



## Research paper

# Treating late-life depression: Comparing the effects of internet-delivered cognitive behavior therapy across the adult lifespan



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## ABSTRACT

**Background:** The burden attributable to late-life depression is set to increase with the ageing population. The size of the workforce trained to deliver psychogeriatric medicine is limited. Internet-delivered cognitive behavioral therapy (iCBT) is an efficacious and scalable treatment option for depression. Yet older adults are under-represented in iCBT research. This study examines the effects of iCBT for depression across the adult lifespan among patients seeking help in routine clinical care ( $N = 1288$ ).

**Methods:** Regression analyses were used to examine the relationship between age group (e.g., 18–24years ( $n = 141$ ); 25–34years ( $n = 289$ ); 35–44years ( $n = 320$ ); 45–54years ( $n = 289$ ); 55–64years ( $n = 180$ ); 65+ years ( $n = 69$ )) and presenting demographic and clinical characteristics, adherence to treatment, and rates of remission, recovery and reliable improvement. Linear mixed models were used to examine whether reductions in symptom severity, distress and impairment varied as a function of age.

**Results:** Patients aged 65+ years were more likely to be male compared to those aged 18–34 years and have been prescribed iCBT by their GP compared to those aged 55–64 years. Patients experiencing late-life depression experienced moderate to large effect size reductions in depressive symptom severity, psychological distress, and impairment, as did all other age groups. Rates of remission, recovery or reliable improvement were comparable across the adult lifespan.

**Conclusions:** iCBT is an effective treatment option for depression including in later life, and can be used to scale evidenced-based medicine in routine clinical care.

**Limitations:** No follow-up data were collected. The long-term effects of treatment, particularly for those who did not experience remission, are unclear.

## 1. Introduction

Approximately one in every 50 community-dwelling adults aged 65 years or over met criteria for Major Depressive Disorder (MDD) in the past year (Kessler et al., 2010; Sunderland et al., 2015), and experienced disturbances in their affect, weight, sleep patterns, ability to concentrate, and/or feelings of worthlessness. The burden attributable to depression is significant. Indeed, the disorder is the second leading cause of morbidity worldwide (Vos et al., 2013) and is associated with increased rates of self-harm, suicide, multimorbidity and excess mortality (Almeida et al., 2012; Nock et al., 2010, 2009; Read et al., 2017; Schoevers et al., 2009). Given that the global population is ageing (United Nations, 2015), the burden attributable to late-life depression is set to increase unless evidenced-based treatments are scaled across the community.

Anti-depressant medications and psychological therapies are recommended as first line interventions for depression (Andrews et al.,

2014; Mahli et al., 2015; National Institute for Health and Clinical Excellence, 2009). Yet, many older adults prefer not to use anti-depressants (Gum et al., 2006; Luck-Sikorski et al., 2017; Van der Auwera et al., 2017), potentially because some classes of these medications increase the risk of falls and cardiovascular events including stroke (Biffi et al., 2017; Ensrud et al., 2002; Hamer et al., 2011; Quach et al., 2013). Of the available face-to-face psychological therapies for adult depression, cognitive behavior therapy (CBT) is the most studied (Cuijpers et al., 2013), and in general, has been shown to be efficacious (Cuijpers et al., 2013) and effective (Hans and Hiller, 2013). Fewer studies have focused on the effects of CBT among older adults specifically, but those that have, have reported improvements in patients' psychosocial functioning (Cuijpers et al., 2006).

Although evidenced-based treatments are available for depression, there continues to be a high level of unmet need for psychogeriatric services. Firstly, many older adults do not seek face-to-face care (Crabb and Hunsley, 2006; Harris et al., 2015; Trollor et al., 2007; Wang et al.,

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2005) because of the stigma and costs of doing so (Anderson et al., 2016; Forbes et al., 2017; Muir-Cochrane et al., 2014; Wuthrich et al., 2015). Secondly, for those who do, the need for services outstrips the size of the current and projected workforces trained to provide psychogeriatric services (Institute of Medicine, 2012). Importantly, studies have found that older adults who did seek help for their mental health in the past year were less likely than those aged in their thirties to late fifties to have received a minimally adequate dose of evidenced-based treatment (Harris et al., 2015; Wang et al., 2005). Strategic changes to how services are provided in the community are therefore needed to scale the size of the workforce that can deliver evidenced-based services to older adults who seek help for their depression.

Over the past decade, substantial progress has been made to increase the scalability of CBT by delivering treatment via the Internet. This treatment modality has the potential to reduce the barriers associated with accessing care, as treatment packages, once developed, can be delivered for less than the cost of face-to-face psychological services (Hedman et al., 2015) and be accessed from patients' own homes, which may be particularly pertinent for older adults experiencing mobility difficulties. Similar to the face-to-face CBT literature, research has demonstrated that iCBT for depression is efficacious for adults in general (Andrews et al., 2010), and effective when prescribed in routine clinical care (Newby et al., 2017; Williams and Andrews, 2013). Although older adults are increasingly using the Internet (Anderson and Perrin, 2017; Office of National Statistics, 2016), this cohort is under-represented in iCBT studies, with estimates suggesting that adults aged 65 years or more account for only 3 per cent of the available iCBT depression research (Crabb et al., 2012). The limited number of studies that have examined the effects of iCBT for adults experiencing symptoms of late-life depression under randomized controlled conditions do suggest that iCBT could provide an efficacious treatment option (Spek et al., 2007; Titov et al., 2015). Yet, in their review of the literature published up until 2010, Crabb et al. (2012) concluded that no study had systematically evaluated whether older adults differed from younger adults in the extent to which they adhered to, and benefited from iCBT for depression. Since that review, Mewton et al. (2013) pooled the effects of iCBT programs for depression, generalized anxiety, panic, and social phobia as prescribed in routine clinical care to identify a sufficient sample of older adults and reported that treatment produced comparable effect size reductions in psychological distress and functional impairment irrespective of patients' age. Adults aged 60 years or more were however, more likely to complete treatment compared to younger adults. Although Mewton et al. (2013) advanced the literature, treatment protocols for depression and each of the anxiety disorders differ, with recent work suggesting that the effects of CBT delivered either in a face-to-face format (Hofmann and Smits, 2008) or via the Internet (Andrews et al., 2010) can vary by the disorder that is being treated. Additional research is therefore needed to quantify the effects of iCBT for late-life depression.

This study examined age-related differences in patient presentation, adherence to, and effects of iCBT for depression in a large sample of patients seeking help in routine clinical care. We aimed to advance the literature by providing the first study to examine the effects of scaling treatment for late-life depression by integrating iCBT into existing clinical services. Consistent with Mewton et al. (2013)'s findings, we hypothesized that patients experiencing late-life depression would adhere more to treatment but experience comparable reductions in depression symptom severity, psychological distress and functional impairment as younger adults.

## 2. Methods

### 2.1. Participants

1288 consecutive patients who were prescribed iCBT for their depression from *ThisWayUp.org.au*, which is a non-profit provider of

online treatment services for depression and anxiety jointly managed by St Vincent's Hospital, Sydney and the University of New South Wales between May 2009 and October 2015 were included in this study. Patients were categorized into six age groups (e.g., 18–24 years ( $n = 141$ ); 25–34 years ( $n = 289$ ); 35–44 years ( $n = 320$ ); 45–54 years ( $n = 289$ ); 55–64 years ( $n = 180$ ); 65+ years ( $n = 69$ )). Patients were prescribed iCBT by their general practitioner, psychiatrist, clinical psychologist, or allied health professional. Prescribers retained responsibility for their patients and managed their patients from their respective clinical practices. Prescribers were advised that their patients were unlikely to benefit from iCBT if they were: (1) actively suicidal, (2) dependent on alcohol or drugs, (3) had schizophrenia or bipolar disorder, or (4) were being treated with benzodiazepines or atypical antipsychotics. Adhering to these recommendations was at the discretion of the prescribers. This study was conducted as part of the routine Quality Assurance activities of ThisWayUp and all self-report measures examined herein were required for the safe conduct of ThisWayUp iCBT for depression. Prior to enrolment in treatment, all patients provided their electronic informed consent that their pooled de-identified data could be collected, collated, analyzed and published for quality assurance purposes.

### 2.2. Intervention

The ThisWayUp iCBT program for depression, which has been shown to be efficacious in randomized controlled trials, included 6 online treatment sessions or "lessons" (Perini et al., 2009; Titov et al., 2010; Williams et al., 2013). Treatment was fully automated and completed independently by the patient, however, prescribing clinicians were encouraged to contact their patients after the first two lessons were completed in order to provide support and promote treatment adherence. Treatment lessons involved (a) psychoeducation about depression and how cognitive and behavioral factors can maintain the cycle of depression, (b) behavioural activation, (c) identifying and challenging unhelpful thinking patterns (including challenging meta-cognitive beliefs that may maintain rumination), (d) structured problem solving, (e) graded exposure, (f) assertiveness skills training, and (g) relapse prevention.

During treatment, patients followed the progress of an illustrated fictional character aged in her mid-thirties to forties (i.e., the age that the prevalence of depression peaks (Kessler et al., 2005b)) who was being treated with CBT, and was progressively gaining mastery over her symptoms and recovering from depression. Following the completion of each lesson, patients were instructed to download homework summaries and complete therapy tasks that reinforced the content of that lesson. Patients completed treatment over 12 weeks with a maximum of one session completed each week. To measure patient progress during the course, the Kessler Psychological Distress Scale (K-10; described below) was administered before each lesson. Clinicians were alerted by automated email if their patient's distress became severe ( $K-10 \geq 30$ ). Prescribers averaged one contact with their patients during treatment ( $SD = 1.32$ ;  $Mdn(IQR) = 0(0-1)$ ).

### 2.3. Measures

#### 2.3.1. Demographics

Patients reported their sex and age, and their rurality was inferred from their postcode in conjunction with the Australian Statistical Geography Standards (Australian Bureau of Statistics, 2013). Prescribers' profession was also recorded.

#### 2.3.2. Outcome measures

*Patient Health Questionnaire-9 (PHQ-9)*: is a 9-item screener for MDD (Kroenke, Spitzer, and Williams, 2001). Patients completed the PHQ-9 before and after treatment and reported the frequency of symptoms experienced in the past two weeks as either "not at all", "on several

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