxiety and depression resulted in the final predictive model accounting for a total of 62% of the variance in OC symptoms, and at almost two thirds of the variance accounted for, the regression model which included mindfulness, age (no longer making a genuine contribution), anxiety and depression provided a very strong predictive tool for OC symptoms.

The hypothesised predictive contributions of anxiety and depression were therefore supported. The addition of anxiety and depression resulted in age no longer being a genuine contributor to the model, possibly as a result of the high levels of predictive contribution made by both anxiety and depression, compared with the much smaller initial predictive contribution of age. Mindfulness continued to be the strongest predictive variable in this model, with anxiety and then depression in decreasing predictive strength.

Hypothesis 5.3 – Additional Analyses

Part and partial correlations (this study), had demonstrated marked reductions in effect size between mindfulness and OC symptoms as a result of the shared variance with anxiety and depression. This finding, along with the strong predictive contributions made in the regression equation (hypothesis 5.3); suggested the benefit of performing mediation analyses of the contributions made by anxiety and depression, towards the relationship between mindfulness and OC symptoms. The relationship between mindfulness and OC

symptoms was found to be mediated by both anxiety and depression, with both having a large effect on the relationship between mindfulness and OC symptoms. The importance of these mediating roles is understandable given the high comorbidity levels found between both anxiety and depression, and OCD (WHO, 2010; APA, 2013b; NICE, 2006; Murphy et al., 2010; Kessler et al., 2005b; Torres et al., 2006), suggesting their involvement in the development and/or maintenance of OCD.

Mindfulness Facets and OC Symptoms

Hypothesis 6: Results from the FFMQ scale development literature (Baer et al., 2006) suggested a hierarchy of importance of mindfulness facets in OC symptomology, based on correlations with two key OCD-related behaviours.   Non-judging was the mindfulness facet most strongly (negatively) associated, followed by acting with awareness / non-reactivity, and then describing; with observing being positively correlated (Baer et al., 2006). However, metacognitive theory does not conclusively lead to the hypothesis that any particular facet of mindfulness would be more important in OC symptomology, and for this study, the whole spectrum of OC symptoms was measured rather than two OC-implicated behaviours, therefore exploratory analysis was used to allow for the detection of any predictive relationship.

Results were consistent with some of the FFMQ mindfulness facet / OC contributor correlation findings in mindfulness scale development literature (Baer et al., 2006). A non-judging approaching to inner experiences was found to have the strongest negative predictive power, again demonstrating the importance of this mindfulness facet in relation to OC symptoms, compared with the other facets. Observing was the only other facet demonstrating a genuine contribution towards prediction, with a smaller and positive

contribution. The positive relationship found between observing and OC symptoms, was not consistent with the correlational findings in this study (with no genuine relationship being found), but was consistent with the relationship found between observing and OCD-related behaviours in non-meditating samples, in mindfulness scale development and validity studies (Baer et al., 2006; Baer et al., 2008).

The findings in this study suggested that, for the purposes of prediction, the observe facet was understood within the less mindful context of a hyper-vigilant and reactive process which has been demonstrated by other non-meditating populations (Baer et al., 2006; Baer et al., 2008), and therefore, more attention paid to internal and external experiences was linked to greater OC symptoms. The mixed findings for FFMQobserve, between correlational and regression analyses, provide further evidence of the lack of stability in this construct. As observe sub-scale items are thought to be interpreted in a variety of ways depending on mindfulness experience (Baer et al., 2006; Baer et al., 2008), the range of prior mindfulness experiences reported by the participants in this sample would have contributed to this inconsistency in construct validity.

The lack of predictive contributions made by three of the FFMQ facets (acting with awareness, non-reactive approach in inner experience, and describing) was surprising considering the high correlations found between these facets and OC symptoms in this study. However, with the mindfulness facets demonstrating high correlations with one another (excluding observe), a high level of shared variance may have resulted in a weakening of any individual contributions made to the predictive model. Interestingly, although highly correlated with other mindfulness facets, nonjudging demonstrated a stronger unique relationship with OC symptoms.

Regression analysis on OC symptoms based on all of the separate mindfulness facets (FFMQ) generated a stronger predictive model, than that using mindfulness total score (SMQ), with greater variance in OC symptoms accounted for by the multi-faceted model (55%) compared with the mindfulness total score model (44%). However, the large range in bootstrapped confidence intervals for regression co-efficient scores for this analysis, suggest that inferences about the population using the multi-facet model, should be cautiously considered.

Critique of the Study

This section will discuss the strengths and limitations of this study and will consider the potential impact of these on making inferences about the population.

Online Methodology

Online methodology has been criticised for limiting the diversity of potential participants based on a supposed typical demographic of internet users, as well as the reliance on computer access/literacy for participation (Rhodes et al., 2003). Other criticisms have included the small number of sites and social networks available (although other methodologies can have the same issues), the inability to calculate response rate (therefore an inability to determine any differences between responders and non-responders), and having less active and noticeable ways of attracting participants compared with face to face or targeted postal methods (Rhodes et al., 2003). Lack of direct researcher involvement has also been raised as an issue with regard to facilitating genuine response efforts, and avoidance of participant response duplication (Gosling et al., 2004).

These and other concerns have been explored in a meta-analysis ($N = 361{,}703$) examining the differences between web-based and traditional surveying methods (Gosling et al., 2004). The results of that study found a comparability of outcomes for online versus more traditional surveying methods, comparable demographic diversity (age, gender, socio-economic status), sustained self-report tool validity, as well as little impact from any non-serious participation (Gosling et al., 2004). In particular, OCD symptoms have been found to be equally measurable by paper and online versions of the same scale, with level of computer expertise not associated with results (Coles et al., 2007).

The use of an online methodology has therefore been supported by past findings, not only due to the parallels with traditional survey methods, but also due to the larger sample sizes which can be accessed, given resource limitations. In further support of this methodology, it has been proposed that online studies are able to access more elusive participants, and provide more privacy/anonymity for participants, therefore facilitating greater response openness (Rhodes et al., 2003). This methodology also provides a more naturalistic setting for survey completion, and no face to face researcher contact can reduce the potential for demand characteristics influencing participant responses. Finally, the forced-choice and completion requirements built into electronic versions of psychological measures, prevent incomplete or obviously erroneous datasets, therefore provide a more ethical safeguarding of participant efforts by preventing unusable responses.

Sample

The present study utilised a community sample to explore the association between mindfulness and OC symptoms, in order to capture a range of OC symptomology. The aim

of gathering a wide range of OC scores, was not only to increase an understanding about mindfulness and OC symptomology in general, but also to better place the study to make inferences about clinical populations, and with it, consider more confident implications for prevention and treatment. This approach has been supported by the findings from a review of OCD studies, which demonstrated a continuity model for OCD symptomology (i.e. a broad range and magnitude of OC symptoms across the population), as well as high levels of people with clinically diagnosable levels of OCD in community samples (Burns et al., 1995). In fact, the sample used in the present study contained a greater proportion of participants with clinical levels of OC symptoms (20%) than those found in adult population prevalence studies (0.1 – 2.3%) (Eaton et al., 2008; Wittchen & Jacobi, 2005; Kessler et al., 2005a; Ruscio et al., 2010). This was possibly as a result of advertising the study on OCD, anxiety and mental health websites, which would be of interest to people with personally noticeable levels of OC symptomology.

The higher proportion of OCD-level symptomology compared with population prevalence rates was not considered problematic for this study, as the purpose of the study was not to provide results for a non-clinical population, but rather to gather a range of OC symptoms scores with which to build a comprehensive and accurate model of OC symptomology versus mindfulness.

One potential participant bias however, was the uneven ratio of those participants with prior mindfulness experiences versus no experience. This presented a possible issue for increased type II error, with the potential need for a greater effect size to exist for the detection of an association. However, the ratio of experience to non-experience was probably lower than that present in the community. Future comparison studies could

specifically target prior mindfulness experience groups when recruiting, to improve comparison group ratios for examining the role of prior mindfulness experience, in current mindfulness skill level and OC symptom level. The use of a larger list of options for prior mindfulness, than the limited definition provided in this study, as well as free-text options, would also be recommended, to enable a better understanding about the range of prior mindfulness experiences that participants have had.

Although not directly targeting participants with OCD, using mental health and OCD websites to advertise the study, may have potentially attracted participants with OCD or clinical levels of OC symptoms. This possibility was considered, and whilst these methods of recruitment were maintained in order to generate a full range of OC symptom scores, safeguards were built in to the study design, to provide a protective feature in the data gathering phase, especially as there was no face to face contact with the researcher, and hence no direct capacity to observe the psychological response to participation, or to provide direct post-completion debriefing or support.

Eligibility criteria excluded the more vulnerable groups of those having current treatment for mental health or drug/alcohol related issues. Consideration and agreement of eligibility criteria for participation in the study, was built into the online survey, so that an informed decision to participate was made by the participant, before commencing. The participant information sheet included information on the potential to become upset when completing the online survey, providing several methods for opting out of the study (with responses removed), as well as information on emergency and mental health support services. The researcher received no feedback from participants with regard to adverse experiences or concerns about participant welfare, during the study.

The potential participation of children on the online survey was considered, and a specific question on age was included on the consent form as well as wording on the participant information sheet, clarifying that this was a study for adult participants. The web-site design was not interesting or colourful, and did not include any cartoonlike images, also recommended for discouraging the attention of children (Nosek, Banaji & Greenwald, 2002).

Social media, snow-balling and word of mouth were used to attract a wide range of participants, however, there is the potential for participant/selection bias when using these methods if respondents are limited to those directly linked to the researcher, and therefore who may have similar characteristics such as geographical location, or training/work/life experiences. To reduce this risk, an invitation to forward on information about the study was included in recruitment wording, to access potential participants one or greater steps removed from the researcher, increasing the range and diversity of potential respondents.

The issue of not knowing anything about the characteristics of those who chose not to participate, was probably of more concern. This was unavoidable as software limitations and ethical considerations precluded automatic collection of data on those who viewed the online survey advertisements or information page, and chose not to participate. Therefore, this remained an unresolved issue, and so the potential for certain characteristics to exist in responders versus non-responders needs to be borne in mind, when making generalisations about the population, based on the results from this study.

Another situation where ethical considerations outweighed the demands of data collection methodology, was in study information provision. In order to assist people in making an informed decision about study participation, information was provided on the study aims and the nature of information being gathered, which may have led to demand characteristics, suggesting an expected association between mindfulness and OC symptoms. However, genuine and honest responses were encouraged, and the importance of generating accurate data, for potential research and clinical purposes, was stated in the participant information sheet.

There are further potential limitations to making inferences about the general population, based on the findings from this study. Although the use of bootstrapped confidence intervals has allowed more confidence when making generalisations about the population, some characteristics of the sample demographic require consideration. Due to a large gender imbalance 4:1 in favour of females (33 male participants), some caution when making inferences about men in the population is suggested. Also two-thirds of participants had a degree or higher qualifications, which does not match the prevalence found in the England/Wales population (around one quarter – ONS, 2014), potentially reflecting the social networking of a researcher involved. Validation studies of the FFMQ found that education was moderately and positively correlated with mindfulness facet scores (Baer et al., 2008). Those with higher level qualifications (graduate degree and above, and mental health professionals) were found to have higher levels of mindfulness than others with less education or less specific mental health profession experience (Baer et al., 2008). However, every effort was made to encourage broad dissemination of study advertising, and many studies with community (or non-clinical) samples use largely tertiary education students (Peterson, 2001). The sample used in the present study therefore

demonstrated a greater diversity in age, occupation and educational experience, than many

of the community or non-clinical populations previously used.

Measures

The measures used in this study were selected following an extensive appraisal of

the scale development literature, as well as review articles. The OCD measure used in this

study (DOCS) was considered the best option available given its even coverage of OCD

sub-types as well as associated symptoms. The DOCS was also the only measure with

robust psychometric properties, not to include hoarding, which is no longer considered an

OCD sub-type, but a separate condition (APA, 2013a). This choice has potentially made

comparison with other research difficult, due to the high number of past studies using other

measures, particularly the Y-BOCs/Y-BOCs-SR, however using the DOCS was considered

important for accuracy of measurement, as well as to contribute towards to the growing

number of studies using this newer measure.

The use of two measures of mindfulness may have added to participant burden,

however it allowed the exploration of the mindfulness facets implicated in OC symptoms

(FFMQ), as well as provided a measure which was contextually appropriate for examining

the relationship with OC symptoms (SMQ). The use of the observe FFMQ facet, with a

non-meditating population has not been recommended (Williams et al., 2014), and scale

development and validation documentation has observed the inconsistency of this measure

across samples (Baer et al., 2006; Baer et al., 2008), especially given the assumption that it

may not be interpreted as a mindfulness-based activity in non-meditating samples.

However, for the purposes of a thorough investigation, as well as enabling the use of an

FFMQ whole scale score, FFMQobserve was included in this study, with limitations of this

mindfulness facet subscale acknowledged.   There was also the potential for there to be meditating participants in this study, where FFMQobserve has been shown to be more accurately interpreted. Around a quarter of study participants reported having experienced beneficial prior mindfulness training/therapy, which may have facilitated mindfulness-based interpretations of the FFMQobserve facet.

The inclusion of a metacognitive scale in this study, might have contributed towards evidence of there being a relationship between mindfulness and OC symptoms, based on a metacognitive model. However, the fundamental question of the existence of a relationship was key to the decisions made on measures selection, and limiting the burden placed on participation was a consideration when deciding on the total number of items on the on-line survey. For this reason, the anxiety and depression scales were deemed appropriate for use in this study, as they have demonstrated the capacity to provide an accurate measure of symptoms with few items, resulting in decreased participant burden without loss of sensitivity (Spitzer et al., 2006; Titov et al., 2011).

Research Bias

The use of bootstrap confidence intervals allowed a greater ability to make inferences about the population, although inferences from the findings made for hypothesis 6, regarding FFMQ facets predicting OC symptoms, should be made cautiously, based on the large range in minimum and maximum confidence interval scores reported.

As a result of finding non-normal distribution for psychological symptoms measures, cross-checking results of non-parametric and parametric tests for the same data were performed, as well as using bootstrapped confidence intervals to detect the existence

of non-genuine relationships. It might have been assumed that non-normal distributions in the OC, anxiety and depression scales would suggest caution when making assumptions about the population based on the findings from this study, however scale development literature (DOCS, GAD-7 and PHQ-9) has confirmed these distribution patterns in their non-clinical samples (Spitzer et al., 2006; Kroenke et al., 2001; Abramowitz et al., 2010).

A self-reflective approach was taken during this study, which allowed an awareness that having previous experience in using mindfulness in clinical and personal settings, may have inadvertently led to bias towards data collection and interpretation. The methodology of internet-based data collection, removing the researcher from direct contact with participants, was considered useful in minimising any potential bias in demand characteristics. Wording on the participant information sheet was reviewed by third parties, for feedback on neutrality of language, as was the interpretation and reporting of results from statistical analyses.

Confounding Variables

Confounding variables must be considered when using multiple regression to form a predictive model. Any variables which correlate with OC symptoms, but do not appear in the model, prevent a more accurate model from being developed (Field, 2013). This may have been the case for the present study, as the introduction section demonstrated the identification of other factors which influence OC development. However, the scope of this study prevented the measurement of all potential variables in OC development, and therefore it was considered more useful to explore the relationships between OC symptoms and the lesser understood or evidenced, but inferred variables.

Strengths

This study has provided a greater understanding about the relationship between OC symptoms and mindfulness, without the need to expose people with OCD to further clinical or experimental interventions which only have a developing evidence-base. Results from this study can however, provide support for a more justifiable position in the continued exploration of the use of mindfulness in the treatment of OC symptoms.

Using a critical realist approach to better understand the relationship between mindfulness and OC symptoms, could be criticised as reducing the potential for exploring the full meaning and magnitude of these constructs, as well as individual experiences (Barker et al., 2008). However, this methodology was necessary to provide consistent comparison of these constructs for a large number of participants, given limited research resources. It has also provided the opportunity to improve the general understanding about how these constructs relate to one another, with implications for the population in general, whilst self-report measures have allowed for the expression of individual interpretations, based on self-observation and self-assessment (Parker et al., 2008; Alvesson & Skoldberg, 2009).

Clinical Implications

The results from this study support the inferences made by previous authors in intervention studies, suggesting that increased mindfulness was the active ingredient in the reduction of OC symptoms (e.g. Hanstede et al., 2008; Franco et al., 2010; Biegel et al., 2009; Patel et al., 2007; Singh et al., 2004; Wilkinson-Tough et al., 2010), and has therefore supported the consideration of mindfulness in the treatment of OCD.

The high levels of shared variance between mindfulness, anxiety and depression, with OC symptoms; as well as the mediating roles of both anxiety and depression, in the relationship between mindfulness and OC symptoms; suggest that management of or reduction in anxiety and depression, is important in the treatment of OCD using mindfulness. Given the now established role for mindfulness in the treatment of anxiety and depression (Baer et al., 2006; Hofmann et al., 2010; Metcalf & Dimidjian, 2014), this study's findings therefore suggest that mindfulness would be a beneficial multi-purpose therapeutic approach in the treatment OCD, and especially useful as anxiety and depression have been found to increase treatment resistance in OCD (Overbeek et al., 2002; Steketee, Chambless & Tran, 2001; Pallanti et al., 2011).

The importance of a non-judging approach to inner experiences in association with and predicting OC symptoms, above other mindfulness facets or whole scores, would suggest that prioritising this mindfulness facet in any mindfulness-based intervention, would be worth considering. Non-judging specific interventions, may achieve this goal, as may the consideration of compassion-based approaches which have non-judgement identified as one of the key attributes of the compassionate mind (Gilbert, 2010). The non-judging elements from the FFMQnonjudge facet subscale (Baer et al., 2006) included: not criticising yourself for unhelpful or inappropriate emotions or feelings; not seeking to determine whether thoughts, ideas, images or emotions are bad, abnormal or good; and not disapproving of yourself based on a determination that your thoughts, ideas, emotions or, images are irrational or inappropriate.

Given the mixed interpretations that are apparently made for the items in the observing mindfulness subscale (Baer et al., 2006; Baer et al., 2008), demonstrated again in

this study; it would seem that caution in the use of this form of mindfulness intervention in treating OCD, is warranted. It has been suggested that non-meditating and therefore people less mindfully experienced have in the past demonstrated a possible misinterpretation of observing as a heightened and concerned rather than neutral attention towards inner and outward experiences (Baer et al., 2006; Baer et al., 2008), with regression analyses in this study confirming the relationship of increased observing predicting increased OC symptoms. Therefore, focussing on this mindfulness skill may be counter-productive in the clinical treatment of OC symptoms, as heightened attention towards stream of conscious thoughts and internal experiences is thought to contribute to OC symptom development and maintenance according to the metacognitive theory of OCD (Wells & Matthews, 1996; Purdon & Clark, 1999). Providing education about the differences between mindfully and non-mindfully observing, and reinforcing these differences during practical exercises, may enable the benefits of using observing in a comprehensive mindfulness intervention package.

Following the results of this study, the clinical implications for older patients presenting with life interfering OCD symptoms may need consideration. An association was found between increased age and decreased OC symptoms, and although past research has reported that spontaneous remission occurs steadily across the lifespan, those people with more severe and longer-established OCD symptoms have been less likely to experience a reduction in symptoms (Fineberg et al., 2013). These findings, alongside the confirmation in this study of a relationship between increased age and reduced OC symptoms, suggest that older patients with OCD may be more likely to find their symptoms resistant to treatment. The level/expertise of resources which may be required in treatment, along with realistic therapeutic timeframes, should therefore be considered for older people

presenting with clinical levels of OC symptoms.

As a relationship has been found between increased mindfulness and decreased OC symptoms, and the linear model demonstrated a continuum of increasing OC symptoms corresponding with a continuum of decreasing mindfulness skills; the preventative and health promotional role of mindfulness should be considered, in terms of illness prevention and creating mental health beneficial environments. The benefits of this sort of intervention have already been observed, in the reduction in OC symptoms in teaching professionals (Franco et al., 2010).

The increasing evidence from newer OCD interventions such as mindfulness, should be continually or at least regularly reviewed by national treatment recommendation bodies such as NICE, given the limitations inherent in currently recommended OCD treatments (helping only around half of OCD sufferers).   Although NICE (2006) have previously acknowledged the limitations of currently recommended treatments, and have concluded that consideration of other therapies would be useful; the OCD review cycle has been moved to the static list, despite disagreement about this decision being made by several stakeholder organisations during the last review of OCD treatment recommendations (NICE, 2014). Given the impact of OCD on everyday life and increased health and mortality risks, an on-going search for additional treatments should be considered. This is especially the case for OCD, as unsuccessful treatment, and therefore a longer term continuation of severe symptoms, has been implicated in increased resistance to symptom reduction (Fineberg et al., 2013).

Implications for Future Research

Using a cross-sectional survey design has enabled the exploration of mindfulness and OC symptoms, across a large number of people, from a wide range of locations. As mentioned previously, there may however be concerns about the representativeness of the sample used in this study. Therefore, further analysis using a wider range of participants (e.g. more males, broad ranging education) and recruitment strategies, may provide further data and therefore increased confidence in the application of these findings, to the general population.

Information gathered using this study design is useful for making inferences about the population in general (with consideration given to any limitations already discussed) and has provided further support for the assumptions made about the role of mindfulness in OCD intervention studies.   The findings cannot however, allow inferences to be made about causality, only relationships and predictions.   Therefore, to further confirm the role for mindfulness in reducing OC symptomology, and building on the discoveries and with consideration given to the observed limitations already reported in intervention studies, further intervention studies would be useful. Study design using a clearly isolatable mindfulness-only intervention, or using only an established and unmodified mindfulness-based package such as MBSR, would provide greater clarity about the actual therapy being provided to participants, and clear mindfulness intervention element. Therapist effect could be minimised by using different therapists to deliver treatments across different interventions.

Using comparable treatment conditions (duration, activity etc.) and/or using established treatments such as ERP or CBT, for comparison (control) groups, could provide

the opportunity to control for therapy effect, and compare against existing recommended treatments. Using large sample sizes, would provide better confidence that outcomes were based on general effects of the treatment rather than individual and idiosyncratic responses to an experience. Measuring mindfulness scores across the duration of the treatment, at treatment end, and on longer term follow-up would allow for the observation of patterns of change in mindfulness versus change in OC symptoms, to further establish an association, as well as treatment durability.   Further studies may also measure changes in metacognitive thinking (e.g. Cartwright & Wells, 2000); to confirm the metacognitive model of OCD and therefore applicability of using mindfulness, a metacognitive process.

Mapping neurological changes pre and post mindfulness intervention, would be useful in identifying and confirming the neurological regions implicated in mindfulness (Holzel et al., 2011) and associated with OCD (Chamberlain et al., 2005; Menzies et al., 2008). This approach could assist in teasing out the role of age in the relationship between mindfulness and OCD. Examination of neuroimaging results of a cohort of participants, taken at regular intervals across the lifespan, could monitor for changes in OCD implicated pathways, mindfulness-implicated pathways, life and learning experiences, and regularly measure mindfulness and OC symptoms; to establish age-related patterns and changes.

Given the wide ranging definitions and interpretations of mindfulness, measuring mindfulness is recognised as an on-going challenge in research and clinical settings (Baer et al., 2009). Measuring performance in neurocognitive tasks which challenge metacognitive processes linked to mindfulness, has been suggested as alternative or supplemental measurement method, to mindfulness self-reports (Baer et al., 2009), to improve confidence in findings. Gathering a pool of data using a range of mindfulness

self-report measures, has also been recommended in establishing a confident evidence-base around mindfulness research (Baer et al., 2009).

This study found that both anxiety and depression were important in mediating the relationship between mindfulness and OC symptoms, however study design has meant that causality is difficult to determine. Cohort studies, observing changes in OC symptomology against changes in anxiety and depression symptomology across a lifespan; and/or intervention research, studying the effects on OC symptoms, following anxiety or depression-based interventions (and vice versa); could provide further information about the causal nature of the relationships between anxiety, depression and OCD.

Conclusion

Obsessive compulsive disorder, whilst not a highly prevalent mental illness, can be an illness of long duration, and one which is severely debilitating for sufferers as well as family members. Currently recommended treatments, which include pharmacological and ERP/CBT-based therapies, have been found to be beneficial for only around half of OCD sufferers, therefore alternative treatments continue to be explored in clinical settings.

Mindfulness has attracted increasing attention as a potential OCD treatment, however methodological limitations have meant that the positive outcomes demonstrated in the small number of experimental, clinical and case studies cannot be clearly attributed to mindfulness. Therefore this study sought to explore the fundamental question of there being a relationship between mindfulness and OC symptoms. The influence of anxiety and depression, conditions with high comorbidity with OCD; as well as age and prior mindfulness experience (given the implicated developmental role in mindfulness

acquisition and OCD symptom reduction), were also explored.

The results from this study supported the inferences made in intervention studies, with an association being found between increased mindfulness and fewer OC symptoms. Anxiety and depression were found to separately and in mediation with mindfulness, be implicated in OC symptomology, with increased anxiety and depression being associated with increased OC symptoms, and decreased mindfulness. A relationship was also found between age and OC symptoms, with increasing age being associated with decreasing OC symptoms, and with increasing mindfulness. Prior mindfulness experience was not found to be strongly associated with current mindfulness skills, nor to have any relationship with OC symptoms, however, the single measure of prior mindfulness used in this study was very broad and may have allowed the inclusion of less optimal prior mindfulness training or experiences in participant responses.

A regression model which included mindfulness, anxiety and depression was able to predict OC symptoms, accounting for a large amount of variance in OC scores. A non-judging approach to inner experiences, was found to be the most highly (and negatively) associated mindfulness facet, and mindfulness measure, when exploring the relationship with OC symptoms. Observing experienced mixed results, with no genuine correlation being found with OC symptoms, but observing making a small positive predictive contribution in a mindfulness multi-facet regression model for OC symptoms.

These findings have implications for OCD treatment, in supporting the association between improved mindfulness and reduced OC symptoms, as well as identifying the importance of a non-judging approach. The use of observing in mindfulness-based OCD

contexts is cautioned, with clarification about mindful versus non-mindful observing recommended in clinical settings. Given the strong associations found between anxiety and depression with OC symptoms in this study, the treatment of anxiety and depression, as presenting comorbid conditions, would warrant consideration in an OCD clinical setting, and when using mindfulness, especially as OC symptoms, anxiety and depression, all appear to be highly correlated with mindfulness.

This study attempted to reduce the impact from any potential bias and confounding factors inherent in cross-sectional design, however limitations remain in the ability to attribute causality for any of the reported associations, given the nature of correlational and regression-bases studies. The use of self-selection, snow-ball sampling and word of mouth in the study design, also mean that the representativeness of the sample used in this study cannot be confirmed, although the full range of recruitment methods aimed to enhance the diversity of participants. Although bootstrapped confidence intervals suggest a confidence in making inferences about the larger population, further studies using a larger and more diverse sample would be beneficial, as well as continued intervention-based research, which investigates the benefits of mindfulness-based interventions, under conditions which control for more of the extraneous variables which have hampered previous studies.

References

Abramowitz, J. S. (2006). The psychological treatment of obsessive-compulsive disorder. *The Canadian Journal of Psychiatry, 51(7)*, 407-416

Abramowitz, J. S., Olantunji, B. O., Timpano, K. R., Rieman, B. C., Adams, T., Storch, A., ... Hale, L. R. (2010). Assessment of obsessive-compulsive symptom dimensions: development and evaluation of the dimensional obsessive-compulsive scale. *Psychological Assessment*, 22(1), 180-198.

Abramowitz, J. S., Taylor, S., & McKay, D. (2005). Potentials and limitations of cognitive treatment for obsessive-compulsive disorder. *Cognitive Behaviour Therapy, 34(3)*, 140-147. doi: 10.1080/16506070510041202

American Psychiatric Association (APA) (2009). *Quick reference to the Diagnostic Criteria from DSM-IV-TR.* Virginia U.S.A.: American Psychiatric Publishing Inc.

American Psychiatric Association (APA) (2013a). *DSM-5.* Retrieved from *http://www.dsm5.org/Documents/Obsessive%20Compulsive%20Disorders%20Fact%20Sheet.pdf*

American Psychiatric Association (APA) (2013b). *Desk reference to the Diagnostic Criteria from DSM-5™.* Virginia U.S.A.: American Psychiatric Publishing Inc.

Amir, N., Freshman, M., & Foa, E. B. (2000). Family distress and involvement in relatives of obsessive-compulsive disorder patients. *Journal of Anxiety Disorders, 14(3)*, 209-217.

Andouz, Z., Dolatshahi, B., Moshtagh, N., & Dadkhah, A. (2012). The efficacy of metacognitive therapy on patients suffering from pure obsession. *Iranian Journal of Psychiatry, 7(1)*, 11-21.

Antony, M. M., Purdon, C., & Summerfeldt, L. J. (2007). Introduction. In M. Antony, C. Purdon, & L. Summerfeldt (Eds.), *Psychological Treatment of Obsessive-Compulsive Disorder* (p. 3-6). Washington, D.C.: American Psychological Association.

Arndt, S., Davis, C. S., Miller, D. D., & Andreasen, N. C. (1993). Effect of antipsychotic withdrawal on extrapyramidal symptoms: statistical methods for analysing single-sample repeated-measures data. *Neuropsychopharmacology, 8(1)*, 67-75.

Aveyard, H. (2010). *Doing a Literature Review in Health and Social Care – A Practical Guide.* Maidenhead England: Open University Press.

Baer, R. A. (Ed.) (2006). *Mindfulness-based Treatment Approaches*. London: Elsevier Academic Press.

Baer, R. A., & Krietemeyer, J. (2006). Overview of mindfulness – and acceptance-based treatment approaches. In, Baer, R. A. (Ed.), *Mindfulness-based Treatment Approaches*. London: Elsevier Academic Press.

Baer, R. A., Smith, G. T., Hopkins, J.. Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13(1)*, 27-45. doi: 10.1177/1073191105283504

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., … Williams., J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment, 15(3)*, 329-342. DOI:10.1177/1073191107313003

Baer, R. A., Walsh, E., & Lykins, E. L. B. (2009). Assessment of mindfulness. In, Didonna, F. (Ed.), *Clinical Handbook of Mindfulness* (pp153-168). New York: Springer Science+Business Media.

Beauregard, M. (2007). Mind does really matter: evidence from neuroimaging studies of emotional self-regulation, psychotherapy, and placebo effect. *Progress in Neurobiology, 81*, 218-236. doi: 10.1016/j.pneurobio.2007.01.005

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56(6)*, 893-897. doi: 10.1037/0022-006X.56.6.893

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory – II*. San Antonio, Texas: Psychological Corporation.

Biegel, G. M., Shapiro, S. L., Brown, K. W., & Schubert, C., M. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: a randomized clinical trial. *Journal of Consulting and Clinical Psychology, 77(5)*, 855-866. doi: 10.1037/a0016241.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., …& Devins, G. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11(3)*, 230-241. doi: 10.1093/clipsy/bph077

British Psychological Society (2007). *Report of the Working Party on Conducting Research on the Internet – Guidelines for ethical practice in psychological research online.* Retrieved from http://www.bps.org.uk/sites/default/files/documents/conducting_research_on_the_internet-guidelines_for_ethical_practice_in_psychological_research_online.pdf

Burns, G. L., Formea, G. M., Keortge, S., & Sternberger, L. G. (1995). The utilization of nonpatient samples in the study of obsessive compulsive disorder. *Behaviour Research and Therapy, 33(2)*, 133-144.

Cartright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: the meta-cognitions questionnaire and its correlates. *Journal of Anxiety Disorders, 11(3)*, 279-296.

Cash, M., & ,Whittingham, K. (2010). What facets of mindfulness contribute to psychological well-being and depressive, anxious, and stress-related symptomatology? *Mindfulness, 1(3)*, 177-182. doi: 10.1007/s12671-010-0023-4

Chadwick, P., Hember, M., Symes, J., Peters, E., Kuipers, E., & Dagnan, D. (2008). Responding mindfully to unpleasant thoughts and images: reliability and validity of the Southampton Mindfulness Questionnaire (SMQ). *British Journal of Clinical Psychology, 47*, 451-455. DOI:10.1348/014466508X314891

Chamberlain, S. R., Blackwell, A. D., Fineberg, N. A., Robbins, T. W., & Shahakian, B. J. (2005). The neuropsychology of obsessive compulsive disorder: the importance of failures in cognitive and behavioural inhibition as candidate endophenotypic markers. *Neuroscience and Biobehavioral Reviews, 29*, 399-419. doi: 10.1016/j.neubiorev.2004.11.006

Chamberlain, S. R., Fineberg, N. A., Blackwell, A. D., Robbins, T. W., & Sahakian, B. J. (2006). Motor inhibition and cognitive flexibility in obsessive-compulsive disorder and trichotillomania. *American Journal of Psychiatry, 163(7)*, 1282-1284.

Chiesa, A., & Malinowski, P. (2011). Mindfulness-based approaches: are they all the same? *Journal of Clinical Psychology, 67(4)*, 404-424. doi: 10.1002/jclp.20776

Childs, D. (2007). Mindfulness and the psychology of presence. *Psychology and Psychotherapy: Theory, Research and Practice, 80*, 367-376. doi: 10.1348/147608306X162600

Clark, D. A., & Purdon, C. (1993). New perspectives for a cognitive theory of obsessions. *Australian Psychologist, 28(3)*, 161-167.

Clifford, C. A., Murray, R. M., & Fulker, D. W. (1984). Genetic and environmental
influences on obsessional traits and symptoms. *Psychological Medicine, 14*, 791-
800.

Cludius B., Hottenrott B., Alsleben H., Peter U., Schroder J., & Moritz S. (2015).
Mindfulness for OCD? No evidence for a direct effect of a self-help treatment
approach. *Journal of Obsessive-Compulsive and Related Disorders, 6* (59-65). doi:
10.1016/j.jocrd.2015.05.003

Coles, M. E., Cook, L. M., & Blake, T. R. (2007). Assessing obsessive compulsive
symptoms and cognitions on the internet: evidence for the comparability of paper
and internet administration. *Behaviour Research & Therapy, 45*, 2232-2240. doi:
10.1016/j.brat.2006.12.009

Cucchi, M., Bottelli, V., Cavadini, D., Ricci, L., Conca, V., Ronchi, P., & Smeraldi, E.
(2012). An explorative study on metacognition in obsessive-compulsive disorder
and panic disorder. *Comprehensive Psychiatry, 53*, 546-553. doi:
10.1016/j.comppsych.2011.09.008

Didonna, F. (2009). Mindfulness and obsessive-compulsive disorder: developing a way to
trust and validate one's internal experience. In, Didonna, F. (Ed.), *Clinical
Handbook of Mindfulness* (pp. 189-219). New York: Springer Science+Business
Media.

Eaton, W. W., Martins, S. S., Nestadt, G., Bienvenu, O. J., Clarke, D., and Alexandre, P.
(2008). The Burden of Mental Disorders. *Epidemiologic Reviews, 30, 1-14*. doi:
10.1093/epirev/mxn011

Eddy, K. T., Dutra, L., Bradley, R., & Westen, D. (2004). A multidimensional meta-
analysis of psychotherapy and pharmacotherapy for obsessive-compulsive disorder.
Clinical Psychology Review, 24, 1011-1030. doi: 10.1016/j.cpr.2004.08.004

Fairfax, H. (2008). The use of mindfulness in obsessive compulsive disorder: suggestions for its application and integration in existing treatment. *Clinical Psychology and Psychotherapy, 15,* 53-59. DOI: 10.1002/cpp.557

Fairfax, H., Easey, K., Fletcher, S., & Barfield, J. (2014). Does mindfulness help in the treatment of obsessive compulsive disorder (OCD)?: an audit of client experience of an OCD group. *Counselling Psychology Review, 29(3)*, 17-27.

Fineberg, N. A., Hengartner, M. P., Bergbaum, C., Gale, T., Rossler, W., & Angst, J. (2013). Remission of obsessive-compulsive disorders and syndromes;[*sic*] evidence from a prospective community cohort study over 30 years. *International Journal of Psychiatry in Clinical Practice, 17*, 179-187. doi: 10.3109/13651501.2013.777744

Fisher, P. L., & Wells, A. (2005a). Experimental modification of beliefs in obsessive-compulsive disorder: a test of the metacognitive model. *Behaviour Research and Therapy, 43*, 821-829. doi:10.1016/j.brat.2004.09.002

Fisher P. L. & Wells, A. (2005b). How effective are cognitive and behavioural treatments for obsessive-compulsive disorder? A clinical significance analysis. *Behaviour Research and Therapy, 43,* 1543-1558. doi: 10.1016/j.brat.2004.11.007

Fisher, P. L., & Wells, A. (2008). Metacognitive therapy for obsessive-compulsive disorder: a case series. *Journal of Behavior Therapy, 39*, 117-132. doi: 10.1016/j.jbtep.2006.12.001

Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., & Salkovskis, P. M. (2002). The obsessive-compulsive inventory: development and validation of a short version. *Psychological Assessment, 14*, 485-495.

Foa, E. B., Kozak, M. J., Goodman, W. K., Hollander, E., Jenike, M. A., & Rasmussen, S. A. (1995). DSM-IV Field trial: Obsessive-compulsive disorder. *The American Journal of Psychiatry, 152(1)*, 90-96.

Foa, E. B., Liebowitz, M. R., Kozak, M. J., Davies, S., Campeas, R., Franklin, M. E., . . . Tu, X. (2005). Randomized, placebo-controlled trial of exposure and ritual prevention, clomipramine, and their combination in the treatment of obsessive-compulsive disorder. *American Journal of Psychiatry, 162*, 151-161.

Fontenelle, L. F., Mendlowicz, M. V., Marques, C., & Versiani, M. (2004). Trans-cultural aspects of obsessive–compulsive disorder: a description of a Brazilian sample and a systematic review of international clinical studies. *Journal of Psychiatric Research, 38*, 403-411. doi:10.1016/j.jpsychires.2003.12.004

Franco, C., Manas, I., Cangas, A. J., Moreno, E., & Gallego, J. (2010). Reducing teachers' psychological distress through a mindfulness training program. *The Spanish Journal of Psychology, 13(2)*, 655-666.

Freeston, M. H., Ladouceur, R., Gagnon, F., & Thibodeau, N. (1993) Beliefs about obsessional thoughts. *Journal of Psychopathology and Behavioral Assessment, 15*, 1-21

Freeston, M. H., Ladouceur, R., Gagnon, F., Thibodeau, N., Rheaume, J., Lertarte, H., & Bujold, A. (1997) Cognitive behavioral treatment of obsessive thoughts: a controlled study. *Journal of Consulting and Clinical Psychology, 65(3)*, 405-413.

Freeston, M. H., Ladouceur, R., Thibodeau, N., & Gagnon, F. (1991) Cognitive intrusions in a non-clinical population. I. Response style, subjective experience, and appraisal. *Behaviour Research and Therapy, 29(6)*, 585-597

Freud, S. (1894). The neuro-psychoses of defence. *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume III (1893-1899): Early Psycho-Analytic Publications.* Retrieved from http://www.pep-web.org/document.php?id=se.003.0000a

Gilbert, P. (2010). *The Compassionate Mind: A New Approach To Life's Challenges*. London: Constable & Robinson Ltd.

Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Fleischmann, R. L., Hill, C. L.,…Charney, D. S. (1989). The Yale-Brown Obsessive Compulsive Scale. I. Development, use, and reliability. *Archives of General Psychiatry, 46*, 1006-1011.

Gosling, S. D., Vazire, S., Srivastava, S., & John,O. P. (2004). Should we trust web based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist, 59 (2),* 93-104. doi: 10.1037/0003-066X.59.2.93

Grabill, K., Merlo, L., Duke, D., Harford, K., Keeley, M. L., Geffken, G., R. & Storch, E. A. (2008). Assessment of obsessive-compulsive disorder: a review. *Journal of Anxiety Disorders, 22*, 1-17. doi: 10.1016/j.janxdis.2007.01.012

Greisberg, S. & McKay, D. (2003). Neuropsychology of obsessive-compulsive disorder: a review and treatment implications. *Clinical Psychology Review, 23*, 95-117.

Grisham, J.R., Fullana, M. A., Mataix-Cols, D., Moffitt, T. E., Caspi, A., & Poulton, R. (2011). Risk factors prospectively associated with adult obsessive–compulsive symptom dimensions and obsessive–compulsive disorder. *Psychological Medicine, 41,* 2495-2506. doi:10.1017/S0033291711000894

Gwilliam, P., Wells, A., & Cartwright-Hatton, S. (2004). Does meta-cognition or responsibility predict obsessive-compulsive symptoms: a test of the metacognitive model. *Clinical Psychology and Psychotherapy, 11*, 137-144. doi: 10.1002/cpp.402

Hale, L., Strauss, C., & Taylor, B., L. (2012). The effectiveness and acceptability of

    mindfulness-based therapy for obsessive compulsive disorder: a review of the

    literature. *Mindfulness*. Online publication. doi:10.1007/s12671-012-0137-y

Hannan, S. E., & Tolin, D. F. (2010). Mindfulness- and acceptance-based behavior

    therapy for obsessive-compulsive disorder. In, Orsillo, S., M., & Roemer, L. (Eds.),

    Acceptance and Mindfulness-Based Approaches to Anxiety (pp. 271-299). New

    York: Springer Science+Business Media.

Hanstede, M., Didron, Y. & Nyklicek, I. (2008). The effects of a mindfulness intervention

    on obsessive-compulsive symptoms in a non-clinical student population. *The*

    Journal of Nervous and Mental Disease, 196(10), 776-779. doi:

    10.1097/NMD.0b013e31818786b8

Harper, D. (2014). Online etymology dictionary. Retrieved from

    http://www.etymonline.com/index.php?allowed_in_frame=0&search=obsession&se

    archmode=none

Hayes, A. F. (2014). Process v2.13 [On-line software]. Retrieved from

    http://www.processmacro.org/download.html

Hertenstein, E., Rose, N., Voderholzer, U., Heidenreich, T., Nissen, Christoph, . . . Kulz, A.

    K. (2012). Mindfulness-based cognitive therapy in obsessive-compulsive disorder

    – a qualitative study on patients' experiences. *BioMedCentral Psychiatry, 12(185)*,

    1-10. doi: 10.1186/1471-244X-12-185   Retrieved from

    http://www.biomedcentral.com/1471-244X/12/185

Heyman, I., Fombonne, E., Simmons, H., Ford, T., Meltzer, H., & Goodman, R. (2001).

    Prevalence of obsessive-compulsive disorder in the British nationwide survey of

    child mental health. *British Journal of Psychiatry, 179*, 324-329.

Heyman, I., Mataix-Cols, D., & Fineberg, N. A. (2006). Obsessive-compulsive disorder – clinical review. *British Medical Journal, 333*, 424-429.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *Journal of Consulting and Clinical Psychology, 78(2)*, 169-183. doi: 10.1037/a0018555

Holzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging, 191*, 36-43. doi: 10.1016/j.pscychresns.2010.08.006

Horwath, E., & Weissman, M. M. (2000). The epidemiology and cross-national presentation of obsessive-compulsive disorder. *Psychiatric Clinics of North America, 23(3)*, 493-507.

Houghton, S., Saxon, D., Bradburn, M., Ricketts, T., & Hardy, G. (2010). The effectiveness of routinely delivered cognitive behavioural therapy for obsessive-compulsive disorder: a benchmarking study. *British Journal of Clinical Psychology, 49*, 473-489. doi: 10.1348/014466509X475414

Hyman, B. M., & Dufrene (2008). *Coping with OCD: Practical strategies for living well with obsessive-compulsive disorder.* Oakland, California: New Harginger Publications, Inc.

Hyman, B. M., & Pedrick, C. (2005). *The OCD workbook: Your guide to breaking free from Obsessive –Complusive Disorder (2nd ed.).* Oakland, California: New Harbinger Publications, Inc.

Irak, M., & Tosun, A. (2008). Exploring the role of metacognition in obsessive-compulsive and anxiety symptoms. *Journal of Anxiety Disorders, 22*, 1316-1325. doi: 10.1016/janxdis.2008.01.012

Jacobson, N. S., & Truax, P. (1991). Clinical significance: a statistical approach to
defining meaningful change in psychotherapy research. *Journal of Consulting and
Clinical Psychology, 59(1)*, 12-19.

Janeck, A. S., Calamari, J. E., Riemann, B. C., & Heffelfinger, S. K. (2003). Too much
thinking about thinking?: metacognitive differences in obsessive-compulsive
disorder. *Anxiety Disorders, 17*, 181-195.

Jimenez, S. S., Niles, B. L., & Park, C. L. (2010). A mindfulness model of affect
regulation and depressive symptoms: positive emotions, mood regulation
expectancies, and self-acceptance as regulatory mechanisms. *Personality and
Individual Differences, 49*, 645-650. doi:10.1016/j.paid.2010.05.041

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and
future. *Clinical Psychology, 10*, 144-156. doi: 10.1093/clinpsy/bpg016

Kabat-Zinn, J., Massion, A. O., Kristeller, J., Peterson, L. G., Fletcher, K. E., Pbert, L., . . .
Santorelli, S. F. (1992). Effectiveness of a meditation-based stress reduction
program in the treatment of anxiety disorders. *American Journal of Psychiatry,
149(7)*, 936-943.

Kellner, M. (2010). Drug treatment of obsessive-compulsive disorder. *Dialogues in
Clinical Neuroscience, 12*, 187-197.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E.
(2005a). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders
in the national comorbidity survey replication. *Archives of General Psychiatry, 62*,
593-602.

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005b). Prevalence, severity,
and comorbidity of 12-month DSM-IV Disorders in the national comorbidity
survey replication. *Archives of General Psychiatry, 62*, 617-627.

Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., . . . Hofmann, S. G. (2013). Mindfulness-based therapy: a comprehensive meta-analysis. *Clinical Psychology Review, 33*, 763-771. doi: 10.1016/j.cpr.2013.05.005

Kichuk, S. A., & Austad, C. S. (2010). Toward increased tolerability of exposure treatment for obsessive-compulsive disorder. *The Behavior Therapist, 33(3)*, 111-115.

Kostanski, M., & Hassed, C. (2008). Mindfulness as a concept and a process. *Australian Psychologist, 43(1)*, 15-21. doi: 10.1080/00050060701593942

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). Validity of a Brief Depression Severity Measure. *Journal of General Internal Medicine*, *16*, 606-613.

Ladouceur, R., Freeston, M. H., Rheaume, J., Dugas, M. J., Gagnon, F., Thibodeau, N., & Fournier, S., (2000). Strategies used with intrusive thoughts: a comparison of OCD patients with anxious and community controls. *Journal of Abnormal Psychology, 109(2)*, 179-187.

Langer, E. J., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues, 56(1)*, 1-9.

Loomis, L. R. (1951). *Plutarch: Selected Lives and Essays, translated from the Greek – Volume Two*. Roslyn, N.Y.: Walter J. Black, Inc.

Lowe, B., Decker, O., Muller, S., Brahler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. *Medical Care, 46(3)*, 266-274.

Luoma, J. B., Hayes, S. C., & Walser, R. D. (2009). *Learning ACT: An Acceptance and Commitment Therapy Skills-Training Manual for Therapists.* Oakland, California: New Harbinger Publications Inc.

MacDonald, M. (1981). *Mystical bedlam: madness, anxiety, and healing the seventeenth-century England.* Cambridge: Cambridge University Press.

Marcks, B. A., & Woods, D. W. (2005). A comparison of thought suppression to an acceptance-based technique in the management of personal intrusive thoughts: a controlled evaluation. *Behaviour Research and Therapy, 43*, 433-445. doi: 10.1016/j.brat.2004.03.005

Martin, J. R. (1997). Mindfulness: a proposed common factor. *Journal of Psychotherapy Integration, 7(4)*, 291-312.

Mataix-Cols, D., Conceircao do Rosario-Campos, M., & Leckman, J. F. (2005). A multidimensional model of obsessive-compulsive disorder. *American Journal of Psychiatry*, *162(2)*, 228-238.

Menzies, L., Chamberlain, S. R., Laird, A. R., Thelen, S. M., Sahakian, B. J., & Bullmore, E. T. (2008). Integrating evidence from neuroimaging and neuropsychological studies of obsessive-compulsive disorder: The orbito-frontal striatal model revisited. *Neuroscience and Biobehavioral Reviews, 32,* 525-549. doi: 10.1016/j.neubiorev.2007.09.005

Metcalf, C. A., & Dimidjian, S. (2014). Extensions and mechanisms of mindfulness-based cognitive therapy: a review of the evidence. *Australian Psychologist, 49*, 271-279. doi: 10.1111/ap.12074

Meyer, V. (1966). Modification of expectations in cases with obsessional rituals. *Behaviour Research and Therapy, 4*, 273-280.

Miguel, E. C., Leckman, J. F., Rauch, S., do Rosario-Campos, M. C., Houniel, A. G., Mercadantel, M. T., Chacon, P., & Pauls, D. L. Obsessive-compulsive disorder phenotypes: implications for genetic studies. *Molecular Psychiatry, 10*, 258-275. doi:10.1038/sj.mp.4001617

Mowrer, O. H. (1951). Two-factor learning theory: summary and comment. *Psychological Review, 58(5)*, 350-354.

Muris, P., Merckelbach, H., & Clavan, M. (1997). Abnormal and normal compulsions. *Behaviour Research and Therapy, 35(3)*, 249-252.

Murphy, D. L., Timpano, K. R., Wheaton, M. G., Greenberg, B. D., & Miguel, E. C. (2010). Obsessive-compulsive disorder and its related disorders: a reappraisal of obsessive-compulsive spectrum concepts. *Dialogues in Clinical Neuroscience, 12(2)*, 131-148.

Murphy, H., & Perera-Delcourt, R. (2014). 'Learning to live with OCD is a little mantra I often repeat': Understanding the lived experience of obsessive-compulsive disorder (OCD) in the contemporary therapeutic context. *Psychology and Psychotherapy: Theory, Research and Practice, 87, 111-125*. doi:10.1111/j.2044-8341.2012.02076.x

Musavi Madani, N. A., Kananifar, N., Atashpour, S. H., & Bin Habil, M. H. (2013). The effects of mindfulness group training on the rate of obsessive-compulsive disorder symptoms on the women in Isfahan City (Iran). *International Medical Journal, 20(1)*, 13-17.

Myers, S. G., Fisher, P. L., & Wells, A. (2009). An empirical test of the metacognitive model of obsessive-compulsive symptoms: fusion beliefs, beliefs about rituals, and stop signals. *Journal of Anxiety Disorders, 23*, 436-442. doi: 10.1016/j.janxdis.2008.08.007

Myers, S. G., & Wells, A. (2005). Obsessive-compulsive symptoms: the contribution of metacognitions and responsibility. *Anxiety Disorders, 19*, 806-817. doi: 10.1016/j.janxdis.2004.09.004

Najmi, S., Riemann, B. C., & Wegner, D. M. (2009). Managing unwanted intrusive

thoughts in obsessive-compulsive disorder: relative effectiveness of suppression,

focused distraction, and acceptance. *Behaviour Research and Therapy, 47*, 494-

503. doi: 10.1016/j.brat.2009.02.015

National Institute for Health and Clinical Excellence [NICE] (2005). *Cost Impact Report

Clinical Guideline 31 – Obsessive-compulsive disorder*. London: National Institute

for Health and Clinical Excellence (NICE).

National Institute for Health and Clinical Excellence [NICE] (2006) *National Clinical

Practice Guideline Number 31. Obsessive-compulsive Disorder: Core

interventions in the treatment of obsessive-compulsive disorder and body

dysmorphic disorder.* London: National Institute for Health and Clinical Excellence

(NICE).

National Institute for Health and Clinical Excellence [NICE] (2014). *Centre for Clinical

Practice Static list - candidate guidelines post consultation.* Retrieved from

http://www.nice.org.uk/proxy/?sourceUrl=http%3a%2f%2fwww.nice.org.uk%2fme

dia%2f3F6%2f9E%2fClinicalGuidelineStaticListAndSHCommentsNov13.pdf

National Research Ethics Service [NRES] (2011*). Information sheets and consent forms.

Guidance for researchers and reviewers.* Retrieved from

http://www.nres.nhs.uk/applications/guidance/consent-guidance-and-

forms/?1311929_entryid62=67013

Nestadt, G., Samuels, J., Riddle, M. A., Liang, K. -Y., Bienvenu, O. J., Hoehn-Saric, R., . .

. Cullen, B. (2001). The relationship between obsessive-compulsive disorder and

anxiety and affective disorders: results from the Johns Hopkins OCD Family Study.

Psychological Medicine, 31(3), 481-487.

Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002) E-Research: ethics security, design, and control in psychological research on the internet. *Journal of Social Issues, 58*, 161-176.

OCCWG (Obsessive Compulsive Cognitions Working Group) (1997). Cognitive assessment of obsessive-compulsive disorder. *Behaviour Research and Therapy, 35(7)*, 667-681.

OCD-UK (2014). *The history of OCD*. Retrieved from http://www.ocduk.org/ocd-history

ONS (Office for National Statistics) (2000). *Psychiatric morbidity among adults living in private households, 2000.* Retrieved from http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.ons.gov.uk%2Fons%2Frel%2Fpsychiatric-morbidity%2Fpsychiatric-morbidity-among-adults-living-in-private-households%2F2000%2Fpsychiatric-morbidity-among-adults-living-in-private-households.pdf&ei=2RDFU_aOEfHY7AbfnoHQCA&usg=AFQjCNEfFWZnyjjrKuAGARie3H8LQL4SZQ&bvm=bv.70810081,d.ZWU

ONS [Office for National Statistics] (2004). *Mental health of children and young people in Great Britain, 2004.* Retrieved from http://www.hscic.gov.uk/catalogue/PUB06116/ment-heal-chil-youn-peop-gb-2004-rep2.pdf

ONS [Office for National Statistics] (2014). Highest levels of qualification across England and Wales. Retrieved from http://www.ons.gov.uk/ons/rel/census/2011-census-analysis/local-area-analysis-of-qualifications-across-england-and-wales/info-highest-qualifications.html

Overbeek, T., Schruers, K., Vermetten, E., & Griez, E. (2002). Comorbidity of obsessive-compulsive disorder and depression: prevalence, symptom severity, and treatment effect. *Journal of Clinical Psychiatry, 63(12)*, 1106-1112.

Pallanti, S., Grassi, G., Sarrecchia, E. D., Cantisani, A., & Pellegrini, M. (2011). Obsessive-compulsive disorder comorbidity: clinical assessment and therapeutic implications. *Frontiers in Psychiatry, 2(70)*, 1-11. doi: 10.3389/fpsyt.2011.00070

Patel, S. R., Carmody, J. & Simpson, H. B. (2007). Adapting mindfulness-based stress reduction for the treatment of obsessive-compulsive disorder: a case report. *Behavioral and Cognitive Practice*, *14,* 375-380.

Pauls, D. L. (2010). The genetics of obsessive-compulsive disorder: a review. *Dialogues in Clinical Neuroscience, 12(2)*, 149-163.

Pauls, D. L., Abramovitch, A., Rauch, S. L., & Geller, D. A. (2014). Obsessive-compulsive disorder: an integrative genetic and neurobiological perspective. *Nature Review Neuroscience, 15*, 410-424. doi:10.1038/nrn3746

Peterson. R. A. (2001). On the use of college students in social science research: insights from a second-order meta-analysis. *Journal of Consumer Research, 28*, 450-461.

Pitman, R. K. (1984). Janet's obsessions and psychasthenia: a synopsis. *Psychiatric Quarterly, 56(4)*, 291-314.

Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: quantitative strategies for communicating indirect effects. *Psychological Methods, 16(2)*, 93–115. doi: 10.1037/a0022658

Purdon. C. (2007). Cognitive therapy for obsessive-compulsive disorder. In M. Antony, C. Purdon, & L. Summerfeldt (Eds.), *Psychological Treatment of Obsessive-Compulsive Disorder* (p. 111-146). Washington, D.C.: American Psychological Association.

Purdon, C. & Clark, D. A. (1999). Metacognition and obsessions. *Clinical Psychology and Psychotherapy, 6*, 102-110.

Rachman, S. (1993). Obsessions, responsibility & guilt. *Behaviour Research and Therapy, 31(2)*, 149-154.

Rachman, S. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy, 35(9)*, 793-802.

Rachman, S. & de Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy, 16*, 233-248.

Rachman, S. & de Silva, P. (2009). *Obsessive-compulsive disorder – The facts (4th ed.).* New York: Oxford University Press Inc.

Rachman, S., Shafran, R., Mitchell, D., Trant, J., & Teachman, B. (1996). How to remain neutral: an experimental analysis of neutralization. *Behaviour Research and Therapy, 34*, 889-898.

Rachman, S., Thordarson, D.S., Shafran, R., & Woody, S.R. (1995). Perceived responsibility: structure and significance. *Behaviour Research and Therapy, 33,* 779-784.

Rhodes, S. D., Bowie, D. A., & Hergenrather, K. C. (2003). Collecting behavioural data using the world wide web: considerations for researchers. *Journal of Epidemiology and Community Health, 57*, 68-73.

Roemer, L., Lee, J. K., Salters-Pedneault, K., Erisman, S. M., Orsillo, S. M., & Mennin, D. S. (2009). Mindfulness and emotion regulation difficulties in generalized anxiety disorder: preliminary evidence for independent and overlapping contributions. *Behavior Therapy, 40,* 142-154.

Rowa, K., Antony, M. M., & Swinson, R.P. (2007). Exposure and response prevention. In M. Antony, C. Purdon, & L. Summerfeldt (Eds.), *Psychological Treatment of Obsessive-Compulsive Disorder* (p. 79-110). Washington, D.C.: American Psychological Association.

Ruscio, A. M., Stein, D. J., Chiu, W. T., & Kessler, R. C. (2010). The epidemiology of obsessive-compulsive disorder in the national comorbidity survey replication. *Molecular Psychiatry, 15*, 53-63.

Saks, M., & Allsop, J. (2007). *Researching Health: Qualitative, Quantitative and Mixed Methods.* London: Sage Publications Ltd.

Salkovskis, P. M. (1985). Obsessive-compulsive problems: a cognitive-behavioural analysis. *Behaviour Research and Therapy, 23*, 571-583.

Salkovskis, P. M. (1989). Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research and Therapy, 27*, 677-682.

Salkovskis, P. M. (2007). Psychological treatment of obsessive-compulsive disorder. *Psychiatry, 6(6)*, 225-262.

Salkovskis, P., & Harrison, J. (1984). Abnormal and normal obsessions: a replication. *Behaviour Research and Therapy, 22*, 549-552.

Salkovskis, P. M., Wroe, A. L., Gledhill, A., Morrison, N., Forrester, E., Richards, C., … Thorpe, S. (2000). Responsibility attitudes and interpretations are characteristic of obsessive compulsive disorder. *Behaviour Research and Therapy, 38*, 347-372.

Savin, N. E. & White, K. J. (1977). The Durbin-Watson test for serial correlation with extreme sample sizes for many regressors. *Econometrica, 45(8)*, 1989-1996.

Schwartz, J. M. (1996). *Brain Lock – Free yourself from Obsessive-Compulsive Behavior*. New York: Harpercollins Publishers, Inc.

Shapiro, S. L., Carlson, L. E., Astin, J. A. & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology, 62(3)*, 373-386. doi: 10.1002/jclp.20237

Simpson, H. B., Huppert, J. D., Petkova, E., Foa, E. B., & Liebowitz, M. R. (2006). Response versus remission in obsessive-compulsive disorder. *Journal of Clinical Psychiatry, 67(2)*, 269-276.

Singh, N. N., Wahler, R. B., Winton, A. S. W. & Adkins, A. D. (2004). A mindfulness-based treatment of obsessive-compulsive disorder. *Clinical Case Studies*, *3(4)*, 275-287. doi: 10.1177/1534650103259646

Solem, S., Myers, S. G., Fisher, P. L., Vogel, P. A., & Wells, A. (2010). An empirical test of the metacognitive model of obsessive-compulsive symptoms: replication and extension. *Journal of Anxiety Disorders, 24*, 79-86. doi: 10.1016/j.janxdis.2009.08.009

Soper, D. (2013). A-priori Sample Size Calculator for Multiple Regression [On-line software]. Retrieved from http://www.danielsoper.com/statcalc3/calc.aspx?id=1

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine, 166*, 1092-1097.

Splevins, K., Smith, A., & Simpson, J. (2009). Do improvements in emotional distress correlate with becoming more mindful? A study of older adults. *Aging and Mental Health, 13(3)*, 328-335. doi: 10.1080/13607860802459807

Stanley, M. A. & Turner, S. M. (1995) Current status of pharmacological and behavioral treatment of obsessive-compulsive disorder. *Behavior Therapy, 26,* 163-186.

Steketee, G., Chambless, D. L., & Tran, G. Q. (2001). Effects of axis I and II comorbidity on behaviour therapy outcome for obsessive-compulsive disorder and agoraphobia. *Comprehensive Psychiatry, 42(1)*, 76-86.

Steketee, G., Frost, R., & Bogart, K. (1996). The Yale-Brown Obsessive Compulsive scale: interview versus self-report. *Behaviour Research and Therapy, 34(8)*, 675-684.

Swales, M. A., & Heard, H. L. (2009). *Dialectical Behaviour Therapy*. New York: Routledge.

Taylor, S., Abramowitz, J. S., & McKay, D. (2007) Cognitive-Behavioural Models of Obsessive-Compulsive Disorder. In M. Antony, C. Purdon, & L. Summerfeldt (Eds.), *Psychological Treatment of Obsessive-Compulsive Disorder* (p. 9-30). Washington, D.C.: American Psychological Association.

Tolin, D. F. & Steketee, G. (2007). General issues in psychological treatment for obsessive-compulsive disorder. In M. Antony, C. Purdon, & L. Summerfeldt (Eds.), *Psychological Treatment of Obsessive-Compulsive Disorder* (p. 31-60). Washington, D.C.: American Psychological Association.

Torres, A. R., Prince, M. J., Bebbington, P. E., Bhugra, D., Brugha, T., Farrell, M., . . . Singleton, N. (2006). Obsessive-compulsive disorder: prevalence, comorbidity, impact, and help-seeking in the British National Psychiatric Morbidity Survey of 2000. *American Journal of Psychiatry, 163 (11)*, 1978-1985.

Tuke, D. H. (1894). Imperative ideas. *Brain, 17,* 179-197

Twohig, M. P., Hayes, S. C., & Masuda, A. (2006). Increasing willingness to experience obsessions: acceptance and commitment therapy as a treatment for obsessive-compulsive disorder. *Behavior Therapy, 37*, 3-13.

University of Essex (2013a). *Research Governance*.   Retrieved from

http://www.essex.ac.uk/reo/

University of Essex (2013b). *Research Governance – Participant Information and

Consent.*   Retrieved from http://www.essex.ac.uk/reo/governance/participants.aspx

Van Niekerk, J. (2009). *Coping with Obsessive-Compulsive Disorder*. Oxford, England:

Oneworld Publications.

Veale, D., & Roberts, A. (2014). Obsessive-compulsive disorder – Clinical Review.

British Medical Journal, 348, g2183 doi: 10.1136/bmj.g2183

Wahl, K., Huelle, J. O., & Zurowski, B. (2013). Managing obsessive thoughts during brief

exposure: an experimental study comparing mindfulness-bases strategies and

distraction in obsessive-compulsive disorder. *Cognitive Therapy and Research,

37(4)*, 752-761. doi: 10.1007/s10608-012-9503-2

Wells, A. (2005). Detached mindfulness in cognitive therapy: a metacognitive analysis

and ten techniques. *Journal of Rational-Emotive & Cognitive-Behavior Therapy,

23(4)*, 337-355. doi: 10.1007/s10942-005-0018-6

Wells, A., & Matthews, G. (1996). Modelling cognition in emotional disorder: the S-REF

model. *Behaviour Research and Therapy, 34(11/12)*, 881-888.

Wells, A., & Papageorgiou, C. (1998). Relationships between worry, obsessive-

compulsive symptoms and meta-cognitive beliefs. *Behaviour Research and

Therapy, 36*, 899-913.

Whittal, M. L., Thordarson, D. S., & McLean, P. D. (2005). Treatment of obsessive-

compulsive disorder: cognitive behaviour therapy vs. exposure and response

prevention. *Behaviour Research and Therapy, 43,* 1559-1576. doi:

10.1016/j.brat.2004.11.012

Wilkinson-Tough, M., Bocci, L., Thorne, K. & Herlihy, J. (2010). Is mindfulness-based

therapy an effective intervention for obsessive-intrusive thoughts: a case series.

Clinical Psychology and Psychotherapy, *17,* 250-268. doi: 10.1002/cpp.665

Williams, M. J., Dalgleish, T., Karl, A., & Kuyken, W. (2014). Examining the factor

structures of the Five Facet Mindfulness Questionnaire and the Self-Compassion

Scale. *Psychological Assessment, 26(2)*, 407-418. doi: 10.1037/a0035566

Williams, M., Teasdale, J., Segal, Z., & Kabat-Zinn, J. (2007). *The Mindful Way Through

Depression*. New York: Guildford Publications, Inc.

Williams, R. (2000) Epistemology. In A. E. Kazdin (Eds.), *Encyclopedia of Psychology,

Vol. 3* (pp. 225-232). Washington, D.C.: American Psychological Association.

Wittchen, H. & Jacobi, F. (2005). Size and burden of mental disorders in Europe – a

critical review and appraisal of 27 studies. *European Neuropsychopharmacology,

15*, 357-376. doi: 10.1016/j.euroneuro.2005.04.012

World Health Organisation (WHO) (2010). *ICD-10 Version:2010*. Retrieved from

apps.who.int/classifications/icd10/browse/2010/en#/F42

Appendices

Appendix A – Search Strategy

Databases:
PsycINFO, PEP archive, Psychology and Behavioural Sciences Collection, PsycARTICLES, MEDLINE, Health Business Elite, CINAHL, Greenfile and Library Information Science and Technology Abstracts, and Cochrane Library.

Dates searched:
Periodically searched from 13/11/2012 onwards.
Last search occurred 31/8/2015.
Restricted to Peer Reviewed articles risking possible publication bias (Aveyard, 2010), however, this approach enabled a first line appraisal of article quality.

Key Search Terms:
Key terms where searched within abstracts as title only searches would have yielded too few studies in a sparse research field.   Key journals were searched using search terms mindful* OR MBBT OR MBCT OR MBSR OR MBCBT AND OCD OR obsess* OR compuls*.

ACT-based studies were excluded from this study, due to mindful components sharing equal prominence with other interventions including values identification, behavioural commitment exercises, myth disconfirming exercises, and detachment psycho-education in ACT-based interventions (e.g. Twohig, Hayes & Masuda, 2006; Luoma, Hayes & Walser, 2009). This equal spread in techniques increases the difficulty in isolating the effect of Mindfulness in the ACT-based studies. DBT studies were equally not included as this integrative therapy is identified and characterised by many components, mindfulness being only a part of the structure (Swales & Heard, 2009). It is not unusual to exclude both ACT and DBT in reviews of the effects of Mindfulness interventions on psychological conditions, due to their multi-faceted curriculums (Khoury et al., 2013; Hertenstein et al., 2012).

The low yield from this search opened the review to the key topic of intrusive thoughts (cognitive intrusions), as they have been identified as key factors in OCD development (Salkovskis, 1989). Therefore the other search string included "intrusive thoughts" OR cognit* AND intrus* with the mindful* combination of terms described above.

Hand searches for more recent issues of relevant journals, and reference list searches from investigated articles, were also used. Journals included Mindfulness Monthly, Mindfulness, Clinical Psychology and Psychotherapy, Behaviour Research and Therapy, Journal of Consulting and Clinical Psychology, Journal of Anxiety Disorders, and Cognitive Therapy and Research.

Inclusion/Exclusion Criteria:

This review included studies whose treatment or experimental condition described a predominantly and more clearly isolated mindful approach, for OCD or obsessive compulsive symptoms. There was no methodological preference, and reporting included qualitative and quantitative studies.

The search excluded non-English language publications due to resource limitations for full accurate translation, and excluded other conditions that were within the Obsessive-Compulsive cluster (APA, 2013b), but not actually OCD.

Appendix B – Literature Search Flow Diagram

Appendix Figure 1

Flow diagram detailing literature search and selection

| Articles identified through database searching ($n = 99$) | | Additional articles identified through other sources ($n = 5$) |

Articles after duplicates removed ($n = 85$)

Abstracts screened ($n = 85$) → Articles excluded ($n = 50$)

Full text articles assessed for eligibility ($n = 35$) → Full text articles excluded ($n = 21$)

Combined modalities in treatment ($n=1$)
Review too general ($n=4$)
Not specific to OCD ($n=11$)
Not about Mindfulness ($n=1$)
Theoretical Paper ($n=1$)
Secondary Source ($n=1$)
Study Protocols ($n=2$)

Studies included in review ($n = 14$)

Appendix C – Standard Recruitment Wording

For Social Networking Sites and other Social Contacting Methods

Dear friends, as part of my Doctorate course I am conducting a study looking into obsessive and compulsive thoughts and behaviours; as well as mindfulness. The results of this will be written up for my dissertation. If you feel you might be interested in taking part, please follow the link below, which will take you to the anonymous online survey. There you will find more details about the study. Please, feel free to copy this onto your walls so that your friends can also take part if interested. Many thanks for your help, Lis

https://moodle.essex.ac.uk/mod/feedback/view.php?id=182822

For Formal Advertising and General Recruitment

This online study is investigating the relationship between Obsessive and Compulsive thoughts and behaviours; and Mindfulness.

Anyone who is 18 years and over, and is not currently receiving treatment for a mental health disorder and/or alcohol and drug abuse/dependence, is eligible to participate.

Participation is anonymous and the online survey should take about 20 minutes to complete.

If you feel you might be interested in taking part, please follow the link below, which will take you to the e-survey on the host university website.   Full information about the study is detailed on the e-survey Information Page.

This research is being conducted by Elisabeth Bakes, Doctor of Clinical Psychology student (University of Essex), as part of a doctoral thesis, and has been approved by the Faculty of Health and Human Sciences Ethics committee at the University of Essex.

Thank you for considering this research.

https://moodle.essex.ac.uk/mod/feedback/view.php?id=182822

Appendix D – Southamptom Mindfulness Questionnaire – SMQ

<u>Usually</u>, when I have distressing thoughts or images

	Agree Totally	Agree Strongly	Agree Slightly	Unsure	Disagree Slightly	Disagree Strongly	Disagree Totally
1. I am able just to notice them without reacting							
2. They take over my mind for quite a while afterwards							
3. I judge the thought/image as good or bad							
4. I feel calm soon after							
5. I am able to accept the experience							
6. I get angry that this happens to me							
7. I notice how brief thoughts and images really are							
8. I judge myself as good or bad, depending what the thought/image is about							
9. I 'step back' & am aware of the thought or image without getting taken over by it							
10. I just notice them and let them go							
11. I accept myself the same whatever the thought/image is about							
12. In my mind I try and push them away							
13. I keep thinking about the thought or image after it's gone							
14. I find it so unpleasant I have to distract myself & not notice them							
15. I try just to experience the thoughts or images without judging them							
16. I lose myself in the thought/images							

Appendix E – Five Facets Mindfulness Questionnaire – FFMQ

Five Facet Mindfulness Questionnaire

Description:

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.

_____ 2. I'm good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I'm easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____ 12. It's hard for me to find the words to describe what I'm thinking.

_____ 13. I am easily distracted.

_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____ 16. I have trouble thinking of the right words to express how I feel about things

_____ 17. I make judgments about whether my thoughts are good or bad.

_____ 18. I find it difficult to stay focused on what's happening in the present.

_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____ 21. In difficult situations, I can pause without immediately reacting.

_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____ 24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. My natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

Appendix F – Dimensional Obsessive-Compulsive Scale – DOCS

1

Dimensional Obsessive-Compulsive Scale

This questionnaire asks you about 4 different types of concerns that you might or might not experience. For each type there is a description of the kinds of thoughts (sometimes called *obsessions*) and behaviors (sometimes called *rituals* or *compulsions*) that are typical of that particular concern, followed by 5 questions about your experiences with these thoughts and behaviors. Please read each description carefully and answer the questions for each category based on your experiences in the last month.

Category 1: Concerns about Germs and Contamination

Examples…

-Thoughts or feelings that you are contaminated because you came into contact with (or were nearby) a certain object or person.
-The feeling of being contaminated because you were in a certain place (such as a bathroom).
-Thoughts about germs, sickness, or the possibility of spreading contamination.
-Washing your hands, using hand sanitizer gels, showering, changing your clothes, or cleaning objects because of concerns about contamination.
-Following a certain routine (e.g., in the bathroom, getting dressed) because of contamination
-Avoiding certain people, objects, or places because of contamination.

The next questions ask about your experiences with thoughts and behaviors related to contamination <u>over the last month</u>. Keep in mind that your experiences might be different than the examples listed above. Please circle the number next to your answer:

1. About how much time have you spent each day thinking about contamination and engaging in washing or cleaning behaviors because of contamination?

   0   None at all
   1   Less than 1 hour each day
   2   Between 1 and 3 hours each day
   3   Between 3 and 8 hours each day
   4   8 hours or more each day

2. To what extent have you avoided situations in order to prevent concerns with contamination or having to spend time washing, cleaning, or showering?

   0   None at all
   1   A little avoidance
   2   A moderate amount of avoidance
   3   A great deal of avoidance
   4   Extreme avoidance of nearly all things

3. If you had thoughts about contamination but could not wash, clean, or shower (or otherwise remove the contamination), how distressed or anxious did you become?

   0   Not at all distressed/anxious
   1   Mildly distressed/anxious
   2   Moderately distressed/anxious
   3   Severely distressed/anxious
   4   Extremely distressed/anxious

4. To what extent has your daily routine (work, school, self-care, social life) been disrupted by contamination concerns and excessive washing, showering, cleaning, or avoidance behaviors?

   0   No disruption at all.
   1   A little disruption, but I mostly function well.
   2   Many things are disrupted, but I can still manage.
   3   My life is disrupted in many ways and I have trouble managing.
   4   My life is completely disrupted and I cannot function at all.

5. How difficult is it for you to disregard thoughts about contamination and refrain from behaviors such as washing, showering, cleaning, and other decontamination routines when you try to do so?

   0   Not at all difficult
   1   A little difficult
   2   Moderately difficult
   3   Very difficult
   4   Extremely difficult

Category 2: Concerns about being Responsible for Harm, Injury, or Bad Luck

Examples…

-A doubt that you might have made a mistake that could cause something awful or harmful to happen.
-The thought that a terrible accident, disaster, injury, or other bad luck might have occurred and you weren't careful enough to
 prevent it.
-The thought that you could prevent harm or bad luck by doing things in a certain way, counting to certain numbers, or by
 avoiding certain "bad" numbers or words.
-Thought of losing something important that you are unlikely to lose (e.g., wallet, identify theft, papers).
-Checking things such as locks, switches, your wallet, etc. more often than is necessary.
-Repeatedly asking or checking for reassurance that something bad did not (or will not) happen.
-Mentally reviewing past events to make sure you didn't do anything wrong.
-The need to follow a special routine because it will prevent harm or disasters from occurring.
-The need to count to certain numbers, or avoid certain bad numbers, due to the fear of harm.

The next questions ask about your experiences with thoughts and behaviors related to harm and disasters <u>over the last month</u>. Keep in mind that your experiences might be slightly different than the examples listed above. Please circle the number next to your answer:

1.   About how much time have you spent each day thinking about the possibility of harm or disasters and engaging in checking or efforts to get reassurance that such things do not (or did not) occur?

   0   None at all
   1   Less than 1 hour each day
   2   Between 1 and 3 hours each day
   3   Between 3 and 8 hours each day
   4   8 hours or more each day

2.   To what extent have you avoided situations so that you did not have to check for danger or worry about possible harm or disasters?

   0   None at all
   1   A little avoidance
   2   A moderate amount of avoidance
   3   A great deal of avoidance
   4   Extreme avoidance of nearly all things

3.   When you think about the possibility of harm or disasters, or if you cannot check or get reassurance about these things, how distressed or anxious did you become?

   0   Not at all distressed/anxious
   1   Mildly distressed/anxious
   2   Moderately distressed/anxious
   3   Severely distressed/anxious
   4   Extremely distressed/anxious

4.   To what extent has your daily routine (work, school, self-care, social life) been disrupted by thoughts about harm or disasters and excessive checking or asking for reassurance?

   0   No disruption at all.
   1   A little disruption, but I mostly function well.
   2   Many things are disrupted, but I can still manage.
   3   My life is disrupted in many ways and I have trouble managing.
   4   My life is completely disrupted and I cannot function at all.

5.   How difficult is it for you to disregard thoughts about possible harm or disasters and refrain from checking or reassurance-seeking behaviors when you try to do so?

   0   Not at all difficult
   1   A little difficult
   2   Moderately difficult
   3   Very difficult
   4   Extremely difficult

3

Category 3: Unacceptable Thoughts

Examples…

-Unpleasant thoughts about sex, immorality, or violence that come to mind against your will.
-Thoughts about doing awful, improper, or embarrassing things that you don't really want to do.
-Repeating an action or following a special routine because of a bad thought.
-Mentally performing an action or saying prayers to get rid of an unwanted or unpleasant thought.
-Avoidance of certain people, places, situations or other triggers of unwanted or unpleasant thoughts

---

The next questions ask about your experiences with unwanted thoughts that come to mind against your will and behaviors designed to deal with these kinds of thoughts over the last month. Keep in mind that your experiences might be slightly different than the examples listed above. Please circle the number next to your answer:

1. About how much time have you spent each day with unwanted unpleasant thoughts and with behavioral or mental actions to deal with them?

   0   None at all
   1   Less than 1 hour each day
   2   Between 1 and 3 hours each day
   3   Between 3 and 8 hours each day
   4   8 hours or more each day

2. To what extent have you been avoiding situations, places, objects and other reminders (e.g., numbers, people) that trigger unwanted or unpleasant thoughts?

   0   None at all
   1   A little avoidance
   2   A moderate amount of avoidance
   3   A great deal of avoidance
   4   Extreme avoidance of nearly all things

3. When unwanted or unpleasant thoughts come to mind against your will how distressed or anxious did you become?

   0   Not at all distressed/anxious
   1   Mildly distressed/anxious
   2   Moderately distressed/anxious
   3   Severely distressed/anxious
   4   Extremely distressed/anxious

4. To what extent has your daily routine (work, school, self-care, social life) been disrupted by unwanted and unpleasant thoughts and efforts to avoid or deal with such thoughts?

   0   No disruption at all.
   1   A little disruption, but I mostly function well.
   2   Many things are disrupted, but I can still manage.
   3   My life is disrupted in many ways and I have trouble managing.
   4   My life is completely disrupted and I cannot function at all.

5. How difficult is it for you to disregard unwanted or unpleasant thoughts and refrain from using behavioral or mental acts to deal with them when you try to do so?

   0   Not at all difficult
   1   A little difficult
   2   Moderately difficult
   3   Very difficult
   4   Extremely difficult

4

Category 4: Concerns about Symmetry, Completeness, and the Need for Things to be "Just Right"

Examples…

-The need for symmetry, evenness, balance, or exactness.
-Feelings that something isn't "just right."
-Repeating a routine action until it feels "just right" or "balanced."
-Counting senseless things (e.g., ceiling tiles, words in a sentence).
-Unnecessarily arranging things in "order."
-Having to say something over and over in the same way until it feels "just right."

The next questions ask about your experiences with feelings that something is not "just right" and behaviors designed to achieve order, symmetry, or balance <u>over the last month</u>. Keep in mind that your experiences might be slightly different than the examples listed above. Please circle the number next to your answer:

1. About how much time have you spent each day with unwanted thoughts about symmetry, order, or balance and with behaviors intended to achieve symmetry, order or balance?

    0   None at all
    1   Less than 1 hour each day
    2   Between 1 and 3 hours each day
    3   Between 3 and 8 hours each day
    4   8 hours or more each day

2. To what extent have you been avoiding situations, places or objects associated with feelings that something is not symmetrical or "just right?"

    0   None at all
    1   A little avoidance
    2   A moderate amount of avoidance
    3   A great deal of avoidance
    4   Extreme avoidance of nearly all things

3. When you have the feeling of something being "not just right," how distressed or anxious did you become?

    0   Not at all distressed/anxious
    1   Mildly distressed/anxious
    2   Moderately distressed/anxious
    3   Severely distressed/anxious
    4   Extremely distressed/anxious

4. To what extent has your daily routine (work, school, self-care, social life) been disrupted by the feeling of things being "not just right," and efforts to put things in order or make them feel right?

    0   No disruption at all.
    1   A little disruption, but I mostly function well.
    2   Many things are disrupted, but I can still manage.
    3   My life is disrupted in many ways and I have trouble managing.
    4   My life is completely disrupted and I cannot function at all.

5. How difficult is it for you to disregard thoughts about the lack of symmetry and order, and refrain from urges to arrange things in order or repeat certain behaviors when you try to do so?

    0   Not at all difficult
    1   A little difficult
    2   Moderately difficult
    3   Very difficult
    4   Extremely difficult

Appendix G – Generalized Anxiety Disorder Brief Scale - GAD-7

GAD-7				
Over the <u>last 2 weeks</u>, how often have you been bothered by the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

(For office coding: Total Score T____ = ____ + ____ + ____)

Appendix H – Patient Health Questionnaire–9 – PHQ-9

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use "✔" to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING ___0___ + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Appendix I – Online Survey – Study Information, Consent Form and Demographic Survey

MOODLE

Home ► Site pages ► Mindfulness and Obsessive Compulsive Disorder - On...

NAVIGATION

Home
▸ **Mindfulness and Obsessive Compulsive Disorder - On...**
Courses

Mindfulness and Obsessive Compulsive Disorder - Online Study

Mindfulness and Obsessive Compulsive Disorder - Online Study

Participant information sheet

You are being invited to take part in a study aiming to explore obsessive and compulsive thoughts and behaviours; as well as mindfulness. If you are 18 years of age and over, currently not receiving treatment for a mental health disorder or drug and alcohol abuse/dependence, then please consider participating in this research.

Before you make your decision, it is important that you read through the information below in order to gain a better understanding of why the research is taking place and what it will involve from you. *Please take your time and feel free to discuss the information provided with anyone.* If you have any concerns or questions about the study that have not been answered, then please contact me (contact details at the end of this page).

What is the study about?

This study aims to explore whether there is a relationship between obsessive and compulsive thoughts and behaviours; and mindfulness. Mindfulness is currently being used in clinical settings, to help people manage OCD (Obsessive Compulsive Disorder) especially when they are not able to be helped by CBT-based approaches. OCD can often be the cause of great distress in people, and this is why brief measures of anxiety and depression symptoms have also been included, as they may play a part in how mindfulness may relate to obsessive/compulsive thoughts and behaviours.

Who is doing the research?

This study is being conducted by Elisabeth Bakes, a Trainee Clinical Psychologist at the University of Essex, UK, as part of her Doctorate in Clinical Psychology training.

Who can participate?

Anyone of the age of 18 and above who is **not** currently receiving treatment for a mental health disorder/s and/or alcohol and drug abuse/dependence.

What do I have to do?

If you give consent to participate in the current study you will be redirected to a University of Essex hosted survey-site, specifically connected with this study. It will contain a list of questions commencing with personal data (eg. date of birth, education background, occupational status, country of origin and gender); and then a combination of questionnaires which measure mindfulness, obsessive/compulsive thoughts and behaviours, and anxious and depressive thoughts and behaviours. All questionnaire items are multiple choice and you are encouraged to answer these in a way that best represents how you see yourself during the periods of time requested. As this is an anonymous online survey you will not be asked to provide any identifiable information such as your name or address. The survey itself should not take longer than 15 to 20 minutes to complete.

Do I have to take part?

It is up to you to decide whether to take part or not in this research. If you decide to take part in the research you have the right to stop participating at any time without giving any reason. Should you wish to do so partway through the survey, you can withdraw from the study by closing your web browser page. Your responses will not be submitted for the study unless you

have reached the end of the survey and pressed the "submit your answers" button.

If you change your mind about participating in the study after you press the "submit your answers" button at the end of the survey, I can remove your data from the study, if you contact me by email, and provide your date of birth, so that I can identify your responses and remove them from the data-set. Please note that once the on-line survey has closed, and the data-set has been analysed, it will be too late to remove individual responses from the study. The on-line survey will close once an optimum number of responses have been collected, and this is currently estimated to occur in July 2014.

Will my participation be anonymous and confidential?

Individually identifiable data such as your name, postal address, facebook or email address will not be requested or collected as part of this survey as this is an anonymous online study. Individual responses to the survey will be combined, and results will be analysed according to patterns and relationships observed on the entire data-set. Access to the anonymised data-set will be restricted to the researcher, her research supervisors (if required), and specific University of Essex Moodle IT support members (if necessary for any technical support). The data-set will be kept securely in the researcher's password protected account.

What will happen to the results of the study?

The study results will be analysed as a whole data-set, and disseminated by the researcher as part of a doctoral thesis.

What are the possible advantages of taking part?

Your participation will contribute to our knowledge about the relationship between mindfulness and obsessive/compulsive thoughts and behaviours. This will add to the understanding about how these factors interact, inform the use of Mindful approaches with OCD symptoms in clinical settings, and assist with future research into this area.

Are there any risks in taking part?

This study has been given ethical approval by the University of Essex Ethics Committee. This means that the study is considered safe to take part in as all possible risk associated with participating have been accounted for and addressed. For anybody who may experience distress whilst participating in the study, perhaps as a result of the study's topics relating to any real-life concerns, there is information on relevant services and resources provided at the end of the survey. Additionally, you can contact the researcher should you wish to share your experience of participating in the study. Please note that this study is conducted from the UK, and therefore some of the suggested services/resources may not be as relevant for non-UK residents.

How long will it take to complete the survey?

The actual survey should take up to 15 to 20 minutes to complete.

What should I do if I have concerns or questions about the study?

Should you have any concerns or questions about the study you can address these by contacting the researcher.

Thank you very much for taking time to read through the information.

 Please press the "Answer the questions" link at the bottom of the page, if you wish to continue

Elisabeth Bakes

Trainee Clinical Psychologist

University of Essex

enbake@essex.ac.uk

Answer the questions...

Help and Support

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Disorder - On...
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There are required fields in this form marked *.

Consent Form with Eligibility Criteria

Before you continue to the survey, please complete the following eligibility criteria checklist and consent form. This is to establish that you have read and understood the study information page, that you are willing to take part in the study and that you meet the study eligibility criteria. Thank you.

Confirming Eligibility and Consent to Participate

1. I have read and understood the study information page

2. I agree that I am 18 years or older

3. Currently I am **not** receiving treatment for a mental health disorder(s)

4. Currently I am **not** receiving treatment for alcohol and/or drug abuse/dependence.

5. I agree to participate in the study

6. I understand that my participation is voluntary and I have the right to withdraw from the study at any time without giving a reason

7. I understand that all of the data collected will be anonymous and will be kept securely

I have read the eligibility and consent form and agree to all items*
    I agree

It is important that only those people who meet the eligibility criteria and are able to consent to all items, take part in this study.

If you are unable to agree to all of the eligibility and consent items at this time, I am sorry that you will not be able to participate in this online study.

Please close this page on your internet browser to end this session, and thank you for your time.

Next page

Cancel

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Note: Clicking on the radio button checking "I agree" was required before the survey would continue

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Mindfulness and Obsessive Compulsive Disorder - Online Study

NAVIGATION

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Courses

Mindfulness and Obsessive Compulsive Disorder - Online Study

There are required fields in this form marked *.
Demographic Questionnaire

What is your date of birth? use format DD/MM/YYYY (for example 4th November 1987 would be 04/11/1987)*

What is your gender?*

What is the highest level of education that you have reached?*

If "other" level of education, please specify

What is your occupational status?*

If "other" occupational status, please specify

What is your country of residence?

Please select the response which best describes your past experience with Mindfulness-based Training / Therapy*

What is your age?*

Previous page   Next page

Cancel

Help and Support

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Notes:
Free-text box for date of birth
Drop down menu for gender (male/female)
Drop down menu for education (8 levels + "other" option)
Free-text box for "other education"
Drop down menu for occupation status (5 levels + "other" option)
Free-text box for "other occupation" (the values of "home duties", "casual employment", "retired" and
      "other – non-specified" were added to the analysis based on the free-text responses).
Drop down menu for country of residence including full list of countries
Drop down menu for mindfulness-based experience (6 levels)
Drop down menu for age from "18" to "Older than 100"

* The remaining standardised scales followed the demographic questionnaire -
  DOCS, FFMQ, SMQ, GAD-7 and PHQ-9, all with drop down menus with
  a list of responses based on paper versions of the scales

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There are required fields in this form marked *.
You are now at the end of the survey

Please press the "submit your answers" button if you are happy to submit your responses and complete this survey

Previous page   Submit your answers

Cancel

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End of survey

Thank you for taking part in the current study looking at obsessive and compulsive thoughts and behaviours; as well as mindfulness. Your participation is greatly valued, as it will help us to gain an understanding about how these things work together.

If you have any comments about the survey or would like to share your experience in taking part, please feel free to contact the researcher Elisabeth Bakes at enbake@essex.ac.uk

In the event that you feel emotionally or psychologically distressed as a result of participating in this study, a number of organisations that you might find helpful are listed below. These organisations provide information, help and support for people who may be struggling with obsessive and compulsive thoughts and behaviours, with anxiety, with depression, or with general mental health issues. The majority of these websites are UK-based, but may provide useful information, or links to related sites in other countries. Clicking on the links below will redirect you to their websites.

Please note that once you click on any of the links below, you will be re-directed to that site and not able to return to this page. It is therefore recommended that you print this page, or copy and paste this page onto a Word Document, should you wish to refer to this page again in the future.

http://www.ocdaction.org.uk/

www.ocduk.org

http://www.anxietyuk.org.uk/

http://www.depressionalliance.org.uk/

http://www.mentalhealth.org.uk/

http://www.rethink.org/

http://www.mind.org.uk/

http://www.samaritans.org

http://www.ocfoundation.org/global_partners/ (provides a list of international OC organisations providing information and/or support for many English-speaking countries not including Australia)

http://www.arcvic.org.au/obsessive-compulsive-disorder (Australian-based information/support web-site for Anxiety-based conditions including OCD)

Additionally, the following website provides information about and contact details for a wide range of health related web-sites and support groups across the U.K. – www.self-help.org.uk

UK Only

If you feel that you need to discuss your issues with someone, in order to be provided with more immediate psychological or emotional support and/or assistance to find on-going help, the Samaritans provide a 24 hour number all year round, ph 08457 90 90 90. Alternatively, your GP or nearest Hospital Accident and Emergency Department can provide a face to face point of contact for any concerns about your immediate safety as a result of a mental health issue.

Rest of World

If you feel that you need to discuss your issues with someone, in order to be provided with

psychological or emotional support and/or assistance to find on-going help, your general medical practitioner or local health clinic may be able to provide advice, assessment and/or referral. For urgent support where you are immediately concerned about risk to yourself or others, please contact your nearest Hosptial Accident / Emergency / Casualty department.

Once again, thank you for taking time to participate in this study

Elisabeth Bakes

Trainee Clinical Psychologist

University of Essex, UK

enbake@essex.ac.uk

You have now finished the survey, please close your web browser

Continue

Help and Support

Need help with Moodle? Please contact the IT Helpdesk.

Appendix J – Approval to Conduct Research

University of Essex

School of Health and
Human Sciences
T 01206 872854
F 01206 873765
E hhs@essex.ac.uk

Colchester Campus
Wivenhoe Park
Colchester CO4 3SQ
United Kingdom
T 01206 873333
F 01206 873598

www.essex.ac.uk

16 January 2014

MS E. BAKES

Dear Elisabeth,

Re: Ethical Approval Application (Ref 12069)

Further to your application for ethical approval, please find enclosed a copy of your
application which has now been approved by Dr Wayne Wilson on behalf of the Faculty
Ethics Committee.

Yours sincerely,

Mel Wiltshire
Ethics Administrator
School of Health and Human Sciences

cc.   Sarah Manning-Press, REO
       Frances Blumenfeld, Supervisor

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Appendix K – Approval of Amendments

University of Essex

School of Health and
Human Sciences
T 01206 872854
F 01206 873765
E hhs@essex.ac.uk

Colchester Campus
Wivenhoe Park
Colchester CO4 3SQ
United Kingdom
T 01206 873333
F 01206 873598

www.essex.ac.uk

03 March 2014

MS E. BAKES

Dear Elisabeth,

Re: Amendment to Ethical Approval Application (Ref 12069)

Further to your application for an amendment to the above ethical approval application, I am
writing to confirm that the amendments outlined in the attached letter have now been
approved by Dr Wayne Wilson on behalf of the Faculty Ethics Committee.

Yours sincerely,

Mel Wiltshire
Ethics Administrator
School of Health and Human Sciences

cc.   Sarah Manning-Press, REO
        Frances Blumenfeld, Supervisor

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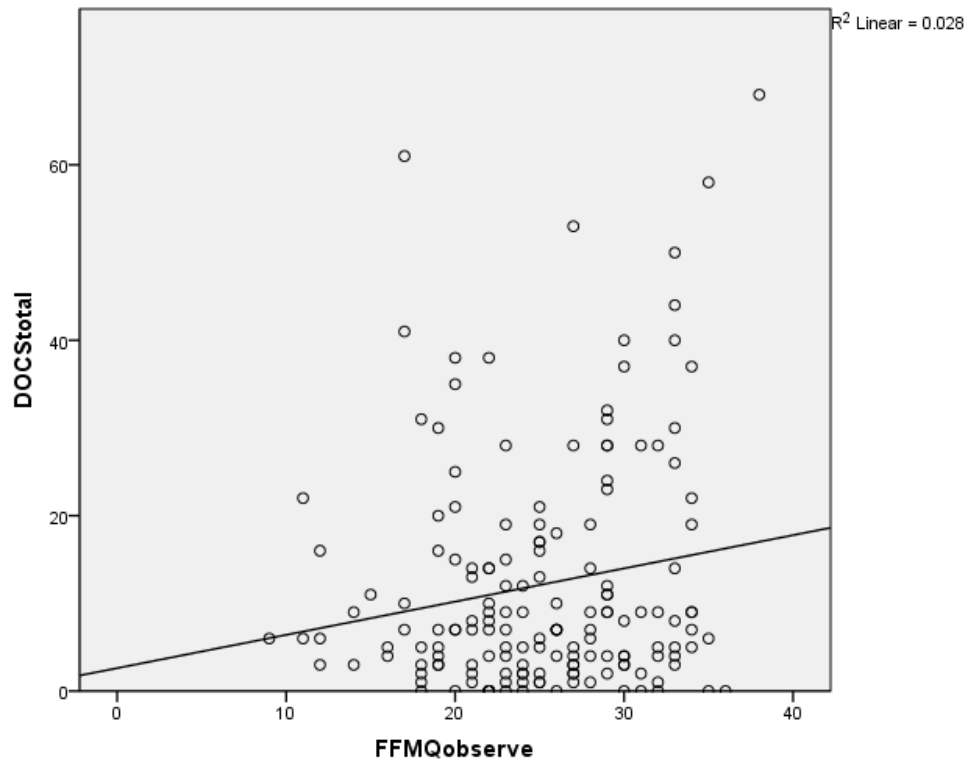2009
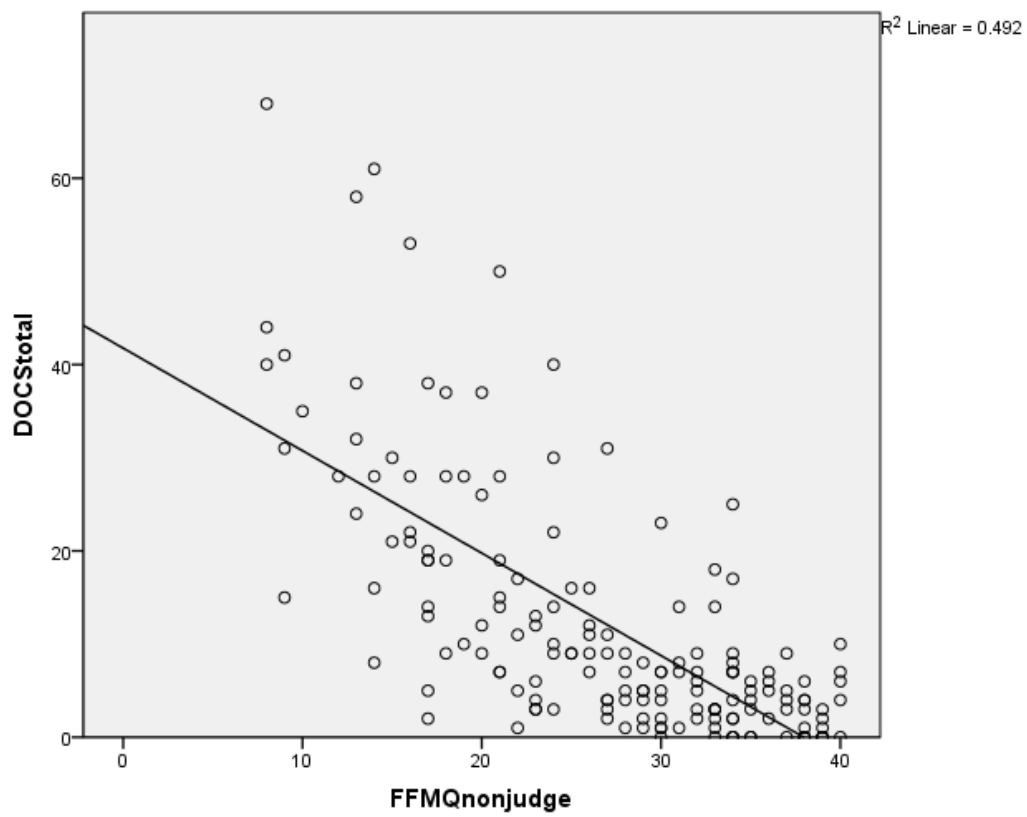
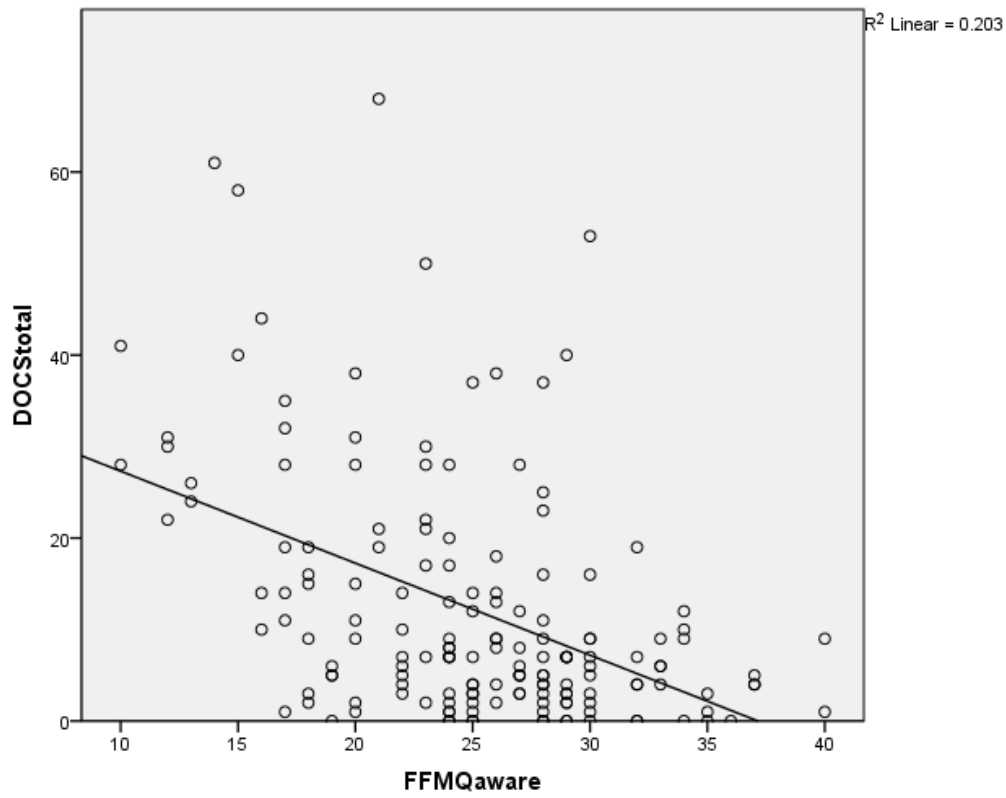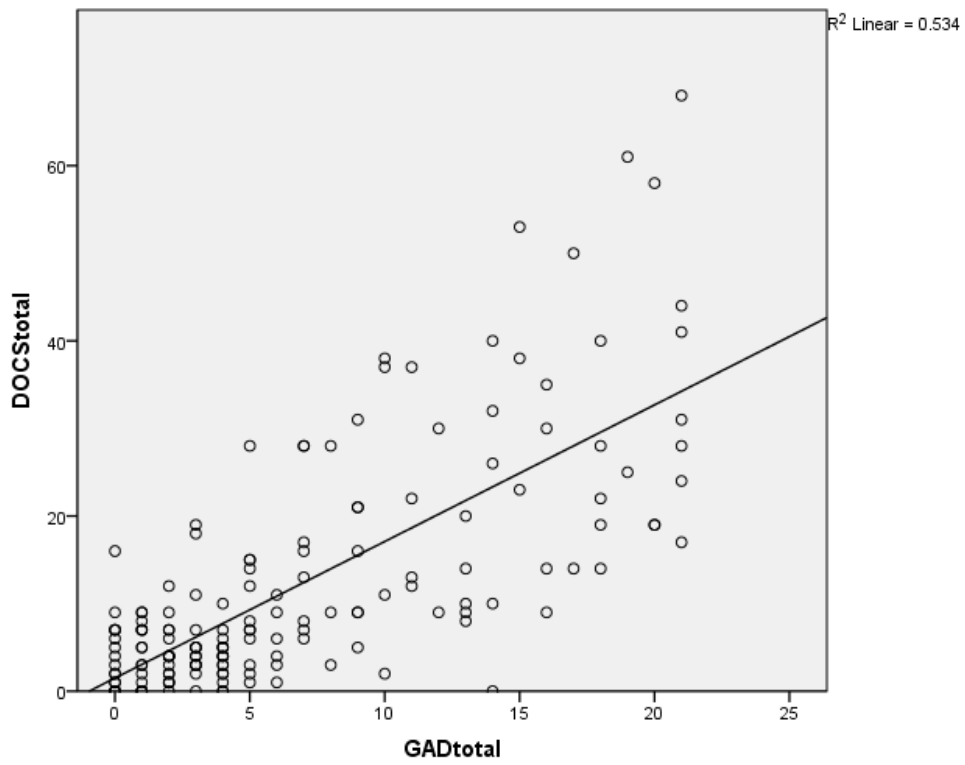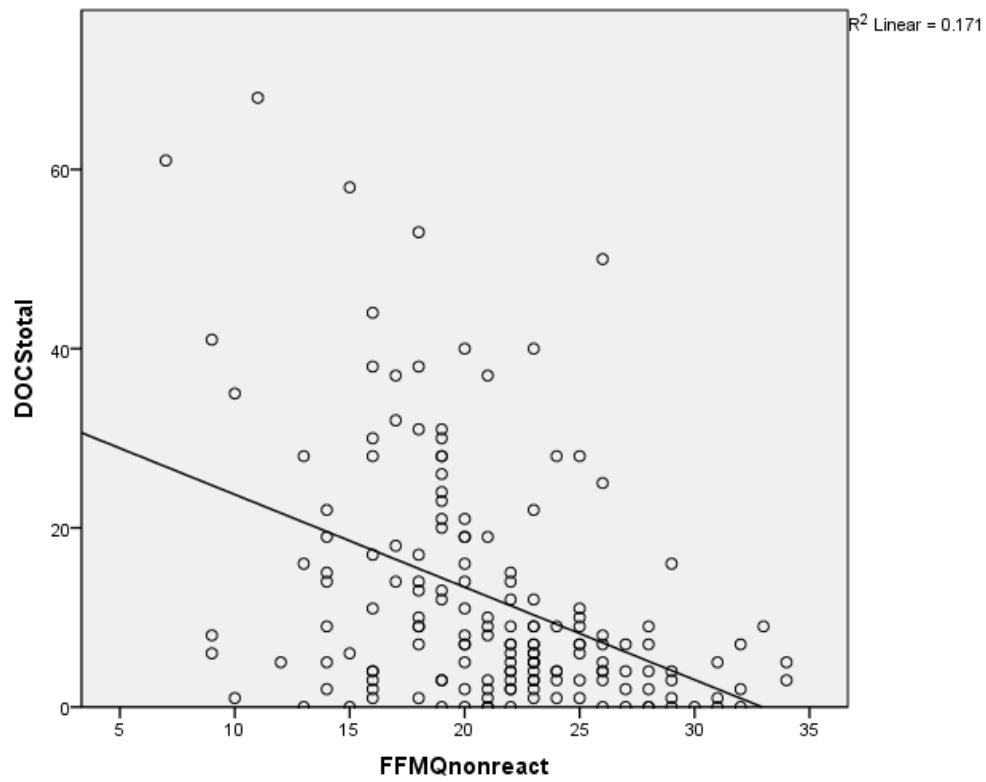## Appendix L – Histograms and P-P plots for each variable
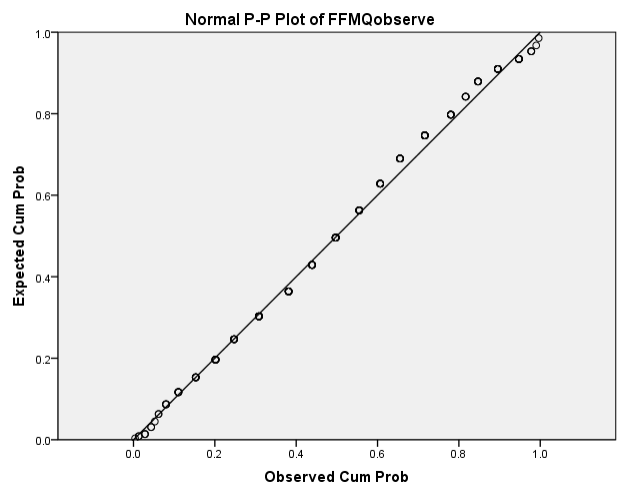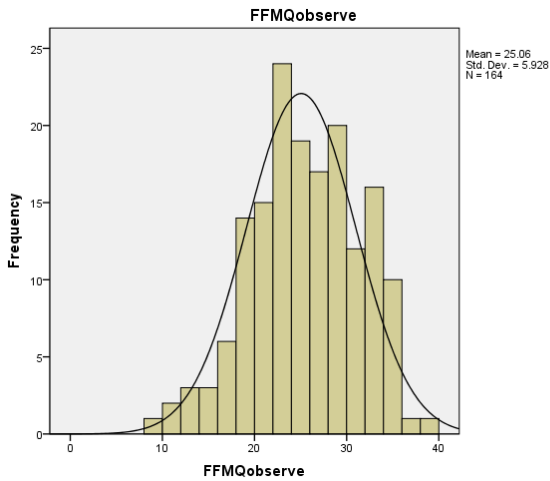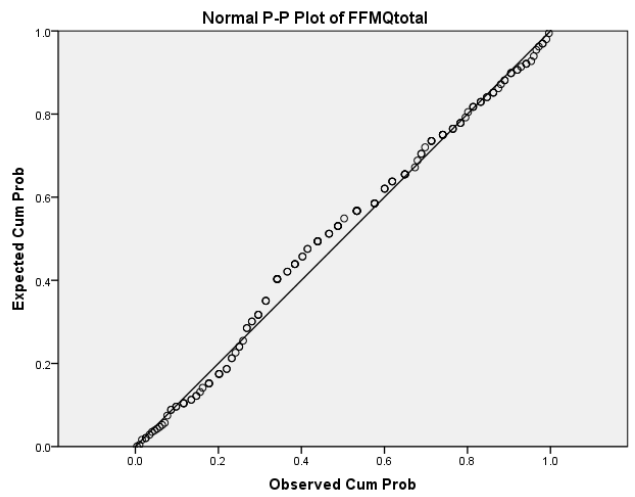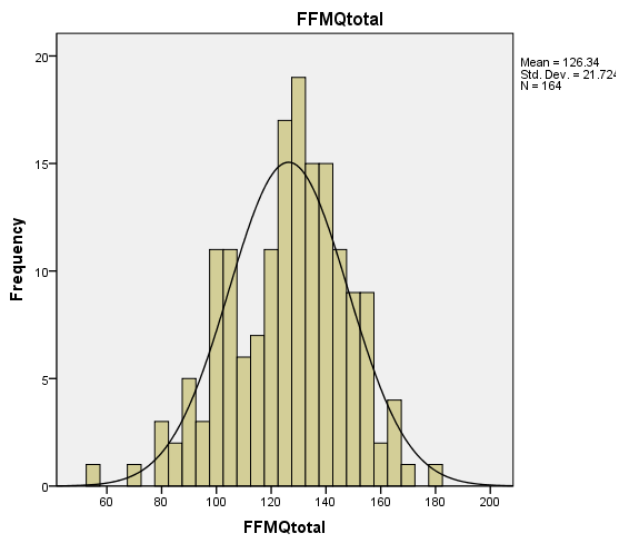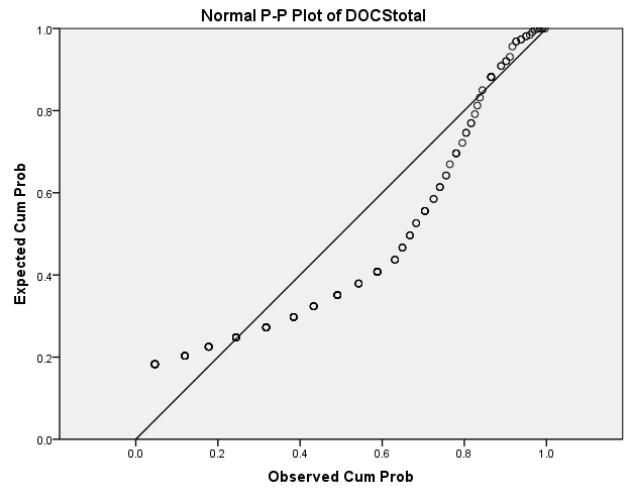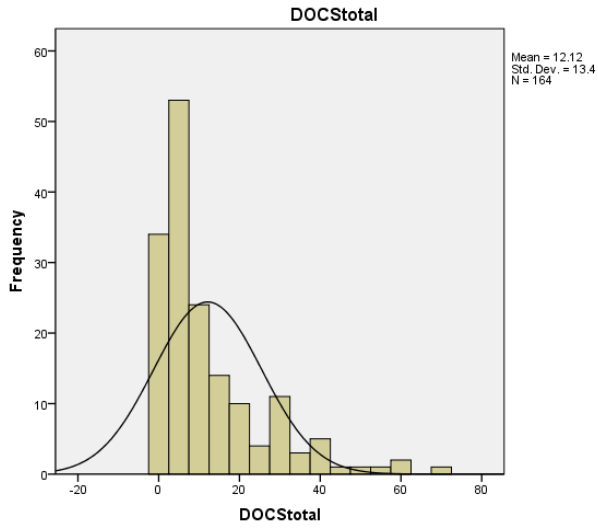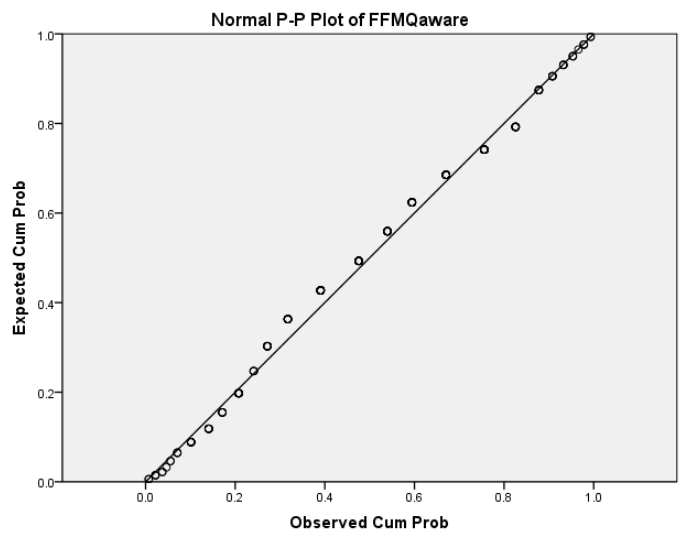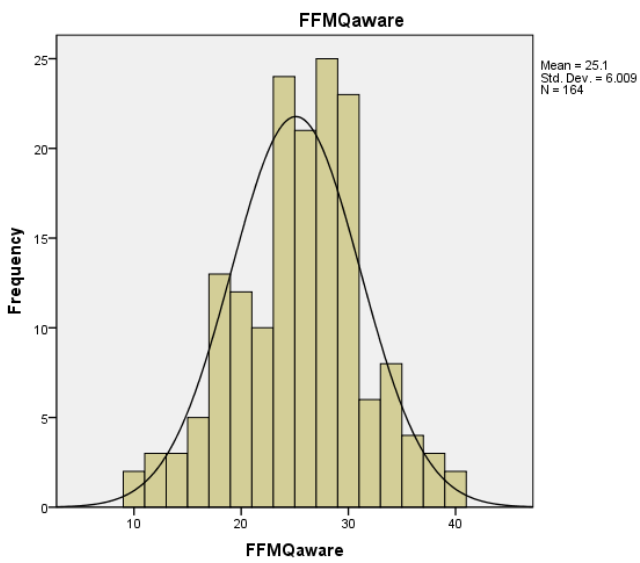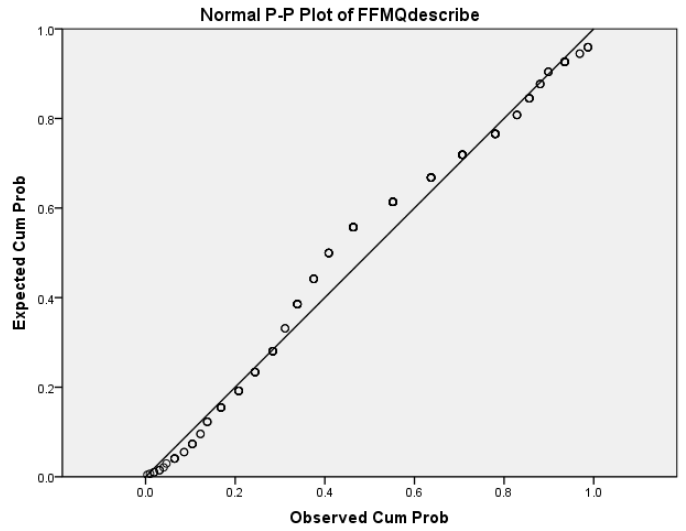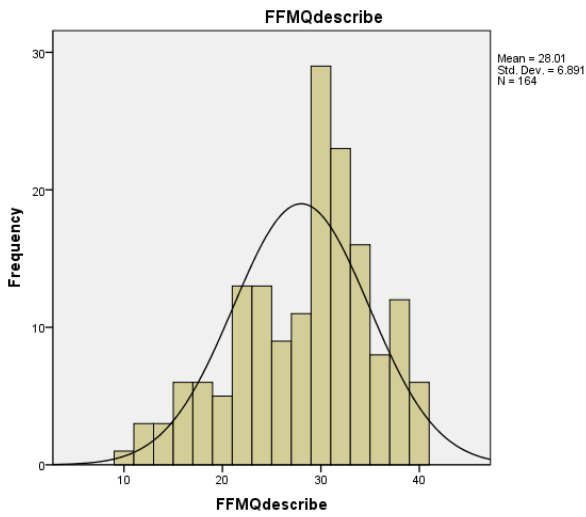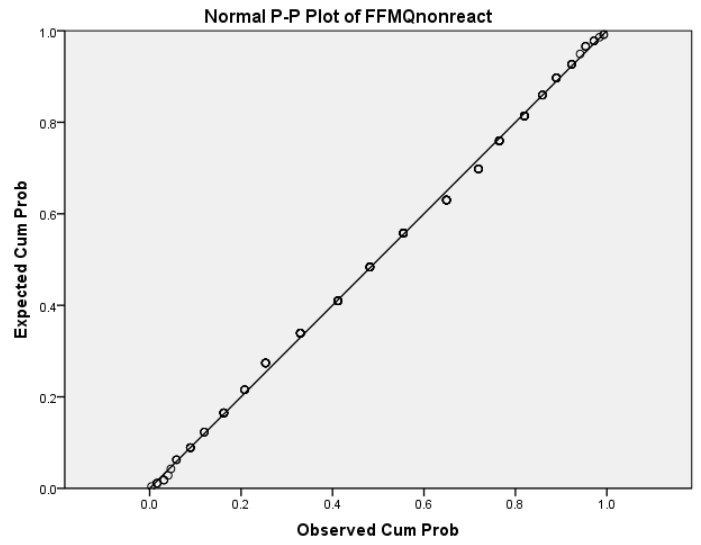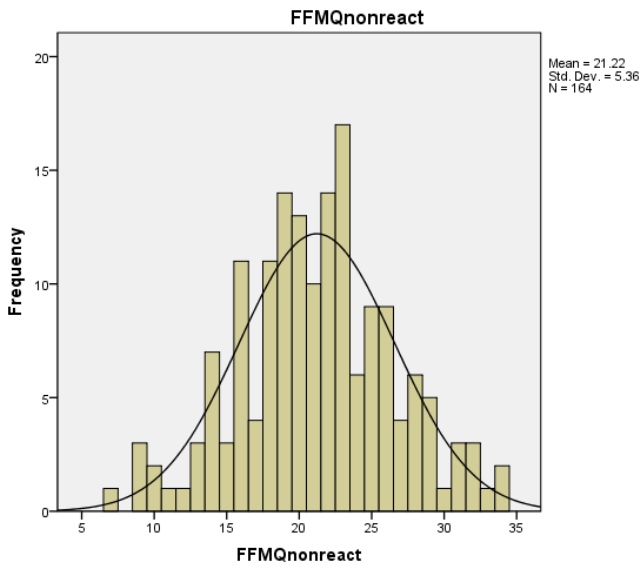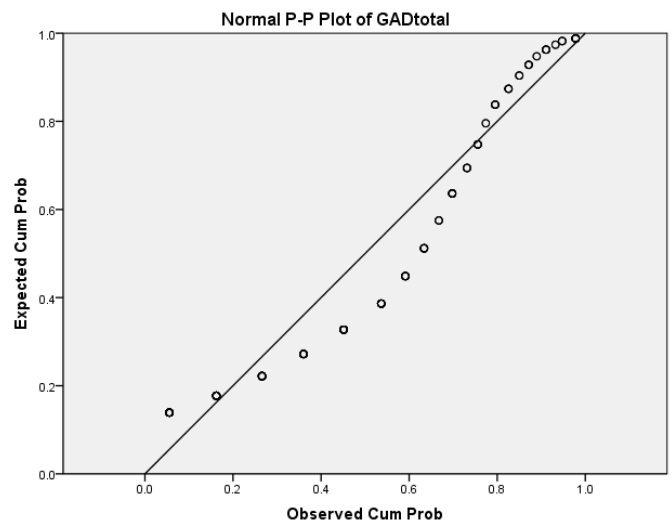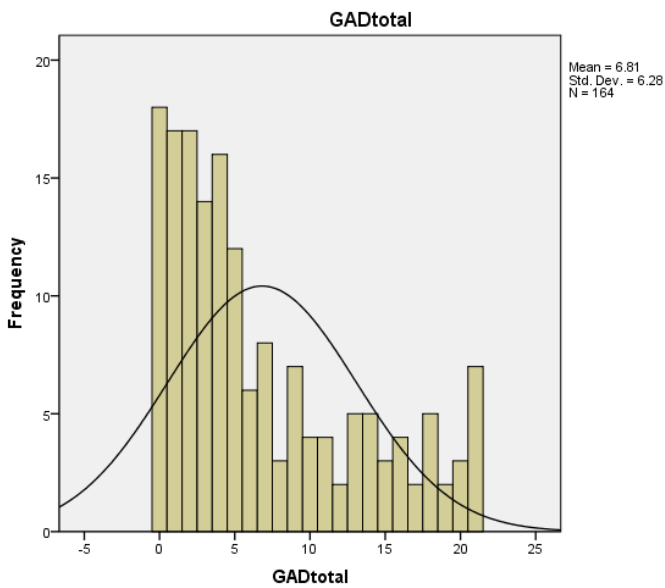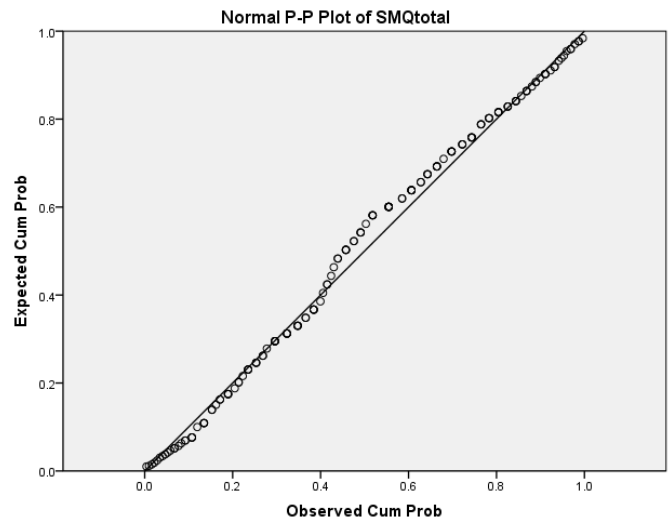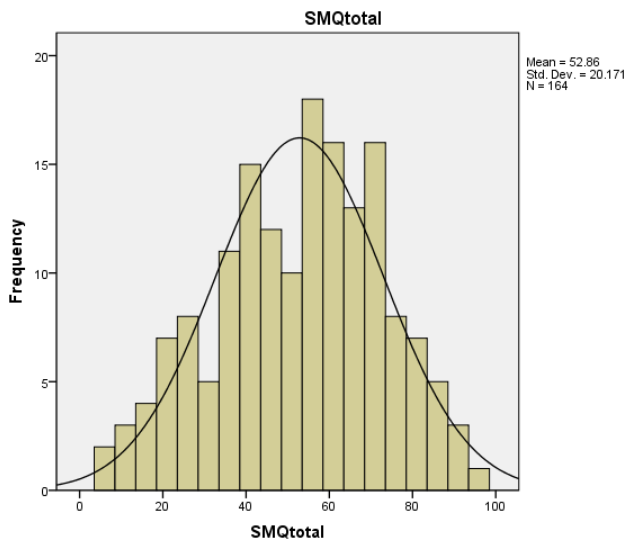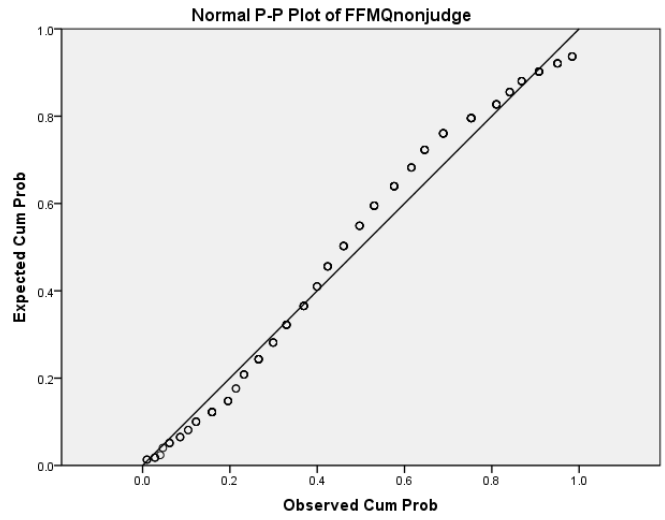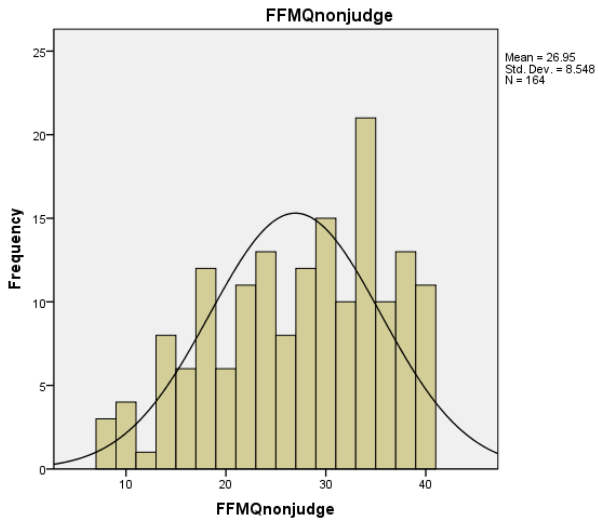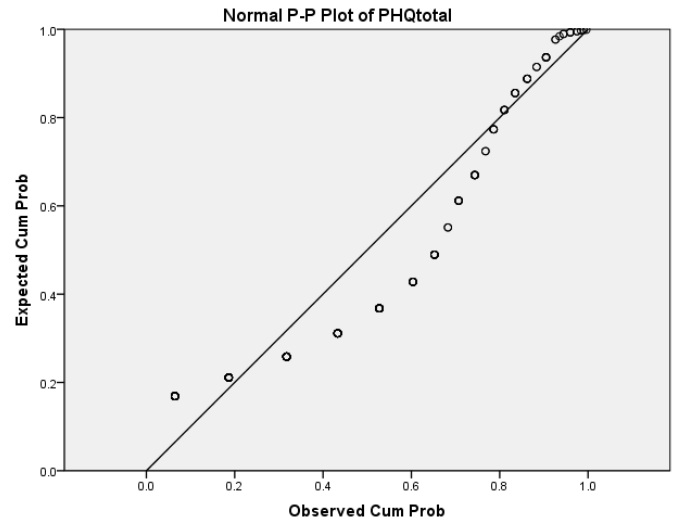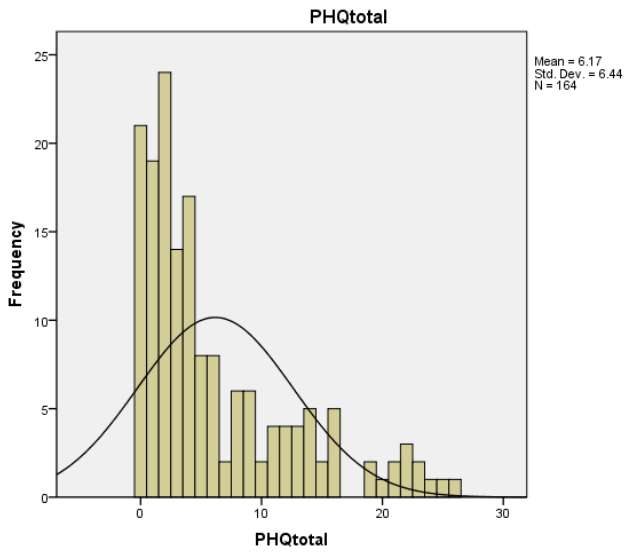
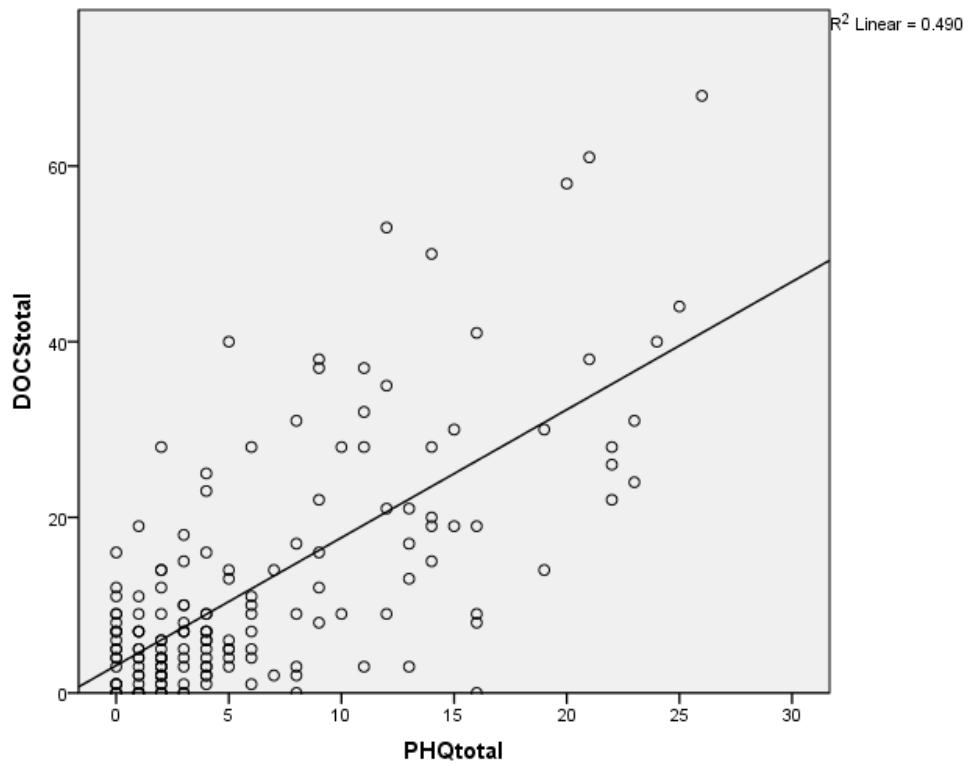**Appendix M – Scatterplots for OC measure versus mindfulness, anxiety and depression measures**
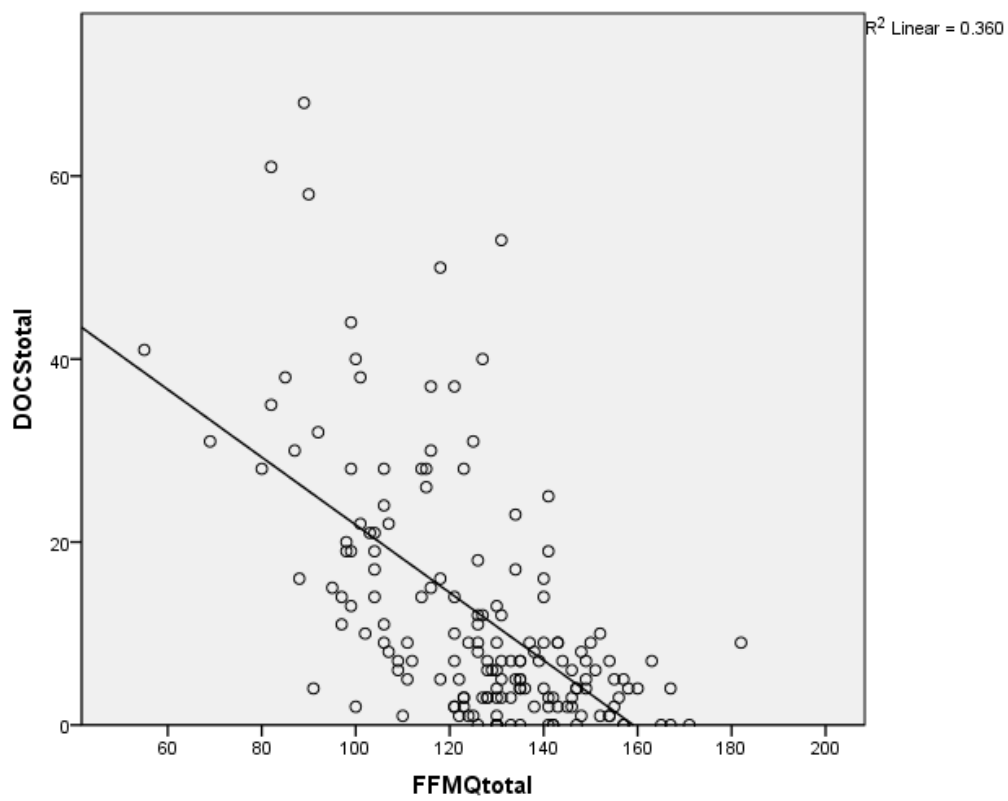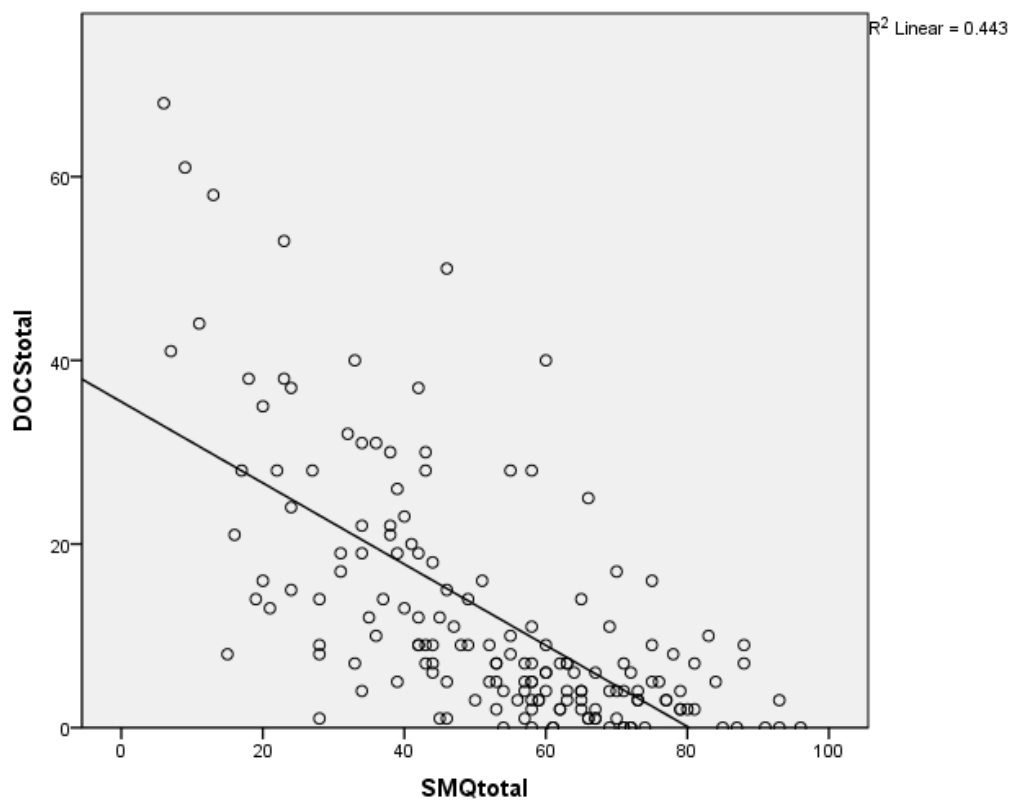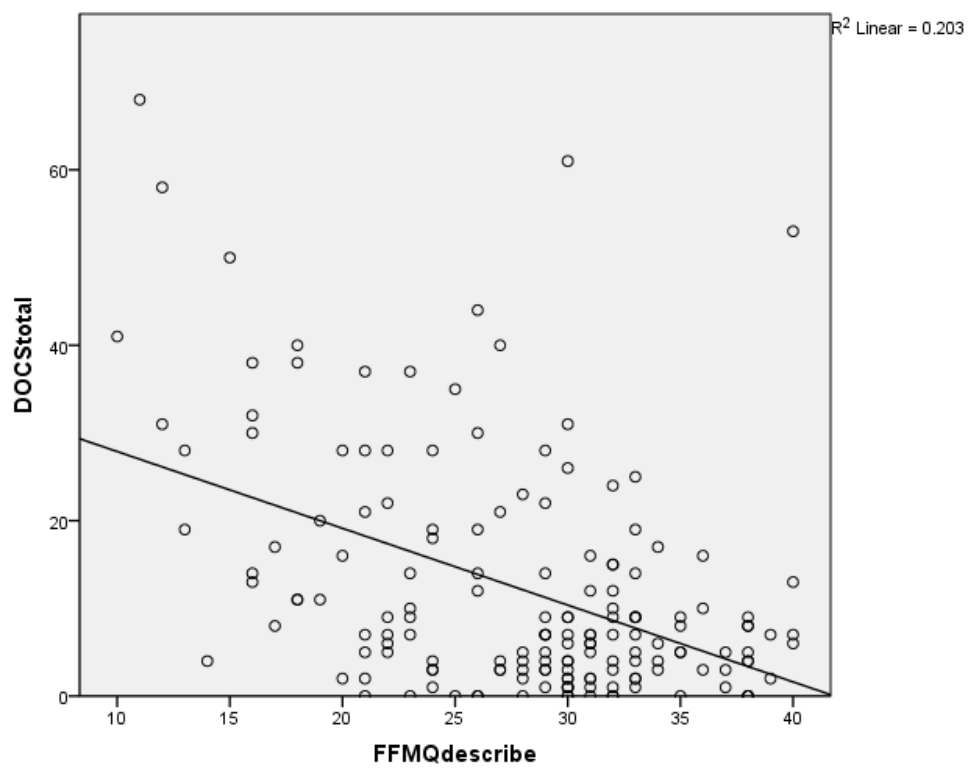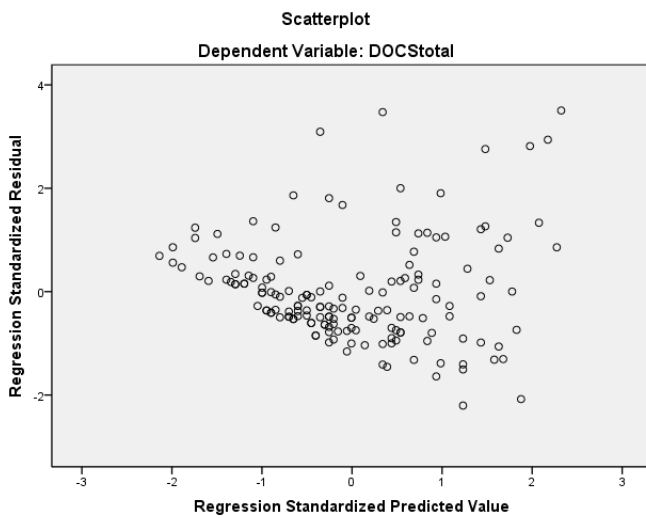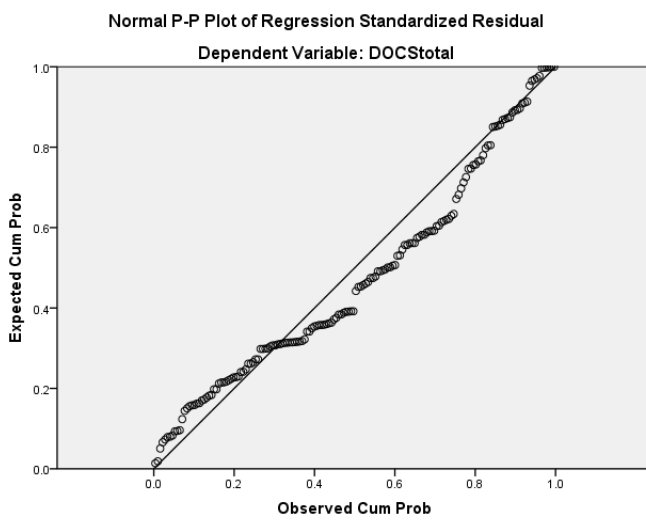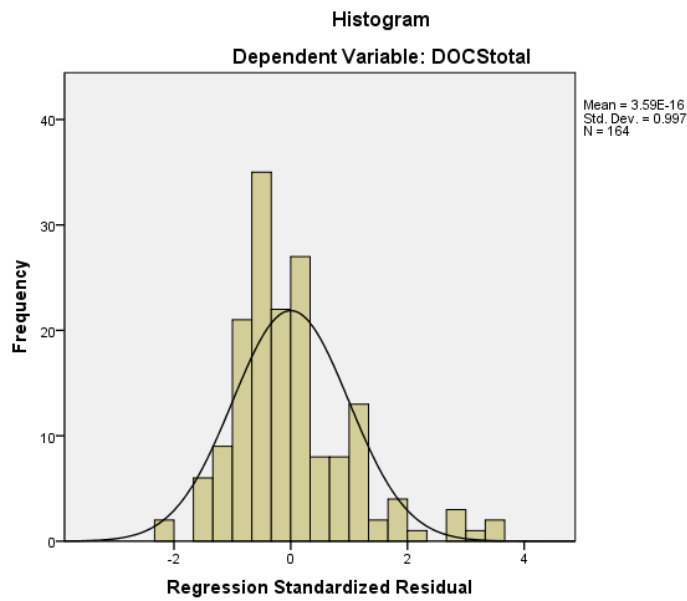
Appendix N

Appendix Table 1

Spearman's rho correlation coefficients for OC symptoms (DOCS), Mindfulness measures FFMQtotal, FFMQobserve, FFMQdescribe, FFMQaware, FFMQnonjudge, FFMQnonreact, and SMQ; anxiety (GAD-7) and depression (PHQ-9)
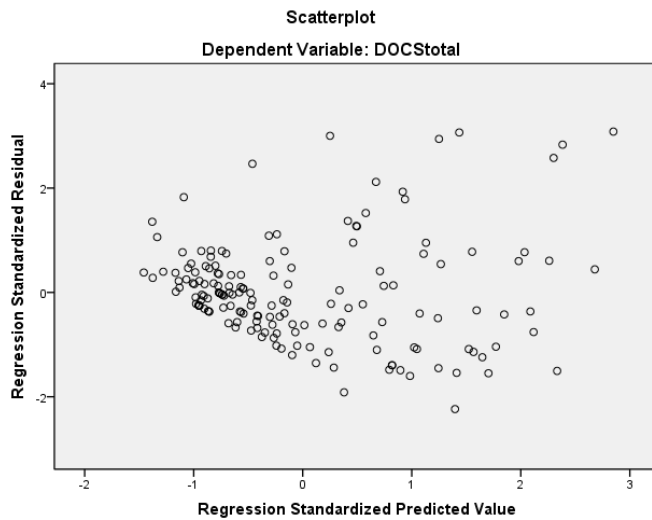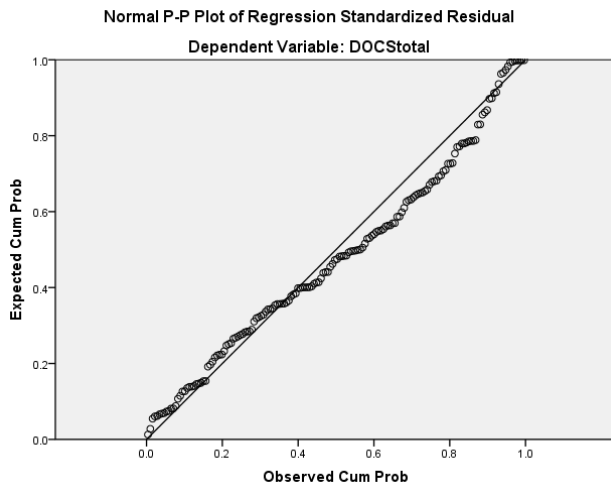
Variables	1	2	3	4	5	6	7	8	9	10
1. DOCS	-									
2. FFMQtotal	-.593***	-								
3. FFMQobserve	.098	.302***	-							
4. FFMQdescribe	-.353***	.698***	.143	-						
5. FFMQaware	-.424***	.687***	-.006	.332***	-					
6. FFMQnonjudge	-.701***	.739***	-.118	.346***	.553***	-				
7. FFMQnonreact	-.400***	.748***	.251**	.457***	.366***	.458***	-			
8. SMQ	-.678***	.740***	-.024	.359***	.507***	.795***	.670***	-		
9. GAD-7	.703***	-.637***	.083	-.382***	-.612***	-.631***	-.459***	-.657***	-	
10. PHQ-9	.577***	-.576***	.084	-.337***	-.631***	-.540***	-.396***	-.579***	.773***	-

Note. *** $p<.001$, ** $p<.01$, * $p<.05$, (2-tailed)

Appendix O – Assumption Testing for Hypothesis 5.1

Histogram

Dependent Variable: DOCStotal

Mean = 3.59E-16
Std. Dev. = 0.997
N = 164

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DOCStotal

Scatterplot

Dependent Variable: DOCStotal

Appendix P – Assumption Testing for Hypothesis 5.2

Histogram

Dependent Variable: DOCStotal

Mean = -1.21E-16
Std. Dev. = 0.988
N = 164

Frequency

Regression Standardized Residual

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DOCStotal

Expected Cum Prob

Observed Cum Prob

Scatterplot

Dependent Variable: DOCStotal

Regression Standardized Residual

Regression Standardized Predicted Value

Appendix Q – Assumption Testing for Hypothesis 5.3

Histogram

Dependent Variable: DOCStotal

Mean = 1.13E-17
Std. Dev. = 0.985
N = 164

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DOCStotal

Scatterplot

Dependent Variable: DOCStotal