

# The Efficacy of Danger Ideation Reduction Therapy for an 86-Year Old Man with a 63-Year History of Obsessive-Compulsive Disorder: A Case Study

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**Abstract**—While OCD is one of the most commonly occurring psychiatric conditions experienced by older adults, there is a paucity of research conducted into the treatment of older adults with OCD. This case study represents the first published investigation of a cognitive treatment for geriatric OCD. It describes the successful treatment of an 86-year old man with a 63-year history of OCD using Danger Ideation Reduction Therapy (DIRT). The client received 14 individual, 50-minute treatment sessions of DIRT over 13 weeks. Clinician-based Y-BOCS scores reduced 84% from 25 (severe) at pre-treatment, to 4 (subclinical) at 6-month post-treatment follow-up interview, demonstrating the efficacy of DIRT for this client. DIRT may have particular advantages over ERP and pharmacological approaches, however further research is required in older adults with OCD.

**Keywords**—Cognitive Therapy, Danger Ideation Reduction Therapy, Obsessive-Compulsive Disorder, Older adults, Psychogeriatrics

## I. INTRODUCTION

**O**BSESSIVE-COMPULSIVE DISORDER (OCD) is one of the leading mental health problems in Australia, with a 12-month prevalence rate of 1.9% in the general population [1]. Individuals with OCD experience intrusive and unwanted obsessions, and/or repetitive, and time-consuming compulsions. It is a particularly disabling condition with a high burden of disease and injury [2] and impairment in functioning across a number of domains is demonstrated [3]. For the majority of individuals with OCD, onset occurs before early adulthood [4], [5]. However, while the onset of OCD after the age of 50 years is considered to be rare [6], significant numbers of elderly people are likely to be living with this disorder [7], [8]. For example, Grenier et al [9] conducted a survey of 2798 community dwelling adults aged 65 years and over and classified over 1.5% of respondents as probable OCD cases.

In a second study Jenike [10] found that 22 (12%) of 183 patients who presented for OCD treatment were older than 50 years and 8 (4%) were older than 60 years.

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Thus, for a number of reasons, the true figure of OCD in older adults may be higher than previously thought [11].

One reason for this under-recognition of OCD in older adults is that the diagnosis may be complicated by the presence of other co-existing physical disorders [7]. Secondly, many elderly people with anxiety may have had their lifestyles, including their opportunities for pursuing social relationships restricted as a result of being more housebound due to the aging process and thus may not meet the specific criterion that symptoms interfere with daily living [12]. Finally, it is also recognised that OCD is a condition that often goes untreated for many years, or is inappropriately treated [13] and it is likely that in some instances older adults may have been living with the condition for many years, either without ever receiving treatment or after receiving ineffective or inadequate treatment [8].

Cognitive and behavioural treatment (CBT), particularly CBT packages that involve ERP have been shown to be effective for both children [14] and adults [15] with OCD. However, studies demonstrating the efficacy of CBT for OCD in the adult literature have generally excluded individuals over the age of 65 years from treatment trials [16], [17], [18]. It is recognised that there is a lack of research focusing specifically on the treatment of OCD in older adults [7], [11], [19], [20] and OCD research in older adults remains largely neglected [21]. As such, we cannot be certain about the suitability and effectiveness of approaches for treating this group, and which treatments are most beneficial. Research into the treatment of the anxious elderly is at a relatively early stage and advice about the treatment of anxiety in this population is likely to be based on personal clinical experience, or extrapolated from research employing younger age groups [22].

The provision of effective OCD treatment is particularly important for older adults since significant functional impairments as a result of OCD symptoms have been noted in this population [9] that may place the person at risk of requiring aged care placement. This would have profound negative consequences for both the individual and the health care system in regard to resourcing and financing this care. The population in Australia is aging and it is estimated that by 2056 the number of individuals aged over 65 will increase from the current 2.4 million to 6.4 million [1]. With this considerable rise in the number of elderly residents it can be expected that the effective treatment of OCD in older adults will become an even more pressing issue.

While research investigating the treatment of OCD in older adults is scarce, findings that provide some support for the efficacy of ERP for the elderly OCD have been reported.

Carmin et al [23] compared ten adults aged over 60 years with ten young adults matched for sex, depression and clinical severity and found no significant differences between groups in treatment response to ERP. The effectiveness of a combined treatment approach involving ERP and the pharmacological agent venlafaxine in a 77-year-old woman with severe OCD was demonstrated by Velayudhan and Katz [24]. Her Y-BOCS score reduced from 36 at pre-treatment to 9 at the end of the three months of treatment. This study demonstrated the occurrence of late onset OCD in the absence of any brain abnormality and also confirms that the use of traditional OCD treatment approaches can successfully ameliorate the condition. However, as noted by Carmin et al [23] pharmacological treatment of the elderly OCD client needs to be carefully considered as it can be complicated by a number of factors. These include age related changes in response to the pharmacokinetic and pharmacodynamic properties of drugs and the relatively high medical comorbidity that can lead to a greater use of additional medications which can interact with drugs used for treating OCD. Fortunately, there are a number of case studies that provide support for the effectiveness of ERP alone for adults older than 70 years [7], [11], [20].

Calamari and Cassiday [7] reported the successful treatment of two older adults with OCD using ERP. In the first case some modifications to the ERP treatment were employed for the 77-year old patient, such as the use of diaphragmatic breathing and relaxation skills to assist with managing the severe anxiety and feared bodily sensations during some exposure sessions. The second case involved an 86-year old female with severe OCD symptoms that she had experienced since the age of five years. ERP involved weekly sessions over eight weeks, instead of multiple sessions per week as her physician was concerned about her hypertension and felt that an exposure protocol that was too intensive would be overly physically taxing for the client. While the client continued to have pronounced OCD symptoms she was happy with her progress and the lessening of OCD symptoms that had occurred.

Carmin and Wiegartz [20] also describe two cases of older adults with severe OCD who received inpatient ERP treatment. Mr X was a 78-year old male with a recent onset of OCD whose rituals occupied him for up to eight hours a day. He had previously received outpatient ERP and pharmacological treatments for his OCD, without long-term benefit. The existence of physical health problems including hypertension and basal ganglia infarcts were noted and treatment was modified accordingly. For example, ERP was not commenced until his hypertension was medically controlled. Instead he was taught progressive muscle relaxation training and diaphragmatic breathing as anxiety management strategies to help minimise blood pressure elevation. His Y-BOCS at pre-treatment was 24, and at 12 weeks post-treatment the Y-BOCS was two. Given that Mr X had difficulties with abstraction, possibly as a result of his basal ganglia infarcts, treatment also involved the repetition and simplification of psycho-educational interventions to facilitate understanding and retention.

The second patient, Mr Y was a 74-year old male who experienced OCD onset approximately six decades earlier. He had previously been hospitalised for his OCD and been prescribed ECT and medications but had not undertaken psychological treatments. Both Mr X and Mr Y were seen for individual ERP sessions twice daily for 60 to 90 minutes. Mr Y's Y-BOCS was 40 at pre-treatment, 16 on the day he was discharged (day 23) and while there was no follow-up Y-BOCS score, it appeared that soon after returning home he had commenced ritualising to premorbid levels. While Mr Y experienced a relapse after discharge, overall both case studies demonstrate that these older adults made considerable progress during the treatment and as such, this provides further support for the role of ERP in the treatment of older adults with OCD.

A more recent published case study involved an 82-year old male named Oscar who was treated with ERP across 20 sessions [11]. His Y-BOCS score at pre-treatment was 18, and 13 at post-treatment Oscar received supportive treatment once a week after finishing the ERP protocol and at 3.5 months after completing ERP his Y-BOCS score was 4. At 12-month-follow-up Oscar reported no OCD symptoms and his Y-BOCS score was zero. Minor adaptations were made to the ERP program, for example, as he did not always remember to adhere to the response prevention plan, Oscar was given signs written in large font to place in his bathroom that reminded him how long he should spend washing his hands and "do not check the door" signs were also placed in his house. Additionally, Oscar's ERP program also involved a less stringent restriction of hand washing. This was argued to be important given that older adults may be more susceptible to contagious diseases. Since Oscar used a cane to assist with walking, the therapist selected rooms to conduct the therapy sessions in that were easily accessible and also had comfortable seating. Therefore, ERP with some age relevant modifications was very effective for an adult over the age of 80 years who had late-onset OCD with no identifiable neurobiological pathology. However, as Price and Salsman [11] noted, Oscar's OCD was of a relatively low degree of severity. They suggest that if Oscar had experienced a more severe OCD presentation it may not have been amenable to treatment. Additionally, since Oscar had lived with OCD for less than a year before receiving treatment the researchers suggest that an older adult with a more longstanding history of OCD may have not benefitted from treatment. While variables relating to illness course such as age of onset and duration of symptoms have generally been poor predictors of outcome [25], greater overall symptom severity has predicted poorer outcome in a number of studies in adult populations [26]. Therefore, further research involving older adults with more severe and longstanding OCD is required. While the case studies above demonstrate the efficacy of ERP for the elderly OCD patient some modifications to ERP treatment may be required. For example, exposure may need to be more gradual since the deliberate exposure to obsessional cues with prevention of the compulsive behaviour is likely to lead to elevated anxiety [7]. As such exposure sessions need to remain within reasonable safety parameters [27].

Therefore, ERP may not be appropriate for some clients with OCD, particularly clients who have significant cardiovascular disease. Additionally, from the general OCD treatment literature it is well understood that due to the anxiety provoking nature of ERP, large numbers of clients either refuse to participate or drop out of ERP prematurely. For example, Foa et al [28] reported a 21% refusal rate and 27% dropout rate for their ERP treatment. When treatment refusal and dropout figures are taken into account, the true rate of treatment response to ERP may be as low as 50% [29]. While no research to date has examined older adults' willingness to engage in ERP, it is likely that rates of refusal and dropout will be similar to those in other age groups. As such, it is suggested that research investigating alternative OCD treatments for the elderly client, such as cognitive therapy, in which prolonged and repeated exposure is not required is urgently needed.

Unfortunately, while there is a lack of research examining the effectiveness of psychological treatments such as ERP for the older adult, there is an even greater paucity of research investigating cognitive therapy interventions for this group. Some case reports have documented the effectiveness of treatment approaches that include a combination of behavioural and cognitive interventions. For example Hirsch et al [27] successfully used a combination of ERP, psycho-education and cognitive restructuring when treating an 80-year old man who had a 50-year history of OCD. However, to our knowledge no studies examining the treatment of OCD for older adults that have employed cognitive therapy alone have been published. We aim to make an important contribution to the literature in this area by presenting the case study of an 86-year old male with longstanding OCD who received the cognitive therapy package Danger Ideation Reduction Therapy (DIRT). This represents the first published report of the use of cognitive therapy for an older adult with OCD.

DIRT was originally developed in the mid-1990s to treat obsessive-compulsive (OC) washing symptoms [30], [31] and consists of six discrete treatment components. DIRT does not involve direct or indirect exposure. Therefore, unlike ERP therapy DIRT does not require the client to endure high levels of anxiety in order to achieve behaviour change. Instead, behaviour change occurs as a natural consequence of cognitive change. The effectiveness of DIRT for OCD has been investigated in ten publications; including: two randomised controlled trials (RCT) [32], [33], one multiple baseline case series [34], one uncontrolled case series [30], one naturalistic study [35] and five single case reports [36], [37], [38], [39], [40]. All of these trials found strong support for the effectiveness of DIRT for OCD.

For example, Krochmalik et al [33] found that DIRT produced significantly greater reductions in OC symptomatology than ERP and had lower dropout rates than ERP.

Recently, the DIRT package was modified to treat people with the OC checking subtype [41]. In an initial trial conducted by Vaccaro et al [42], three adult OC checkers all aged below 55 years received DIRT in 12-14 individual one hour sessions conducted by a clinical psychologist.

At post-treatment, substantial and clinically significant reductions in scores on a range of standardized outcome measures of OCD symptom severity were apparent for all three participants. These improvements were maintained at four-month follow-up. Overall, there is considerable evidence since 1997 supporting the usefulness of DIRT. While DIRT has not previously been trialled in cases of geriatric OCD, it is hypothesised that DIRT will result in significant improvements in OCD symptoms in the current single case study.

## II. METHOD

### A. Participant

David<sup>1</sup> was an 86-year-old married, retired man who reported a 63-year history of OCD. He had no history of any involvement with mental health services and had not previously undertaken treatment for OCD. He had undergone cardiac surgery in 2008 and had severe osteoporosis. He was taking medications for these physical conditions. David presented to the University of Sydney Anxiety Clinic to take part in a 14-week randomized controlled trial investigating the efficacy of two treatments ERP and DIRT for OCD checking subtype. The trial was authorised by the University of Sydney Ethics Committee.

### B. Pre-Treatment Baseline Assessment

David met DSM-IV-TR [43] criteria for a current diagnosis of clinical OCD using the CIDI Auto v2.1 [44] and presented with a number of OCD concerns. His predominant OCD symptoms involved repeated checking. He checked household taps as he was concerned about wasting water, checked door locks as he was fearful that he would be robbed and checked electrical appliances including the stove, kettle, iron, heater as he was concerned about the possibility that a fire would start and burn down the house. He also checked letters and emails he had written before sending them in case he had written the wrong thing and was concerned that he had offended people when interacting with them. He also checked the car speedometer when his wife was driving as he was concerned that his wife would speed and get a speeding fine. If he fixed things he doubted whether he had done this correctly so would check for example whether the screw was on tightly enough. He had largely given up driving as he was concerned that he could harm others if he was not careful enough. He also frequently asked his wife to perform checks of electrical appliances and doors on his behalf and regularly sought reassurance from his wife. David also met DSM-IV-TR [43] criteria for a current diagnosis of clinical OCD using the CIDI Auto v2.1 [44].

David completed the following clinician and self-report measures at baseline, post-treatment and 6-month follow-up. The clinician-administered measures were obtained by the third author who was blind to the nature of the treatment received.

<sup>1</sup> David is not the client's real name.

### C. Measures

#### 1. Yale-Brown Obsessive Compulsive Scale (Y-BOCS) [45], [46]

The Y-BOCS [45], [46] is a 10-item clinician administered questionnaire that assesses the nature and severity of OCD. Each question is scored on a 4-point Likert scale (0; no symptoms–4; severe symptoms). Total scores range from 0-40 and higher scores reflect greater impairment. It is considered the gold standard of OCD assessment. A recent international OCD working group defined recovery on the Y-BOCS as a score of 7 or less [47] which reflects an almost total absence of OCD symptomatology.

#### 2. Obsessive-Compulsive Inventory-Revised (OCI-R) [48]

The OCI-R [48] was employed to measure symptom change. The OCI-R is an 18-item revision of the original OCI [49]. Six three-item scales assess Checking, Washing, Ordering, Obsessing, Neutralizing, and Hoarding. Responses are provided on a 5- point scale ranging from 'not at all' to 'extremely'. Research by Foa et al [49] supports internal consistency (median alpha = .75 and one-week retest correlations ranged from .74 to .91. The participant's checking scores were obtained by summing the ratings he gave on the items contained on the checking subscale of the inventory. Possible scores on the checking subscale range from 0 to 12, with higher scores indicating a higher level of checking compulsions.

#### 3. Beck Depression Inventory-II (BDI-II) [50]

The BDI-II [50] is a 21-item self-report scale that yields possible scores from 0 to 63 and is the most widely used measure of depression in clinical and research settings. The BDI-II has demonstrated excellent internal consistency in samples of psychiatric outpatients (.92) [51] and college students (.89) [52]

### D. Treatment

David was randomly allocated to the DIRT condition. This intervention was based on the DIRT package described by Vaccaro et al [41] and involves six components. DIRT is a cognitive package and does not include any exposure or behavioural experiments. Treatment consisted of 50-minute weekly treatment sessions for 12 weeks and two 50-minute sessions in week 13. The treatment was conducted by the second author, a licensed clinical psychologist.

During the first session a rationale and description of the method was presented. The treatment rationale demonstrated that the way situations are perceived can effect emotions. It was explained that ritualistic checkers believe that there is a high probability that death, disaster or injury will befall other people or themselves. For example, they may believe that fire or theft will occur due to them leaving an electrical appliance on or leaving a door open. This belief leads to feelings of anxiety and an intense fear when confronted with specific situations, such as leaving the house, or the active avoidance of coming in contact with these stimuli. If these excessive and erroneous danger beliefs, about probability and severity of harm can be eliminated, anxiety will reduce, and there will no longer be any need to engage in compulsive or avoidance

behaviours. From the second session a variety of DIRT components were introduced including the following:

*Attentional Focusing.* This procedure, described in detail by Clarke and Wardman [53], involved a focusing task that aimed to reduce the frequency of threat-related intrusive thoughts by increasing the participants' ability to attend to alternative cognitive targets in a rhythmic breathing exercise. It assists the client to focus their attention thereby decreasing the number of intrusive thoughts and the intensity of these thoughts. The client is taught this technique by the therapist and expected to practice this twice daily for 10 minutes.

*Cognitive Restructuring.* This component combined elements of systematic rational restructuring [54] and rational-emotive therapy [55] and was modelled on the procedures described by Mattick et al [56] and Menzies and Clarke [57]. David identified his irrational thoughts related to checking and was asked to re-evaluate these thoughts, changing them to be more realistic and adaptive to the demands of the situation. Once constructed, David was asked to rote-learn his reappraisals, reading and copying them on a daily basis for 15 minutes. In later sessions he was shown how to apply these reappraisals to novel situations. David received a minimum total of 90 minutes therapist facilitated practice of cognitive restructuring within sessions.

*Filmed Interviews.* David viewed filmed interviews relevant to his particular checking concerns, from a series of filmed interviews with various workers who had regular contact with checking-related stimuli. Interviewees included a bus driver, security guard, registered nurse, electrical appliance salesperson, laboratory pathologist and accountant. Each interviewee described in detail their repetitive work-related tasks that involve contact with OCD-related stimuli (e.g. demonstrating the use of electrical appliances to customers, driving a vehicle.). Workers were questioned about the frequency of negative outcomes occurring (e.g. robberies, electrical fires, vehicle accidents and injury). The absence of work-related harmful consequences was highlighted. David received a minimum of 40 min of this component within sessions.

*Double-Checking Experiments.* David was presented with the findings from studies examining the nature of OCD and doubt [58], [59]. The link between doubting memory and repetitive checking was demonstrated to participants from these reports. The therapist discussed the findings with David and explained how performing repeated checking behaviours can actually lead to reduced confidence in memory about whether a task had been performed. The relationship between this doubt in memory and future excessive checking behaviour was also made clear in this treatment component.

*The Probability of Catastrophe.* As described by Hoekstra [60], this procedure involved comparing David's initial estimates of the probability of a negative outcome with an estimate derived from an analysis of the sequence of events that are necessary for that feared event to occur. For example the David was asked to provide an initial estimate of the likelihood that his house would be robbed if one of the doors was left unlocked during the day when he was out. He was then asked to give estimates of the likelihood that each of the

sequence of events involved in such an outcome would occur. These include: the likelihood that this unlocked door can be seen from the street; that someone walking past sees that this door is unlocked; that this person is a thief and wants to break into the house at this time; that the thief would not think that someone must be home; that the thief would get into the house without being noticed by neighbours or passers-by; that the thief is able to gather up and carry their property out of the house without being noticed by neighbours or passers-by; and finally that the thief is able to get away from the home, carrying the stolen property before David returned home. The therapist then assisted David in calculating the probability that all of the required steps will occur concurrently (which would be necessary if the feared consequence were to occur). This involves multiplying the individual probabilities together. Discrepancies between the initial global estimate and that obtained through the probability sequencing task are highlighted and discussed.

*Corrective Information.* David received a set of fact sheets describing a wide range of subjects pertinent to checking, as well as information about normal 'non-checking' behaviour and the realistic consequences of such behaviour. The information highlights common misconceptions about the probability of harm as well as the severity of the harm that can realistically occur. Fact sheets include information about the odds of dying or suffering injury from various causes in the Australian population and the safety and security behaviours of everyday Australians. For example: rates of fires and burn injuries and the types of safety behaviours and levels of use when driving, when using electricity or gas, and for home security.

### III. RESULTS

Y-BOCS data were collected at baseline, post-treatment and 6-months follow-up. The scores on the Y-BOCS reduced 84% from 25 (severe) at baseline, to 4 (subclinical) at 6-month follow-up. Post-treatment Y-BOCS score was 9 (mild). For the OCI-R total scores reduced 34% from 41 at baseline to 26 at 6-month follow-up. On the checking subscale, which was David's dominant compulsive behaviour, scores reduced 38% from 8 to 5. BDI-II scores reduced 21% from 19 at baseline to 15 at 6-month follow-up.

At the end of treatment David indicated he was very happy with the progress he had made and commented that his life would have been so much better if he had received treatment all those years ago. At both post-treatment and follow-up David no longer met DSM-IV-TR [43] criteria for OCD using the CIDI Auto v2.1 [44].

### IV. DISCUSSION

This case study represents the first published investigation of a cognitive treatment for geriatric OCD. It documents the successful treatment of an 86-year old man with a 63-year history of this disorder. After only 14 DIRT sessions David no longer met diagnostic criteria for OCD. The results are extremely promising and suggest that while much more

research in this area is needed, DIRT appeared to be both an acceptable and successful treatment for an older adult with severe OCD. Additionally, DIRT is an exposure free treatment and so does not require clients to experience excessive anxiety in order to alleviate their symptoms. This is particularly important for the elderly OCD client living with cardiovascular disease since previous case reports have described necessary modifications to standard ERP so that exposure sessions are kept within safe parameters [7], [27]. Since cardiovascular disease is very common in the elderly, DIRT may be a more appropriate treatment for elderly clients.

Some age related considerations were required for David during treatment. David had some mobility problems and required a cane when walking. As our clinic is on the ground floor of a building with a car park located very close to the clinic entrance we did not have to schedule David's therapy in a different location, but depending on the location of the clinic other elderly clients may require their scheduled therapy to take place in a different location. David was unable to drive himself to the clinic and required either his daughter or community transport staff to drive him, so it needs to be recognised that some older adults, particularly those without family or community supports may not be able to physically access treatment. In regard to client comfort while in the clinic, we ensured that a comfortable chair of appropriate height was provided for David during each session. When working with older adults with OCD we suggest that possible modifications to treatment should be considered on a case-by-case basis.

A Mini Mental State Examination was not undertaken prior to David's treatment, but there was no evidence of memory impairment during treatment. Calamari and Cassidy [7] used signs written in large font for their ERP treatment reminding the client how long he should spend washing his hands, but reminders for DIRT homework exercises were not seen as necessary for David. Since the DIRT package contains written information sheets and homework exercises and worksheets, so such prompts may not be required with this mode of treatment.

While David did not appear to experience any cognitive impairment it is likely that some older adults with OCD may experience memory or other cognitive deficits. This could pose complications that would significantly impact on their ability to benefit from cognitive treatments like DIRT, since cognitive therapy requires that the client is able to think logically and recall information. Therefore we suggest that appropriate assessment takes place prior to therapy commencement. Additionally, since DIRT packages have been developed for people whose clinical features predominantly involve either checking [41] or washing concerns [31], DIRT would not be suitable for older adults who have other clinical presentations.

### V. CONCLUSION

In conclusion, the findings reported in this case study demonstrate that DIRT may be as beneficial for older adults as it has been found for younger adults [32], [42] and may have

particular advantages over ERP and pharmacological approaches. Clearly, future research is needed to assess whether this optimism is warranted.

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#### REFERENCES

- [1] Australian Bureau of Statistics, *Australian Social Trends: Future population growth and ageing, Cat. no. 4102.0*. Canberra: Author, 2009.
- [2] C. Mathers, T. Vos, and C. Stevenson, *The burden of disease and injury in Australia*. Canberra: Australian Institute of Health and Welfare, 1999.
- [3] J. L. Eisen, M. A. Mancebo, A. Pinto, M. E. Coles, M. E. Pagano, R. Stout, et al., "Impact of obsessive-compulsive disorder on quality of life," *Comprehensive Psychiatry*, vol. 47, no. 4, pp. 270-275, 2006.
- [4] K. C. Burke, J. D. Burke, D. A. Regier, and D. S. Rae, "Age at onset of selected mental disorders in five community populations," *Arch. Gen. Psychiatry*, vol. 47, pp. 511-518, 1990.
- [5] S. A. Rasmussen and J. L. Eisen, "The epidemiology and clinical features of obsessive-compulsive disorder," *Psychiatric Clin. North Am.*, vol. 15, pp. 743-759, 1992.
- [6] A. P. Weiss and M. A. Jenike, "Late-onset obsessive-compulsive disorder: A case series," *J. Neuropsych. Clin. Neurosci.*, vol. 12, no. 2, pp. 265-268, 2000.
- [7] J. E. Calamari and K. L. Cassiday, "Treating obsessive-compulsive disorder in older adults: A review of strategies", in *Handbook of counseling and psychotherapy with older adults*, M. Duffy, Ed. New York: Wiley, 1999, pp. 526-538.
- [8] M. A. Jenike, "Geriatric obsessive-compulsive disorder," *Geriatr. Psychiatry Neuro.*, vol. 4, pp. 34-39, 1991.
- [9] S. Grenier, M. Préville, R. Boyer, and K. O'Conner, "Prevalence and correlates of obsessive compulsive disorder among older adults living in the community," *J. Anxiety Disord.*, vol. 23, pp. 858-865, 2009.
- [10] M. A. Jenike, "Obsessive-compulsive disorders in the elderly," in *Geriatric psychiatry and psychopharmacology: A clinical approach*, M. A. Jenike, Ed. Chicago: Year Book Medical Publishing, 1989, pp. 339-362.
- [11] M. C. Price and N. L. Salsman, "Exposure and response prevention for the treatment of late-onset obsessive-compulsive disorder in an 82-year-old man," *Clin. Case Studies*, vol. 9, no. 6, pp. 426-441, 2010.
- [12] A. J. Flint, "Epidemiology and comorbidity of anxiety disorders in the elderly," *Am. J. Psychiatry*, vol. 151, pp. 640-649, 1994.
- [13] R. Crino, T. Slade, and G. Andrews, "The changing prevalence and severity of obsessive compulsive criteria from DSM-III to DSM-IV," *Am. J. Psychiatry*, vol. 162, no. 5, pp. 876-882, 2005.
- [14] H. J. Watson and C. S. Rees, "Meta-analysis of randomized, controlled treatment trials for pediatric obsessive-compulsive disorder," *J. Child Psychol. Psychiatry Allied Disciplines*, 49(5), 489-498, 2008
- [15] I. Gava, C. Barbui, E. Aguglia, D. Carlino, R. Churchill, M. De Vanna, and H. F. McGuire, "Psychological treatments versus treatment as usual for obsessive compulsive disorder (OCD)," *Cochrane Database of Syst. Rev.*, Issue 2, Art. No.: CD005333, April 2007, DOI: 10.1002/14651858.CD005333.pub2.
- [16] J. Cottraux, I. Note, S. N. Yao, S. Lafont, B. Note, E. Mollard, et al., "A randomized controlled trial of cognitive therapy versus intensive behavior therapy in obsessive compulsive disorder," *Psychother. Psychosom.*, vol. 70, no. 6, pp. 288-297, 2001.
- [17] E. Nakatani, A. Nakagawa, T. Nakao, C. Yoshizato, M. Nabeyama, A. Kudo, et al., "A randomized controlled trial of Japanese patients with obsessive-compulsive disorder - Effectiveness of behavior therapy and fluvoxamine," *Psychother. Psychosom.*, vol. 74, no. 5, pp. 269-276, 2005.
- [18] M. L. Whittal, D. S. Thordarson, P. D. McLean, "Treatment of obsessive-compulsive disorder: Cognitive behaviour therapy vs. exposure and response prevention," *Behav. Res. Ther.*, vol. 43, pp. 1559-1576, 2005.
- [19] C. R. Ayers, J. T. Sorrell, S. R. Thorp, and J. L. Wetherell, "Evidence-based psychological treatments for late-life anxiety," *Psychol. Aging*, vol. 22, pp. 8-17, 2007.
- [20] C. N. Carmin and P. S. Wiegartz, "Successful and unsuccessful treatment of obsessive-compulsive disorder in older adults," *J. Contemporary Psychother.*, vol. 30, no. 2, pp. 181-193, 2000.
- [21] J.E. Calamari, N.K. Pontarelli, K.M. Armstrong, and S.A. Salstrom, "Obsessive-Compulsive Disorder in Late Life," *Cogn. Behav. Practice*, to be published, doi:10.1016/j.cbpra.2010.10.004
- [22] C. Krasucki, R. Howard, and A. Mann, "Anxiety and its treatment in the elderly," *Int. Psychogeriatrics*, vol. 11, no. 1, pp. 25-45, 1999.
- [23] C. N. Carmin, C. A. Pollard, and R. L. Ownby, "Obsessive Compulsive Disorder: Cognitive behavioral treatment of older versus younger adults," *Clin. Gerontologist*, vol. 19, no. 2, pp. 77-81, 1998.
- [24] L. Velayudhan and A. W. Katz, "Late-onset obsessive-compulsive disorder: the role of stressful life events." *Int. Psychogeriatrics*, vol. 18, pp. 341-344, 2006.
- [25] M. K. Keeley, E.A. Storch, L.J. Merlo, and G.R. Geffken, "Clinical predictors of response to cognitive-behavioural therapy for obsessive-compulsive disorder," *Clin. Psychol. Rev.*, vol. 28, pp. 118-130, 2008.
- [26] M. E. Franklin, J. S. Abramowitz, M. J. Kozak, J. T. Levitt, and E. B. Foa, "Effectiveness of exposure and ritual prevention for obsessive-compulsive disorder: Randomized compared with nonrandomized samples," *J. Consult. Clin. Psychol.*, vol. 68, pp. 594-602, 2000.
- [27] A. Hirsch, K. O'Brien, G. R. Geffken, J. Adkins, W. K. Goodman, and E. A. Storch, "Cognitive-behavioral treatment for obsessive-compulsive disorder in an elderly male with concurrent medical complaints," *Am. J. Geriatr. Psychiatry*, vol. 14, no. 4, pp. 380-381, 2006.
- [28] E. B. Foa, M. L. Liebowitz, M. J. Kozak, S. Davies, R. Campeas, M. E. Franklin, et al., "Randomized, Placebo-Controlled Trial of Exposure and Ritual Prevention, Clomipramine, and Their Combination in the Treatment of Obsessive-Compulsive Disorder," *Am. J. Psychiatry*, vol. 162, pp. 151-161, 2005.
- [29] G. P. J. Keijsers, C. A. L. Hoogduin, and C. P. D. R. Schaap, "Predictors of treatment outcome in the behavioural treatment of obsessive-compulsive disorder," *Br. J. Psychiatry*, vol. 152, pp. 781-786, 1994.
- [30] M. K. Jones and R. G. Menzies, "Danger Ideation Reduction Therapy (DIRT): preliminary findings with three obsessive-compulsive washers," *Behav. Res. Ther.*, vol. 35, pp. 955-960, 1997.
- [31] T. St Clare, R. G. Menzies, and M. K. Jones, *Danger Ideation Reduction (DIRT) for obsessive-compulsive washers: A comprehensive guide to treatment*. Bowen Hills QLD: Australian Academic Press, 2008.
- [32] M. K. Jones and R. G. Menzies, "Danger Ideation Reduction Therapy (DIRT) for obsessive-compulsive washers. A controlled trial," *Behav. Res. Ther.*, vol. 36, pp. 959-970, 1998.
- [33] A. Krochmalik, M. K. Jones, R. G. Menzies, and K. Kirkby, "The Superiority of Danger Ideation Reduction Therapy (DIRT) over Exposure and Response Prevention (ERP) in Treating Compulsive Washing," *Behav. Change*, vol. 21, pp. 251-268, 2004.
- [34] A. Krochmalik, M. K. Jones, and R. G. Menzies, "Danger Ideation Reduction Therapy (DIRT) for treatment-resistant compulsive washing," *Behav. Res. Ther.*, vol. 39, pp. 897-912, 2001.
- [35] L. M. Drummond, A. Pillay, P. Kolb, and S. Rani, "Specialised inpatient treatment for severe, chronic, resistant obsessive-compulsive disorder," *Psychiatric Bulletin*, vol. 31, pp. 49-52, 2007.
- [36] L. M. Drummond and P. Kolb, "Obsessive-compulsive contamination fears and Anorexia Nervosa: the application of the new psycho-educational treatment of Danger Ideation Reduction Therapy (DIRT)," *Behav. Change*, vol. 25, pp. 44-50, 2008.
- [37] S. Govender, L. M. Drummond and R. G. Menzies, "Danger Ideation Reduction Therapy for the treatment of severe, chronic and resistant Obsessive-Compulsive Disorder," *Behav. Cogn. Psychother.*, vol. 34, pp. 477-480, 2006.
- [38] J. Hambridge and M. Loewenthal, "Treating Obsessive Compulsive Disorder: a new role for infectious diseases physicians?" *Int. J. Infectious Diseases*, vol. 7, pp. 152-155, 2003.
- [39] M. O'Brien, M. K. Jones and R. G. Menzies, "Danger Ideation Reduction Therapy (DIRT) for intractable, adolescent compulsive washing: a case study," *Behav. Change*, vol. 21, pp. 57-65, 2004.

- [40] T. St. Clare, "Danger Ideation Reduction Therapy (DIRT) for atypical Obsessive-Compulsive Disorder: a case study," *Behaviour Change*, vol. 21, pp. 186-196, 2004.
- [41] L. D. Vaccaro, M. K. Jones, R. G. Menzies, and T. St. Clare, *Danger Ideation Reduction Therapy for Obsessive- Compulsive Checkers: A Comprehensive Guide to Treatment*, Bowen Hills, QLD: Australian Academic Press, 2010.
- [42] L. D. Vaccaro, M. K. Jones, R. G. Menzies, and B.M. Wootton, "Danger Ideation Reduction Therapy for obsessive-compulsive checking: preliminary findings," *Cogn. Behav. Therapy*, vol. 39, no. 4, pp. 293-301, 2010.
- [43] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders*, 4<sup>th</sup> ed., text revised, Washington, DC: Author, 2000.
- [44] World Health Organisation, *Composite International Diagnostic Inventory*, Core, Version 2.1, Geneva: Author, 1997.
- [45] W. K. Goodman, L. H. Price, S. A. Rasmussen, C. Mazure, R. L. Fleischmann, C. L. Hill, et al., "The Yale-Brown obsessive-compulsive scale: Part 1 development, use and reliability," *Arch. Gen. Psychiatry*, vol. 46, pp. 1006-1011, 1989.
- [46] W. K. Goodman, L. H. Price, S. A. Rasmussen, C. Mazure, P. Delgado, G. R. Heninger, et al., "The Yale-Brown obsessive-compulsive scale: Part 2. Validity," *Arch. Gen. Psychiatry*, vol. 46, pp. 1012-1016, 1989.
- [47] S. Pallanti, E. Hollander, C. Bienstock, L. Koran, J. F. Leckman, D. Marazziti, et al., "Treatment non-response in OCD: methodological issues and operational definitions," *Int. J. Neuropsychopharmacol.*, vol. 5, pp. 181-191, 2002.
- [48] E. B. Foa, J. D. Huppert, S. Leiberg, R. Langner, R. Kichic, G. Hajcak, et al., "The obsessive-compulsive inventory: development and validation of a short version," *Psychological Assessment*, vol. 14, pp. 485-495, 2002.
- [49] E. B. Foa, M. J. Kozak, P. M. Salkovskis, M. E. Coles, and N. Amir, "The validation of a new obsessive-compulsive disorder scale: The Obsessive Compulsive Inventory," *Psychological Assessment*, vol. 10, pp. 206-214, 1998.
- [50] A. T. Beck, R. A. Steer, and G. K. Brown, *Beck Depression Inventory - Second Edition manual*, San Antonio, TX: The Psychological Corporation, 1996.
- [51] A. T. Beck, R. A. Steer, R. Ball, and W. F. Ranieri, "Comparison of the Beck Depression Inventories-IA and -II in psychiatric outpatients," *J. Personality Assessment*, vol. 67, pp. 588-797, 1996.
- [52] M. A. Whisman, J. E. Perez, and W. Ramel, "Factor Structure of the Beck Depression Inventory - Second Edition (BDI-II) in a Student Sample," *J. Clin. Psychology*, vol. 56, pp. 545-551, 2000.
- [53] J. C. Clarke and W. Wardman, *Agoraphobia. A personal and clinical account*, Pergamon: Sydney, 1985.
- [54] M. R. Goldfried and A. P. Goldfried, "Cognitive change methods," in *Helping people to change*, 2<sup>nd</sup> ed., F. H. Kanfer and A. P. Goldfried Eds. New York: Pergamon, 1980.
- [55] A. Ellis, *Reason and emotion psychotherapy*, New York: Stuart, 1962.
- [56] R. P. Mattick, L. Peters and J. C. Clarke, "Exposure and cognitive restructuring for social phobia: A controlled study," *Behav. Ther.*, vol. 20, pp. 3-23, 1989.
- [57] R. G. Menzies and J. C. Clarke, "Individual response patterns, treatment matching and the effects of behavioural and cognitive interventions for acrophobia," *Anxiety Stress Coping*, vol. 8, pp. 141-160, 1995.
- [58] A. S. Radomsky, P. T. Gilchrist and D. Dussault, "Repeated checking really does cause memory distrust," *Behav. Res. Ther.*, vol. 44, pp. 305-316, 2006.
- [59] M. Van den Hout and M. Kindt, "Repeated checking causes memory distrust," *Behav. Res. Ther.*, vol. 41, pp. 301-316, 2003.
- [60] R. Hoekstra, "Treatment of obsessive-compulsive disorder with rational-emotive therapy," paper presented at the *First World Congress of Cognitive Therapy*, Oxford, 28 June-2 July, 1989. G. R. Faulhaber, "Design of service systems with priority reservation," in *Conf. Rec. 1995 IEEE Int. Conf. Communications*, pp. 3-8.