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Examining internet-delivered cognitive behaviour therapy for patients with chronic kidney disease on haemodialysis: A feasibility open trial

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ABSTRACT

Objective: Treating depression among patients with chronic kidney disease (CKD) is imperative because of its high prevalence and health-related costs. However, many patients with CKD experience significant barriers to effective face-to-face psychological treatments. Internet-delivered cognitive behaviour therapy (iCBT) may help overcome the treatment barriers. The aim of the present study was to explore the acceptability and preliminary efficacy of iCBT for depression and anxiety among patients with CKD on haemodialysis.
Methods: A single-group open trial design involving 22 patients on dialysis and an established iCBT treatment for anxiety and depression was employed. The primary outcomes were symptoms of depression, anxiety and general psychological distress. The secondary and tertiary outcomes were disability, quality of life, kidney disease-related loss and kidney disease burden. A generalised estimation equation modelling technique was employed.
Results: Clinically significant improvements (avg. % of improvement) were observed in the primary outcomes of depression (34%), anxiety (31%) and general distress (26%), which were maintained or further improved to 3-month follow-up. Improvements were also observed for quality of life (12%) and kidney disease-related loss (30%). However, no improvements in disability and kidney disease burden were found. High levels of acceptability were reported and relatively little clinician time (99.45 min; SD = 14.61) was needed to provide the treatment.
Conclusion: The present results provide encouraging support for the potential of iCBT as an innovative way of increasing access to effective psychological treatment for CKD patients. These results provide much needed support for further research in this area.
Trial registration: Australian and New Zealand Clinical Trials Registry: ACTRN12613000103763.

1. Introduction

Chronic kidney disease (CKD) is an increasing global health burden [1,2]. Despite technological advances in dialysis treatments, patients continue to experience a number of mental health problems [3], especially depression which has an estimated prevalence rate ranging from 23% to 39% for CKD Stage 5 (4, 5). Some patients may experience depressive symptoms as identified in the psychometric scales, without meeting the depression diagnosis [5]. Depressive symptoms may improve within the first year of dialysis [6], yet tend to persist among long-term dialysis patients [7]. Depression in dialysis patients has been associated with increasing mortality, frequency of hospitalization, poor treatment adherence, and reduced quality of life (QoL) [8]. Therefore, treating depression in dialysis patients has the potential to not only improve their mental health and QoL, but also to significantly reduce their morbidity and mortality, in turn leading to reduced cost to the health care system.

The aetiology of depression in CKD is complicated and probably involves multiple biological (e.g., inflammatory process, uremia, and dialyzers) and psychosocial factors (e.g., social support, cognitive appraisal, personality attributes and coping) [9,10]. A recent meta-analysis identified that, among psychosocial variables, cognitive appraisal (e.g., illness perception, locus of control, and self-efficacy) and personality attributes (e.g., extravert personality, hope, and optimism) have the largest

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association ($ES_r = 0.46$) with depression [4]. Recently, Chan and colleagues found a possible relationship between cognitive factors (e.g., perceived kidney disease-burden, kidney-disease-related loss, and self-efficacy), depression and QoL in dialysis patients [11,12]. Their studies showed that kidney-disease-related loss contributes to depression, which in turn impacts on patients' QoL. These results suggest that psychological treatments for depression, which focus on modifying maladaptive cognitive styles and behavioural patterns (e.g., cognitive behaviour therapy (CBT)), may be suitable and helpful for adults with CKD.

Anxiety is frequently comorbid with depression, but unlike depression has long been understudied among patients with CKD. However, research indicates that anxiety is common among dialysis patients with, for example, an average prevalence rate of 38% (ranging from 12% to 52%) [13]. It has been argued that untreated anxiety may contribute to the development of depression as well as exacerbate depression symptoms and disability, thus, complicated the treatment of depression [14]. Unfortunately, while effective psychological treatments for anxiety are available, very few studies have focused on or reported the outcomes of treatment for anxiety among patients with CKD [14]. Thus, more research is needed focusing on anxiety alongside depression in CKD and it is possible that psychological treatments that target both may result in better overall treatment outcomes.

Effective treatments for depression include antidepressant medications and psychological therapies. Unfortunately, treating dialysis patients with antidepressants is difficult as many patients are reluctant to use or adhere to medications [15,16], with, for example, some studies finding 50% discontinuation rates for anti-depressants among CKD patients [16]. Antidepressant use is also complicated by contraindications and adverse reactions [16–19]. Psychological therapies, such as CBT, are also effective at treating depression. Two randomised control trials (RCTs; total n = 139) have shown that CBT is effective in reducing dialysis patients' depressive symptoms and improving their QoL [20,21]. However, while encouraging, there are a number of barriers to the delivery of traditional face-to-face CBT to patients with CKD, such as dialysis schedules and transportation, especially when provided on non-dialysis days [10,20]. Thus, to increase treatment accessibility and uptake, Cukor et al. [21] (n = 59) demonstrated the feasibility of providing CBT to patients while they were receiving haemodialysis (coined "chairside CBT").

Internet-delivered CBT (iCBT) is a new and innovative approach to the delivery of psychological treatment that may overcome many of the barriers associated with face-to-face CBT, including direct cost, time, distance and mobility limitation [22,23]. iCBT employs the same theoretical underpinnings, treatment principles and therapeutic components as traditional face-to-face CBT, but is administered via computer and the internet, often with support from trained clinicians provided by telephone and email [24]. As with face-to-face CBT, iCBT treatments aim to provide evidence-based information to help patients understand their symptoms and difficulties, and systematically support patients to learn cognitive and behaviour skills for reducing maladaptive cognitions and behaviours [24]. There is a large and growing body of evidence for the clinical efficacy and cost-effectiveness of iCBT for reducing the level of depression and anxiety [22,25–27]. There is also emerging evidence of the efficacy of iCBT for adults with complex and chronic health conditions, such as chronic pain [28,29], multiple sclerosis [30] and cancer [31]. However, to date, no studies have explored the use of iCBT with adults with chronic kidney disease patients on haemodialysis. This is unfortunate given the potential advantages of iCBT in terms of increasing access to cost-effective psychological treatment.

The aim of the present study was to explore the acceptability and preliminary efficacy of iCBT for depression and anxiety amongst patients with chronic kidney disease (CKD) on haemodialysis. The present study sought to gather preliminary data to inform subsequent larger scale clinical trials and represents the first study to examine iCBT for patients with CKD. It was hypothesised that iCBT would be acceptable to patients with CKD and that it would be associated with improvements in symptoms of depression and anxiety as well as general psychological distress, and disability levels. The impact of iCBT on kidney-disease-related loss and burden was also explored although no formal hypotheses were proposed.

2. Methods and materials

2.1. Design

A single-group uncontrolled open trial design was employed with symptom assessment at pre-treatment, immediately post-treatment and at 3-month follow-up. The study was approved by the Human Research Ethics Committee (HREC) of South Western Sydney Local Health District, Sydney, Australia and the trial was registered on the Australian and New Zealand Clinical Trials Registry (ANZCTR) as ACTRN12613000103763.

2.2. Participants

Participants were recruited from a major university teaching hospital in a Local Health District, Sydney, Australia over a period of two years. Participants were made aware of the study when attending the outpatient nephrology clinic and via a general mail out from the clinic. The ethical approval for the study limited the researchers to approaching potential participants only once they had voluntarily expressed an interest to participate to impartial clinic staff not involved in the research. After their expression of interest, potential participants were contacted and assessed by the researchers to determine their suitability for the study. Of the 30 assessed, 3 were excluded for not meeting the inclusion criteria, 1 received a kidney transplant prior to the commencement of the intervention, and 4 withdrew their participation (see Fig. 1). There were 22 participants who commenced but 20 who completed the intervention.

The inclusion criteria were: (1) aged 18 or above, (2) on dialysis ≥ 6 months, (3) having a pre-treatment score > 4 on PHQ9 (representing mild symptoms) [32], and (4) having reliable access to a computer and internet. The exclusion criteria were: (1) currently receiving CBT, (2) experiencing an unmanaged psychotic illness or very severe symptoms of depression (defined as a total score > 23 on the PHQ-9 or responding >2 to question 9 on PHQ-9), and (3) if taking anti-depressant medications, not being on a stable dose for at least 1 month with no intention of changing their usage.

Fig. 1 shows the flow of participants through the study from assessment to 3-month follow-up as well as the rates of treatment and questionnaire completion. Importantly, during the study, 6 participants who originally had computer and internet access experienced unresolvable internet or computer-related difficulties and, consequently, were provided a hardcopy workbook version of the course; identical to the online version. Table 1 shows the demographic characteristics and diagnostic composition of the sample.

2.3. Measures

2.3.1. Primary outcome measures

2.3.1.1. Patient Health Questionnaire-9 Item (PHQ-9). The PHQ-9 is a 9-item self-rated measure of symptoms of depression based on the DSM-IV diagnostic criteria for major depressive disorder [32]. The PHQ-9 is widely used, has good psychometric properties and is sensitive to treatment-related change [33]. Scores range from 0 to 27 with higher scores indicating greater severity.

2.3.1.2. Generalized Anxiety Disorder 7-Item Scale (GAD-7). The GAD-7 is a 7-item self-rated measure sensitive to the symptoms of generalised anxiety disorder, social anxiety disorder, panic disorder and general