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Exploring the Feasibility of Internet-Delivered Treatment of Depression and Anxiety in Chinese-Speaking International University Students in Australia in Two Open Trials

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Abstract

Two open trials examined the feasibility of a transdiagnostic internet-delivered cognitive-behavioural therapy (iCBT) treatment for Chinese-speaking international university students in Australia. Participants were diagnosed with depression, anxiety or both. The primary outcome measures were the Generalised Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9), which measure anxiety and depressive symptoms, respectively. In Study 1 (N=8), a minority (25%) of participants completed a non-culturally adapted iCBT intervention and obtained significant reductions in GAD-7 scores but non-significant reductions in PHQ-9 scores from pre-treatment to three-month follow-up. Large within-group effect sizes (Cohen's d) of 1.46 and 1.76 were found at follow-up on the PHQ-9 and GAD-7, respectively. In Study 2 (N=4), 75% of participants completed a brief and culturally-adapted version of the intervention from Study 1 and obtained significant reductions in PHQ-9 scores but non-significant reductions in GAD-7 scores from pre-treatment to three-month follow-up. Large within-group effect sizes of 3.79 and 1.80 on the PHQ-9 and GAD-7 were found at follow-up, respectively. These results provide preliminary support for a transdiagnostic iCBT intervention for treating depression and anxiety in this population. However, considerable recruitment and engagement difficulties were encountered with this population, and possible solutions for these challenges are discussed.

Keywords: Chinese international university students; Co-morbidity; Internet treatments; Transdiagnostic; Dissemination

Introduction

Depressive and anxiety disorders are prevalent, disabling, and often co-morbid [1]. The prevalence of these conditions are elevated in samples of domestic university students [2-4], but even higher in Asian international students studying in Western countries [5,6]. In addition to the difficulties commonly faced by domestic students, Asian (including Chinese-speaking) international students in USA also experience unique problems including language difficulties, perceived discrimination, homesickness, social isolation and stress from negotiating cultural differences [7,8]. Chinese-speaking international students that is overseas-born university students who speak Chinese as their first language or identify as of Chinese ethnic origin, represent one of the largest ethnic groups of university students in Australia [9]. They represent a high risk group for developing psychological distress [10] and encounter more adjustment difficulties than their European and Australian counterparts [5].

Cognitive-behavioural therapy (CBT) is an effective treatment for depression and anxiety [11] and its core principles are highly compatible with Chinese cultural values [12]. Although CBT for depression and anxiety has been found to be effective with Chinese-speaking indigenous [13] and immigrant populations [13], Chinese-speaking immigrants and Chinese-speaking international students in Australia have limited access to such treatments [14]. Barriers to accessing treatment among Chinese-speaking immigrants and Chinese-speaking international students include stigma, language difficulties, perceived discrimination, low treatment credibility, limited knowledge of available services and psychological symptoms, concerns about treatment costs, transportation difficulties and a shortage of culturally appropriate services [10,14].

One strategy that may increase access to treatments by Chinese-speaking immigrants and Chinese-speaking international students is internet delivered CBT (iCBT). iCBT involves the delivery of highly structured online lessons that include information and skills that are similar to those commonly taught in face-to-face CBT, often with telephone or email support from a trained coach or therapist [15]. Meta-analyses indicate that iCBT administered with therapist support results in clinically significant positive outcomes and high satisfaction from users [16,17]. A recent survey of Chinese-speaking international students in Australia indicated that a considerable percentage of these students would consider using internet treatments for managing symptoms of depression and anxiety [10].

To date, one study has evaluated the use of a culturally-adapted iCBT program for depression with Chinese immigrants in Australia [18], which included both literal and conceptual translations of all treatment materials. The randomised controlled trial, which compared an eight-week iCBT intervention with waitlist condition, demonstrated that treatment group participants achieved significantly greater

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positive outcomes than waitlist control participants [18]. Moderate patient satisfaction rates were also reported and treatment gains were maintained at three month follow-up [18]. The cultural adaptations of this iCBT program required considerable resources, including administration by Chinese-speaking therapists, which limit its potential implementation. An outstanding question is whether materials can be successfully and acceptably presented in English, and how much translation is required given that Chinese students are required to meet minimum English language skills for entry into Australian universities.

The present study aimed to evaluate the efficacy and acceptability of two versions of a transdiagnostic iCBT protocol for treating depression and anxiety among Chinese-speaking international students from a university in Australia. Transdiagnostic treatments aim to treat several co-morbid conditions in a single protocol through the application of core CBT principles that tap common etiological factors across similar disorders [19]. Several transdiagnostic iCBT interventions have been developed for people with symptoms of depression and anxiety [20-23].

Both versions of the treatment protocol reported here were shortened adaptations of an existing transdiagnostic iCBT treatment, the Wellbeing Course [23], previously reported as clinically effective. Study 1 employed a version which was not adapted for Chinese-speaking international students, and therapist support was provided mostly in the English language. Study 1 was designed to simulate how the treatment might be most easily implemented by a student counselling service. Study 2 employed a version modified to address issues likely to be relevant to this population, with therapist support provided mostly in the Mandarin language. Both versions were evaluated using open trials with the aim of pragmatically exploring issues that might affect their implementation in a student counselling service.

Method for Study 1

Design, sample size and hypotheses

Study 1 employed an open trial design examining pre-to-post-treatment and pre-to-three-month follow-up results. Sample size calculations indicated that, using 80% power and a two-tailed model, a sample of 15 was sufficient to detect an effect size of d=0.6, the minimum expected based on a previous trial [18]. It was expected that: (1) the intervention would result in significant improvements on measures of depression and anxiety, from pre-to-post-treatment and gains would be sustained at three-month follow-up, and; (2) participants would rate the intervention as acceptable.

Participants and recruitment

Recruitment occurred over nine weeks. In order to reduce stigma, promotional materials about the study were presented in both English and Chinese languages. To reduce barriers relating to stigma, the study was described as an online educational course, the UniWellbeing Chinese Course, designed to improve general psychological wellbeing. The study was promoted in print and electronic media, and via public presentations.

Inclusion and exclusion criteria required that individuals were: (1) residents of Australia, (2) currently enrolled as students at Macquarie University, (3) self-identified as Chinese and born overseas in a country where Chinese was their first language, (4) at least 18 years of age , (5) had access to a computer, the internet and use of a printer, (6) self-identified as having elevated stress, anxiety, or low mood, (7) self-reported adequate English language requirements as evidenced by any of the tests as follows: (i) minimum overall score of 6.5 on IELTS, (ii) minimum overall score of 570 on TOEFL (paper based test), (iii) minimum overall score of 90 on TOEFL (internet-delivered test), and (iv) at least a C pass on the Cambridge Certificate of Proficiency in English; (8) if taking medication for anxiety or depression, had been taking the same dose for at least one month and did not intend to change that dose during the study; (9) were not participating in CBT elsewhere during the study, (10) not currently experiencing a psychotic mental illness; (11) not currently experiencing severe symptoms of depression (defined as a total score ≥23 or responding >2 to Question 9 of the Patient Health Questionnaire-9) [24]; and (12) provided informed consent.

Twenty-four participants provided informed consent and applied for Study 1. Of these, 13 were eligible to participate and eight were eligible for analysis (Figure 1). Eligible participants were informed that they received a chance to win an iPad contingent on completing all questionnaires. However, they were not informed of this opportunity until they had met all inclusion criteria for the study. The study was approved by the Human Research Ethics Committee (HREC) of Macquarie University (Sydney, Australia) and registered with the Australian and New Zealand Clinical Trials Registry as ANZCTR12612000214831.

Primary outcome measures

Patient health questionnaire-9: The PHQ-9 is a nine-item self-report measure of symptoms and severity of major depressive disorder, using the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition [24,25] criteria for depression. Scores on each item range from 0 (not at all) to 3 (nearly every day). An overall cut-off score

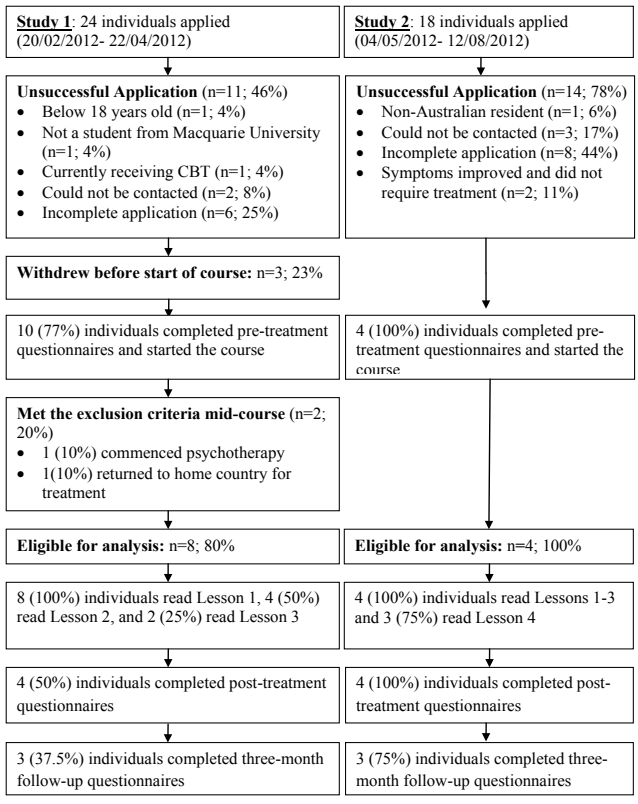

Figure 1: Study 1 and 2 flow chart.

of 10 or greater has been found to be sensitive to a DSM-IV diagnosis of depression [26]. The PHQ-9 has good convergent validity with other depression measures [26]. The internal consistency (Cronbach's α) of the PHQ-9 in the current trial was 0.76.

Generalised anxiety disorder-7: The GAD-7 is a seven-item self-report measure of symptoms and severity of Generalised Anxiety Disorder (GAD), using the DSM-IV criteria for GAD. Scores for each item range from 0 (not at all) to 3 (nearly every day). An overall cut-off score of 10 or greater has been found to be sensitive to DSM-IV diagnoses of GAD, social phobia and panic disorders [27,28]. The GAD-7 has good convergent validity with other anxiety scales [26] and is increasingly adopted in empirical studies and in large scale dissemination studies as a general measure of shifts in anxiety symptoms [29]. The internal consistency (α) in the current trial was 0.91.

Time points

Participants who started the course were instructed to complete the online outcome measures (PHQ-9 and GAD-7) immediately before treatment, once weekly throughout treatment, immediately after treatment, and three months after treatment. Feedback about the course was elicited throughout the course and at post-treatment.

Intervention

The treatment intervention (the UniWellbeing Chinese Course) was based on the Wellbeing Course [23] but adapted for university students in the following ways: i) the course content was reduced from five to three lessons, ii) the course duration was reduced from eight to six weeks, iii) case examples and stories were adapted to increase relevance to university students. The UniWellbeing Chinese Course included automated reminder and notification emails, weekly email and telephone support from a therapist, a 'Do-It-Yourself Guide (DIY)' consisting of a summary and homework for each lesson and additional downloadable resources. Lesson one comprised education about symptoms of anxiety and depression, thought-challenging and structured problem-solving strategies. Lesson two provided information about physical symptoms and strategies for relaxation and activity scheduling. Lesson two also provided education about behavioural symptoms and strategies for conducting graded exposure. Lesson three comprised education about enhancing effective communication skills, assertiveness training, and information on relapse prevention.

Therapist

A provisionally registered psychologist (SHL), fluent in Mandarin, undergoing specialist postgraduate training and who had five years of clinical experience working with individuals with depressive and anxiety disorders, provided all contact with participants. The content of contact was scripted and mostly conducted in English, with the exception of rare translation of questions into Mandarin, when required. The scripted content provided the therapist with a specific structure for each contact with participants, and included liberal opportunities for reinforcing participants, guidelines about answering frequently asked questions, additional information to provide, and phrases to facilitate engagement and to resolve barriers to progress. The translation into Mandarin was only provided under circumstances when responses from participants were vague or irrelevant to the questions posed, reflecting either a lack of understanding of the questions or difficulties with responding in English. The frequency and duration of all contact with participants were documented.

Statistical analyses

A mixed-models approach [30] with an autoregressive covariance structured and using maximum likelihood estimation was used to analyse data collected at pre-treatment, weekly, post-treatment and three-month follow-up. However, to facilitate meaningful comparisons with results from previous studies [18,23], only data on pre-treatment, post-treatment and three-month follow-up will be reported. Differences in scores across different time points were analysed using pair wise comparisons. All reported post-treatment and three-month follow-up means are based on the Estimated Marginal Means resulting from the mixed-models analyses. Effect sizes (ESs; Cohen's d) and 95% ES confidence intervals were calculated to quantify the magnitude of change in symptoms between pre and-post treatment and between pre and-three-month-follow-up, based on the pooled standard deviation. All analyses were performed in PASW version 19.0 [31].

Results for Study 1

Demographic characteristics of participants, adherence and attrition

Characteristics of the samples in Study 1 and 2 are included in Table 1. All participants in Study 1 completed Lesson 1, four of eight (50%) participants completed Lesson 2 and two of eight (25%) participants completed Lesson 3 within the six weeks of the program. Post-treatment and three-month follow-up data in Study 1 were collected from four of eight (50%) and three of eight (37.5%) participants, respectively.

Outcome measures and effect sizes

The mixed-models analyses revealed no significant effect for Time on the PHQ-9 ($F_{7, 18.25}$=1.78, p=0.154). However, a significant effect for Time was found on the GAD-7 ($F_{7, 16.20}$=2.74, p=0.045). Pair wise comparisons revealed no significant change in GAD-7 scores from pre-treatment to post-treatment, t (22.75)=1.98, p=0.060, but GAD-7 scores improved significantly from pre-treatment to three-month

	Study 1		Study 2	
	n	%	n	%
Gender				
Female	7	87.5	4	100
Male	1	12.5	-	-
Country of Birth				
Mainland China	8	100	3	75
Hongkong	-	-	1	25
Age				
Mean	25 (3.63)	-	22 (1.71)	-
Range	20-32	-	21-25	-
Marital Status				
Single/ Never Married	6	75	4	100
Married/ De Facto	2	25	-	-
Current education level				
Undergraduate	3	37.5	-	-
Graduate	5	62.5	4	100
Enrolment status				
Full-time	8	100	3	75
Part-time	0	0	1	25
Employment				
Part-time paid work	3	37.5	1	25
Unemployed	5	62.5	3	75
Previous mental health treatment	2	25	2	50

Table 1: Demographic characteristics of participants from Study 1 and 2.

follow-up, t(16.84)=2.96, p=0.009. ESs for the outcome measures are shown in Table 2. Large within-group ESs between pre-to-post-treatment were found on both outcome measures and maintained at three-month follow-up.

Treatment satisfaction

Four of eight participants completed post-treatment feedback, including ratings of treatment satisfaction. All four of these participants reported that they were extremely satisfied with the course and would recommend this course to a friend with stress, anxiety or low mood. When asked to provide a rating from 0 (very difficult) to 10 (very easy), participants rated the course as easy to understand (M=8.75, SD=0.96). When asked to provide a rating from 0 (not helpful) to 10 (very helpful), participants rated the course as helpful (M=8.75, SD=0.50).

Qualitative feedback

Of the six participants who did not complete all lessons, four cited time constraints due to demands of their university assignments as a major barrier to completing the course, one reported feeling disappointed that the course covered what the participant already knew and one reported that the course was irrelevant as the participant anticipated the course would provide academic support. Suggestions for improving the intervention included recommendations to reduce the course content and to include more culturally-relevant examples. Potential topics of interest suggested by the participants for future courses included strategies for managing emotional over-eating and ways to improve study skills efficiency.

Time spent per participant

The mean total therapist contact time per participant was 36.13 min (SD=8.46 min) including sending and reading online messages and telephoning participants. During the course, participants received a mean of 17 automated emails per participant (SD=0.83) with the therapist sending a mean of 7 (SD=2.00) additional personal online messages per participant. The therapist also made a mean of 7 telephone calls per participant (SD=1.41).

Discussion for study 1

The aims of Study 1 were to explore the efficacy and acceptability of a therapist-guided, transdiagnostic iCBT course for treating depression and anxiety among Chinese-speaking international students in an Australian university, using an open trial design. Importantly, the course had not been translated from English into Chinese, and had not been culturally adapted, in order to simulate how such a course might be used for this population by student counselling services in Australian universities. While all participants reported that they had met the standard university English language requirements, half of the sample had difficulties with spoken English, warranting occasional translation of questions into Mandarin. The majority of participants rated the course as easy to understand, suggesting that translation into Mandarin may only be required for spoken but not written English.

Results revealed that from pre-treatment to three-month follow-up, there were statistically significant reductions in symptoms of anxiety and a non-significant reduction in symptoms of depression. Within-group ESs for the outcome measures were large at post-treatment and three-month follow-up. The ESs are generally consistent with the results from the original version of the Wellbeing Course [23] and other transdiagnostic face-to-face programs [19], but the completion rates and overall levels of satisfaction were considerably lower, despite a relatively large number of applications to participate.

These results need to be interpreted in light of the limitations of the study, which included a small sample size, low treatment completion rate and lack of a comparison group. One possible reason for the low treatment completion could be due to time constraints in the context of university demands. Although the time frame for the course was chosen to avoid the examination period, half of the participants reported that the course coincided with assignments and they found the competing time pressure to be considerable.

Study 2 extended the present results by using a similar research design but with a version of the course modified in four ways which incorporated the feedback from participants in Study 1. First, changes were made to the course to make it more culturally relevant for a Chinese-speaking population. Second, the content of the course was reduced and delivered across four instead of three lessons which were presented over four weeks instead of six weeks. Third, additional strategies for unhelpful eating patterns, procrastination, cross-cultural communication, as well as a glossary and a resource list for support services were included. Fourth, more flexible and in-depth therapist support was provided mostly in Mandarin.

Method for Study 2

Design, sample size, hypotheses, outcome measures and time points

Study 2 employed the same design, sample size estimates, hypotheses and outcome measures as Study 1. The administration of the outcome measures followed the same time points as Study 1. Given the small sample size, no formal analysis of the internal consistency of these measures was conducted.

Participants, recruitment and intervention

Participants for Study 2 were recruited using the same strategies as those for Study 1. Recruitment was conducted over a one month

	Observed Means			Estimated Means			Within-group ESs (based on estimated means)	
	Pre	Post	Follow-up	Pre	Post	Follow-up	Pre to post	Pre to follow-up
Study 1								
PHQ-9	9.25 (4.50)	5.25 (2.50)	3.33 (3.21)	9.25 (3.34)	5.38 (4.72)	2.86 (5.23)	0.95 (-0.13 to 1.92)	1.46 (0.29 to 2.47)
GAD-7	8.75 (3.77)	5.75 (2.50)	2.00 (2.00)	8.75 (2.86)	5.83 (3.90)	2.63 (3.99)	0.85 (-0.21 to 1.83)	1.76 (0.53 to 2.80)
Study 2								
PHQ-9	13.00 (2.83)	6.00 (4.55)	2.67 (2.31)	13.00 (2.50)	6.00 (2.50)	2.79 (2.88)	2.80 (0.60 to 4.26)	3.79 (1.16 to 5.41)
GAD-7	9.75 (4.57)	5.50 (4.80)	3.00 (3.00)	9.75 (3.56)	5.50 (3.56)	2.85 (4.08)	1.19 (-0.44 to 2.51)	1.80 (-0.02 to 3.15)

Note. Standard deviations and confidence intervals of ESs are shown in parentheses. Pre: Pre-treatment; Post: Post-treatment; Follow-up: Three month follow-up; PHQ-9: Patient Health Questionnaire 9-item; GAD-7: Generalised Anxiety Disorder 7-item.

Table 2: Observed and Estimated Means, standard deviations, ESs (Cohen's d) and confidence intervals (CIs) for outcome measures.

period. Eighteen participants provided informed consent and applied for the study. Of these, four were eligible for analysis (Figure 1). Eligible participants received a chance to win an iPad contingent on completing all questionnaires. Inclusion and exclusion criteria were the same as Study 1. A comparison of the treatment protocols in both studies is shown in Table 3.

Therapist and statistical analysis

The same therapist (SHL) from Study 1 provided all contact with participants. The frequency and duration of all contact with participants were documented. The models of statistical analysis were the same as those used in Study 1.

Results for Study 2

Adherence and attrition

All participants completed Lesson 1, 2, and 3 and three of four (75%) participants completed Lesson 4 within the four weeks of the program. All participants completed post-treatment questionnaires, and three of four (75%) participants provided 3-month follow-up.

Outcome measures and effect sizes

The mixed-models analyses revealed a significant effect for Time on the PHQ-9 ($F_{5, 17.70}$=6.81, p=0.001). Pairwise comparisons revealed significant improvements on the PHQ-9 from pre-treatment to post-treatment, t(21.95)=3.98, p=0.001, and from pre-treatment to three-month follow-up, t(13.45)=5.16, p<0.001. The analyses examining GAD-7 revealed no significant effect for time ($F_{5, 14.41}$=1.73, p=0.192). ESs for outcome measures are shown in Table 2. Large within-group ESs between pre-to-post-treatment were found on both outcome measures and maintained at three-month follow-up.

Treatment satisfaction

All participants reported either being satisfied or very satisfied with the course. All participants reported that the course was worth their time, had increased their confidence in adjusting to university life and they would recommend this program to a friend with stress, anxiety or low mood. When asked to provide a rating from 0 (very difficult) to 10 (very easy), participants rated the program as easy to understand (M=9.00, SD=1.41) and all reported being very satisfied with the therapist support.

Qualitative feedback

Three out of four participants (75%) reported that the most helpful aspect of the course was receiving telephone support from the therapist. Three out of four participants (75%) recommended that Lesson 1 be shortened and modified to provide more practical strategies and information on the aetiology of psychological distress. Two (50%) participants recommended including more information on learning cross-cultural communication and 1/4 (25%) participant recommended reducing the content of the course and extending it over a longer duration.

Time spent per participant

The mean total therapist contact time per participant was 127.5 min (SD=60.87 min) including sending and reading online messages and telephoning participants. During the course, participants received a mean of 19 automatic emails per participant (SD=2.94) with the therapist sending a mean of 4 (SD=4.03) additional personal online messages per participant. The therapist also made a mean of 11 telephone calls per participant (SD=1.50).

Discussion for study 2

The aims of the present study were to examine the efficacy and acceptability of a culturally adapted version of the protocol used in Study 1, with therapist support provided mostly in Mandarin. Results revealed significant reductions in symptoms of depression and non-significant reductions in symptoms of anxiety from pre-treatment to post-treatment and pre-treatment to three-month follow-up. Within-group ESs for the primary measures were large for both outcome measures at post-treatment and gains were maintained at three-month follow-up. The effect sizes are consistent with the results from Study 1 and previous similar studies [19,23].

The percentage of participants completing all lessons (75%) and treatment satisfaction rates (100%) were also higher than Study 1. Several possible reasons for this relate to the adaptations made in Study 2 including the reduction in the content and duration of the program, the inclusion of culturally relevant examples, the addition of potential topics of interest and the provision of more flexible therapist support mostly in Mandarin. However, due to the lack of systematic changes to the intervention between the two present studies and the small sample sizes, these reasons remain speculative and warrant further investigation in future research. The same limitations (i.e. small sample size and a lack of comparison group) discussed in Study 1 are relevant in this study.

General Discussion

Previous research has found Chinese-speaking international students in Australia are a high risk group for developing psychological distress and they encounter more adjustment difficulties than their European and Australian counterparts [5,10]. However, they tend to underuse mental health services due to multiple practical and cultural barriers [32]. Given that Chinese-speaking international students comprise approximately 30% of the total international students in Australia [9] and research on evidence-based treatments for this

	Study 1	Study 2
Language medium of course	English	English
Duration	Six weeks	Four weeks
Content	Three lessons	Four lessons, with each lesson containing approximately half the volume of content as the lessons in Study 1. Content was modified to include strategies for managing unhelpful eating patterns, procrastination, and cross-cultural communication. A glossary and a resource list for study skills, career and social support services were also included.
Case examples	Non-culturally adapted	Culturally-adapted
Therapist support	Scripted, mostly in English	Followed the same script as Study 1, except that the therapist had greater flexibility to elaborate on the course materials and provide clinical advice related to applying treatment to specific symptoms. Conducted mostly in Mandarin.

Table 3: Nature of interventions in Study 1 and 2.

population is scarce [33], there is a need to contribute to the extant literature and examine ways of improving access to treatments for this population. The present studies sought to examine the feasibility of two versions of a transdiagnostic iCBT protocol for treating depression and anxiety among Chinese-speaking international students from an Australian university.

An important lesson from these trials was that, despite multiple advertisement initiatives adopted in both studies and the large number of students who were targeted with promotional materials, only a relatively small number of applications were received and even fewer were successful. This was somewhat surprising given a recent report indicating that a considerable number of Chinese-speaking international students in Australia reported that they would use internet treatments if they encountered psychological distress [10], and evidence of successful application of iCBT to Chinese immigrants in Australia [18]. Anecdotal feedback was that stigma from the association of these studies with mental health services may have dissuaded some people from participating in these studies. Nonetheless, those who did complete the course obtained good outcomes and were satisfied with the course.

This paper contributes to the literature in the following ways. First, it provides preliminary evidence that the two versions of a transdiagnostic iCBT intervention have potential for treating depression and anxiety among Chinese-speaking international students in an Australian university. Large effect sizes, ranging from 1.46 to 3.79 from pre-treatment to three-month follow-up, were obtained in both trials, which are consistent in magnitude with those reported in previous studies [19,23].

Second, this paper suggests that it may be beneficial to provide translation into Mandarin for telephone support but not for the written material. Although all participants in both studies reported that they met the standard university English language requirements and the original aim of Study 1 was to provide therapist support solely in English, occasional translation into Mandarin was required as half of the sample had difficulties with spoken English. This is consistent with previous research [34] reporting that Chinese-speaking students are more proficient in understanding written than spoken English.

Third, although the small sample sizes in both studies pose a major limitation in this paper, the lessons learnt from recruiting and engaging with this population provide useful information for future researchers, policy-makers and service providers. A major challenge relates to how to disseminate information about mental health services to this population who are reluctant to admit to psychological distress and subsequently are reluctant to use mental health services [35]. Related issues include cultural differences in the understanding of terms relating to emotional health and wellbeing across Western and Chinese cultures [35], as well as generally low levels of awareness in the community about iCBT. These issues pose considerable challenges that are likely to require sustained educational campaigns that include Chinese communities as both deliverers as well as recepients of such information.

An additional and significant challenge of maintaining engagement with participants in these studies relates to the competing demands on their time due to their university studies. This issue is not unique to international students, but speaks to a broader challenge in delivering services to people who are likely to benefit, but have time constraints. An attempt was made after Study 1 to reduce the course demands on participants, which did result in an increase in completion rates, although the small sample size limits conclusions.

Implications

Consistent with previous research which found that Asian Americans tend to present at counselling services for academic or career support due to their initial reluctance to admit to having psychological distress [36,37], it might be helpful to market such programs as an educational or self-enhancement course with a focus on addressing academic or vocational concerns and their links with psychological wellbeing. To promote recruitment for iCBT programs, service providers may need to consider the role of stigma, and advertise these programs with more acceptable terms such as confidence, success and satisfaction rather than psychological wellbeing, and include active involvement from Chinese communities in the development and delivery of such campaigns.

Given that previous research has found that Asian Americans are more likely to seek help from existing social networks in their natural environment (e.g. faculty staff or administrators) than university counsellors [38], greater collaboration could be established between mental health service providers, academic and administrative staff, in order to disseminate mental-health related information to Chinese-speaking international students. Education about the effectiveness of iCBT may also improve treatment seeking by this population.

Given that time constraints due to demands of their university studies was frequently cited by our participants as a major barrier for not completing the course, it is important for future developers and service providers to ensure that iCBT courses are kept brief and concise for this population. Alternately, given the high prevalence of depression and anxiety in university students (Bayram & Bilgel, 2008; Cooke et al., 2006; Stallman, 2010) and the potential negative impacts of these conditions on academic performance (Stallman & Shochet, 2009), it might be beneficial to include information and strategies about facilitating psychological wellbeing as part of structured university courses, which could attract course credits towards qualifications and therefore improve response rates.

Limitations

Limitations of the two studies include small sample sizes, a lack of a comparison group, use of a convenience sample with potential selection bias (e.g., respondents might possess pre-existing positive attitudes towards iCBT), limited generalisability of the present findings to the general adult Chinese-speaking immigrant population which arguably possesses distinct characteristics from the student population [39], floor effects associated with low pre-treatment scores, and potential bias from the predominant use of self-report data. Additionally, it is difficult to draw conclusions from any differences in the findings between Study 1 and 2 because the assignment of participants to the two treatment groups was not randomised. Moreover, the considerable but non-systematic changes to the intervention between Study 1 and 2 limits the conclusions that can be drawn about the most effective elements of the intervention. Nonetheless, the results of these studies provide valuable information about ways to engage with this population [40-42].

Conclusion

These studies represent a preliminary attempt to explore the feasibility of implementing a transdiagnostic iCBT intervention for treating depression and anxiety among Chinese-speaking international students in an Australian university. It describes difficulties encountered and lessons gained from implementing the two trials.

Improvements on outcome measures for both studies occurred in the clinically expected direction, suggesting that trandiagnostic iCBT has potential for improving accessibility to evidence-based treatments for Chinese-speaking international students and potentially, other university students in Australia.

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