

**A randomised controlled trial of online group CBT for symptoms of
depression and anxiety among university students in South
Africa**

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INTRODUCTION

Depression and anxiety are common and debilitating disorders, both internationally (Eisenberg, Gollust, Golberstein, & Hefner, 2007; Hajduk, Heretik, Vaseckova, Forgacova, & Pecenak, 2019; Hasin, Goodwin, Stinson, & Grant, 2005; Hunt, Slade, & Andrews, 2004), and in South Africa (Herman et al., 2009). Among university students, symptoms of depression and anxiety are also very common (Bantjes et al., 2019) and are associated with significant problems including higher rates of academic failure and suicidal behaviours (Cranford, Eisenberg, & Serras, 2009; Eisenberg et al., 2007; Hysenbegasi, Hass, & Rowland, 2005). Despite viable psychotherapeutic and pharmacological options, the majority of depressed or anxious university students, like others in the general population, do not pursue treatment (Tolin, 2010; Trivedi et al., 2006; Wilson & Deane, 2010). Further, barriers to care, both those involving practical issues and psychological factors, lead to high attrition rates from treatment, resulting in modest effect sizes in effectiveness trials (Collins, Westra, Dozois, & Burns, 2004; Fergusson, Horwood, Ridder, & Beautrais, 2005). As a means of increasing accessibility and retention, effective psychological group interventions for symptoms of depression and anxiety have been developed and tested (Conley, Durlak, & Kirsch, 2015). Identifying individuals with a high likelihood of responding to psychological group interventions would enable clinicians to target this inexpensive treatment only to the patients with a high probability of responding; allowing more intensive treatments to be reserved for patients who would not respond to group-based skills training. The development of a system to make this determination would represent a major advance and address an unmet need. To date no attempts have been made to trial the use of psychological interventions for clinically significant symptoms of depression or anxiety among university students in South Africa. It is within this context that we propose a randomized controlled trial on the use of online group interventions for symptoms of depression or anxiety among university students in South Africa. The research project is a collaboration between the Centre for Student Counselling and Development at Stellenbosch University (SUN), the Institute for Life Course Health Research, Department of Global Health at SUN, and experts from the University of West Virginia and Harvard University.

METHODS

Study aims:

The specific aims of the study are:

- 1) Determine the proportion of university students who will utilize online psychological interventions for symptoms of depression and anxiety.
- 2) Determine if a 10-week online group CBT (GCBT) intervention effectively reduces symptoms of depression and anxiety among university students when compared with three control group interventions (i.e., Mood Flow, SilverCloud guided, and SilverCloud unguided).

This is a parallel group, unblinded randomized controlled trial (RCT), to assess the effectiveness of a novel 10-week online group CBT (GCBT) intervention that we have developed for university students reporting symptoms of depression or anxiety.

Students will be recruited from Stellenbosch University to participate in this RCT. Students will be sent an email invitation in randomized batches of 400 students at a time. The email will explain that we are conducting research on the use of digital interventions to reduce symptoms of depression and anxiety. The email will also invite students to enrol in the study by completing an online baseline assessment. Students will be asked to complete an Informed Consent Form before participating in the baseline assessment or any of the interventions. The Online Informed Consent Form outlines the primary aims of the study, inclusion/exclusion criteria, and rights as a participant (e.g., skip any question, discontinue at any time, right to withdraw) as well as detail about the online psychological group interventions. Students who meet the inclusion criteria will be randomized in a 1:1 ratio to one of the four study arms: the experiment group (i.e., the 10-week online GCBT intervention) or one of the three control groups (i.e., Mood Flow, SilverCloud guided, and SilverCloud unguided). We will repeat this recruitment strategy until we reach our target sample size of at least 400 students (i.e., a minimum of 100 students per intervention arm).

Students who enrol in the study will complete a baseline assessment prior to randomization. Follow-up assessments will also be conducted at 3-months, 6-months and 12-months post intervention. Assessment will consist of online self-report questionnaires administered using Qualtrics^{xM} software to record the following:

- (a) Respondent contact information
- (b) Background information

- (c) COVID-19
- (d) Physical health
- (e) Attention and concentration
- (f) Substance use
- (g) Symptoms of depression
- (h) Worry and anxiety
- (i) Panic attacks
- (j) Social anxiety
- (k) High mood
- (l) Obsessive-compulsive disorder
- (m) Stressful experiences
- (n) Other behavioural health problems
- (o) Self-harm
- (p) Personal relationships
- (q) Intervention evaluation for group therapy
- (r) Social networks
- (s) App and technology use
- (t) Treatment
- (u) Personality
- (v) Childhood experiences
- (w) University experiences

Inclusion Criteria:

- (a) Aged 18 or older years.
- (b) Enrolled as a student at Stellenbosch University.
- (c) Provide Informed Consent and completed baseline assessment.
- (d) Access to internet and a device that support apps.

Exclusion Criteria:

- (a) No internet availability or no device that supports apps.

Enrolment in group intervention:

Eligible students for the experiment group (i.e., online GCBT intervention) or control group (i.e., Mood Flow, SilverCloud guided, and SilverCloud unguided) will be sent an email inviting them to attend an online individual information session and briefing

about the group that they have been randomized to. The online individual information session will be conducted using the Microsoft Teams platform which is a free easy-to-use virtual meeting space. Information about the intervention they have been assigned to will also be sent via email.

No incentives will be paid for participating in the intervention.

Details of the online group CBT (GCBT) intervention:

The online GCBT intervention we have developed and previously piloted in a pragmatic trial (Bantjes et al., 2021), will be delivered via Microsoft Teams (a secure web-based video conferencing platform) in 10 weekly workshops of 60-75 minutes. The content was drawn from common elements identified from GCBT interventions shown to be effective for university students (Hamamci, 2006; Peden, Hall, Rayens, & Beebe, 2000; Takagaki et al., 2016; Yang, Zhao, Chen, Zu, & Zhao, 2018; Zemestani, Davoodi, Honarmand, Zargar, & Ottaviani, 2016). The content was organised into five themes with each theme spanning two workshops. To make the intervention more engaging and relevant to the target population, we consulted regularly over the development period with a group of four student advisors to select suitable examples, plan activities, and inform the lay-out and design of materials. Consultation with the student advisors took place in an iterative process over the course of a year while we developed and refined the intervention materials. We also consulted with three Psychologists working in student counselling centres and the intervention materials were critically reviewed by two CBT experts.

Participants assigned to the online GCBT intervention will be provided with electronic interactive pdf workbooks consisting of exercises and brief summaries of the main ideas and skills for each session before each workshop. Participants will be given the option to remain anonymous by keeping their web-cameras off and/or by using pseudonyms, although they will be encouraged to use web-cameras to show their faces during the workshops. Participants will also be invited to use the online chat function to type comments, questions, or responses during the sessions if they felt uncomfortable speaking in the group. Strategies that will be used to improve retention include giving participants permission to miss sessions but encouraging attendance at each new session, sending follow-up emails to students who missed

sessions prompting them to join the following week, and giving a brief recap of the previous workshop at the start of each new session.

Sessions will be facilitated by registered counsellors (the equivalent of psychological technicians with four years of university training) and registered psychologists. A facilitators' handbook, with detailed descriptions of the content of each session and facilitation guidelines will be provided and facilitators will be trained on group therapy facilitation. Online sessions will be recorded so that they could be reviewed during supervision.

Control groups:

The control groups will be directed to make use of one of three digital applications (apps); i.e., Mood Flow, SilverCloud (guided), and SilverCloud (unguided).

Assessment schedule:

As part of the study, the experimental group intervention participants will complete a baseline assessment at the start of the study and process assessments every two weeks. Follow-up assessment will also be administered to monitor symptom change (i.e., 3-month post-treatment, 6-month post-treatment, and 1-year post-treatment). The control group will only complete the baseline assessment and a 3-month follow up assessment.

Management of risk

If during the initial screening and recruitment or follow-up assessments, any participant endorses a "2" (more than half the days) or "3" (nearly every day) on the PHQ-9 (Thoughts that you would be better off dead or of hurting yourself in some way), they will receive an automated message that provides a list of emergency resources. The email and text message will be sent immediately after endorsing the item. Students who report active suicidality with intent at any time during the study will be referred to appropriate campus-based crises services, and national suicide helplines.

Statistical Analyses:

Data will be cleaned and analysed with SPSS (version 27). Descriptive statistics will be used to summarise participant characteristics, attendance rates, and primary outcomes.

We will evaluate aggregate intervention effects, as well as evaluate aggregate

differences across arms using conventional intent to treat (Gupta, 2011) and complier average causal effect (CACE) (Angrist, Imbens, & Rubin, 1996) analyses based on inverse probability weights to deal with loss to follow-up (Robins, Rotnitzky, & Zhao, 1994). Log-binomial regression will be used to estimate remission and to report adjusted prevalence ratios with 95% CIs. If convergence problems occur, we will fall back on Poisson regression with robust variance estimation. We will calculate numbers needed to treat for each outcome (remission of anxiety, depression, and combined PHQ-ADS). To estimate CACE, we will use two-stage least squares (Wooldridge, 2020) and control function procedures (Clarke & Windmeijer, 2012). We will evaluate the validity of the assumptions needed for this estimation and conduct sensitivity analyses. Distributions and correlates of dropout and missing data will be provided in reports.

Process analyses will allow us to investigate the pathways through which the intervention affects the outcomes by investigating intermediate effects of the individual intervention rule (IIR) in predicting responses in the five-minute process assessments that will be carried out every two weeks with students in the intervention arm over the 10 weeks of the intervention. The instrument used in these process assessments, the CBRSS (Miner, Schueller, Lattie, & Mohr, 2015), measures frequency of applying core cognitive skills (CSF) and core behavioral skills (BSF) during times of stress. We will also use the 4-item screening version of the GAD-7 and PHQ-9, the PHQ-4 (Kroenke, Spitzer, Williams, & Löwe, 2009), to assess anxiety-depression over each 2-week period. We will begin by investigating associations of the CSF and BSF measures both cross-sectionally and with a 2-week time-lag in predicting PHQ-9 scores. Our interest will be in determining whether CSF and BSF predictor PHQ-9 scores and if these associations increase over time.

We will also be interested in the associations of CSF and BSF data and individual differences in the slopes of PHQ-4 scores on CSF and BSF with the outcomes at the end of the intervention and in the 3-month, and 6-month follow-ups (i.e., academic attrition, performance, and engagement along with diagnostic classifications based on the GAD-7, PHQ-9, and PCL). We will also be interested in individual differences in mean values of CSF and BSF over the course of the intervention, changes (i.e., stronger changes in CSF and BSF over time for some students than others), and slopes of PHQ-9 scores on CSF and BSF scores in predicting long-term outcomes. We will be especially interested in the possibility of nonlinearities that document the existence of important minimum engagement

thresholds for achieving treatment effects (Chien et al., 2020). We will use a multilevel modelling framework to carry out these analyses. Finally, we will be interested in the extent to which the association of the IIR scores with long-term outcomes are mediated by the process measures obtained in the process assessments collected every two-weeks.

ETHICAL CONSIDERATIONS

Consent:

Eligible participants who satisfy the inclusion criteria and do not meet the exclusion criteria outlined in this proposal will be invited to participate in the online psychological group interventions and will be provided with an Online Informed Consent Form on participation in the research and online group intervention. The Online Consent Form outline: (a) aim of the research study, (b) risks and benefits of the research study, (c) assurance of confidentiality, (d) rights as a participant, including the right to refuse to answer any question, discontinue participation at any time, and withdraw from the study and (e) details on participating in online group interventions. No information obtained will be used without receiving the completed Informed Consent Form. After completing the consent form, participants will be emailed a pdf copy of the Informed Consent Form for their records.

Potential risks:

(a) *Privacy*. Participants who provided informed consent will be given details on the online intervention groups that they have been randomized to. Respective group facilitators will make a note of which students join which session as an online form of a register. Each participant will be assigned an alphanumeric ID so that data is stored in a way that is not directly linked to any identifying information.

All collected electronic data will be password protected and will be accessed only by authorized personnel. The data will only be used for this study and will be destroyed after a three-year period. Scientific publications or presentations on the results will only report analyses on an aggregated level.

(b) *Discomfort*. If participants experience discomfort when completing the study questionnaires or throughout the intervention, they can refuse to answer any questions. Further, all participants may choose to discontinue the assessment/intervention and/or withdraw from the study. This is outlined in the relevant Informed Consent Form.

Clinical Risk and Benefits. There are risks with any intervention, most specifically that they will not work or that a person might get frustrated by this intervention approach. However, there also are benefits as the group nature of this intervention shows students that they are not alone. There is no reason to believe this intervention would not prove effective in university students given past research showing that psychological group interventions in depressed and anxious higher education students are effective (Conley et al., 2015). Additionally, there are a number of benefits for the greater community. Namely, the study will advance our collective understanding of the feasibility in using psychological skills training group interventions for treating symptoms of depression and anxiety in university students. This information may then be utilized to develop more effective intervention programs.

Institutional permission:

We will seek institutional permission from the appropriate authorities at Stellenbosch University to conduct this study.

MONITORING, ASSESSMENT, AND RISK MANAGEMENT OF PARTICIPANTS

(a) The PIs will have the responsibility for continuous monitoring of data and safety of subjects in the study. Data and safety monitoring will take place continuously throughout the study's duration.

(b) Following the initial baseline assessment, those participants who report severe symptoms of depression, or suicidality will receive an automated message that provides a list of emergency resources.

- (c) Students' identified as being at risk will be immediately referred to the SSVO for further assessment and management. They will not be discharged from the RCT, but we will insist that they are also receiving individual care at the same time and that they are aware of the crises services available to students' (i.e. ER 24 crises line). The group facilitators will manage this referral process in collaboration with the SSVO.
- (d) All administrators will be trained and supervised by Professor Jason Bantjes.
- (e) Of note, the administrators will not specifically probe or assess suicide risk. However, in the unlikely situation that a participant explicitly states that he/she is suicidal, the participant would be provided with a list of emergency resources, per email and phone text message.
- (f) We will report both adverse events and all serious adverse events that occur during the course of the study to the Institutional Review Board (IRB). Specifically, we will record all adverse events in a tracking log based on IRB templates, which will be submitted to the IRB at each continuing review.
- (g) At the time of the continuing review we will provide the IRB with a summary of any unexpected and related adverse events as well as any other unanticipated problems that occurred since the last continuing review.
- (h) Adverse events and unanticipated problems will be reported to the IRB per PHRC reporting guidelines. We will report to the IRB any unanticipated problems and adverse events that occur: (a) during the conduct of the study, (b) after study completion, or (c) after subject withdrawal or completion. Reports will be submitted within 5 working days/7 calendar days of the date the investigator first becomes aware of the problem.
- (i) Throughout the study there may be circumstances where a subject's participation may be terminated by the PI without the subject's consent. Specifically, potential reasons for participation termination may include: (a) increased participant suicidality, and (b) participant no longer satisfies inclusion criteria.

DATA STORAGE

The data will be stored for a period of three years after the study has been completed. All data will be stored in a way that ensures it is de-identified (i.e., no data will be stored with names or other identifying info). This will be done by assigning each participant a unique identifier that cannot be linked to the individual simply by looking at it. A separate document will be stored in a different location containing the name, surname and accompanying unique identifier for each participant which will be used for follow-up assessment purposes. Only the data manager will have access to the document linking each participant to their unique identifier.

REFERENCES

- Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of Causal Effects Using Instrumental Variables. *Journal of the American Statistical Association*, 91(434), 444. <https://doi.org/10.2307/2291629>
- Bantjes, J., Lochner, C., Saal, W., Roos, J., Taljaard, L., Page, D., ... Stein, D. J. (2019). Prevalence and sociodemographic correlates of common mental disorders among first-year university students in post-apartheid South Africa: implications for a public mental health approach to student wellness. *BMC Public Health*, 19(1), 922. <https://doi.org/10.1186/s12889-019-7218-y>
- Bantjes J, Kazdin AE, Cuijpers P, Breet E, Dunn-Coetzee M, Davids C, ... Kessle RC. (2021). A Web-Based Group Cognitive Behavioral Therapy Intervention for Symptoms of Anxiety and Depression Among University Students: Open-Label, Pragmatic Trial. *JMIR Mental Health*, 8(5). <https://doi.org/10.2196/27400>
- Chien, I., Enrique, A., Palacios, J., Regan, T., Keegan, D., Carter, D., ... Belgrave, D. (2020). A Machine Learning Approach to Understanding Patterns of Engagement with Internet-Delivered Mental Health Interventions. *JAMA Network Open*, 3(7), 2010791. <https://doi.org/10.1001/jamanetworkopen.2020.10791>
- Clarke, P., & Windmeijer, F. (2012). Instrumental Variable Estimators for Binary Outcomes on JSTOR. *Journal of the American Statistical Association*, 107(500), 1638–1652. Retrieved from https://www.jstor.org/stable/23427361?seq=1#metadata_info_tab_contents
- Collins, K. A., Westra, H. A., Dozois, D. J. A., & Burns, D. D. (2004). Gaps in accessing treatment for anxiety and depression: challenges for the delivery of care. *Clinical Psychology Review*, 24(5), 583–616. <https://doi.org/10.1016/j.cpr.2004.06.001>
- Conley, C. S., Durlak, J. A., & Kirsch, A. C. (2015). A Meta-analysis of Universal Mental Health Prevention Programs for Higher Education Students. *Prevention Science*, 16(4), 487–507. <https://doi.org/10.1007/s11121-015-0543-1>
- Cranford, J. A., Eisenberg, D., & Serras, A. M. (2009). Substance use behaviors, mental health problems, and use of mental health services in a probability sample of college students. *Addictive Behaviors*, 34(2), 134–145. <https://doi.org/10.1016/j.addbeh.2008.09.004>
- Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77(4), 534–542.

<https://doi.org/10.1037/0002-9432.77.4.534>

- Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais, A. L. (2005). Subthreshold Depression in Adolescence and Mental Health Outcomes in Adulthood. *Archives of General Psychiatry*, *62*(1), 66.
<https://doi.org/10.1001/archpsyc.62.1.66>
- Gupta, S. (2011). Intention-to-treat concept: A review. *Perspectives in Clinical Research*, *2*(3), 109. <https://doi.org/10.4103/2229-3485.83221>
- Hajduk, M., Heretik, A., Vaseckova, B., Forgacova, L., & Pecenak, J. (2019). Prevalence and correlations of depression and anxiety among Slovak college students. *Bratislava Medical Journal*, *120*(09), 695–698.
https://doi.org/10.4149/BLL_2019_117
- Hamamci, Z. (2006). Integrating psychodrama and cognitive behavioral therapy to treat moderate depression. *Arts in Psychotherapy*, *33*(3), 199–207. Retrieved from [internal-pdf://64.59.158.93/Hamamci-2006-Integrating psychodrama and cogni.pdf](internal-pdf://64.59.158.93/Hamamci-2006-Integrating%20psychodrama%20and%20cogni.pdf)
- Hasin, D. S., Goodwin, R. D., Stinson, F. S., & Grant, B. F. (2005). Epidemiology of Major Depressive Disorder. *Archives of General Psychiatry*, *62*(10), 1097.
<https://doi.org/10.1001/archpsyc.62.10.1097>
- Herman, A. A., Stein, D. J., Seedat, S., Heeringa, S. G., Moomal, H., & Williams, D. R. (2009). The South African Stress and Health (SASH) study: 12-month and lifetime prevalence of common mental disorders. *South African Medical Journal*, *99*(5 Pt 2), 339–344. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/19588796>
- Hunt, C., Slade, T., & Andrews, G. (2004). Generalized Anxiety Disorder and major depressive disorder comorbidity in the National Survey of Mental Health and Well-Being. *Depression and Anxiety*, *20*(1), 23–31.
<https://doi.org/10.1002/da.20019>
- Hysenbegasi, A., Hass, S. L., & Rowland, C. R. (2005). The impact of depression on the academic productivity of university students. *The Journal of Mental Health Policy and Economics*, *8*(3), 145–151. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/16278502>
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics*, *50*(6), 613–621. <https://doi.org/10.1176/appi.psy.50.6.613>
- Miner, A. S., Schueller, S. M., Lattie, E. G., & Mohr, D. C. (2015). Creation and

- validation of the Cognitive and Behavioral Response to Stress Scale in a depression trial. *Psychiatry Research*, 230(3), 819–825.
<https://doi.org/10.1016/j.psychres.2015.10.033>
- Peden, A. R., Hall, L. A., Rayens, M. K., & Beebe, L. L. (2000). Reducing negative thinking and depressive symptoms in college women. *Journal of Nursing Scholarship*, 32(2), 145–151. <https://doi.org/10.1111/j.1547-5069.2000.00145.x>
- Robins, J. M., Rotnitzky, A., & Zhao, L. P. (1994). Estimation of Regression Coefficients When Some Regressors Are Not Always Observed. *Journal of the American Statistical Association*, 89(427), 846. <https://doi.org/10.2307/2290910>
- Takagaki, K., Okamoto, Y., Jinnin, R., Mori, A., Nishiyama, Y., Yamamura, T., ... Yamawaki, S. (2016). Behavioral activation for late adolescents with subthreshold depression: a randomized controlled trial. *European Child and Adolescent Psychiatry*, 25(11), 1171–1182. Retrieved from internal-pdf://0076065818/Takagaki-2016-Behavioral activation for late a.pdf
- Tolin, D. F. (2010). Is cognitive–behavioral therapy more effective than other therapies? A meta-analytic review. *Clinical Psychology Review*, 30(6), 710–720. <https://doi.org/10.1016/j.cpr.2010.05.003>
- Trivedi, M. H., Rush, A. J., Wisniewski, S. R., Nierenberg, A. A., Warden, D., Ritz, L., ... STAR*D Study Team. (2006). Evaluation of outcomes with citalopram for depression using measurement-based care in STAR*D: implications for clinical practice. *The American Journal of Psychiatry*, 163(1), 28–40. <https://doi.org/10.1176/appi.ajp.163.1.28>
- Wilson, C. J., & Deane, F. P. (2010). Help-Negation and Suicidal Ideation: The Role of Depression, Anxiety and Hopelessness. *Journal of Youth and Adolescence*, 39(3), 291–305. <https://doi.org/10.1007/s10964-009-9487-8>
- Wooldridge, J. (2020). *Econometric Analysis of Cross Section and Panel Data, Second Edition* | The MIT Press. MIT Press. Retrieved from <https://mitpress.mit.edu/books/econometric-analysis-cross-section-and-panel-data-second-edition>
- Yang, X., Zhao, J., Chen, Y., Zu, S., & Zhao, J. (2018). Comprehensive self-control training benefits depressed college students: a six-month randomized controlled intervention trial. *Journal of Affective Disorders*, 226, 251–260. <https://doi.org/10.1016/j.jad.2017.10.014>
- Zemestani, M., Davoodi, I., Honarmand, M. M., Zargar, Y., & Ottaviani, C. (2016). Comparative effects of group metacognitive therapy versus behavioural

activation in moderately depressed students. *Journal of Mental Health*, 25(6), 479–485. Retrieved from internal-pdf://243.161.130.27/Zemestani 2016.pdf