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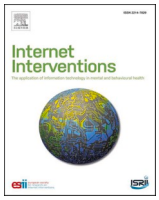

Internet-delivered cognitive behaviour therapy for university students: Preference trial for various course durations

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ABSTRACT

Background: Internet-delivered cognitive behaviour therapy (ICBT) is an accessible and effective treatment option for post-secondary students, but engagement and completion rates are less favourable than in non-student populations in routine care. Studies on students' treatment preferences suggest that a range of options should be offered. Examining students' engagement and outcomes associated with ICBT course options of varying durations can help inform how to optimally deliver ICBT to university students in routine care.

Methods: University students ($N = 72$) were offered a choice of a transdiagnostic ICBT course of three different durations (i.e., ultra-brief with no time locks, brief, or standard-length). The trial examined course preferences, predictors of preferences, treatment outcomes (depression, anxiety, and perceived academic functioning) at post-treatment and 4-month follow-up, as well as treatment engagement and satisfaction across course options.

Results: Of the 72 students who started treatment, 32 (44.4 %) chose the brief course, 36 (50.0 %) chose standard-length, and 4 (5.6 %) chose the ultra-brief course. Between-group comparisons focused on the brief and standard-length courses, as uptake was too low for the ultra-brief course. From pre-treatment to post-treatment, clients in both groups experienced large reductions in depression (brief: $d = 1.26$, 95 % CI [0.84, 1.69]; standard: $d = 1.43$, 95 % CI [0.88, 1.98]) and anxiety (brief: $d = 1.40$, 95 % CI [0.96, 1.84]; standard: $d = 1.59$, 95 % CI [1.03, 2.15]), and small but not significant improvements in perceived academic functioning (brief: $d = 0.27$, 95 % CI [−0.12, 0.67]; standard: $d = 0.44$, 95 % CI [−0.07, 0.95]). At 4-month follow-up, improvements in depression and anxiety were maintained and improvements in perceived academic functioning reached significance in both groups, with medium effects found. There were no pre-treatment between-group differences in demographic or clinical characteristics and treatment satisfaction was comparable between the groups. The percentage of clients who accessed all lessons was similar in the brief (59.4 %) and standard (55.6 %) courses.

Conclusions: As the brief and standard-length course options had similar uptake, outcomes, completion rates, and client satisfaction and similar costs in terms of therapist resources, clinics can confidently offer these options and accommodate student preferences. The low interest in an ultra-brief course prevented evaluation of the outcomes of this course but implies allocating time and resources to offering this option when offered alongside other options is not worthwhile in this particular clinic. Further research could explore whether offering ultra-brief ICBT under different circumstances is of interest and benefit to students.

1. Introduction

Mental health concerns are common among university students (Bruffaerts et al., 2019) and are associated with impairment in social and academic functioning (Auerbach et al., 2016; Bruffaerts et al., 2018; Duffy et al., 2019). In the most recent report on the Canadian reference group in the American College Health Association-National College Health Assessment III (ACHA-NCHA III; American College Health Association, 2022), 36.4 % of students reported that symptoms of anxiety, and 23.4 % of students reported that symptoms of depression, negatively impacted their performance in a class. Of those who had a lifetime diagnosis of a depressive or anxiety disorder, approximately three-quarters of students had an appointment with a healthcare or mental health professional in the previous 12 months to discuss their condition.

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In a study of 8248 Canadian university students who had accessed campus mental health services, 83.7 % reported feeling anxious and 68.0 % reported feeling depressed in the last 12 months (Ogrodniczuk et al., 2021), although these were measured using a single 'Yes/No' item. Further, one-quarter of students accessing mental health services reported suicidal ideation indicating the potential seriousness of their symptoms.

Other studies in Canada have examined students' perceptions of campus-based mental health resources and barriers to accessing mental healthcare. Moghimi et al. (2023) surveyed 448 university students in Ontario, Canada and reported that 73.2 % of students felt that their institution needed to increase mental health resources. The most frequent barriers to accessing care were financial barriers (50.5 %), long wait times (47.6 %), and insufficient resources (38.9 %). The combination of high prevalence rates and numerous barriers to accessing care suggests that university students would benefit from more accessible mental healthcare options.

Internet-delivered cognitive behaviour therapy (ICBT) is an effective and acceptable way of delivering evidence-based treatment for a range of mental health concerns in routine care, including anxiety and depression (Etzelmueller et al., 2020). Studies on ICBT for university students are heterogeneous (Harrer et al., 2019), with considerable variety in terms of therapist support (e.g., self-guided or therapist-assisted) and the duration of the interventions. Additionally, effect sizes for reductions in symptoms of depression, anxiety, and stress appear to be lower among student populations (Harrer et al., 2019) compared to ICBT programs for non-students (Etzelmueller et al., 2020). Some studies of ICBT offered to university students in a routine care setting yield more promising results. Large effect sizes were found for reductions in symptoms of depression and anxiety, as well as small improvements in academic functioning in a trial of a transdiagnostic, 5-week ICBT course for university students (Peynenburg et al., 2022). Improvements were maintained at 1-month and 3-month follow-ups. However, only 54 % (150/277) students completed treatment, which highlights that nearly half of students are not receiving the full dose of therapy. This finding also raises questions about whether it would be beneficial to offer much briefer ICBT and to offer ICBT in a way that gives students more choice and control over their treatment.

University students also express varied preferences when it comes to therapist support in ICBT (Peynenburg et al., 2019), with many students indicating a preference for weekly therapist support (32.48 %) or once every 2–3 days (27.07 %), although some students also expressed a preference for no therapist support (16.61 %). These findings suggest that a one-size-fits-all approach to ICBT is unlikely to meet this population's needs and preferences. In the literature on students' use of services in face-to-face settings, students usually attend three or fewer sessions at campus counselling centres (Broglia et al., 2017; Dear et al., 2019; Lees and Dietsche, 2012). Therefore, students might prefer briefer online interventions than what is typically offered in a structured ICBT course. Little is known about the uptake, engagement, and outcomes of ICBT courses of varying lengths when offered to university students.

2. Objectives and research questions

In the current trial, we were interested in investigating the following treatment course options: a single-lesson course with access to additional content that clients could self-select over the span of up to 5 weeks (ultra-brief course), a four-lesson course administered over the span of 5 weeks (brief course), and a five-lesson course spanning 8 weeks (standard-length course). The ultra-brief course was offered based on the growing evidence for single-session therapy in face-to-face settings (Hymmen et al., 2013; Kim et al., 2023), as well as ultra-brief interventions in ICBT settings (Bisby et al., 2024). Further, findings on university students' utilization of mental health services suggest that the average student attends three or fewer therapy sessions (Broglia et al., 2017; Dear et al., 2019; Lees and Dietsche, 2012), which highlights the potential utility of brief ICBT interventions for university students. The brief (5-week) course has been examined previously in student populations in Australia (Dear et al., 2019; Mullin et al., 2015) and Canada (Peynenburg et al., 2022) and the standard-length (8-week) course has been studied extensively in non-student populations (e.g., Titov et al., 2015; Hadjistavropoulos et al., 2021). The standard-length course is also routinely offered in our clinic, so if students express a preference for this course, it may reduce the need to offer a student-specific course. Whereas the ultra-brief and brief courses include examples that are specific to students, the standard-length course includes diverse examples that range in age and occupational background (see Hadjistavropoulos et al., 2023).

A primary objective was to increase understanding of university students' preferences for three ICBT course options of varying durations. A further objective was to compare adherence and mental health outcomes across the three ICBT courses as offering clients their preferred choice is only supported if the different options show similar levels of effectiveness. We were interested in examining the following research questions: 1) How do enrollment rates differ across the three ICBT course options?; 2) What are the demographic and clinical predictors of clients' course preferences?; 3) Are there differences in treatment engagement across the three ICBT course options?; 4) How do client outcomes (i.e., depression, anxiety, and perceptions of academic functioning) compare across the three ICBT course options?; and 5) How does client treatment satisfaction compare across the courses? This was primarily an exploratory study and no specific hypotheses were made regarding enrollment rates, predictors of course preferences, or client outcomes as these three options have not been compared previously. It was nevertheless predicted that the ultra-brief course option would have satisfaction and engagement rates that are at least as high as the brief and standard-length courses, given previous reports of students utilizing three or fewer sessions in face-to-face settings (e.g., Broglia et al., 2017; Dear et al., 2019; Lees and Dietsche, 2012).

3. Methods

3.1. Design and ethics

This was an observational preference trial that was conducted through the Online Therapy Unit (OTU), which offers ICBT to residents of Saskatchewan funded through the provincial government. This trial was registered through ClinicalTrials.gov (NCT05333627) and received ethics approval from the University of Regina Research Ethics Board (file #2019-205b). Clients provided informed consent for their participation in the trial.

3.1.1. Trial changes

In the trial registration, we intended to administer the Work and Social Adjustment Scale (WSAS; Mundt et al., 2002) pre- and post-treatment. Due to a programming error, the WSAS was not administered to clients between May and September 2022 and consequently the results of the WSAS are not reported. Further, the trial registration indicates that 19 questions related to treatment satisfaction were administered to clients. For consistency with the previous trial on ICBT for university students in our clinic (Peynenburg et al., 2022), we only report on the six treatment satisfaction questions that were also used in the previous trial.

3.2. Recruitment

Clients who identified as university students and applied to one of the three ICBT course options between May 9, 2022 and March 20, 2024 were included in the preference trial. Potential clients learned about the OTU and trial through a variety of sources including: family physicians or other healthcare practitioners, community mental health clinics, online advertising, word of mouth, and media or email announcements.

3.3. Eligibility criteria

To be eligible for the preference trial, prospective clients had to meet the following inclusion criteria: be registered as a student at a university or college in Saskatchewan, be at least 18 years of age, endorse at least mild symptoms of depression (score of 5 or greater on the Patient Health Questionnaire 9-item; Kroenke et al., 2001) or anxiety (score of 5 or greater on the Generalized Anxiety Disorder 7-item; Spitzer et al., 2006), and have access to a computer and the Internet, as well as comfort using them. Prospective clients were excluded if they met any of the following exclusion criteria: at high risk of suicide, hospitalization for mental health in the past 12 months, unmanaged primary concerns with alcohol or drug use, severe unmanaged psychiatric illness (e.g., psychosis or mania), or receiving other psychological services more than twice per month. Individuals who were excluded during the telephone screening were offered suggestions for other types of mental health care based on their location, primary concerns, and level of risk (e.g., community mental health clinics, addictions services, crisis lines).

3.4. Intervention

Clients who were accepted into the trial were given the choice between the following three course options: an ultra-brief course (single lesson, up to 5 weeks of support), a brief course (5 weeks), and a standard-length course (8 weeks). Information about the three course options was provided immediately after clients completed the online screening questionnaire. The information was always provided in the same order (i.e., ultra-brief, brief, then standard-length options). Clients were informed that the ultra-brief course includes one core lesson and that they can choose from optional additional resources on other topics if they wish over a period of up to 5 weeks (the course was described to students as Fast-Track). The description of the brief course highlighted that there are four core lessons shared over 5 weeks with additional resources. Finally, the standard-length course description highlighted that the course consists of five lessons over the span of 8 weeks, with access to additional resources throughout. Clients were also informed that the ultra-brief and brief courses included examples related to student experiences, whereas the standard-length course included diverse stories.

Despite the above differences, the three course options also shared several similarities. All courses were based on principles of cognitive behaviour therapy (CBT) and introduced clients to common CBT skills. Clients in all course options had access to the following additional resources while they were enrolled in the course: assertiveness, communication skills, grief, managing beliefs, mental skills, problem solving, good sleep, alcohol, managing panic, building motivation, agricultural mental health, and managing posttraumatic stress disorder.

3.4.1. Standard-length course

The standard-length course (i.e., the *Wellbeing Course*; Titov et al., 2015) was developed at Macquarie University and has been used in routine care at the Australian MindSpot Clinic with >30,000 Australian adults. This course consists of five lessons focused on a variety of CBT strategies (i.e., identifying symptoms using the CBT model, thought monitoring and challenging, de-arousal strategies and pleasant activity scheduling, graded exposure, and relapse prevention) that are released over the span of 8 weeks. There are no student-specific case stories or examples included in the content. The course has been extensively studied in a Canadian context in routine clinical care (e.g., Hadjistavropoulos et al., 2020a; Hadjistavropoulos et al., 2020b; Hadjistavropoulos et al., 2022) and has been found to result in large reductions in symptoms of depression and anxiety, among other comorbid concerns.

3.4.2. Brief course

The brief course consists of four lessons that are released over the span of 5 weeks. Lessons include the same overall CBT strategies as the standard-length course, but less time is allotted to each lesson. Whereas the standard-length course includes a stand-alone lesson on relapse prevention, the brief course combines the content on graded exposure and relapse prevention into a single lesson. The course was developed at Macquarie University (referred to as the *UniWellbeing Course*; Mullin et al., 2015; Dear et al., 2019) and has been found effective in a Canadian context in a previous study (see Peynenburg et al., 2022 for more details). Case stories in the course are tailored to the experiences of university students.

3.4.3. Ultra-brief course

The ultra-brief course consists of a single lesson and Do-It-Yourself Guide that assist clients in identifying their cycle of symptoms, includes information on motivation, and provides a brief overview of strategies to help manage symptoms of depression and anxiety (e.g., thought challenging, de-arousal strategies, pleasant activity scheduling, and graded exposure). After completing the single lesson, clients have the option to access additional Do-It-Yourself guides that target identifying and challenging thoughts, de-arousal strategies and activity planning, and graded exposure/relapse prevention. These additional Do-It-Yourself guides can be accessed in any order while the client is logged into the ICBT platform and can be downloaded as a PDF document.

3.5. Therapist support

Three therapists provided support in this trial (2 registered social workers and 1 Canadian Certified Counsellor with the following degrees: master's in social work, master's in educational psychology, and master's in counselling psychology). All therapists received training in ICBT, coaching with a senior provider during their first group of clients, ongoing coaching, and ongoing auditing of 10 % of messages to ensure fidelity (Hadjistavropoulos et al., 2018; Hadjistavropoulos et al., 2020a, 2020b, 2020c). All clients received optional therapist support. In the consent form, clients were informed that they can message their therapist whenever it is convenient for them during the course and that their therapist would respond to any messages sent once per week. At the beginning of the course, therapists notified clients about the designated day they would respond to messages each week. Therapists did not send any messages to clients on weeks where the client did not message the therapist. Therapists were instructed to spend approximately 15 to 20 min per message and to include the following components in each message: demonstrate warmth and concern, offer feedback on symptom measures, highlight lesson content, reinforce skill acquisitions, manage risks, address questions from clients, and provide information about the upcoming lesson and next check-in. Messages were audited and feedback was provided to therapists using standards that have been described elsewhere (e.g., Hadjistavropoulos et al., 2018; Hadjistavropoulos et al., 2020c). Clients who selected the ultra-brief or brief course could receive up to five weeks of optional therapist support and clients who selected the standard-length course could receive up to 8 weeks.

3.6. Measures

3.6.1. Demographics and clinical history

As part of the online screening, clients completed a series of questions about their demographic characteristics and clinical history including: age, gender, marital status, name of college or university, student status (i.e., full-time or part-time; domestic or international student), year of studies, employment status, ethnicity, size of community, referral source, current and lifetime mental health service use,

mental health diagnoses, and psychotropic medication use in the previous three months.

3.6.2. Primary outcome measures

Primary outcome measures were administered at pre-treatment, post-treatment (varied based on the course's duration), and 4-month follow-up. These same measures were administered on a weekly basis before clients accessed course content. Weekly measures were administered so that therapists could monitor and offer feedback on symptom changes throughout the course and were also used in analyses. Cronbach's alpha ranges represent the different Cronbach's alpha values across the pre-treatment, post-treatment, and follow-up.

Patient Health Questionnaire 9-item (PHQ-9; Kroenke et al., 2001*).* The PHQ-9 includes 9 self-report items to assess for depressive symptoms in the previous 2 weeks. Scores can range between 0 and 27, with a score $\geq$ 10 often used to indicate clinically significant symptoms of depression (Kroenke et al., 2001). Cronbach's alpha ranged between 0.79 and 0.89 within this trial.

Generalized Anxiety Disorder 7-item (GAD-7; Spitzer et al., 2006*).* The GAD-7 consists of 7 self-report items about symptoms of general anxiety in the previous 2-week period. Scores can range from 0 to 21 and a score $\geq$ 10 can indicate clinical levels of generalized anxiety (Spitzer et al., 2006). Cronbach's alpha ranged between 0.84 and 0.94 within this trial.

Perceptions of Academic Functioning (PAF; Peynenburg et al., 2022*).* The PAF consists of 3 items to assess for student's perceptions of their academic functioning in the past week (i.e., ability to attend classes/lectures, ability to complete academic tasks, and ability to absorb information from lectures or readings). Total scores can range between 0 and 30, with higher scores indicating better perceived functioning. This measure was created for a previous study on ICBT for university students (Peynenburg et al., 2022). Cronbach's alpha ranged between 0.81 and 0.94 in this trial.

3.6.3. Secondary outcome measures

The Alcohol Use Disorder Identification Test (AUDIT; Saunders et al., 1993) and Drug Use Disorder Identification Test (DUDIT; Berman et al., 2005) were administered solely for screening purposes at intake. Cronbach's alpha was 0.77 and 0.83 for the AUDIT and DUDIT, respectively.

Treatment Credibility and Expectancy (CEQ; Devilly and Borkovec, 2000). Clients responded to 4 questions related to treatment credibility and expectancy at screening and post-treatment. Using a 10-point scale, they rated how logical ICBT seemed, how useful ICBT was in raising their functioning. and how confident they would be in recommending ICBT to a friend. Additionally, they were asked to estimate their improvement in functioning, ranging from 0 to 100 %, with 10 % increments. Cronbach's alpha was 0.83 for the treatment credibility and expectancy questions.

Treatment Satisfaction Questionnaire (TSQ; Dear et al., 2011*).* The TSQ was completed by clients at post-treatment. It contains 6 items assessing satisfaction with ICBT. Clients complete a combination of yes/no questions (i.e., whether the course was worth their time, whether they would refer it to a friend), as well as questions rated on a 1 (very dissatisfied) to 5 (very satisfied) scale regarding satisfaction with the treatment overall and the quality of the course content. It also contains questions rated from 1 (greatly reduced) to 5 (greatly increased) regarding the extent to which the course impacted client confidence to manage their symptoms and motivation to seek help in the future.

3.6.4. Treatment engagement and other metrics

Treatment engagement was defined as completion of the core course content (i.e., number of lessons accessed in the brief and standard-length courses). Additionally, the ICBT platform tracks other metrics such as the number of messages and phone calls exchanged between clients and therapists, the number of times clients login to the platform, and the days between clients' first and last login to the platform.

3.7. Analyses

Analysis of the data was completed using IBM SPSS Statistics (Version 29.0). Clients' pre-treatment demographic and clinical characteristics were summarized using descriptive statistics (e.g., means, standard deviations, and percentages). Course preference groups (i.e., brief and standard-length) were compared using Chi-squared tests for binary/categorical variables and *t*-tests or ANOVA for continuous variables. We conducted an exploratory analysis to identify potential demographic (e.g., age, gender, student status, employment status, and ethnicity) and clinical (e.g., pre-treatment GAD-7 and PHQ-9 scores, current mental health service use, mental health diagnosis, and psychotropic medication use in the past three months) predictors of course preference. A series of mixed model analyses were conducted to examine changes in the primary outcomes (i.e., PAF, GAD-7, PHQ-9) over time and to assess if these changes differed between the brief and standard-length groups across the six weekly assessments for the brief group and nine weekly assessments for the standard-length group. Due to the small sample size ($n = 6$), the ultra-brief group was excluded from the mixed-model analysis.

For each outcome, models involving random intercept (i.e., symptom scores at pre-treatment) and slope (time) were used. The fixed-effect models included time, the preference group (group), and their interaction (time $\times$ group). Intraclass correlation coefficient was used to determine the appropriateness of mixed-model analyses. Various within-individual covariance structures (e.g., scaled identity, diagonal, autoregressive, unstructured) were tested. The models with the smallest Akaike's Information Criterion and Bayesian Information Criterion were selected for the final analysis. Final models used a first-order autoregressive [AR(1)] within-individual covariance structure. Estimates were calculated using the full information maximum likelihood method with the Satterthwaite approximation for the denominator's degrees of freedom. Significant pre-treatment differences in demographic and clinical characteristics did not emerge between the groups, so none of these variables were included in the model as covariates.

Paired-sample *t*-tests were used to determine pre- to 4-month follow-up treatment effects for each of the primary outcomes. Pre- to post-treatment effect sizes (Cohen's *d*; Cohen, 1988) and the associated 95 % confidence intervals were computed using estimated marginal means and standard deviations from the mixed-model analysis. Cohen's *d* for pre- to 4-month follow-up was obtained from paired-sample t-tests.

The analytic plan originally included a comparison of treatment outcomes and treatment satisfaction across the three course options (i.e., ultra-brief, brief, and standard-length). However, due to low uptake of the ultra-brief course, it was not possible to include clients from the ultra-brief course in the comparison. Therefore, between-group comparisons focus on outcomes and satisfaction rates between the brief and standard-length course options.

3.7.1. Missing data

There were no missing demographic and clinical data at pre-treatment assessment while there were missing data for some individuals in PAF, GAD-7, and PHQ-9 across all weekly assessments including post-treatment, and follow-up assessments. Up to 42.6 % of data were missing at post-treatment, and 38.2 % were missing at longer term follow-up due to noncompletion. Analysis of missingness using Little's Missing Completely at Random (MCAR) test ($\chi^2 = 708.51$, $df = 713$, $p = .54$) indicated that the missing data followed a MCAR pattern (Little and Rubin, 2002), and hence the missing data were assumed to be missing at random (MAR; Enders, 2023; Little and Rubin, 2002).

A longitudinal mixed-model analysis with maximum likelihood method of estimation can handle missing data, imputation prior to analysis was not necessary (Twisk et al., 2013). However, following modified intention-to-treat (ITT) analyses as well as a part of sensitivity analyses, thirty multiply imputed data sets were created (Enders, 2023; Graham et al., 2007) and analyzed.

4. Results

4.1. Patient flow

Between May 2022 and March 2024, 199 individuals completed the online screening, with 126 meeting the initial inclusion criteria and 96 completing the telephone interview. Overall, 83 clients were accepted into the trial, with 43 choosing the standard-length course, 34 the brief course, and 6 the ultra-brief course.

See Fig. 1 for additional details about client flow and reasons for exclusion. Of the 6 clients who chose the ultra-brief course, only 4 clients started treatment. Due to the very small sample size eligible for analysis, the ultra-brief group was excluded from any between-group analyses. A summary of the outcomes for the ultra-brief course (i.e., treatment satisfaction, therapist usage, and treatment engagement) is included in Section 3.7.

The majority of clients were White (54.2 %), women (69.4 %), single or dating (75.0 %), with a mean age of 24.79 years (SD = 7.49 years). A

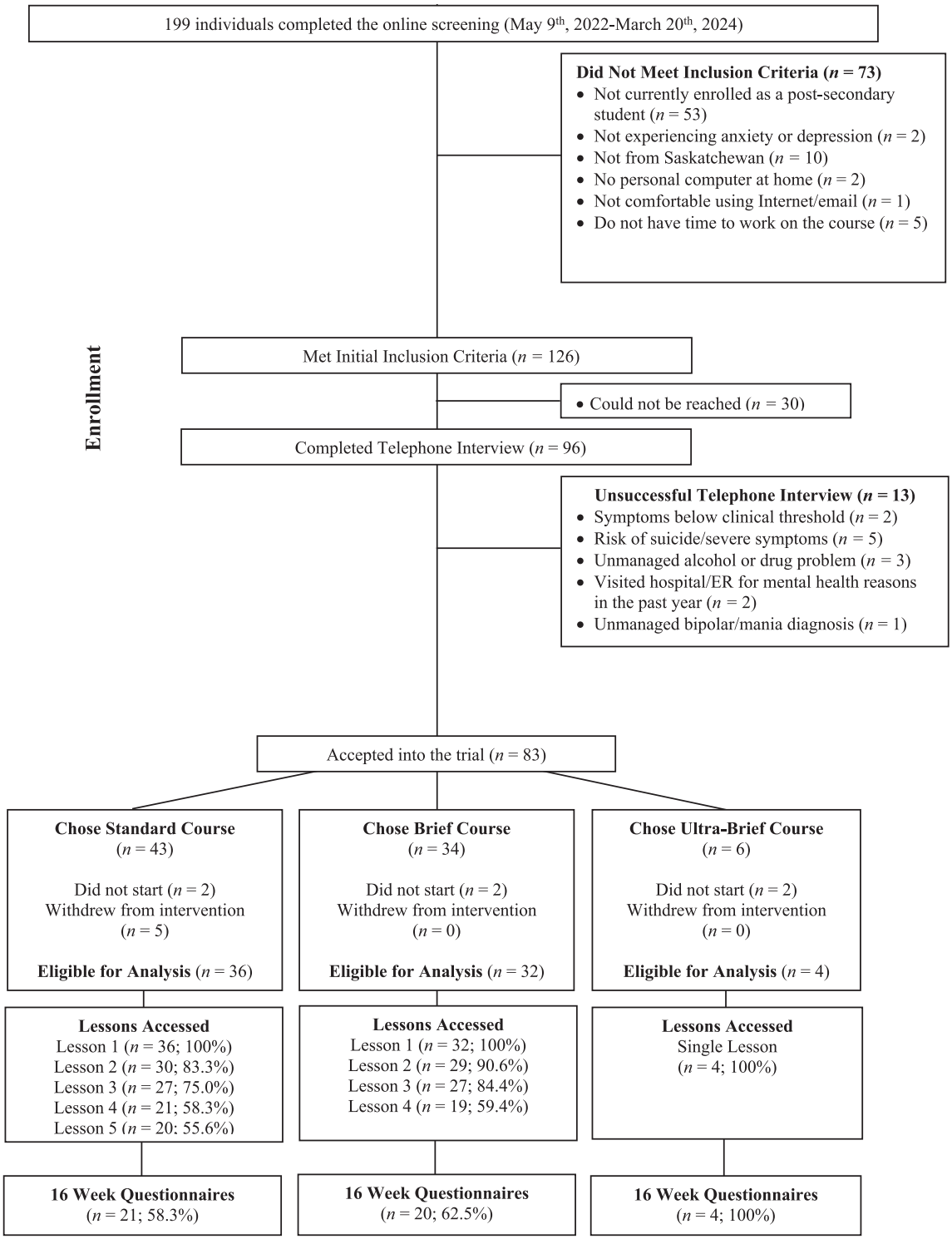

Fig. 1. Client flow diagram from screening until 16-week follow-up for the standard, brief, and ultra-brief courses.

few were international students (8.3 %), had a first language other than English (16.7 %), and were receiving other mental health treatments on occasion (41.7 %) (see Table 1 for other details). Groups were comparable in terms of demographic and pre-treatment clinical characteristics, with no statistically significant differences in any of the assessed demographic and pre-treatment variables (see Table 1 for other details). Further, there were no significant difference in treatment credibility and expectancy across the groups.

In the exploratory analysis, none of the tested demographic or clinical predictors reached statistical significance (p range: 0.07–0.99). The only predictor that approached marginal significance was current mental health service use ($p = .07$), with a higher percentage of clients in the 5-week course not receiving treatment (71.9 %) compared to the other courses.

4.2. Treatment outcomes (pre-to post-treatment)

The mixed-model analysis comparing the effects of brief and standard-length ICBT course revealed a significant time effect for all primary outcomes. As expected, PHQ-9 and GAD-7 scores decreased, while PAF scores increased.

For the PHQ-9, there was a significant decrease in scores over time ($\beta = -1.04$, SE = 0.12, $p < .001$). The within-group effect sizes were large for the pre-to-5-week assessment ($d = 1.26$, 95 % CI [0.84, 1.69]) and the pre-to-8-week assessment ($d = 1.43$, 95 % CI [0.88, 1.98]). The time × group interaction effect was also significant ($\beta = 0.51$, SE = 0.25, $p = .05$), suggesting that the change in PHQ-9 scores over time differed significantly between the brief and standard-length groups. To identify the difference in change between groups, we examined the PHQ-9 means at post-treatment assessments for the brief and standard-length groups. This analysis revealed that the brief course group achieved a greater pre-to-post-treatment decrease in mean scores (7.21 points) compared to the standard-length course group (5.60 points). However, when within-group effect sizes were calculated separately for each group, both groups obtained similar pre-to-post-treatment effect sizes (brief group, $d = 1.40$; standard-length group, $d = 1.43$).

Table 1
Comparison of pre-treatment characteristics across the treatment preference groups.

	Course preference groups								Statistical significance (F, t, X^2 tests)	
	Ultra-brief ($n = 4$)		Brief (n = 32)		Standard ($n = 36$)		Total ($N = 72$)			
Baseline characteristics	M	SD	M	SD	M	SD	M	SD	p	P[b]
Age (range: 18–52)	22.25	2.63	23.97	6.21	25.81	8.75	24.79	7.49	0.48	0.33
PHQ-9	12.50	1.29	14.25	5.09	15.42	6.28	14.74	5.60	0.51	0.41
GAD-7	13.75	5.68	13.69	5.02	15.31	4.62	14.50	4.85	0.38	0.17
PAF	18.00	2.16	17.75	5.51	14.47	7.47	16.12	6.61	0.10	0.05
ICBT Credibility	16.50	2.38	20.81	4.19	21.36	4.93	20.84	4.59	0.13	0.63
	n	%	n	%	n	%	n	%		
Gender										
Women	2	50	21	65.6	27	75	50	69.4	0.52[a]	0.53[a]
Men	2	50	7	21.9	7	19.4	16	22.2		
Other (nonbinary = 2, transgender = 3, not disclosed = 1)	0	0	4	12.5	2	5.6	6	8.3		
Education										
High school diploma or less	0	0	5	15.6	3	8.3	8	11.1	0.91[a]	0.66[a]
Some college or university	3	75.0	20	62.5	25	69.4	48	66.7		
University degree	1	25.0	7	21.9	8	22.2	16	22.2		
Ethnicity										
Asian	1	25.0	7	21.9	7	19.4	15	20.8	0.76[a]	0.48[a]
Black	0	0	4	12.5	2	5.6	6	8.3		
Indigenous	0	0	3	9.4	7	19.4	10	13.9		
White	3	75.0	18	56.3	18	50	39	54.2		
Other	0	0	0	0	2	5.6	2	2.8		
First language English										
No	1	25	4	12.5	7	19.4	12	16.7	0.50[a]	0.52[a]
Yes	3	75.0	28	87.5	29	80.6	60	83.3		
Relationship status										
Single never married	2	50.0	12	37.5	13	36.1	27	37.5	0.99[a]	0.98[a]
Dating	1	25.0	13	40.6	13	36.1	27	37.5		
Married/common law/living with partner	1	25.0	6	18.8	8	22.2	15	20.8		
Separated/divorced/widowed	0	0	1	3.1	2	5.6	3	4.2		
Relationship concerns										
No	2	100	15	78.9	14	66.7	31	73.8	0.61[a]	0.49[a]
Yes	0	0	4	21.1	7	33.3	11	26.2		
Student status										
Part-time student	1	25.0	2	6.3	6	16.7	9	12.5	0.21[a]	0.27[a]
Full-time student	3	75.0	30	93.8	30	83.3	63	87.5		
International student										
No	4	100	28	87.5	34	94.4	66	91.7	0.59[a]	0.41[a]
Yes	0	0	4	12.5	2	5.6	6	8.3		
Other psychiatric diagnoses										
No	3	75.0	20	62.5	21	58.3	44	61.1	0.86[a]	0.81[a]
Yes	1	25.0	12	37.5	15	41.7	28	38.9		
Receiving other mental health treatments										
No	1	25.0	23	71.9	18	50	42	58.3	0.07[a]	0.08[a]
Yes	3	75.0	9	28.1	18	50	30	41.7		

Note. PHQ-9 = Patient Health Questionnaire-9; GAD-7 = Generalized Anxiety Disorder-7; PAF = Perceptions of Academic Functioning; and ICBT = Internet-delivered cognitive behaviour therapy.

[a] Fisher-Freeman-Halton Exact Test.

[b] Comparing Brief and Standard course groups only.

For the GAD-7, there was a significant decrease in scores over time ($\beta = -1.14$, SE = 0.11, $p < .001$). The within-group effect sizes were large for the pre-to-5-week assessment ($d = 1.40$, 95 % CI [0.96, 1.84]) and the pre-to-8-week assessment ($d = 1.59$, 95 % CI [1.03, 2.15]). However, the time × group interaction effect was not significant ($\beta = 0.46$, SE = 0.25, $p = .06$), suggesting that the change in GAD-7 scores over time did not differ significantly between the brief and standard-length groups.

For the PAF, the mixed-model analysis revealed a significant time effect ($\beta = 0.35$, SE = 0.145, $p = .01$), indicating a significant increase in PAF scores over time. The within-group effect sizes (Cohen's *d*) were small for the pre-to-5-week assessment (post-treatment assessment for the brief course) ($d = 0.27$, 95 % CI [−0.12, 0.67]) and for the pre-to-8-week assessment (post-treatment assessment for the standard-length course) ($d = 0.44$, 95 % CI [−0.07, 0.95]). However, the 95 % confidence intervals containing zero indicate that these effects were not statistically significant. The time × group interaction effect was also not significant ($\beta = 0.28$, SE = 0.32, $p = .39$), suggesting that the change in PAF scores over time did not differ significantly between the brief course and standard-length courses.

The mixed-model analysis with 30 multiply imputed datasets yielded similar pooled estimates for time for PHQ-9 (β = −0.92, SE = 0.08; p < .001), GAD-7 (β = −1.02, SE = 0.07; p < .001), and PAF (β = 0.36, SE = 0.09; p < .001), suggesting that missing data had no significant impact on the results.

4.3. Treatment outcomes (pre-to 4-month follow-up)

Paired-sample *t*-tests showed a medium but significant increase in PAF scores from pre-treatment to 4 months post-treatment ($d = 0.68$, 95 % CI [0.34, 1.02]), while there was a large and significant decrease in both GAD-7 ($d = 1.50$, 95 % CI [1.05, 1.94]) and PHQ-9 ($d = 1.07$, 95 % CI [0.68, 1.44]) scores. No significant differences were found between groups in pre-to-4-month follow-up assessments for any of the primary outcomes (*p* range: 0.16–0.76). Therefore, effect sizes for each group were not computed separately. The results of the paired-sample t-tests indicate a sustained effect of the ICBT on all outcomes.

4.4. Treatment satisfaction

Table 2 presents the post-treatment satisfaction and engagement results comparing the brief and standard-length courses. As shown in Table 2, of the 42 clients who responded to the satisfaction questionnaire, 76.2 % ($n = 32$) were satisfied with the treatment overall, and 88.1 % ($n = 37$) were satisfied with the website as well as with the lessons and Do-It-Yourself guides. Most clients reported increased confidence in managing their symptoms (73.8 %; $n = 31$) and increased motivation to seek other treatments if needed (71.4 %; $n = 30$). Additionally, 95.2 % ($n = 40$) indicated that the course was worth their time and that they were willing to recommend it to friends. There were no statistically significant differences in the satisfaction variables between the brief and standard-length courses, except for increased motivation to seek other treatments. A higher percentage of clients in the brief course (87.0 % vs. 52.6 %; $p = .02$) reported increased motivation to seek other treatments.

4.5. Treatment completion

Table 3 shows the descriptive results on treatment completion for the brief and standard-length courses. In the brief course, 59.4 % accessed all four lessons and 84.4 % completed three or more lessons, with a mean of 3.34 ($SD = 0.97$) lessons accessed. In the standard-length course, 55.6 % accessed all five lessons and 58.4 % accessed four or more lessons, with a mean of 3.72 lessons ($SD = 1.60$). No statistical test was conducted to compare these groups because the groups received a different number of lessons; clients in the brief course received four lessons while clients in the standard-length course received five.

4.6. Therapist use

The number of messages received by clients in the brief ($M = 3.66$, $SD = 1.38$) and standard-length courses ($M = 4.14$, $SD = 2.95$) was similar ($p = .40$), as well as the number of messages sent by clients in the brief ($M = 1.84$, $SD = 2.52$) and standard-length ($M = 1.94$, $SD = 5.41$) courses ($p = .92$). Further, no significant differences in the average number of client logins to the treatment portal (brief: $M = 16.88$, $SD = 14.06$; standard-length: $M = 29.89$, $SD = 73.97$; $p = .33$) or days

Table 3
Engagement comparing Brief and Standard course groups.

	Brief $n = 32$		Standard $n = 36$		Total $N = 68$	
	n	%	n	%	n	%
Accessed majority of lessons[a]	27	84.4	21	58.4	54	79.4
Accessed all lessons[b]	19	59.4	20	55.6	40	58.8
	M	SD	M	SD	M	SD
Lessons accessed M (SD)	3.34	0.97	3.72	1.60	3.54	1.34

[a] Defined as ≥3 lessons for Brief group and ≥ 4 lessons for Standard group.
[b] Defined as 4 lessons for Brief group and 5 lessons for Standard group.

Table 2
Treatment satisfaction comparing Brief and Standard course groups.

	Brief $n = 23$		Standard $n = 19$		Total $N = 42$		Statistical Significance[a]
	n	%	n	%	n	%	p (F, X^2)
Satisfied overall							
Yes	20	87	12	63.2	32	76.2	0.14
Satisfied with the website							
Yes	21	91.3	16	84.2	37	88.1	0.64
Satisfied with materials (lessons and DIY guides)							
Yes	20	87	17	89.5	37	88.1	1.00
Increased confidence managing symptoms							
Yes	18	78.3	13	68.4	31	73.8	0.50
Increased motivation to seek other treatment							
Yes	20	87	10	52.6	30	71.4	0.02
Course was worth the time							
Yes	22	95.7	18	94.7	40	95.2	1.00
Would recommend the course to a friend							
Yes	22	95.7	18	94.7	40	95.2	1.00

Note. DIY guides = Do-It-Yourself guides.
[a] Fisher-Freeman-Halton Exact Test.

between the first and last login (brief: $M = 31.94$, $SD = 25.20$; standard-length: $M = 40.58$, $SD = 28.53$; $p = .19$) emerged between the courses.

4.7. Findings from ultra-brief course

All clients ($n = 4$) in the ultra-brief course reported being satisfied with the treatment overall and the treatment platform, reported increased motivation to seek other treatment, reported the course was worth their time, and indicated that they would recommend the treatment to a friend. Of the four clients, three (75.0 %) reported being satisfied with the lesson material and Do-It-Yourself guides and three (75.0 %) reported that they had increased confidence in their ability to manage their symptoms. Clients in the ultra-brief course sent an average of 4.25 ($SD = 1.89$) messages to therapists and received an average of 4.50 ($SD = 0.58$) messages from their therapists. The average number of logins to the treatment portal was 25 logins ($SD = 14.86$), with an average of 32.50 days ($SD = 5.26$) between the first and last login.

5. Discussion

In routine practice, little is known about university students' preferences for and uptake and outcomes associated with ICBT courses of varying durations. Trials of ICBT in this population often report high attrition rates, which may suggest that longer ICBT course durations do not match the needs and preferences of students. In this pragmatic observational trial, we offered university students the choice between three different ICBT course options (i.e., ultra-brief, brief, and standard-length courses). We examined student's preferences for the course options, as well as between-group differences in treatment outcomes, completion rates, and satisfaction with the courses. The findings of this trial can help inform which course options should be offered to university students to maximize benefit to students in a routine care setting.

Overall, we did not find any significant differences in enrollment rates between the brief ($n = 32/72$, 44.4 %) and standard-length ($n = 36/72$, 50.0 %) course options. A surprising finding was that very few students selected the ultra-brief course ($n = 4/72$, 5.6 %), which seems to contradict findings about students' usage of mental health services in face-to-face settings (Broglia et al., 2017; Dear et al., 2019; Lees and Dietsche, 2012). This finding might suggest that students feel a need for a longer duration of support when receiving ICBT compared to face-to-face services. The current trial did not include an assessment of clients' reasons for selecting one of the course options over the others, so it is unclear why the uptake of the ultra-brief course was substantially lower than the other two course options. One possible explanation is that clients perceived a need for more course content or more opportunities for therapist support. There may also have been a bias in how the course descriptions were presented to clients. Course descriptions were presented in the same order for all clients (i.e., ultra-brief, brief, and standard-length) and one of the differences that was the number of lessons they would be reviewing in each course.

No significant predictors of course preference emerged in terms of demographic (i.e., age, gender, student status, employment status, or ethnicity) or clinical characteristics (i.e., pre-treatment GAD-7 and PHQ-9, current mental health service use, mental health diagnosis, and psychotropic use in the past 3 months). These analyses were exploratory and predictors of preference for a brief versus standard-length ICBT course have not been examined in a university student population before, so it is possible that predictors might emerge in other samples.

The current study found course completion rates were comparable between the brief and standard-length course, with 59.4 % of clients completing all lessons in the brief course and 55.6 % of clients completing all lessons in the standard-length course. Therefore, offering a brief course does not appear to improve the amount of treatment completed, even though clients in the brief course are only completing four core lessons compared to the five core lessons in the standard-length course. At pre-treatment, 41.7 % of clients indicated that they were receiving other mental health treatments on occasion, which may have contributed to reduced engagement in the ICBT course. Completion rates in the brief course were similar to previous trials involving the brief course (54.2 % in Peynenburg et al., 2022 and 53 % of self-referred clients in Dear et al., 2019), despite the current trial having optional therapist support rather than once-weekly support. Optional therapist support has been associated with lower completion rates compared to weekly therapist support (56.6 % versus 82.4 %; Hadjistavropoulos et al., 2017) in trials of ICBT for adults. We also did not find any significant differences in other measures of engagement such as the number of messages sent by clients, number of logins to the treatment portal, or number of days between clients' first and last logins.

As predicted, the mixed-model analysis of brief and standard-length ICBT courses delivered to students showed significant time effects for all primary outcomes. Specifically, PAF scores increased, while GAD-7 and PHQ-9 scores decreased over time. Both brief and standard-length groups exhibited similar improvements in GAD-7 scores, with large effect sizes for both. For PHQ-9, although both groups showed significant decreases with large effect sizes, the brief course group achieved a slightly greater reduction in scores compared to the standard-length group. However, no significant difference was found between the groups in terms of changes in PAF and GAD-7 scores. These findings indicate that both the brief and standard-length ICBT courses are associated with improvements in anxiety and depression symptoms, with the brief course showing a marginally greater impact on depression scores. Further, improvements on these measures were maintained at 4-month follow-up. Our findings are consistent with those reported in a meta-analysis of ICBT for students experiencing anxiety, in which no significant effects were found when comparing interventions of different lengths (Oliveira et al., 2023).

Offering optional therapist support instead of weekly therapist support may have impacted client engagement with the course, but did not appear to impact client outcomes given the effect sizes for depression and anxiety were comparable to previous studies of the course (e.g., Dear et al., 2019; Peynenburg et al., 2022). This finding is consistent with what was reported in a meta-analysis of ICBT for students experiencing anxiety (Oliveira et al., 2023), in which guided ICBT did not result in significantly better outcomes than unguided ICBT.

Overall, the findings for the brief course were similar to previous trials that examined the course, such that there were large reductions in symptoms of depression (Cohen's *d*: $d = 1.26$) and anxiety (Cohen's $d = 1.40$) from pre-treatment to post-treatment. In their sub-analyses of clients who started in the moderate to severe range for symptoms, Dear et al. (2019) reported large reductions in symptoms of depression (Cohen's *d*: 1.42–1.97), as well as anxiety (Cohen's *d*: 1.93–2.13). Similarly, clients in another trial of the course (Peynenburg et al., 2022) experienced large reductions in symptoms of depression (Cohen's *d*: 1.25–1.67) and anxiety (Cohen's *d*: 1.42–2.01). The PAF has only been used in one previous trial of the course to examine the impacts of ICBT on perceived academic functioning (Peynenburg et al., 2022). Whereas the time effect was not significant for pre-to post-treatment in the current trial for the PAF (Cohen's $d = 0.27$, 95 % CI [−0.12, 0.67]), the previous trial found significant, but small improvements in PAF (Cohen's *d*: 0.40–0.49). It is unclear why the time effect did not reach significance in the current trial for the PAF, but one possible explanation is that clients in the current trial received optional therapist support, which means they would not have received any tailored messages about academic functioning unless they sent their therapist a message that week. The current trial did not have a control group, so the effect sizes cannot be compared to the between-group effect sizes reported in the meta-analysis of internet interventions for university students with depression and anxiety (Harrer et al., 2019) or the meta-analysis of ICBT for students with anxiety (Oliveira et al., 2023).

In terms of treatment satisfaction, a greater percentage of clients in the brief course expressed satisfaction with the treatment overall compared to the standard-length course (87.0 % vs 63.2 %), although

this difference did not reach significance. A possible explanation for this difference is that the brief course included case stories and examples that were tailored to common experiences for university students. In comparison, the standard-length course was designed for the general adult population and does not include student-specific examples. Motivation to seek additional treatment in the future was significantly lower for clients in the standard-length compared to the brief course (52.6 % vs 87.0 %), which might suggest that clients who were less satisfied with treatment expressed less willingness to engage in other forms of treatment in the future. Alternatively, students in the brief course may have felt that they still required additional treatment at the end of the course, so they may have had greater motivation to seek other forms of treatment. These findings may speak to the importance of adapting ICBT to meet the needs of specific populations, for example, by including case stories and examples that are relevant to students.

Overall, while it appears that allowing students to select their preferred treatment choice does not impact outcomes of the courses, the costs and benefits of offering the brief and standard-length courses should be considered when making decisions about delivering these courses in the future. In terms of costs, it may be more difficult to allocate therapist resources when both are administered, as therapist schedules would have a combination of 5-week and 8-week clients. Service delivery could be more streamlined and potentially more efficient if only one of the course options is offered. However, since the brief and standard-length courses result in similar levels of engagement, treatment outcomes, and costs associated with delivering the courses, it may be worthwhile to continue offering both courses to students so that they can select their preference. Allowing students to select their preferred course duration may improve students' willingness to enroll in ICBT, as treatment preferences have been found to affect enrollment, attrition, adherence, satisfaction, and outcomes (Preference Collaborative Review Group, 2008).

5.1. Strengths

To our knowledge, this is the first preference trial to examine the uptake and outcomes of three different ICBT course options offered to university students. A strength of this study is that it provides data on student preferences for three ICBT course durations in routine care. The results show that the desire for an ultra-brief course option is very low when offered alongside a brief or standard-length option. By analyzing data on the number of messages sent by therapists in the two course options, we were also able to evaluate the costs associated with each of the options, which can be used to inform decisions in routine care clinics. Although we were not able to evaluate the ultra-brief option for engagement or outcomes, we were able to evaluate it in terms of student preferences. The study replicated findings of previous trials of the brief course (Dear et al., 2019; Peynenburg et al., 2022, in that we found large reductions in symptoms of anxiety and depression. Further, this was the first trial that examined outcomes for the brief course in a Canadian context after the COVID-19 pandemic and we found that the outcomes were comparable during and after the pandemic.

5.2. Limitations and future directions

The most significant limitation of this study was the low uptake of the ultra-brief course, which prevented the ultra-brief course clients from being included in the analyses of group differences and to understand the outcomes of this option. It would be worthwhile to include a qualitative exploration of why students choose the brief or standard-length courses over the ultra-brief course to better understand student preferences. Future trials could be designed using stratified sampling or randomization, in which clients are randomly assigned to receive the ultra-brief, brief, or standard-length courses to ultimately compare differential outcomes. This would help to ensure that there is sufficient power to examine between-group differences across the three course options. However, such trials should assess and consider student preferences in order to examine the relationship between preferences and treatment outcomes alongside treatment outcomes.

Overall, we found a lower uptake of ICBT among university students in the 2-year period of the current trial, compared to the previous trial of ICBT for students in this clinic (Peynenburg et al., 2022), which suggests that more research is needed to ensure students are aware of ICBT as a treatment option. The clinic involved in the current trial also only delivers ICBT. Future trials could examine how uptake of ICBT compares to other services students have available (e.g., counselling services or medications).

Additional research on the ultra-brief course would allow for increased understanding of why students were less likely to select it compared to the other course options. University students could be presented with a description of the ultra-brief course and then answer a series of open-ended survey questions or complete an interview in which they are asked about the perceived benefits and challenges of completing the ultra-brief course. Qualitative feedback may also help inform how to market the course to university students so that it is more appealing to them. In general, it would be worthwhile to include questions to assess clients' reasons for selecting their preference out of the three course options, which could be analyzed using thematic analysis. Focus groups provide another option to gain insight into students' preferences for different types of ICBT courses. Finally, the results of the current trial are specific to a single routine care ICBT clinic. Possible barriers to implementing these course options in other settings that do not routinely offer ICBT include: therapist training, ongoing auditing of messages, resource allocation, and integrating the service into existing service options. While it is possible that the findings would be similar in other settings, additional research should examine the generalizability of this study's findings.

6. Conclusions

When offered a choice between an ultra-brief, brief (5-week), or standard-length (8-week) transdiagnostic ICBT course, most university students select either the brief or standard-length options. Both courses are associated with large reductions in symptoms of depression and anxiety, as well as small to moderate improvements in perceptions of academic functioning. The cost to deliver the brief and standard-length courses with optional therapist support is similar, as therapists sent a similar number of messages to clients in the two courses. The findings of this study suggest that it may be worthwhile to offer both a brief and standard-length ICBT course option to university students to accommodate student preferences, given similar findings for treatment outcomes, engagement, and costs associated with delivering the course options.

Declaration of competing interest

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