



School of Psychology

Ysgol Seicoleg

Group Interventions for the Reduction of Psychological Distress in University Students

Thesis submitted in partial fulfilment of the requirement for

the degree of:

Doctorate of Clinical Psychology (DClinPsy)

South Wales Doctoral Programme in Clinical Psychology

Cardiff University

John Butler

Supervised by: Dr. Helen Penny and Dr. Cerith Waters

8th June 2021

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Acknowledgements

I would firstly like to thank all the participants and researchers involved in the Activate Your Life study, the data of which saved me in my time of need! Your devotion to facilitate and participate in this endeavour so that we may better help future university students is admirable.

I would also like to thank Logan Harris and Jacob Oleson, at the University of Iowa, for their consultation on statistical analyses.

I would also like to thank all my friends, family, and colleagues, who have supported and been with me on this journey. With special thanks:

- To Dr. Helen Penny – thank you for picking me and the project up when we needed a new supervisor, and then staying with us through all the various revisions and changes we had to make! You have been the constant through it all and a source of containment as well guidance in overcoming all the obstacles.
- To Dr. Cerith Waters – thank you for later bringing me on board to the Activate Your Life study, allowing me access to the data, and joining the supervisory team. Your friendly input and expertise have been instrumental in allowing me to still submit on time!
- To Dr. Kerry-Ann Holder – as my placement supervisor since my project change, I want to thank you for trusting me to balance my clinical and academic responsibilities, and being flexible to allow for this. The support, containment, and guidance during placement has undoubtedly enhanced my time spent on research.
- To the cohort - it has been a pleasure to work with and get to know every one of my colleagues in the Cardiff 2018 DClinPsy Cohort. It has also been such a shame to not be able to see as much of each other as we should have. However, the virtual peer support from you all has been so welcomed and needed and I look forward to catching up in person again on the other side of all this! I would like to thank in particular: Chris Taylor, for his friendly zoom check-ins, help as my independent reviewer, and guidance in exploring the world of Linear Mixed Models; and Emma Keenan, for what I hope was ultimately a helpful co-dependent voicenote relationship to get us both through the thesis stress.
- To my parents – thank you for the many forms of support you have given to me these 30 years, to help me get to this point. Studying clinical psychology has only made more appreciative of the safe, loving, and opportunity-filled childhood you provided for me. And thank you for the last-minute proof-reading!
- To my partner Rich – somehow you managed to start and remain living with me during all the stress from COVID and the thesis. Your unparalleled kindness has shone once again in how you have looked after me and the house when it has all felt a bit too much. Thank you for everything, and I respect you enough to not expect you to read any further than this - you've heard all about it for the past year anyway!

Finally, I would not like to thank 2020 for its generally unhelpful approach to this thesis.

Preface

This thesis offers information about the use of group interventions to treat and reduce psychological distress in university students. Psychological distress is defined here as various combinations and levels of stress, anxiety, and depression. The number of university students struggling with these conditions appears to be increasing each year and university wellbeing services (UWSs) are struggling with the demand. Two papers presented to help further knowledge in this area.

The first is a systematic review and meta-analysis of the topic. This aimed to answer how effective group interventions are in reducing psychological distress for students, as well as what factors might affect this effectiveness. Potentially relevant articles were identified by systematically searching databases (CINAHL, Medline, PsycInfo, SCOPUS, and Web of Science). 28 studies were included in the review, with 26 able to be used in the meta-analysis. Group interventions were varied in their approach with the main categories identified as: cognitive behavioural therapy, mindfulness-based, psychoeducational, acceptance and commitment therapy (ACT), dialectical behavioural therapy, and arts-based. This breadth was purposeful as the paper makes a case for the benefit of transdiagnostic intervention and assessment. As such, the included studies tended use the GHQ, DASS, and SCL-90 for measures of psychological distress. The results suggest that group interventions have a medium effect on reducing distress in students, comparable to that of individual interventions. Potential economic benefits to UWSs are discussed. Additionally, the type of control group used in the study and the time spent in the intervention were found to significantly moderate this effect. There is also preliminary evidence that the frequency of sessions, the training of the group facilitators, and the outcome measures used may be potential moderators. Recommendations for UWSs and future research are tentatively suggested from these findings.

The second paper is an empirical study that used a randomised control trial design to explore the effectiveness of a 4-week ACT-based group intervention, *Activate Your Life*, in reducing the distress of 71 Cardiff University students. The group did prove effective in reducing students' scores on the GHQ-12, and again the main focus of this paper was to then identify factors that might influence this effectiveness or predict which students do best from it. The idea of doing well from the intervention was explored through the concept of a 'sudden gain'. This is a large and stable drop in symptoms between measurements that is

associated with better outcomes at the end of interventions and during follow-up. Results showed that the amount of skills practice was a moderator of the intervention's effectiveness, and that session attendance together with students' readiness to change were good predictors of who might experience a sudden gain. Additionally, an unsuspected finding of equal, if not greater, effectiveness from attending sessions by accessing online recordings was noted. Therefore, suggestions are made for future research to look to replicate these new findings and for UWSs to employ readiness screening and highlight the benefit of participant engagement.

Overall, the thesis provides rationale for UWSs to adopt group interventions as a key service provision, as a solution to the increased demand they are facing. Appropriate time and staff training should be devoted to them to allow their full potential to be realised. Nevertheless, the thesis also provides evidence that briefer ACT-based interventions could be effective. If UWSs choose them as an approach for group interventions, they should offer them to participants who are ready to change, and then highlight the importance of skills practice and attendance, whether in person or through recordings.

Paper 1 has been prepared for submission to the **British Journal of Psychology**, in accordance with the **guidelines for authors (Appendix 1)**. For ease of reading, tables and figures have also been embedded in the main body of the paper and shaded; however, they will be placed in supplementary information and re-formatted for journal submission.

Paper 1: The effectiveness of group interventions in reducing transdiagnostic psychological distress for university students: a systematic review and meta-analysis.

PROSPERO: CRD42020224785

John Butler ^a, Dr. Helen Penny^a, and Dr. Cerith Waters^a

^a South Wales Doctoral Programme in Clinical Psychology, Cardiff University, Cardiff, CF10 3AT

Corresponding author:

John Butler, Cardiff University, 70 Park Place, Tower building 11th floor Cardiff CF10 3AT

butlerjw@cardiff.ac.uk

Word count (exc. abstract/figures/tables): **7962**

Abstract

Background: Prevalence of psychological distress in students is increasing, and university wellbeing services are struggling to meet demands.

Objectives: To estimate the effectiveness of group interventions in reducing transdiagnostic psychological distress for university students, identify moderators, and discuss economic and academic impacts.

Methods: Databases (CINAHL, MEDLINE, PsycInfo, SCOPUS, Web of Science) were searched on the 6th of December 2020. Additional studies were found through citation-chaining. 2403 relevant studies were screened against eligibility criteria, such as RCT design and transdiagnostic evaluation. 28 studies were identified; 26 of these were appropriate for onward meta-analysis. Data was extracted using predefined data fields, including quality assessment and risk of bias tools.

Results: A medium ($g=-0.62$ (95%CI:-0.79,-0.45)) effect size was found. Time in treatment and control group type were significant moderators. Level of facilitator training, the frequency of sessions, and the outcome measures used, were also included in the best-fit model for explaining the resultant heterogeneity. No studies conducted formal assessments of cost-effectiveness or academic outcome.

Discussion: With effectiveness comparable to individual treatment, transdiagnostic group interventions have a place in the repertoire of university wellbeing services. Future research should aim to strengthen the preliminary evidence for moderators and explore potential wider benefits.

Introduction

Psychological Distress in University Students

Psychological distress, in the forms of depression, anxiety, or stress, is one of the most frequent difficulties found in the university student population (Conley et al., 2015). The most common is depression, with Ibrahim et al. (2013)'s meta-analysis reporting a weighted mean prevalence of 30.6%. Moreover, through the last decade, the proportion of students disclosing mental health conditions has quintupled (Thorley 2017). In the United Kingdom, a study recorded the levels of anxiety and depression of 16,460 students longitudinally (Bewick et al., 2010). Anxiety scores peaked in the first term of second year and final year; depression scores rose steadily over time, peaking at the end of the final year; and at no time during university did psychological distress return to pre-admission levels. These prevalence trends show that psychological distress in students is more than an adjustment reaction following a transition, and highlights an increasing healthcare need.

Drapeau et al. (2012) note that although psychological distress is commonly used as an indicator of mental health and as an outcome in intervention studies, its overall concept in literature is vague. Similar to Conley et al. above, Dyrbye et al. (2005) defined it as an overarching framework including depression, anxiety, and burnout. In keeping with these interpretations, this review defines psychological distress as a transdiagnostic concept that consists of a combination of at least three key domains: depression, anxiety, and a form of stress. Despite using the terms depression and anxiety, the review is not associating these with any diagnostic criteria or level of severity, so these domains can be interpreted as 'low mood' and 'worry' respectively. The domain of stress also requires clarification due to varying use in the literature. This review follows the stress subscale of the "Depression Anxiety Stress Scales" (DASS) questionnaire that suggests forms of stress as: difficulty relaxing, nervous arousal, agitation, irritability, and impatience (Lovibond & Lovibond, 1995). The DASS, along with the Kessler-10 (K-10), General Health Questionnaire (GHQ), and the Symptom Checklist (SCL-90), with its offspring: the Brief Symptom Inventory (BSI) and Hopkins Symptom Checklist (HSCL-25), are established as validated outcome measures that explore three or more domains of psychological distress (Winefield et al. 2012; Ghawadra et al. 2019). Therefore, this review regards these as adequate single questionnaire measures to operationalise our definition of psychological distress.

Additionally, regarding definitions, this review will use the term “student” to refer to any adult enrolled in a higher education establishment.

Students are likely at higher risk of psychological distress because they are often under academic pressures of deadlines and exams, face financial stress, are in a transitional period, and fall within the age range where common mental health problems are at their developmental peak (Huang et al., 2018) Most universities have established internal wellbeing or mental health services to help address the need. However, with the increasing prevalence of psychological distress, these university wellbeing services (UWSs) are struggling to meet the growing demand (Seppala et al., 2020). A 5-year survey of 93 UWSs in the U.S., conducted by the Center for Collegiate Mental Health (2016), showed a 38.4% increase in UWS appointments: seven times the concurrent 5.6% increase in enrolment. This unmet need is worrying as long-term morbidity stemming from psychological distress has an adverse effect on occupational trajectories, social outcomes, and economic wellbeing (Blanco et al., 2014). Moreover, this is a critical population as in most developed countries, more than half of young adults are in higher education (Reavley & Jorm, 2010). Therefore, effective treatment of psychological distress in the student population could lead to substantial benefits from a societal perspective (Cuijpers et al., 2016). While the prevalence and need for action has been brought to light by literature, the manner in which to intervene still warrants further research.

Group Interventions

Addressing this need on an individual basis is resource-intensive; instead Kitzrow (2003) recommend therapy groups to manage the increasing demand. This would only be ethical if group interventions can be shown to be as effective as individual ones. Meta-analyses offer mixed results for the adult population, but most do not find significant differences between format, with some even noting effectiveness trends in favour of the group format over individual (Cuijpers et al. 2008; Pozza and Dèttore, 2017). Burlingame et al. (2016) believed these mixed results from previous meta-analyses had arisen due to small samples and use of between-study comparisons. Their meta-analysis reviewed 67 studies that compared group-versus-individual interventions directly and matched them for patients, treatments, and ‘dosage’. They found no differences between formats for rates of treatment acceptance, dropout, remission, or improvement in psychological distress. This provides more convincing evidence of equal effectiveness between group and individually delivered psychological interventions, although this review evaluated various heterogeneous samples across

both adult and child populations. There is a lack of meta-analyses exploring this comparison in students, but some individual studies reflect this finding. Fawcett et al. (2019) reported reductions in anxiety and depression with no significant differences between the group and individual interventions. And Hustad et al. (2014) found no significant differences in the format of a brief motivational intervention for alcohol-related consequences, in 278 students. It is important that more research on group interventions continues to focus on this specific population; because to generalise from other adult populations may miss nuances of groups occurring in UWSs. For example, Kay and Schwartz (2010) note that universities function as largely self-contained communities and there could be effects from privacy difficulties and managing relationships students have with each other outside of the group. Nevertheless, group interventions may have greater potential to reduce psychological distress arising from interpersonal issues, than individual ones; and Whitaker (2006) notes that the age of this population means many are struggling with relational difficulties.

Regarding potential additional benefits, it is important that research looks beyond just symptom reduction to determine the effectiveness of an intervention in this population. Psychological distress is often associated with other negative outcomes including poor academic performance and dropping out of university; therefore, Eisenberg et al. (2009) suggest these two measures should be used as the ultimate benchmark for higher education interventions. Another outcome that would be invaluable for these under-resourced UWS to have more information on is cost-effectiveness. Again, currently, we must look to a wider adult population for synthesised evidence around this. Tucker and Oei (2007) reviewed 36 studies regarding the comparative cost-effectiveness of group-versus-individual cognitive behaviour therapy (CBT). The results were mixed: group CBT appeared more cost-effective for depression and for children, but less cost-effective in substance and anxiety disorders. However, they note poor cost calculation methodologies prevent any firm conclusions. Comprehensive and valid strategies need developing as Weatherford (2017) notes, the time-taken to build and manage therapy groups could negate the logical savings of treating multiple students at once. This review will also aim to collate information regarding wider benefits from the included studies.

Transdiagnostic Focus

Aspects that will factor into the effectiveness of groups are their make-up, model of intervention, and process of evaluation. There is strong rationale for holding a transdiagnostic focus throughout these levels, as the mental health problems seen in distressed students are highly comorbid (Huang et al., 2018). This is likely due to risk, protective, and maintenance factors that operate across nosological categories (Buckholtz & Meyer-Lindenberg, 2012).

Regarding intake, populating transdiagnostic groups is faster than disorder-specific; thereby improving efficiency, which suits settings with high demand and limited resource like UWSs (Norton & Barrera, 2012). This can likely be done without impacting on effectiveness as no difference in symptom reduction was found between transdiagnostic and diagnosis-specific groups in Norton and Philipp (2008)'s meta-analysis. Moreover, there is even a theoretical basis for enhanced reduction of distress in transdiagnostic groups, as patients learn from each other's differing presentations (Straus, 2020).

Transdiagnostic interventions are those that target the core vulnerabilities and psychological processes present in multiple disorders; whereas diagnosis-led interventions heavily focus on processes only for the primary disorder that they target (Gutner et al., 2016; Dalgleish et al., 2020). Transdiagnostic interventions therefore benefit from ease of dissemination (Norton & Barrera, 2012), given once facilitators are trained and group protocols established, they can be used flexibly with any group. This increases their cost-effective value as facilitators need only receive training in one intervention to provide evidence-based treatment for a range of presentations, (McHugh et al., 2009). Additionally, Dalgleish et al., (2020) theorise that, as transdiagnostic approaches also address the comorbidity and heterogeneity of clinical presentations found in conditions of psychological distress, they could outperform diagnosis-specific interventions, when looking at holistic improvement of a patient. Recently this potential has been realised in a meta-analysis of both individual and group psychological interventions for mental health disorders in students (Barnett et al. 2021). Researchers found transdiagnostic approaches were associated with greater symptom improvement than disorder-specific interventions. They highlight the adaptability and suitability of transdiagnostic interventions for UWSs, where subthreshold comorbid problems are common, and recommend that transdiagnostic interventions are a promising avenue for future research.

Previous meta-analyses have reported effect-sizes for separate domains of psychological distress (Regehr et al., 2013; Huang et al., 2018) and concluded that interventions are effective in reducing anxiety and depression in students. However, by aggregating studies that look at each separately, it cannot then be assumed that this means they are effective in reducing them simultaneously; especially when some interventions have been targeted at only one domain of psychological distress. Therefore, as Dalglish et al. (2020) recommend, future evaluations should encompass not only the primary disorder but also any comorbid difficulties if the holistic benefits of transdiagnostic approaches are to be understood. This can be achieved through use of transdiagnostic outcome measures or combinations of domain-specific outcome measures. Therefore, this review will identify studies that fit this criterion.

Moderators

There are many potential variables that could influence the transdiagnostic effectiveness of group interventions for students' distress, and more exploration of moderators in psychological is being called for (Holmes et al., 2018). Whether different models of intervention are associated with better or worse effect sizes is commonly investigated, given the potential for streamlining services; yet meta-analyses have often found no effect or been inconclusive (Barkowski et al., 2020; Huang et al., 2018; Kösters et al., 2006). Therefore, intervention model, along with other intervention characteristics that meta-analyses have begun to build evidence for, such as: group size, total treatment time, frequency of sessions (Barkowski et al., 2020), intervention style (Roepke, 2015), and facilitator training (Barnett et al., 2021), will be explored. Additionally, common study characteristics also with previous meta-analytic evidence, such as: type of control group, country (Huang et al., 2018), sample-distress (Heron-Speirs et al., 2013), and the outcome measure used (Sloan et al., 2013), will be considered in subgroup analysis and meta-regression.

Aim of Review

The primary aim of this review is to conduct a meta-analysis of randomised controlled studies to determine the effectiveness of group interventions in reducing transdiagnostic psychological distress in students. Secondary aims include moderator analyses to explore what factors might influence this effectiveness, and a systematic review of the literature to determine any wider benefits to UWSs.

Methodology

This review was prospectively registered on PROSPERO (CRD42020224785) and adhered to the PRISMA guidelines (Moher et al., 2009)

Literature Search Strategies

Boolean operators were used to combine keywords and subject-headings to target the correct population and interventions, while searching the databases detailed in Table 1. Their corresponding search strings can be found in Appendix 2. These results were screened against the inclusion/exclusion criteria listed in Table 2. Forward-and-backward citation chaining was then conducted on the eligible studies and their authors were contacted to ensure a thorough search process and to identify studies not held by the chosen databases. A record of author contact can be seen in Appendix 3. Figure 1. depicts the entire literature search process in detail.

Table 1. Online databases used to search literature

| Database & Version | Interface | Time Period Searched |
|---|---------------------|--------------------------------------|
| CINAHL plus with full text | EBSCOHost | January 1st 1937 - December 6th 2020 |
| MEDLINE (R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions® | Ovid | January 1st 1946 - December 6th 2020 |
| APA PsycInfo | Ovid | January 1st 1806 - December 6th 2020 |
| SCOPUS | Elsevier B.V. | January 1st 1960 - December 6th 2020 |
| Web of Science Core Collection | Clarivate Analytics | January 1st 1900 - December 6th 2020 |

Notes. Some sources of grey literature, such as conference proceedings, are searched by Web of Science and SCOPUS, which also searches “The Grey Journal” index.

Table 2. Inclusion and exclusion criteria

| PICOS Element | Inclusion | Exclusion |
|----------------------|--|---|
| -- | Written in English | If no English translation available |
| Population | Focused on adult (18+) students in higher education setting: e.g. college/university | Adolescent school students or non-student population |
| Population | Transdiagnostic group intake. Non mental-health subpopulations (such as: medical students, blind, international students) are eligible. | Specific grouping by presentation (e.g. solely anxious or depressed, or bereaved) i.e. exclude if participants needed to score a certain level on a measure (unless a measure of transdiagnostic psychological distress) or have a specific diagnosis, such as: PTSD, OCD, specific phobia, substance-related and addictive disorder, psychosis, eating disorder, behavioural disorder. |
| Intervention | Only transdiagnostic models of intervention. i.e. universal interventions. | Condition or diagnosis specific treatments e.g. CBT for anorexia, or group therapy for alcohol addiction, or CBT-SAD. i.e. targeted interventions. |
| Intervention | Only group interventions | If intervention includes individual element to the intervention as well or other concurrent treatments like medication as part of the intervention under investigation. |
| Intervention | Looking to treat existing psychological distress | Looking to prevent future psychological distress |
| Comparison | Only direct comparison studies | Indirect comparison studies (where they compare to results of another study) |
| Outcome | Study reports a measure of transdiagnostic psychological distress as one of the dependent variables. Either through one questionnaire (e.g.: GHQ, SCL-90, DASS, K-10) or a combination of 3 measures, looking at depression, anxiety, AND a form of stress (such as burnout, or somatisation) (e.g. PHQ & PSWQ & PSS). | No measure of psychological distress as defined as anxiety, depression, and at least one form of stress. Or no combination of outcome measures to achieve this. Studies using a condition specific measure of psychological distress e.g. eating disorder or alcohol consumption measures. |
| Outcome | Quantitative measure | Only qualitative evaluation |
| Study Design | Control or comparison group and randomised – i.e. RCT | No adequate control group, inadequate randomisation, does not meet RCT criteria. |

Notes. A notable difference between these criteria and some other meta-analyses in this field, such as Barnett et al. (2021) is that this review did not narrow the focus to just **psychological** group interventions. Although logical, it was felt presumptuous to assume this category of intervention would be best suited for reducing psychological distress; especially given some reviews, such as Huang et al. (2018), have found that alternative interventions of art, exercise, and peer support had the highest effect sizes for both depression and generalised anxiety disorder.

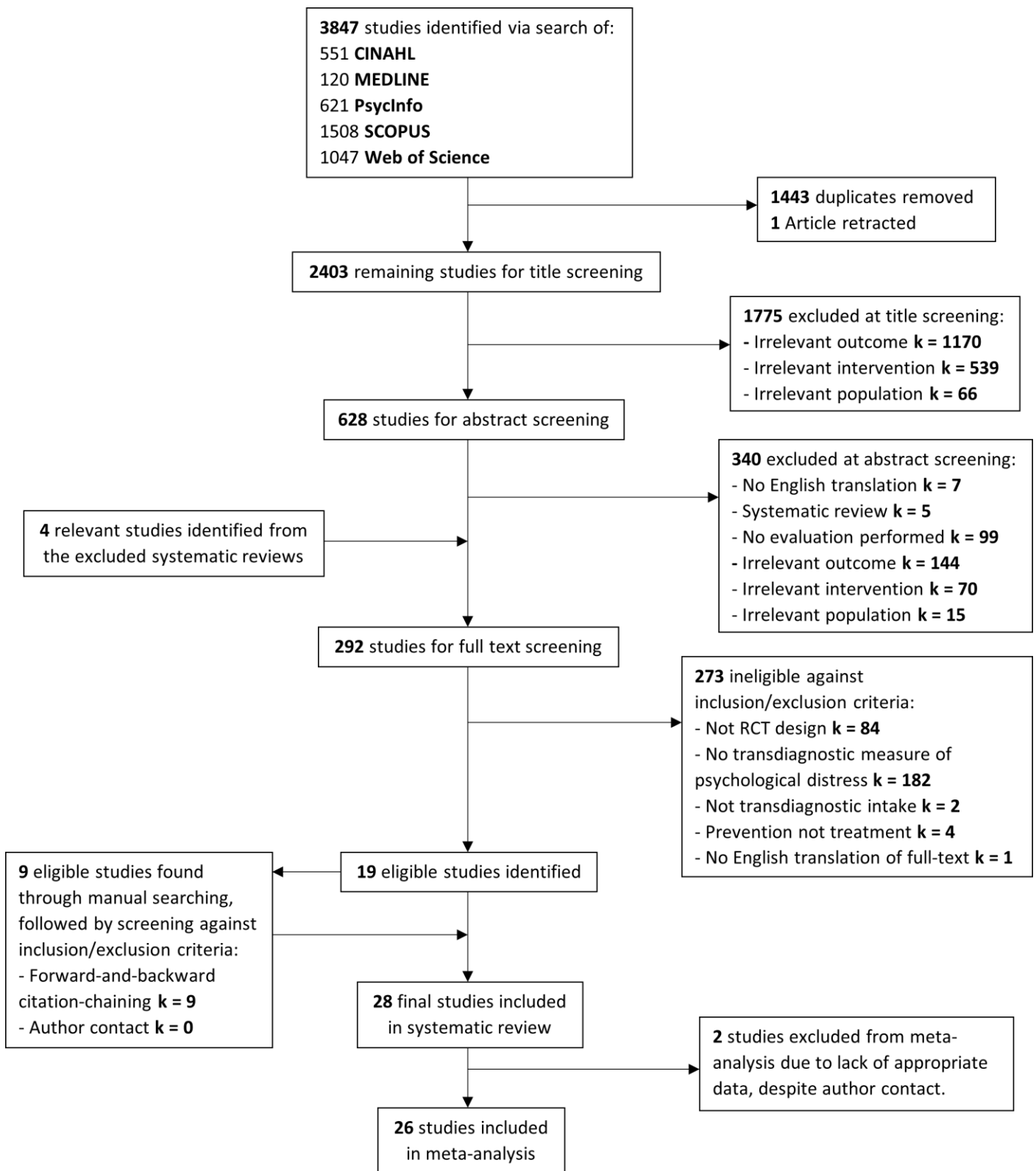


Figure 1. PRISMA flowchart outlining the process for the systematic review and meta-analysis

Quality Assessment

Eligible studies were assessed for quality using the Cochrane Risk of Bias tool (J. P. T. Higgins et al., 2011). However, as noted by Kocsis et al. (2010) this measure is not well-suited to assess psychological interventions. They highlight the lack of aspects pertinent to psychotherapy trials, such as: follow-up, facilitator training and supervision, model adherence, and therapist allegiance. Additionally, the inevitable difficulty of blinding in psychological interventions means that the Cochrane Risk of Bias tool struggles to differentiate psychotherapy studies in its ‘Measurement of the Outcome’ domain. Kocsis et al. (2010) developed a new tool, the Randomized Controlled Trial Psychotherapy Quality Rating Scale (RCT-PQRS) to address these issues. It is a 25-item scale; items are rated on a 0-2 Likert scale depending on the study’s description, rationale, and execution, with the final item being an omnibus quality rating from 1-7 (Sitko et al., 2020). This allows for a numerical as opposed to categorical rating that allows further differentiation when assessing quality. However, it is less well known, thus its output less familiar to a wider audience; therefore, this review used both tools.

Data Extraction

A bespoke data extraction template was created a priori to the quality assessment and data extraction stages. Table 3. lists the information that was sought from each study.

Table 3. Data extraction template headings

| Population Characteristics | Design Characteristics | Intervention Characteristics | Primary Outcome Data | Additional Outcome Information |
|-----------------------------------|-------------------------------|-------------------------------------|------------------------------|---------------------------------------|
| Initial Sample Size | Randomisation Process | Specified Intervention | Psychological Distress Means | Dropout |
| Subpopulation | Specified Control | Superordinate Category | Psychological Distress SDs | Economics |
| Country | Control Category | Intervention Style | N Used in Analyses | Risk of Harm |
| Percentage Female | Length of Follow-Up | Process Description | Outcome Measure(s) Used | Other Notable Information |
| Mean Age | Linked Publications | Model Adherence | | |
| Methods of Recruitment | Sponsorship | Number of Sessions | | |
| Inclusion/Exclusion Criteria | | Length of Sessions | | |
| Screening | | Frequency of Sessions | | |
| | | Size of Groups | | |
| | | Facilitator Training | | |
| | | Facilitator Supervision | | |
| | | Setting | | |
| | | Adjuncts | | |

Notes. The data extraction chart was populated manually on re-reading through each study included in the systematic review. These characteristics were chosen a priori to data extraction and quality assessment stages. A prior version of the template was piloted on 7 (~25%) randomly-selected studies to check its viability for the task. The only adjustment made was dropping the ethnicity category, as none of the randomly selected papers reported on this characteristic.

Statistical Analyses

The primary outcome of effectiveness in reducing psychological distress required the calculation of an effect size for onward meta-analysis. Hedge's g was chosen because as a standardised mean difference, it allows comparisons across studies using different outcome measures, albeit for the same concept. It was calculated by subtracting the post-intervention mean of the intervention group from the post-intervention mean of the control group, and dividing this by the pooled standard deviation (Higgins and Green, 2011).¹ Hedges' g provides an unbiased estimate even when sample sizes are small (Hedges and Olkin, 1985). There were two scenarios where prior calculations were necessary. When the DASS was used but no combined distress score was provided, this was calculated by finding the mean of the means and calculating a pooled standard deviation for this value. This approach was taken by Dereix-Calonge et al. (2019) who validate its appropriateness by noting that each DASS subscale has the same number of items and same number of participants rating them. The other situation was when a combination of 3 measures were used that together could provide a proxy for psychological distress. Although this does not create a validated measure of psychological distress; in this scenario, the Cochrane Handbook (Higgins et al., 2019) recommends treating the 3 outcomes as a 'mini-meta-analysis' and calculating effect size and standard error in that way. However, Puhan et al. (2006) note that such analysis requires the measures to be correlated. Thankfully, VanDyke et al. (2004) found a strong ($r=0.83$) correlation between the State-Trait Anxiety Inventory (STAI) and the Center for Epidemiologic Studies Depression Scale, and Andrade et al. (2001) found a moderately strong correlation ($r=0.66$) between the STAI and Beck's Depression Inventory, which are some of the domain-specific measures used in the included studies. Two studies were excluded from the effect size calculation: Elemo and Türküm, (2019) who appropriately chose to use non-parametric statistics and therefore did not report means and standard deviations (SDs); and Hatamzadeh et al. (2012) who presented F values for subscales of the GHQ, from which it was not possible to infer total psychological distress means and SDs. Authors were contacted where means and SDs were not reported. All analyses were performed with Stata version 16 (StataCorp, 2019) using random-effects models. Negative effect sizes indicate effects in favour of the

¹ Cheng (2015) and Chinaveh (2010) both used the GHQ measure, where higher scores usually equate to higher distress. However, both authors reported numerical data showing means increasing for the intervention group, yet wrote repeatedly throughout the paper, sometimes adjacent to the apparent contradictory numerical data, that the intervention group improved in terms of psychological distress. It is possible that something has been lost in translation. Authors were contacted for clarification; but with no response had, this review took the decision to reverse the sign of the Hedge's g calculation for both these studies.

intervention. Sensitivity testing was performed through a ‘one-study-omitted’ influence analysis and an Egger test was performed to explore publication bias. Heterogeneity was calculated using I^2 : a value of 0% represents no heterogeneity and 25%, 50%, or 75% suggest low, moderate, or high heterogeneity between studies, respectively (Higgins et al., 2003). Resultant heterogeneity was then explored through subgroup and moderator analysis.

Independent Reviewing

The first author conducted the systematic review process. To minimise selection bias and human error, an independent reviewer was enlisted. As seen in Table 4., almost-perfect agreement was found. This suggests there was minimal selection bias and error; thus, the resulting studies included in the review are likely a reliable representation of the relevant available evidence for the question at hand.

Table 4. Agreement levels between lead author and independent reviewer

| Stage | Studies Reviewed (% of total) | Percentage Agreement | Cohen's Kappa | Agreement Category |
|--|-------------------------------|----------------------|---------------|--------------------|
| Title Screening | 240 (10%) | 92% | 0.81 | Almost Perfect |
| Abstract Screening | 63 (10%) | 92% | 0.83 | Almost Perfect |
| Full-Text Screening | 29 (10%) | 100% | 1.00 | Perfect |
| Data Extraction and Quality Assessment | 7 (25%) | 94% | 0.90 | Almost Perfect |
| Overall | -- | 95% | 0.89 | Almost Perfect |

Notes. At each stage of screening, an independent reviewer examined 10% of the studies in question, in keeping with the minimum proportion suggested by NICE (2012). With lower total numbers at data extraction and quality assessment, it was feasible to increase this proportion to 25%. The reviewer used the same data extraction template, Cochrane Risk of Bias Tool, and RCT-PQRS at these stages. The studies identified for independent review were randomly selected by using the software available online at: www.random.org. When disagreements arose, these were resolved by consensus discussion. Cohen’s Kappa was calculated in addition to percentage agreement, as the latter cannot account for false agreement through random chance. Cohen’s Kappa scales from -1 to +1, where 0 is the amount of agreement to be expected by chance; Cohen also presents agreement categories to help with interpretation (McHugh, 2012).

Results

Included Studies

Figure 1. details how the final 28 studies came to be selected. The extensive data extraction template yielded much information. Characteristics that allowed for good comparison across studies and could be easily tabulated are detailed in Table 5. Features of the remaining characteristics are described below it.

Table 5. Summary of study and intervention characteristics

| Lead Author & Year (Sample Size) | Country | Intervention (Category) Style | Brief Intervention Description | No. x Length of sessions (Frequency) | Sample Size (Distress) | Facilitator Training 0 – 2 | Control (Category) | Hedge's g (Std. Error) Measure |
|-------------------------------------|----------|--|--|--|------------------------------|----------------------------------|---|--------------------------------------|
| Ahmadi Forooshani 2020 (30) | Iran | Spiritual Problem-Solving (Cognitive-Behavioural) Training | Uses spiritual meaning, attitude, and values as sources of problem-solving orientation. Self-efficacy-based coping skills taught for negative thoughts. Training in self- and acceptance of others based on spiritual beliefs. | 10 x 90mins (unstated) | 15 (0) | 0 | Waitlist for abridged int. (No treatment) | -0.775 (0.369) GHQ |
| Bu 2019 (79) | China | Positive Cognitive (Cognitive-Behavioural) Therapy | Identification of strengths through survey and through contacting important social connections. Confirmation of signature strengths by themselves and talking to others. Then strength-based goal setting and future-planning. | 1 x 90mins (single) | 39 (0) | 0 | No intervention (No treatment) | -0.844 (0.254) DASS |
| Cao 2011 (22) | China | Music Therapy (Arts-Based) Therapy | Experience psychological acceptance from a group. Learn basic drumming Experience rhythm mindfully and link it with emotions. "Self-unfold", learn to show and regulate emotion. Develop confidence and interpersonal skills | 28 x 120mins (weekly) | 11 (1) | 0 | No intervention (No treatment) | -2.509 (0.558) SCL |
| Cheng 2015 (66) | China | Meaning Centred Approach (Psychoeducational) Training | Based on Yalom's four stages of group development. Skills to identify and challenge dysfunctional thinking, and to rediscover positive aspects of life. Meaning-related processes and meaning systems emphasised throughout. | 9 x 135mins (weekly) | 17 (1) | 1 | No intervention (No treatment) | -2.246 (0.312) GHQ |
| Chinaveh 2010 (79) | Iran | Problem-Solving Training (Psychoeducational) Training | Teaching skills for: enhanced problem-solving; realistic goal setting; creativity and generating alternate solutions; predicting consequences; developing a solution plan; determining its effectiveness. | 6 x 120mins (weekly) | 15 (1) | 0 | No intervention (No treatment) | -0.47 (0.226) GHQ |
| Damián Neto 2020 (141) | Brazil | Mindfulness (Mindfulness-Based) Training | Understand mindfulness. Give various meditation techniques. Increase awareness of internal and external environments. Cultivate positivity. Emotional regulation skills. Embed mindfulness approach into daily life. | 6 x 120mins (weekly) | 45 (0) | 2 | Organisational Group (Active) | 0.045 0.168 DASS |
| Danitz 2014 (98) | USA | ACT (ACT) Therapy | Identification of current stressors and coping strategies. Discussion of control and avoidance and effects. Introduction and experience of acceptance, mindfulness, and values. Peer values articulation exercise. | 1 x 90mins (single) | 2 to 8 (0) | 1 | Waitlist (No treatment) | -0.958 0.316 DASS |
| Deckro 2002 (128) | USA | Mind-Body Training (Cognitive Behavioural) Training | Intervention consisted of relaxation-response-based skills (incl. mindfulness); cognitive-behavioural strategies; discussion on the science behind stress; coping and physiology; and encouraged skills-practice. | 6 x 90mins (weekly) | 21 (0) | 1 | Waitlist (No treatment) | -0.528 0.179 SCL |
| Dereix-Calonge 2019 (85) | Colombia | ACT (ACT) Training | Repetitive negative thinking -focused, uses a narrative around three characters to illustrate ACT concepts through "Knowing the problem and finding solutions" "Observing your thoughts" "Focusing on what matters". | 6 x 60mins (weekly) | 15 (0) | 2 | Waitlist (No treatment) | -0.393 0.217 DASS |
| deVibe 2013 (288) | Norway | MBSR (Mindfulness-Based) Therapy | Based on Kabat-Zinn programme. Physical and mental mindfulness exercises. Teaching on stress management. Group process to facilitate acceptance and reflections on mindfulness and how to embed into lifestyle. | 6 x 90mins (weekly) | Unstated (0) | 2 | No intervention (No treatment) | -0.773 0.122 GHQ |
| Elemo 2014 (18) | Turkey | CBT (Cognitive Behavioural) Balanced | Interactive social experiences for interpersonal skills. Identify stressors, current coping style, and alternatives explored through self-disclosure. Socratic questioning-based group guided discovery. Group reflections. | 8 x 90mins (weekly) | 9 (0) | 2 | No intervention (No treatment) | No Mean or SD Data DASS |
| Elstad 2020 (202) | Norway | Yoga (Mindfulness-Based) Training | Yoga based on Ashtanga Vinyasa. Consisted of asanas (poses), pranayama (breathing exercises), and dhyana (meditations). Aimed to promote strength, flexibility, mindfulness, and relaxation. | 12 x 75mins (twice a week) | 25 (0) | 2 | Waitlist (No treatment) | -0.175 0.14 HSCL |
| Goldman 2012 (113) | USA | REACH Forgiveness (Psychoeducational) Training | REACH: Recall the hurt, Empathise with the offender, Altruism, Commit to forgiveness, Hold onto forgiveness. Skills taught in line with these concepts and goal setting. Therapeutic letter writing. | 6 x 90mins (twice a week) | Unstated (0) | 2 | Waitlist for abridged int. (No treatment) | -0.387 0.274 BSI |
| Goldman 2012 (113) | USA | Anger Management (Psychoeducational) Therapy | Included relaxation, cognitive restructuring, and social skills building. Use of 'forgive'-based language avoided. Imaginal exposure to past trauma and guided imagery and rescripting undertaken. | 6 x 90mins (twice a week) | Unstated (0) | 2 | Waitlist for abridged int. (No treatment) | -0.572 0.28 BSI |
| Grégoire 2018 (144) | Canada | ACT (ACT) Balanced | Values clarification and encouraged committed action via small goals. Experiential avoidance examined. Acceptance and cognitive defusion explored experientially. Mindfulness strategies introduced and practised. | 4 x 150mins (weekly) | 8 to 15 (1) | 2 | Waitlist (No treatment) | -0.622 0.111 Combo |

| | | | | | | | | |
|-----------------------|-------------|--|---|----------------------------|--------------|---|---|--------------------------|
| Hatamzadeh 2012 (36) | Iran | Emotional Intelligence Train. (Psychoeducational) Training | Principles of emotional intelligence taught based on the theories of Salovey and Mayer. Includes how to process one and others' emotions and using this information to guide adaptive behaviour. | 4 x 120mins (weekly) | 12 (0) | 0 | Self-Study Bibliotherapy (Active) | No Mean or SD Data GHQ |
| Hatamzadeh 2012 (36) | Iran | Emotional Intelligence Train. (Psychoeducational) Training | Principles of emotional intelligence taught based on the theories of Salovey and Mayer. Includes how to process one and others' emotions and using this information to guide adaptive behaviour. | 4 x 120mins (weekly) | 12 (0) | 0 | Waitlist (No treatment) | No Mean or SD Data GHQ |
| Kang 2009 (41) | South Korea | MBSR (Mindfulness-Based) Therapy | Based on Kabat-Zinn programme. Physical exercises and stretching start each sessions. Various mindfulness exercises undertaken. Reflections on strengths, gratitude, and mortality are discussed. | 8 x 105mins (weekly) | 21 (0) | 2 | No intervention (No treatment) | -0.601 0.204 Combo |
| Kim 2016 (99) | South Korea | Stress Management (Cognitive-Behavioural) Training | Skills taught on cognitive reconstructing, emotional control, and behavioural control, which includes a heavy focus on communication. Further stress management and problem-solving strategies introduced. | 8 x 120mins (twice a week) | 10 (1) | 2 | Waitlist for abridged int. (No treatment) | -0.414 0.219 GHQ |
| Mohammadi 2013 (41) | Iran | Unified Protocol (Cognitive-Behavioural) Therapy | Unified Protocol aims to increase: present emotional awareness; cognitive flexibility; prevention of maladaptive emotion-driven behaviours; awareness and tolerance of physical sensations; and emotion-focused exposure. | 8 x 120mins (weekly) | 20 (1) | 0 | Cognitive Therapy (Active) | -0.223 0.341 DASS |
| Mohammadian 2011 (28) | Iran | Poetry Therapy (Arts-Based) Therapy | Poems are used to elicit emotions and motivate discussion and expression of these. Filling in the gaps of poems with their own words facilitates self-analysis. Collaborative writing new poems as a group akin to rescripting. | 7 x 105mins (weekly) | 14 (1) | 0 | Waitlist (No treatment) | -1.092 0.395 DASS |
| Phang 2015 (75) | Malaysia | MBSR (Mindfulness-Based) Therapy | Experiential approach to mindfulness and contacting the present. Bodily exercises and mindful imagery included. Cultivation of grateful thinking. Thought scans to transform thinking errors. Kindness emphasised. | 5 x 120mins (weekly) | 10 (0) | 2 | Waitlist for abridged int. (No treatment) | -1.02 0.243 GHQ |
| Post 2017 (59) | USA | TARMAC Process Group (Psychoeducational) Therapy | Explores effects of cross-cultural childhood and cultural identity and rootlessness and restlessness. Explores relational patterns for group members and how to cope with loss and grief. | 10 x 90mins (weekly) | 6 to 10 (1) | 2 | No intervention (No treatment) | -0.109 0.372 DASS |
| Sezer 2012 (14) | Turkey | Music Therapy (Arts-Based) Therapy | Participants spent the duration of each session, reclined on cushions in a dimly lit room and as a group listened to "sufi ney" (Ney music). | 14 x 45mins (twice a week) | 7 (1) | 0 | No intervention (No treatment) | -1.283 0.556 BSI |
| Shapiro 1998 (78) | USA | MBSR (Mindfulness-Based) Balanced | Based on Kabat-Zinn programme. Introduced various meditations, scans, and yoga. Introduced listening and empathy experiential exercises and discussions and reflections of these. Stress and coping skills taught. | 7 x 150mins (weekly) | 18 (0) | 0 | Waitlist (No treatment) | -0.699 0.231 SCL |
| Soleimani 2015 (32) | Iran | Behavioural Activation (Cognitive-Behavioural) Training | Followed guidelines of Gollan and Martell. Skills to identify behaviours, especially avoidance, associated with distress and to change to behaviours that improve emotional regulation. Encourage to increase "life activity". | 8 x 90mins (unstated) | 8 (1) | 1 | Cognitive Therapy (Active) | -0.109 0.345 DASS |
| Song 2015 (44) | South Korea | MBSR (Mindfulness-Based) Therapy | Yoga, sitting, walking, breath-work, body scan, and eating meditations. Group discussion had on experiences and feelings encountered during the exercises and of impact of and from outside life. | 8 x 120mins (weekly) | 21 (0) | 2 | Waitlist (No treatment) | -0.49 0.301 DASS |
| Talakar 2016 (40) | Iran | CBT (Cognitive-Behavioural) Therapy | Based on Riley and Shropshire anger management manual. Includes: arousal control, relaxation techniques, re-appraisal of cognitions (including core-beliefs) problem-solving, interpersonal skills, behavioural experiments | 8 x unstated (weekly) | Unstated (0) | 0 | Waitlist (No treatment) | -0.969 0.328 GHQ |
| Tobon 2020 (76) | Canada | Motivational DBT (DBT) Therapy | 4 sessions of motivational enhancement each with a focused exercise: "decision to change" "triggers, consequences, and alternatives", "values", "stages of change". Followed by the 12-week DBT curriculum. | 16 x 120 (weekly) | 4 to 12 (1) | 2 | DBT (Active) | -0.529 0.232 K-10 |
| Yang 2020 (97) | China | Zhong-Yong DBT (DBT) Therapy | Mindfulness integrated throughout. 4 modules: acceptance-oriented skills; distress tolerance exercises; emotional regulation skills; and interpersonal effectiveness experiential exercises. | 12 x 120 (weekly) | 8 (1) | 2 | Waitlist (No treatment) | -0.338 0.247 SCL |
| Yang 2020 (97) | China | Zhong-Yong DBT (DBT) Therapy | Mindfulness integrated throughout. 4 modules: acceptance-oriented skills; distress tolerance exercises; emotional regulation skills; and interpersonal effectiveness experiential exercises. | 12 x 120 (weekly) | 8 (1) | 2 | Supportive Group Therapy (Active) | -0.137 0.245 SCL |

Population Characteristics

13 studies focused on heterogeneous student populations; 15 explored specific subpopulations, with the most common being: medical students ($k=4$), psychology students ($k=3$), nursing students ($k=2$), and first-years ($k=2$). Regarding gender: four studies looked at females only, one at males only, and four did not report. Overall, populations were skewed towards females ($M=68\%$ female). Age range was rarely reported, given the niche population ($M=22$ yrs). Regarding recruitment, only six studies used monetary incentives; the majority relied on volunteers from advertising campaigns. Screening information varied greatly in detail and manner of description across the papers so was rebranded as the binary characteristic 'sample-distress'. This was done for ease of comparison and for use as a covariate in onward analysis. Studies scored a '1' if inclusion criteria required participants to be referred from UWSs or external clinicians or to reach a certain level of transdiagnostic psychological distress, at screening. The results can be seen in the sixth column of Table 5. above. Exclusion criteria were rare, but the most common ($k=6$) were around severe mental health disorders; these were defined differently between studies, but often referred to psychosis and suicidality.

Design Characteristics

Most studies ($k=18$) did not report on the method of randomisation; the others used a computer-generated process. However, Shapiro et al. (1998) also matched students for gender, race, and university year, and Elstad et al. (2020) matched for gender, due to few male students. No studies mentioned any linked publications, and only four declared any sponsorship and this was never from a proponent of the intervention in question.

Intervention Characteristics

Overall, interventions were well described: poor description ($k=1$), some description ($k=6$), strong description ($k=11$), and manualised interventions ($k=10$). Model adherence, however, was only reported in some form in eight of the studies, and only Goldman and Wade (2012) used video footage and provided quantitative evaluation. They had research assistants, blinded to all other factors, review 185 3-minute clips to determine their model adherence of 99%. Facilitator supervision was also often unstated ($k=21$), in these cases it is

unknown whether facilitators were unsupervised or whether this is missing data. Additionally, only five studies reported on the setting of the intervention. This was usually a brief description of the UWS. Half ($k=14$) of the studies did not report on using any adjuncts to the group intervention. With the exception of Yang et al. (2020) where this was once-a-month individual phone contact, these adjuncts were all conceptualised as homework/home-practice, and many provided audio files and encouraged use of diaries. However, engagement with homework was not routinely measured; and in the one instance where there may have been an attempt, the diaries were discontinued due to <20% usage (Damião Neto et al., 2020). Attrition ranged from 0% - 58% across the studies, with an average of 15%; most common reasons for dropout were reported as “lack of time” and “conflict with other activities”.

Additional Characteristics

No studies formally assessed cost-effectiveness or academic outcome, and only eight discussed this and other economic factors of their interventions, in their paper. Only four studies reported on risk of harms from the intervention: de Vibe et al. (2013) and Elstad et al. (2020) were able to say there were none, thanks to adverse event recording during sessions; Dereix-Calonge et al. (2019) reported that it was unlikely, given comparable deterioration rates with the control group; and similarly (Goldman & Wade, 2012) provided figures of 7% deterioration in the intervention group compared to 13% in the control, allowing this inference.

Quality Assessment

There was a spread of quality across the included studies. Tables 6. and 7. provide elaboration on this aspect.

Overall, the majority of studies were of good quality and low to medium risk of bias, as evaluated in the context of psychological intervention trials. The impact of the varying quality is explored later through subgroup and moderator analyses.

Table 6. Results from the Cochrane Risk of Bias tool

| Study Lead Author | D1 | D2 | D3 | D4 | D5 | Overall | Adjusted |
|---------------------------------|----|----|----|----|----|---------|----------|
| Ahmadi Forooshani et al. (2020) | ! | + | + | ! | + | ! | ! |
| Bu et al. (2019) | + | + | + | ! | + | ! | + |
| Cao et al. (2011) | + | + | + | ! | + | ! | + |
| Cheng et al. (2015) | + | + | + | ! | + | ! | + |
| Chinaveh (2010) | + | + | + | ! | + | ! | + |
| Damião Neto et al. (2020) | + | + | - | ! | + | - | - |
| Danitz et al. (2014) | + | + | - | ! | + | - | - |
| Deckro et al. (2002) | + | + | ! | ! | + | ! | ! |
| Dereix-Calonge et al. (2019) | + | + | + | ! | + | ! | + |
| deVibe et al. (2013) | + | + | + | ! | + | ! | + |
| Elemo et al. (2014) | + | + | ! | ! | + | ! | ! |
| Elstad et al. (2020) | + | + | + | ! | + | ! | + |
| Goldman et al. (2012)a | + | ! | ! | ! | + | ! | ! |
| Grégoire et al. (2018) | + | + | + | ! | + | ! | + |
| Hatamzadeh et al. (2012) (both) | + | ! | ! | ! | + | ! | ! |
| Kang et al. (2009) | ! | + | ! | ! | + | ! | ! |
| Kim et al. (2016) | + | + | ! | ! | + | ! | ! |
| Mohammadi et al. (2013) | + | + | ! | ! | + | ! | ! |
| Mohammadian et al. (2011) | + | + | + | ! | + | ! | + |
| Phang et al. (2015) | + | + | ! | ! | + | ! | ! |
| Post (2017) | - | + | ! | ! | + | - | - |
| Sezer (2012) | + | + | + | ! | + | ! | + |
| Shapiro et al. (1998) | + | + | ! | ! | + | ! | ! |
| Soleimani et al. (2015) | + | + | + | ! | + | ! | + |
| Song et al. (2015) | + | + | ! | ! | + | ! | ! |
| Talakar et al. (2016) | + | + | - | ! | + | - | - |
| Tobon et al. (2020) | + | + | ! | ! | + | ! | ! |
| Yang et al. (2020) | + | + | + | ! | + | ! | + |

- + Low risk
- ! Some concerns
- High risk

- D1 Randomisation process
- D2 Deviations from the intended interventions
- D3 Missing outcome data
- D4 Measurement of the outcome
- D5 Selection of the reported result

Notes. The ‘Overall’ column reports the summary risk of bias for each study, as determined by the standard algorithm. However, because all included studies used patient self-report outcome measures and the inherent difficulty in blinding participants in psychological intervention trials, all studies scored ‘some concerns’ in Domain 4. This then means that no study can receive an overall bias of ‘low’ by the standard algorithm, limiting the ability to discern studies in this respect. Therefore the ‘Adjusted’ column has been added, which excludes Domain 4 from the calculation of the overall risk of bias, and allows those studies with better methodological quality to be revealed. With the exception of Post (2017), where description suggests that allocation to groups may not have been random, the reason why studies were scored as a ‘high risk of bias’ was because of inappropriate handling of missing data in their analyses. This domain was also the cause for most studies to enter the ‘some concerns’ category, with the difference being that these studies were able to report reasons for patient dropout that suggested it was not due to the variable in question – psychological distress.

Table 7. Results from the RCT-PQRS tool

| Study Lead Author | D1 | D2 | D3 | D4 | D5 | Overall |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|----------------|
| Sezer (2012) | 2.00 | 0.40 | 0.80 | 1.20 | 1.67 | 2.92 |
| Hatamzadeh et al. (2012) | 1.75 | 0.80 | 1.00 | 1.20 | 2.00 | 3.06 |
| Cao et al. (2011) | 2.00 | 0.20 | 0.40 | 0.80 | 1.67 | 3.35 |
| Chinaveh (2010) | 2.00 | 0.60 | 0.80 | 1.20 | 1.67 | 3.65 |
| Mohammadian et al. (2011) | 1.50 | 0.40 | 0.60 | 1.20 | 1.67 | 3.65 |
| Talakar et al. (2016) | 1.75 | 0.80 | 0.60 | 1.20 | 2.00 | 3.65 |
| Mohammadi et al. (2013) | 2.00 | 0.60 | 1.00 | 0.80 | 1.67 | 3.79 |
| Post (2017) | 2.00 | 0.60 | 0.80 | 1.40 | 1.67 | 3.94 |
| Shapiro et al. (1998) | 2.00 | 0.80 | 1.00 | 1.80 | 2.00 | 3.94 |
| Kang et al. (2009) | 2.00 | 1.00 | 0.80 | 1.60 | 2.00 | 4.08 |
| Soleimani et al. (2015) | 1.75 | 1.60 | 1.00 | 1.20 | 1.67 | 4.08 |
| Ahmadi Forooshani et al. (2020) | 1.75 | 0.60 | 1.20 | 1.60 | 2.00 | 4.23 |
| Danitz et al. (2014) | 2.00 | 1.80 | 1.20 | 1.60 | 2.00 | 4.23 |
| Kim et al. (2016) | 2.00 | 1.20 | 0.60 | 1.60 | 2.00 | 4.23 |
| Song et al. (2015) | 1.00 | 0.20 | 0.60 | 0.80 | 1.67 | 4.23 |
| Cheng et al. (2015) | 1.50 | 0.80 | 0.80 | 1.20 | 1.67 | 4.38 |
| Damião Neto et al. (2020) | 1.75 | 0.80 | 0.60 | 1.20 | 1.67 | 4.38 |
| Deckro et al. (2002) | 1.75 | 0.40 | 0.80 | 1.20 | 1.67 | 4.52 |
| Yang et al. (2020) | 1.50 | 0.40 | 0.80 | 0.80 | 1.67 | 4.52 |
| Bu et al. (2019) | 2.00 | 0.80 | 0.80 | 1.60 | 2.00 | 4.67 |
| Elstad et al. (2020) | 1.25 | 1.60 | 0.80 | 0.80 | 1.00 | 4.96 |
| Phang et al. (2015) | 1.50 | 0.00 | 0.60 | 0.60 | 1.67 | 4.96 |
| deVibe et al. (2013) | 2.00 | 0.20 | 0.40 | 1.20 | 2.00 | 5.10 |
| Elemo et al. (2014) | 1.75 | 0.80 | 0.80 | 1.40 | 1.67 | 5.10 |
| Grégoire et al. (2018) | 1.75 | 0.60 | 0.80 | 1.20 | 1.67 | 5.10 |
| Dereix-Calonge et al. (2019) | 1.75 | 0.20 | 1.00 | 0.80 | 1.67 | 5.25 |
| Tobon et al. (2020) | 2.00 | 1.60 | 0.80 | 1.60 | 2.00 | 5.54 |
| Goldman et al. (2012) | 2.00 | 1.20 | 0.60 | 1.20 | 2.00 | 5.83 |
| Domain Averages: | 1.79 | 0.75 | 0.79 | 1.21 | 1.77 | 4.33 |

D1 Description of Subjects

D2 Definition and Delivery of Treatment

D3 Outcome Measures

D4 Data Analysis

D5 Treatment Assignment

Notes. Studies are listed in ascending order methodological quality. Using this tool that is tailored to trials of psychological interventions, suggests that the studies are of better quality than indicated by the Cochrane tool; with all but the first three having an overall quality above the average of 3.50. This was calculated in a manner similar to Sitko et al. (2020): by averaging all previous 24 items and multiplying the result by 3.5 to place studies on the omnibus item’s 7-point scale . Although of generally good quality, this table also shows that the quality domains in which these studies are lacking are those of ‘defining and delivering the treatment’ and the ‘use and reporting of outcome measures’. The raw items scores suggest that this is because there is poor reporting on adherence checks, little use or description of facilitator supervision, and poor commentary on concurrent treatments. Regarding the outcome measures domains, this is in part influenced by the use of patient self-report measures, but also due to lack of long-term follow-up assessment.

Psychological Distress

Figure 2. shows the 26 studies included in the meta-analysis.

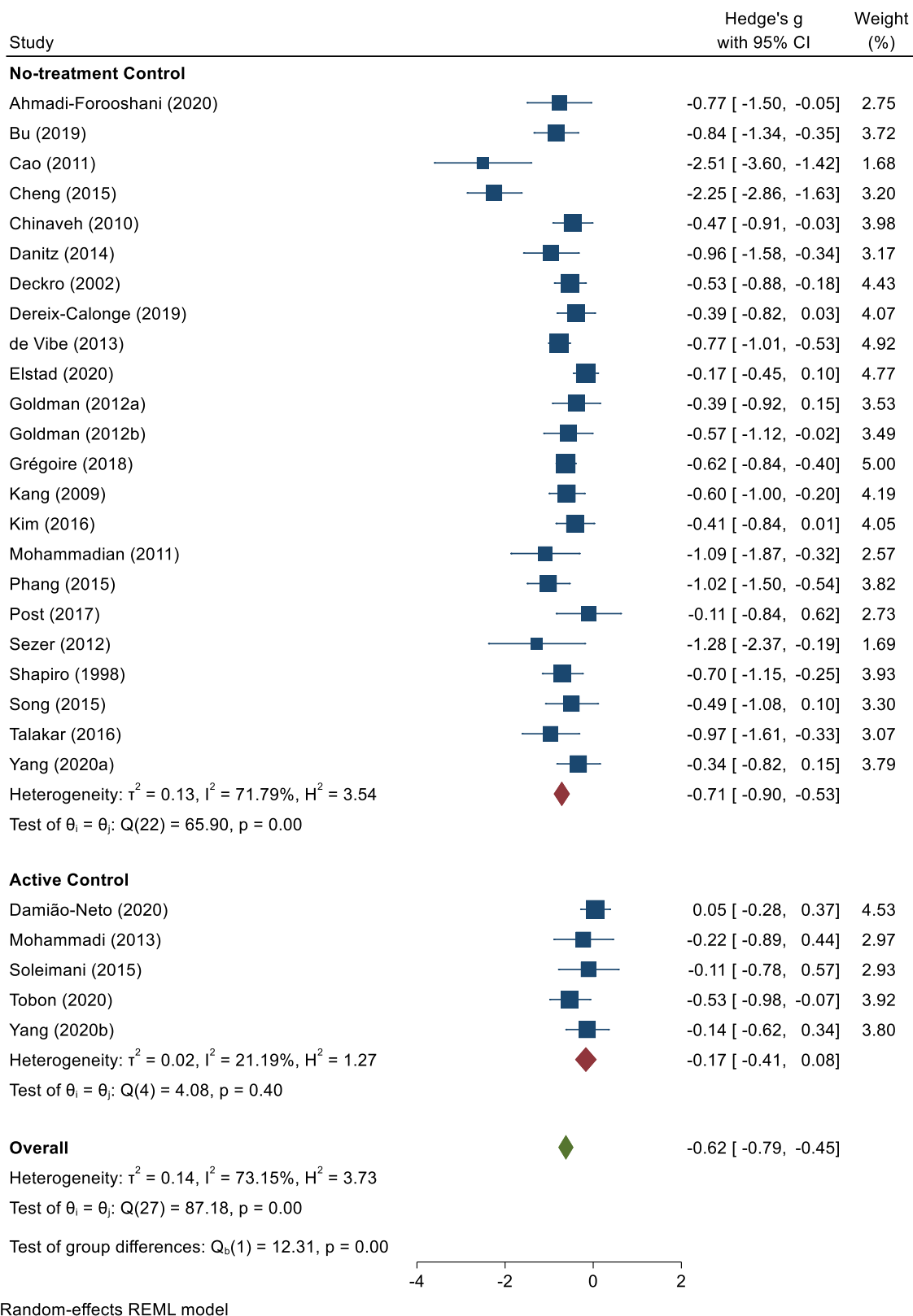


Figure 2. A forest-plot of the subgroup analysis by the control covariate.

The overall estimated effect size of group interventions on university students' psychological distress was $g = -0.62$ (95%CI: -0.79, -0.45). Hedge's g , as an adjustment to Cohen's d , can use the same interpretative categories. Therefore, results suggest a medium effect in reducing students' distress (Cohen, 1988). However, a stark difference is seen in effect size between studies with no-treatment controls ($g = -0.71$ (95%CI: -0.90, -0.53)) and those with active controls ($g = -0.17$ (95%CI: -0.41, 0.08)) to the extent that the effect seen with active controls is no longer statistically significant. These findings were concluded to be robust, and no studies warranted exclusion, following sensitivity and influence analyses that are documented in Appendix 4. Statistically significant ($Q(27) = 87.18, p = 0.00$) heterogeneity was identified that neared high level ($I^2 = 73.15\%$), so subgroup and moderator analyses were undertaken.

Subgroup Analysis

The categorical covariates, identified a priori, were combined in the subgroup analysis and are presented in Table 8.

Table 8. Tests of group differences

| Covariate | df | Q_b | P > Q_b |
|--------------|----|-------|---------|
| control | 1 | 9.46 | 0.002 |
| country | 9 | 20.84 | 0.013 |
| distressed | 1 | 0.78 | 0.378 |
| frequency | 2 | 6.39 | 0.041 |
| intervention | 5 | 8.63 | 0.125 |
| measure | 6 | 10.42 | 0.108 |
| style | 2 | 0.35 | 0.840 |
| training | 2 | 6.69 | 0.035 |

Full Sample

| Covariate | df | Q_b | P > Q_b |
|--------------|----|-------|---------|
| country | 8 | 9.21 | 0.325 |
| distressed | 1 | 1.36 | 0.243 |
| frequency | 2 | 8.28 | 0.016 |
| intervention | 5 | 6.33 | 0.275 |
| measure | 5 | 11.11 | 0.049 |
| style | 2 | 1.06 | 0.589 |
| training | 2 | 6.44 | 0.040 |

No-treatment Controls Only

Notes. These tables show the amount of heterogeneity explained (Q_b) and, given the degrees of freedom, the likelihood of this being statistically significant (P > Q_b). Those highlighted are significant ($p < 0.05$). The control classification was the most significant covariate for the full sample. Country, frequency, and training also appear significant, but this significance has not yet been controlled for multiple comparisons. Indeed, when exploring subgroup analysis on the studies with no-treatment controls, country is no longer significant. This suggests a lot of the heterogeneity in that category was explained by the type of control group studies that country chose to use. Instead, measure has reached significance. Again, these significance reports must be interpreted lightly, as multiple comparisons have not yet been controlled for. However, it can provide suggestions of which covariates to add first when building the model of best fit for meta-regression.

It is unsurprising that the type of control (active or ‘no-treatment’) has the biggest moderation on the resulting effect size; hence the decision to showcase the results by this subgroup analysis in Figure 2. The set of studies with active controls (k=5) is too small to allow for further covariate analysis, but revisiting subgroup analysis of the set with no-treatment controls revealed shifts in significance, which informed the approach when building the meta-regression model.

Meta Regression

Neither of the continuous variables: group size and time in treatment (calculated by multiplying the number and duration of sessions together for each study), proved to be a significant moderator alone. Although time did achieve statistical significance when the two single-session studies were excluded. Therefore, for the base model, the significant variables displayed in the full sample in Table 8. were used. Then a stepwise approach, detailed in Appendix 5., was undertaken to determine the model of best-fit, presented in Table 9. Intervention model, intervention style, sample-distress, country, and group size were all explored but were not supported as moderators by the final model.

Table 9. Model of best-fit following meta-regression analyses with its follow-up permutation test

| Covariate | Coefficient | Standard Error | t | P>[t] |
|------------------|-------------|----------------|-------|-------|
| Control | 0.6803 | 0.2069 | 3.29 | 0.004 |
| Training | 0.1818 | 0.0929 | 1.96 | 0.064 |
| Frequency | 0.2633 | 0.1569 | 1.68 | 0.108 |
| Time | -0.0006 | 0.0002 | -3.21 | 0.004 |
| Measure | 0.0735 | 0.0447 | 1.64 | 0.115 |
| _cons | -1.2420 | 0.3316 | -3.75 | 0.001 |

| Covariate | Unadjusted p | Adjusted p |
|------------------|--------------|------------|
| Control | 0.000 | 0.000 |
| Training | 0.116 | 0.302 |
| Frequency | 0.140 | 0.419 |
| Time | 0.000 | 0.023 |
| Measure | 0.116 | 0.419 |

Meta-Regression

REML estimate of between-study variance
 % residual variation due to heterogeneity
 Proportion of between-study variance explained
 Joint test for all covariates
 With Knapp-Hartung modification

Number of observations = 27
 $\tau^2 = 0.05001$
 $I^2_{res} = 45.50\%$
 $Adj R^2 = 66.24\%$
 Model $F(5,21) = 4.8$
 $Prob>F = 0.0044$

Permutations = 20000

Largest Monte Carlo SE(P) = 0.0752

Notes. The meta-regression table (left) displays the combination of covariates that best explains the heterogeneity found in the meta-analysis, with 66.24% of the between-study variance explained. A follow-up permutation test (right) was performed to control for multiplicity when combining multiple covariates in a meta-regression. ‘Control’ and ‘Time’ have been highlighted as their adjusted p values remain significant.

The meta-regression identified that the type of control group used and the total amount of time that students spend receiving treatment are statistically significant moderators of the effectiveness of group interventions on student's psychological distress. These make logical sense. However, as stated in Bender et al. (2008), subgroup and moderator analyses are exploratory in nature and conclusions should not be made from them, even based on significance testing. Yet in spite of the risk of random errors, Buyse (1989) notes it is necessary to undertake them to shape hypotheses of future research. In this spirit, our model would suggest that facilitator training, frequency of sessions, and differing outcome measures are also worthy of future investigation. These and the other measured covariates are explored in the discussion.

Follow-Up

Only 11 of the included studies conducted follow-up assessments. Length of follow-up ranged from one to six months, the median and mode being three months. The forest-plot in Figure 3. details their respective effect sizes, grouped by type of control. Overall, there is evidence that the significant medium effect size persists at follow-up: $g=-0.60$ (95%CI:-0.87,-0.33). Even when compared to active controls, the reduction in psychological distress is now significant ($g=-0.38$ (95%CI:-0.71,-0.05)). However, this conclusion is only based on 2 studies and therefore is not reliable. Nevertheless, this finding does highlight the importance of follow-up measurement in future active-control trials. The small set of studies also compromises any further moderator analyses of follow-up effects.

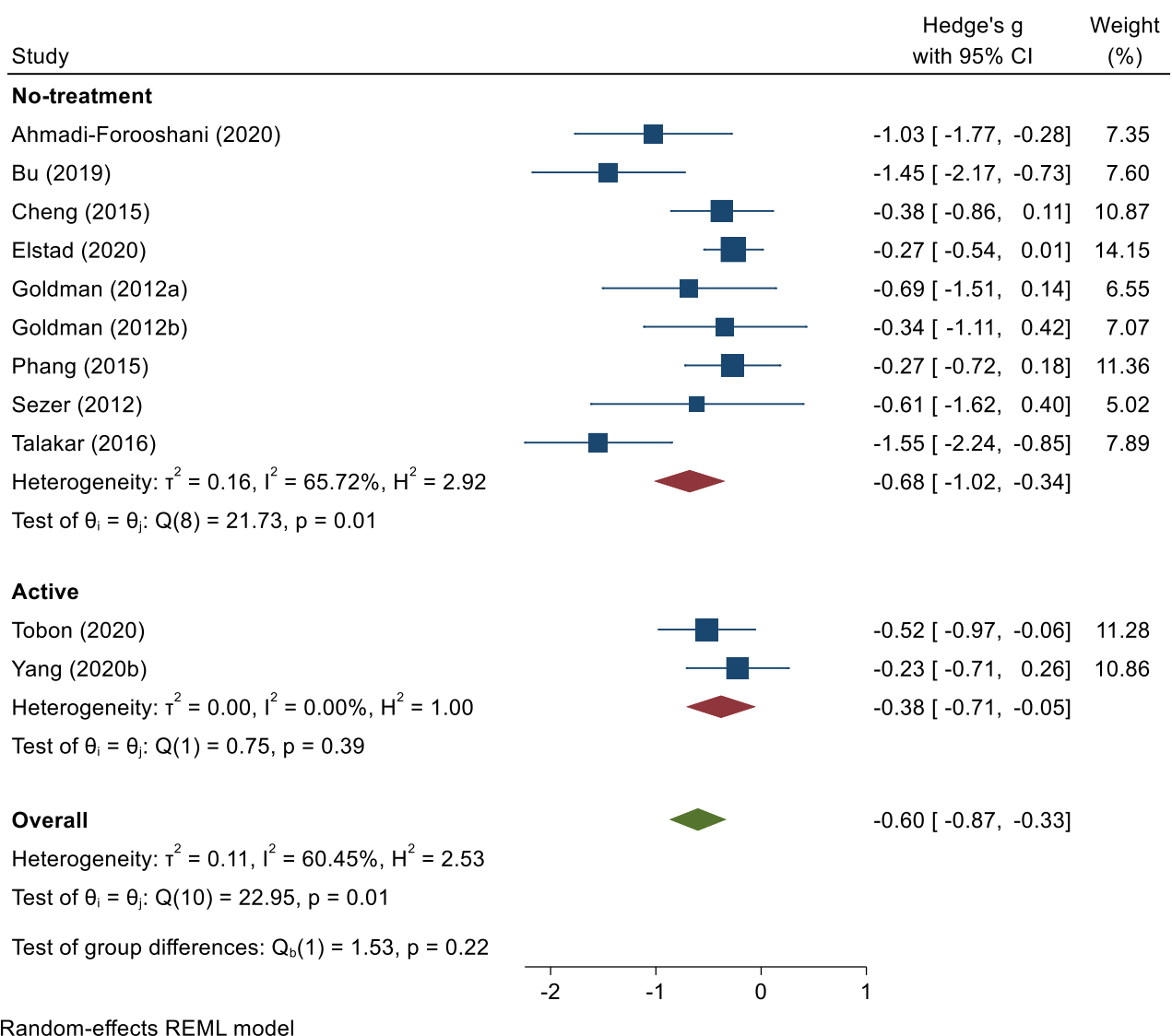


Figure 3. Forest-plot showing the subgroup analysis by control type of the studies that reported follow-up measurements of psychological distress. Where studies made multiple follow-up measurements, the final measurement was the one used in the calculation of the Hedge's g, and the length of follow-up documented.

Impact of Study Quality on Effect Size

This was examined in two ways. Subgroup analysis by the adjusted risk of bias category from the Cochrane tool showed that there was no significant difference between groups ($p=0.569$). Meta-regression by the omnibus quality rating on the RCT-PQRS also proved non-significant ($p=0.212$). Therefore, study quality was unlikely to be affecting the estimate of effect size. Finally, to further confirm the robustness of the overall estimation, the meta-analysis was run on only high-quality studies. Analysing only the studies of a low risk of

bias ($k=12$) on the Cochrane tool yields an effect size of $g=-0.766$ (95%CI:-1.133,-0.400). Analysing the top half of studies as ranked by methodological quality on the RCT-PQRS (i.e. an omnibus rating >4.35) yields an effect size of $g=-0.585$ (95%CI:-0.844,-0.325). Both of these results sit within the original estimate's confidence window; therefore, suggest that it is appropriate to report the initial effect size estimation, without need for any exclusions.

The effect size moved in different directions for the two quality measures, suggesting there is a conceptual difference between them. Ordinarily, the effect size is lessened when poorer quality studies are removed (Johnsen & Friberg, 2015). This occurred when analysing according to the RCT-PQRS, but not the Cochrane tool; perhaps supporting the idea that the RCT-PQRS is better suited to measure quality of psychological intervention studies.

Publication Bias

A regression-based Egger test suggested significant small-study effects $\beta_1 = -2.23$ (SE: 0.785) $p=0.004$. A contour-enhanced funnel plot seen in Appendix 6. shows that the area devoid of studies, creating the asymmetry, is in the area of non-significance. This would suggest non-reporting of non-significant results (Page et al., 2021). However, running a non-parametric trim-and-fill analysis to correct for this, resulted in no studies being imputed and therefore the overall effect size estimate not shifting. Therefore, although significant publication bias was detected, it is likely to have had negligible impact on overall effect size estimation.

Discussion

17 comparisons found a statistically significant benefit of group intervention, 10 comparisons found a non-significant benefit, and 1 study found a non-significant worsening of distress. Given the above-average methodological quality and below-average risk of bias, combined with the sensitivity analyses results, the

overall estimate of a medium effect size of $g=-0.62$ seems robust. For studies with 'no-treatment' controls the subgroup estimate was $g=-0.71$; for active controls it was $g=-0.17$. There appears an absence of meta-analyses solely exploring individual psychological interventions in students. However, these figures are comparable with effects sizes found in meta-analyses that included both group and individual interventions, and performed subgroup analysis by control type (depression: $g=-0.87$ and -0.30 , anxiety: $g=-0.73$ and -0.26 , (Barnett et al. 2021); and: $g=-0.92$ and -0.20 (Huang et al. 2018). This suggests that group interventions can be nearly as effective as individual. As noted in the introduction, there is scope for the group format to introduce other mechanisms of change that could compensate for the lack of the personalised approach seen in individual therapy. For example, the concept of belonging can buffer psychological distress and is particularly of benefit to subpopulations such as international student groups, as noted by Elemo and Türküm (2019) and Post (2017). Additionally, it is hard to fairly compare the effectiveness of these transdiagnostic interventions to disorder-specific ones, as the studies in the above meta-analyses often only evaluated with disorder-specific measures, as opposed to psychological distress ones. Despite this, the transdiagnostic group interventions still achieve comparable effect-sizes.

Meta-Regression Model Moderators

In meta-analysis interpretations, as noted by Higgins et al. (2002), all associations observed in sub-group analysis and meta-regressions are observational and could be confounded by unmeasured variables. Therefore, no causality can be assumed. Even if there is theory or logic behind apparent patterns, this should only be used to set up future investigations or suggest possible improvements to current practice, not as evidence for conclusions. However, these patterns warrant discussion and should be tested in future studies, even the non-significant ones. This is because the potential ability of moderators to explain heterogeneity is limited by real variation in the effect; thus, as psychological distress is an inherently 'noisy' outcome, it is challenging to capture some its true variance with moderator analysis.

Control

Significantly greater effect sizes were found when the control was of the 'no-treatment' category, which is consistent with other meta-analyses (Mohr et al., 2009; Davies et al., 2014; Cuijpers et al., 2016). However, only four studies, (five comparisons) used an active control, and in these there was variation in the type of active control: such as whether it was another therapy or something just to achieve non-specific group factors. This compromises much interpretation about this subgroup.

Nevertheless, it may be wrong to assume that comparison to an active-control group or "psychological placebo" is the gold-standard. The impossibility of blinding participants in psychological interventions means that is impossible to control for placebo effects (Button and Munafò, 2015). Additionally, use of non-specific group factors as an 'inactive' control is not the equivalent of the placebo pill in pharmacological trials, as a placebo pill contains no active ingredients; but non-specific group factors have been argued as an important mediator for psychotherapies (Mulder et al., 2017). Indeed, Tobon et al., (2020) measured DBT skills acquirement and found that this did not fully mediate the reductions seen in the intervention group, suggesting that non-specific group factors had some effect as well.

However, there is argument for using some form of intervention as a control in this field. Jealousy of not being in an intervention group could translate into psychological distress. Therefore, it could be important to offer something over nothing, to not inflate effect sizes. This is exemplified by Mohammadian et al. (2011) who were able to statistically show the increased post-treatment stress in the control group, theorising it arose from the dissonance between the desire to be in poetry group but having to wait for it. However, to use active control groups, these should be structurally equivalent (Donovan et al. 2009) and, as highlighted by the RCT-PQRS, therapist allegiance should be controlled. Goldman and Wade (2012) noted their therapists favoured the "forgiveness" approach, and therefore their commitment to delivering the "anger management" may not have been as strong and artificially inflated the resultant effect size.

The control-type dilemma is a challenging issue; however, there are some strategies that could be adopted to help. Assessment of treatment expectancies or credibility prior to intervention could help in controlling

for the placebo effect (Laird et al., 2017). Alternatively, a design of three concurrent treatment arms: a psychological intervention, a pharmacological intervention, and a placebo pill intervention, could be used. The addition of the pharmacological arm allows for the psychological intervention to be directly compared to a placebo pill, as participants in the latter group could still have the hope of improving, thinking they were in the pharmacological group.

Time

Total time receiving intervention encompassed a broad range from 1.5hrs, from single-session interventions, to 56hrs. The mean was 14hrs, achieved through eight $1\frac{3}{4}$ hr sessions. Time was the only other significant moderator of effect size in the meta-analysis. The relationship between increased time in treatment and increased symptom reduction is logical and one evidenced by The Center for Collegiate Mental Health's (2018) Annual Report. What is needed now, akin to dosage titration RCTs in pharmacology studies, is for future research to find if there is plateau point, after which additional group sessions do not equate to any further reductions in distress. However, as a combination of number and length of sessions, there is scope to also play with the ratio of these two variables to determine any pattern of interaction that best augments effect sizes.

Frequency

Although not reaching significance, the frequency of group sessions was a moderator in the best-fit model for explaining the heterogeneity, thus warrants further discussion. Most interventions adopted the weekly approach ($k=22$). There was a trend of single-session and weekly sessions being better than twice a week sessions. It is likely that higher effect-sizes from the single-session treatments might reflect the immediacy of the post-measurements and the recency effect. Regarding biweekly sessions and a suggested association with poorer effect sizes, it could be that group interventions adopting this higher frequency were harder for students to manage with their busy schedules, or missing out on extracurricular activities created a new source of distress.

Training

11 studies scored '0' (poor/no description or underqualified therapists), four scored '1' (some description or adequate therapists), and 16 scored '2' (well-described and well-qualified therapists). The emerging trend was that level '1' training was associated with the greater effect sizes. It may be that these less experienced 'adequate therapists' were currently undertaking professional postgraduate qualifications. Therefore, while still developing skills and with fresher training compared to well-qualified therapists, they may have been more model-adherent in their intervention delivery, which can be associated with better therapy outcomes (Strunk et al., 2010). Alternatively, training level could also potentially be conflated with age of therapist. The level '1' therapists were often doctoral students themselves; perhaps they were seen more as peers or more in-touch with the current student population and their needs. However, this variable was not suggested as a significant moderator in this model. Additionally, the nature of the RCT-PQRS, from which these scores were generated, conflates the level of facilitator training with the quality of its description in the paper, which could strongly bias the true moderator relationship.

Measure

The majority of studies ($k=28$) employed an outcome measure from one of three families: GHQ, SCL-90, or DASS. Though non-significant, this moderator's presence in the model calls into question whether the differing outcomes measures used are in fact measuring exactly the same concept of psychological distress. It is likely there are discrepancies between them, given the aforementioned variation in its definition in the literature. There is even debate around the use of the combined DASS score for this (Shea et al. 2009; Nanthakumar et al., 2017). However, Osman et al., (2012) found the combined score actually correlates more highly with transdiagnostic measures than disorder-specific, suggesting good suitability here. What was more questionable, despite previously cited correlations between some domain-specific measures, was the decision to combine 3 separate measures into one rating of psychological distress. This is not a validated process, and could give rise to heterogeneity in this concept. However, this was only done for 2 studies. In future, studies should standardise to one measure, or psychological distress battery consisting of GHQ, SCL-

90, and DASS, to compare benefits to and moderators of transdiagnostic psychological distress. If such a battery is established, it is important that there be a validated translation in every language required. The study by Elemo and Türküm (2019) reflected their use of the DASS in English when this was not their student's native language; thus its validity was affected.

Notable other variables

The two variables below had multiple subcategories and therefore only had a few studies in each category, which will have reduced the ability for the subgroup analysis to detect a moderating effect. However, some differences were identified that warrant further discussion so future more highly-powered reviews might be able to explore their validity.

Intervention Category

Much like Huang et al. (2018) concluded, effect sizes were not significantly associated with intervention model, which may suggest there is not currently a leading intervention for UWSs. This could suggest that UWSs can adopt any transdiagnostic group intervention model, perhaps to match with current in-house training, and see equal effects. However, this would be a highly tentative conclusion, given the small size of each subgroup and difficulties encountered in defining and assigning categories, due to overlap of elements between models. Therefore, Table 10. discusses identified trends as they may be beneficial for shaping future research.

Table 10. Potential trends in effect sizes of intervention model categories

| Category | k | Hedge's <i>g</i> | Comments |
|-------------------|---|------------------|---|
| ACT | 3 | -0.609 | This medium effect size reflects Bai et al. (2020)'s meta-analysis finding (<i>SMD</i> =0.62) for ACT's effect on reducing depression. Out of the interventions that adhered to a defined psychological model, ACT seemed to fair slightly better than others. Mediation analyses from the included studies suggest this benefit was achieved through increasing acceptance (Dereix-Calonge et al., 2019) and decreasing repetitive negative thinking (Danitz et al., 2014). Additionally, as noted in the Grégoire et al. (2018) study, ACT focuses more on building a meaningful life than symptom reduction. This holistic approach may better suit transdiagnostic evaluation. |
| Arts-Based | 3 | -1.574 | With an effect size more than double the size of the next highest category, this finding certainly warrants comment. Especially, as arts-based interventions, not being as supported by psychological theory, are often overlooked or excluded in reviews into psychological distress. 2 of the studies here used Music Therapy. Cao and Dong (2011) also presented data showing that 97% of students enjoy listening to music and 92% believe it can help with relaxation and change their mood. Perhaps this strong alignment of model with student's beliefs and values helps amplify the therapy's effect. The other study by Sezer (2012) suggests that it is its impact on anger that might mediate its stronger effect. Finally a paper by Li (2017), excluded at full-text screening, showed that the effect of Music Therapy on anxiety can be significantly augmented by combining it with biofeedback. From a transdiagnostic perspective, it may not be that psychological approaches are the only or best way to reduce distress. Arts-based interventions need more investigation against more established psychological models in future experiments to fully explore their potential. |
| CBT | 7 | -0.550 | CBT is by far the most-researched model in this area, and our findings that it has a medium effect on psychological distress are reflected in a number of other meta-analyses (Conley et al., 2015; Frazier et al., 2015; Hintz et al., 2015; Lo et al., 2018) |
| DBT | 3 | -0.342 | The fact DBT appears to have the lowest Hedge's <i>g</i> should not be interpreted as a reflection of less effectiveness. The lower effect size found is much more likely attributed to the fact that 2 of the 3 studies used an active control, which was previously identified as the most influential covariate. |
| Mindfulness-Based | 7 | -0.513 | Mindfulness-based interventions are increasingly common, but Lo et al. (2018) only found an effect for stress, not anxiety or depression in healthcare students. However, Regher et al. (2013), who looked at all students, much like this review did, also found effects for anxiety and depression; reflecting our findings of transdiagnostic improvement. |
| Psychoeducational | 5 | -0.756 | This is a varied category, one that interventions were assigned to when they subscribed more to a particular area of information than a psychological model-based approach. This is likely why other meta-analyses have found mixed results. Conley et al. (2015) found modest significant effects of psychoeducation on student distress; Lo et al. (2018) did not and suggest their lack of searching grey literature and older studies could be cause for the discrepancy. A psychoeducational approach matches well with student culture, presenting information in a format they are well accustomed to. This familiarity could be one explanation for its apparent greater effectiveness. |

Notes. Intervention categories and potential effect sizes are listed with comparisons to other systematic reviews, and some hypotheses for apparent associations are explored. The table purposefully lists the models alphabetically as opposed to by Hedge's *g* value to try and prevent any false conclusions of one category's effectiveness over another. It is not possible to comment on a favoured model from the data in this subgroup analysis.

Country

The initial significant result found for the country variable in the subgroup analysis was likely due to correlation with the control variable. However, some non-significant trends regarding country did remain when analysing solely the no-treatment control studies. The countries with most data to infer from were the USA (k=6), Iran (k=6), and China (k=5). Preliminary trends suggest marginally higher effect sizes in Iran over the USA, and those reported in Chinese studies appeared almost twice as high. Similar findings have been seen in other meta-analyses: Odgers et al. (2020) reported no significant effects for mindfulness in adolescents in the West and Australia, only finding evidence for them in Iran. While a number of hypotheses could explain this, such as varying social desirability effect in different cultures, studies in the review suggest there could be better matching between certain models and certain cultures. For example, Mohammadian et al. (2011) noted the cultural significance and popularity of poetry and storytelling in Iran; and Yang et al. (2020) noted that DBT's dialectics integrate well with zhongyong thinking ("maintaining the best balance between extremes"), which is embedded in Chinese culture. Regardless of the potential true effect, cultural adaptations are always necessary to ensure group interventions will be appropriate for respective UWSs. For example, in the Phang et al. (2016) study, as yoga has been prohibited for Muslims in Malaysia at times, they replaced it with mindful stretching and relaxation.

Remaining Variables

The outstanding variables were too inadequate for presentable interpretation for several reasons. Group size and sample-distress did not show any strong trends in this meta-regression. The style of intervention was too difficult to operationalise in a meaningful way. Adjuncts, such as homework, were somewhat reported, but very minimal detail given, preventing comparison. Risk of harms, facilitator supervision, model adherence and concurrent treatment were only mentioned in three to six of the studies. Two new potential variables for future reviews to explore were identified from the 'any notable information' heading during data extraction: participant attendance and mediating factors; but again, were only reported in a handful of papers. Nevertheless, what insight can be gleaned from these remaining variables is discussed in Appendix 7.

Wider benefits

No study measured change in academic grades or student retention as an outcome, and the concepts were rarely discussed. The nearest thing was Danitz and Orsillo (2014), who reported an almost significant ($p=0.07$) increase in the intervention group's endorsement of academic values.

Eight studies commented on some principle of economics; however, none formally assessed any cost-effectiveness. Most simply stated that group interventions should be more cost effective than current UWS practice. Soleimani et al. (2015) provided some rationale, saying their Behavioural Activation, as a subset of the Cognitive Therapy that it outperformed, will be quicker and therefore cheaper to train staff in; others just stated it as an assumption. However, Grayson and Meilman (2015) note this assumption could be unfounded. Groups can require staff time for planning, marketing, recruiting, location-sorting, and evaluation interviews; they may double the staff hours by having two co-leaders, or by running two-hour sessions; or may have such small membership they hardly qualify as groups anymore. Their study on group cost-effectiveness found mixed results. In the autumn term, the impact of running groups was estimated as between a net loss of 7 individual sessions and a net saving of 5 individual sessions for the UWS. The spring term suggested a positive range of a net saving of between 4 and 10 individual sessions. They conclude it is difficult to anticipate how many groups will run and with how many participants, making it hard to anticipate any savings; thus they call for more naturalistic research in this area. Without a single formal analysis of cost-effectiveness from the included studies, this review can provide no comment on economic effectiveness of UWSs adopting group interventions.

It must also be considered that group interventions are not the only way that UWSs can achieve more cost-effective practice. Other forms of interventions such as guided-self-help or computer/internet-based exist for this population and could see equal if not greater cost-effectiveness benefit, due to reduced therapist requirement. However, this should be considered alongside therapeutic effectiveness; for if these formats do not produce equivalent effect sizes, their cost savings will be negated by the need for more iterations of them. A meta-analysis of internet-based CBT in students by Davies et al. (2014) initially suggested similar moderate effect sizes on psychological distress ($SMD=0.43-0.73$). However since, Huang et al. (2018)'s review concluded that easy to disseminate interventions, including single-session intervention, bibliotherapy, unguided online-CBT, and self-help, had smaller effect sizes compared to more complex,

longer and guided interventions for student depression. Harrer et al. (2019) found similar for internet interventions, reporting small effect sizes between $g=0.18-0.27$ for the domains of psychological distress. Therefore, if future research does show groups to be cost-effective, then with their more comparable effect sizes to individual interventions, their increased usage by UWSs may be advocated.

Conclusions

Overall Summary

This meta-analysis reports a robust medium effect size of $g=-0.62$ for group interventions in their ability to reduce the psychological distress of university students. This finding should have relatively good external validity to student populations, for several reasons. There was a spread of countries included in the review; most studies did not focus on subpopulations and the ones that did varied. Although some studies excluded participants with severe psychological difficulties, which limits generalisability, this was only true in 6 of the 28 studies. Finally, the review focuses on transdiagnostic groups, models, and outcomes, which reflects and fits well with the varied and integrative clinical practice found in many UWSs. Additionally, the interventions reviewed were generally manualised or well described which allows for reproducibility in future research and for UWSs to reliably recreate them, in their own settings. Therefore, the review suggests group interventions have a place in the repertoire of UWSs. However, this review also highlighted that there is not enough evidence yet to confidently comment on other benefits of group interventions, such as cost-effectiveness. Further recommendations for UWSs are discussed below.

Limitations

Due to the exclusion of studies without an English translation, there is a possibility of language bias; but this risk is small, with only 8 out of 2403 studies excluded for this. The population represented is predominantly female. This reduces the confidence with which we can assume group interventions will be as effective for men; especially as some included studies that explored gender differences found significant differences for certain domains of psychological distress (de Vibe et al., 2013). But again, these studies themselves suffered from a lack of male participants for firm conclusions to be made. Additionally, although the interventions were well described, the lack of adherence reporting undermines the reliability of the outcomes calculated.

Another limitation faced by any review of group interventions is that of dependency of data. The fact that the students were treated in groups meant they shared a common environment, such as same therapist and interactions with the same group members. When this is not accounted for statistically, it leads to inflation of type I error; thus if primary studies ignored this data dependency it might have led to reporting of false positives (Barkowski et al., 2020). Finally, despite thorough subgroup analysis, meta-regression, and best-fit modelling, there still exists unresolved heterogeneity ($I^2=45.5\%$), suggesting that not all students benefit equally from group interventions. Therefore, future research in this is field is still warranted, and is discussed below.

Recommendations for UWSs

In 1993, Golden et al. found that the typical group intervention in UWSs consisted of 5-8 students, is co-led for 90 minutes, and meets weekly. They suggested that although widely practised, group interventions are not carrying enough of the burden of treatment delivery. This review suggests that group membership could be increased to the average of 15, and still see equivalent effect sizes to individual therapy. UWSs could also look to address barriers to students engaging with group interventions. Downs and Eisenberg (2012) found the most common were: a preference for dealing with stress alone, believing that stress is normal in university and not serious, and not having time for treatment. Student motivation can be increased by providing information at screening about scheduling, timings, policies, and group format, to help recruit appropriate candidates (Kay & Schwartz, 2010). Parcover et al. (2006) note that in addition to ineffective advertising and student's hesitancy towards group participation, staff resistance to groups as a preferred treatment modality is also a factor. Providing staff with training to adequately facilitate group interventions could help combat this, and is suggested by this review to potentially be a moderator of the intervention's effect. Moreover, Denton et al. (2017) have shown that having criteria for which staff are eligible group facilitators was a predictor of student attendance at groups. Their research also shows correlations between UWS directors' beliefs in the clinical usefulness of groups with student attendance. Therefore, circulating reviews such as this to UWS directors will be beneficial, as well as ensuring cost-effectiveness analyses are built into future research. Appendix 8. provides some tentative suggestions about what could make a group intervention most effective for UWSs, based on trends noted from our analyses and recommendations from the reviewed literature. However, the context of university is acknowledged as a stressful one, and with each

year the volumes of literature students must digest to complete assignments grows. Preventative measures by adjusting curriculums or evaluation expectations are another avenue to explore. This could be dove-tailed with the evidence for group interventions, by building time for them into the curriculums so they do not become another extracurricular endeavour for students to stress over finding time for.

Recommendations for future research

As noted above, there are barriers to treatment and a World Mental Health Survey found that only one in five psychologically distressed students receive treatment (Auerbach et al., 2016). Therefore, longitudinal research is needed to see whether adjustments to UWSs practice, such as suggestions in Appendix 8. lead to any increase in treatment rates. Long-term research will also allow the effectiveness of these interventions to be explored in terms of student retention and academic grades, which will also be of utmost interest to UWSs (Danitz & Orsillo, 2014). The Shapiro et al. (1998) study that ran their group so that post-measurement coincided with exam time, suggests a design that could be replicated more often. Given exams are one of the most common sources of student distress, it would be beneficial to know which groups prove effective against them. More longitudinal research is also needed in the studies of clinical effectiveness themselves, to ensure adequate follow-up periods. This is because newly taught skills in psychological interventions often take time to implement and have their effects realised. This can be challenging in a student population where students might have graduated or be on a year out, during follow-up periods. However, it should always be attempted, given studies like Elemo and Türküm (2019) and Yang et al. (2020) found greater effect sizes at follow-up. Yang theorised that non-specific group factors might account for more immediate changes in distress, but skills like mindfulness and distress tolerance are what mediate maintenance of reductions. The methodology of these studies should always ensure that model fidelity is commented upon, concurrent treatments noted and factored into analysis, and the theorised mediation processes are explored. As noted by (Post, 2017), factoring in students' previous intervention history could be another useful moderator for research to start recording. More research is needed in general to better identify potential moderators that have been suggested by trends found in this meta-analysis. This review has also highlighted the benefit of evaluating interventions transdiagnostically. Dagleish et al. (2020) suggest that transdiagnostic models should be used for future large-scale hybrid designs with multiple primary outcomes. For example, as performed by Kim et al. (2016), cortisol measurement could be added alongside psychological distress

questionnaires, to provide evidence that does not rely on self-report. In summary, more direct comparisons of group to individual interventions for students, undertaken with the above recommendations, would greatly add to our understanding of what to advise for UWSs.

Closing Statement

Group interventions have a medium effect size in reducing transdiagnostic psychological distress in university students. Increasing time in treatment and not using an active control group are significant moderators of this effectiveness. The amount of group facilitator training, the frequency of sessions, and the outcome measure used, explain a good proportion of the between-study variance in effectiveness, but more research is required to explore their moderating potential. Additionally, more research is needed looking at cost-effective and academic outcomes of group interventions, as the lack in this literature hinders any comment.

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Paper 2 has been prepared for submission to the British Journal of Clinical Psychology, in accordance with the guidelines for authors (Appendix 9). For ease of reading, tables and figures have also been embedded in the main body of the paper and shaded; however, they will be placed in supplementary information and re-formatted for journal submission. Additionally, the 8000-word count limit has been used here to ensure all relevant information is included for the examiners.

**Paper 2: Addressing psychological distress in university students:
moderators of effectiveness and sudden gains from a brief
Acceptance and Commitment Therapy (ACT)-based group
intervention.**

John Butler^a, Dr. Cerith Waters^a and Dr. Helen Penny^a

^a South Wales Doctoral Programme in Clinical Psychology, Cardiff University, Cardiff, CF10 3AT

Corresponding author:

John Butler, Cardiff University, 70 Park Place, Tower building 11th floor Cardiff CF10 3AT

butlerjw@cardiff.ac.uk

Word count (exc. abstract/figures/tables): **7121**

Abstract

Objectives: To identify variables that may moderate the effectiveness of a 4-week Acceptance and Commitment Therapy (ACT)-based intervention, in reducing university students' psychological distress; including those that may predict sudden gains from the treatment.

Methods: A randomised controlled design was used, where participants were randomly allocated to either the ACT group or a waitlist. Participants were 73 Cardiff University students who self-referred into the study, in response to university-wide advertising. The General Health Questionnaire (GHQ-12) was used to measure psychological distress at five time-points. The potential variables of interest – session attendance and skills practice – were captured through participant self-report and readiness to change was measured using the University Rhode Island Change Assessment (URICA). Primary analyses were able to be performed with an intention-to-treat approach on 71 of the participants, through linear mixed modelling and logistic regression.

Results: At 2-month follow-up a significant effect size ($g=-0.97$) was seen favouring the ACT group, in which participants' distress reduced more than twice as fast compared to controls. A trend proposed skills practice as a moderator of this effectiveness. Results also showed students that accessed more recordings, rather than attending in person, experienced equal if not faster reductions in their distress. Both total session attendance and readiness to change significantly predicted which participants experienced a sudden gain.

Conclusions: University wellbeing services could employ readiness screening to help treatment-matching and consider increased use of recordings for remote-attendance. Further research is needed to expand on preliminary evidence for other identified trends.

Introduction

Psychological Distress in University Students

In 2009, in the United Kingdom (UK), Russell and Shaw evidenced that 10% of university students had moderate to severe levels of social anxiety. In 2013, Ibrahim et al.'s meta-analysis suggested the most common source of psychological distress in UK university students was from depression, with a prevalence of 30.6%. Year on year, the proportion of UK students disclosing mental health conditions grows; and by 2017, Thorley had noted a fivefold increase over the previous decade. This rising distress prevalence has since continued and been reflected in high levels of suicidal ideation, with 42.2% of UK students having contemplated suicide at least once per year (Akram et al., 2020). With suicide being the leading cause of death among young adults (WHO, 2014) and psychological distress leading to worse academic outcomes and problematic health behaviours (Sharp & Theiler, 2018), there is a staggering need for UK universities to address this issue. However, university wellbeing services (UWSs) are overwhelmed with the increased demand (Auerbach et al., 2018). Effective, short-term, group interventions are one way to help UWSs meet this need, by supporting a number of students simultaneously, in a time-limited way.

Acceptance and Commitment Therapy (ACT)

ACT is an intervention model that aims to reduce distress by promoting psychological flexibility. It encompasses six interrelated therapeutic processes: contact with the present moment, acceptance, cognitive defusion, self-as-context, values clarification, and committed action (Hayes et al., 2006). A meta-analysis of 39 randomized controlled trials concluded that ACT is more effective than waitlist ($g=0.82$), treatment as usual ($g=0.64$), and psychological placebo ($g=0.51$), in treating conditions like anxiety and depression (A-Tjak et al., 2015). Similar findings have recently been confirmed by Gloster et al. (2020)'s review of meta-analytic evidence on the effectiveness of ACT. Levin et al. (2017) suggest that the transdiagnostic nature of ACT is well suited to UWSs, where students often present with difficulties without specific diagnoses, such as academic pressures, relationship issues, and distress associated with multiple transitions. Additionally, ACT has been translated into brief, group-format interventions, and studies are starting to emerge that suggest this style is effective in the student population. Gregoire et al. (2018) found

that 72 Canadian students, who completed a 4-week ACT-based intervention, showed significantly reduced symptoms of stress, anxiety, and depression than their waitlist counterparts.

Moderators of Outcome

One of the calls to action for future psychological research, laid out by Holmes et al. (2018), is for more investigation into moderators of treatment effects. Identification of moderators can then inform inclusion and exclusion criteria for stratification of future research; while in clinical practice, it can help the matching of individual patients with suitable treatments (Knopp et al., 2013). Understanding for whom and under what conditions treatments exert their greatest effects, is essential for prudent healthcare (Wolitzky-Taylor et al., 2012). Therefore, building this evidence base might help UWSs tailor interventions to different student subpopulations (Pots et al., 2016) and could facilitate joint decision making. This would better enable matching the right treatment, to the right patient, at the right time.

Baseline Distress

Given that it usually does not involve any additional measures to the one being used for the primary outcome, baseline distress is a readily available moderator for researchers to explore. Both McConachie et al. (2014) and Pots et al. (2016) found that higher baseline distress was predictive of greater symptom reduction following an ACT intervention, in adult populations. However, there appears a lack of studies exploring whether this moderating relationship holds true for student populations. There are arguments that the moderating effects of baseline distress severity is a statistical artifact, caused by regression to the mean or 'floor effects' (Schneider et al., 2010). Nevertheless, as Flaxman & Bond (2010) highlight, low levels of baseline distress at the individual level could dilute the impact of intervention effects at the sample level. Therefore, it is a useful variable to include and control for in moderation analyses, even if not deemed a moderator itself.

Readiness for Change

The transtheoretical model of intentional behaviour change has its origins in smoking cessation research and practice, but has increased its scope to include a broad range of mental health behaviours (Prochaska & Velicer, 1997). One of its core constructs is the 'stages of change' that details different phases individuals can be in relation to an identified change: precontemplation, contemplation, preparation, action, and

maintenance (Nigg, 2005). At any one time, an individual's profile: their thoughts, emotions, and behaviour, can exist in each of these stages to different degrees. From this pattern of distribution, an idea of their readiness to change can be understood. This concept of readiness is now being seen as crucial to consider for most psychotherapies for its influence on outcome (Renninger, 2013). A meta-analysis of psychotherapies, predominantly cognitive-behavioural therapy (CBT), found clinically significant effect sizes for the association between readiness and psychotherapy outcomes ($d=0.46$) (Norcross et al., 2011). There is less research to show that this phenomenon holds true for ACT; although one study exists, showing low readiness did predict poorer outcome from an ACT intervention for OCD (Cole Monaghan et al., 2015). The current study will measure participant readiness for change at baseline to determine its moderator potential of ACT for transdiagnostic distress in a student population.

Participant Engagement

In their systematic review, Kim et al. (2012) comment that poor engagement is a significant obstacle to efficacy and outcomes of mental health treatments. The strong positive association between participant engagement and successful outcome from psychological interventions is established to such an extent that research has started looking for predictors of treatment engagement directly (Beatty & Binnion, 2016). Engagement can be operationalised in different ways. Two approaches are to investigate how much participants commit to sessions, by recording attendance, and to between-session work, by documenting homework and skills practice. Burns & Spangler (2000) noted the bidirectionality of the association between homework compliance and improvement in depression. However, using non-recursive structural equation modelling techniques, they were able to show the temporal pattern and suggest that homework practice had a causal effect on improvements in depression with large effect size. Increased session attendance has been shown to be a likely predictor of successful outcome following psychological treatment, in a systematic review on gambling (Merkouris et al., 2016). Brumfitt & Sheeran (1997) looked at both of these engagement concepts in aphasic participants and found better attendance and greater completion of homework tasks were both associated with statistically significant improvements in depression scores ($r=0.858$ and $r=0.770$, respectively). Nevertheless, there is limited information focusing on brief ACT interventions and participant engagement. Additionally, given the recent shift to increased use of virtual and remote therapy, brought on by the COVID-19 pandemic, this study will also explore whether the type of session attendance: in-person or

viewing a recording, also moderates the intervention's effectiveness. If no difference is seen, it may suggest suitability of the intervention for remote treatment. This would be beneficial for when barriers exist for in-person attendance.

Sudden Gains (SGs)

In addition to exploring whether the above variables might moderate treatment outcome, the current study will investigate whether they can predict a specific type of therapy outcome – the sudden gain (SG). SGs, defined as large and stable drops in symptoms from one session to the next, have become well-established as consistent predictors of better outcomes at post-treatment and over follow-up (Andrews et al., 2020). This has been seen in interventions including CBT, supportive expressive therapy, lone behavioural activation, and general psychotherapy for depression (O'Mahen et al., 2017). However, these authors note that studies have failed to find an association between SGs and outcome in other therapy models, such as interpersonal therapy. Keinonen et al. (2018) have since evaluated a 6-session ACT intervention and also found that sudden gainers (SGs) presented with significantly lower depression levels at post-treatment than participants without a SG. They were also able to suggest some baseline predictors of SGs: milder baseline symptoms of depression and unemployed status. However, this was a one-to-one individual ACT intervention, as opposed to a group intervention. The current study will explore whether this relationship persists for briefer group ACT interventions, and whether participant engagement, readiness, and baseline distress moderate this relationship. Further investigations of potential SG predictors is warranted, as despite some preliminary findings such as those in the Keinonen study and Vincent & Norton (2019), who established an association between participant engagement and SGs in CBT for anxiety, many studies looking for robust predictors of SGs have struggled to find them (Zilcha-Mano et al., 2019). Once identified, UWSs can use knowledge of SG predictors to inform students of how best to make use of their services, to reduce re-referrals, and potentially alleviate demand.

Aims of the study

The current study employed a randomised controlled design, where university students received a 4-week ACT-based intervention or were assigned to a waitlist. The five following hypotheses were examined:

1. The ACT group will reduce in psychological distress significantly faster than the waitlist group. While this hypothesis is not the primary focus of the paper, if supported, it sets the context and rationale for the subsequent hypotheses.
2. Baseline distress, baseline readiness, and participant engagement will significantly moderate the effectiveness of the ACT intervention.
3. Increased sessions attended in person, as opposed to via recording, will improve the effectiveness of the ACT intervention.
4. Baseline distress, baseline readiness, and participant engagement will predict which ACT participants make SGs during treatment.
5. Being a SGr will increase the effectiveness of the ACT intervention.

Methodology

Participants

Recruitment to the study was achieved through a number of methods. The study was advertised on university's Experimental Management System, where psychology students receive course credit for participation. To reach students from different disciplines, advertisements, such as the example seen in Appendix 10, were disseminated through email lists, posters around campus, university societies, and through the university's social media platforms. n=87 participants expressed interest in the study and were sent an information sheet about the study that gave information about their rights as a participant. If willing to participate, a consent form was sent to participants for completion. Figure 1. shows the CONSORT diagram that details the flow of participants through the study. Inclusion criteria solely required participants to be a student at Cardiff University; no upper age limit was set. Participants allocated to the intervention and waitlist conditions could continue to access statutory and non-statutory mental health services during the course of the intervention and follow-up time periods. There were no significant differences found on any baseline demographic variable between the ACT and control groups (see Table 1. for more detailed sample characteristics). The sample predominantly consisted of white Europeans, females, and psychology students. Baseline distress did not significantly differ between groups, but was found to be high, with 70% of

the sample above the clinical cut-off of 12 (Goldberg et al., 1997), likely reflecting the rising prevalence rates previously discussed.

Table 1. Demographics of study sample

| Baseline Characteristic | | ACT (n=33) | | Waitlist (n=37) | | Full Sample (n=70) | |
|-------------------------|-------------------|-----------------|------|-----------------|------|--------------------|------|
| | | n | % | n | % | n | % |
| Sex | Male | 2 | 6.1 | 8 | 21.6 | 10 | 14.3 |
| | Female | 31 | 93.9 | 29 | 78.4 | 60 | 85.7 |
| Relationship Status | Single | 17 | 51.5 | 12 | 32.4 | 29 | 41.4 |
| | In a relationship | 16 | 49.5 | 25 | 67.6 | 41 | 58.6 |
| Age | 18-19 | 19 | 57.6 | 23 | 62.2 | 42 | 60.0 |
| | 20 | 7 | 21.2 | 8 | 21.6 | 15 | 21.4 |
| | 21-22 | 6 | 18.2 | 1 | 2.7 | 7 | 10.0 |
| | 23-24 | 1 | 3.0 | 2 | 5.4 | 3 | 4.3 |
| | 25-34 | 0 | 0.0 | 2 | 5.4 | 2 | 2.9 |
| | 45-54 | 0 | 0.0 | 1 | 2.7 | 1 | 1.4 |
| Ethnicity | White European | 29 | 87.9 | 28 | 75.7 | 57 | 81.4 |
| | Other | 4 | 12.1 | 9 | 24.3 | 13 | 18.6 |
| Course | Psychology | 24 | 72.7 | 28 | 75.7 | 52 | 74.3 |
| | Other | 9 | 27.3 | 9 | 24.3 | 18 | 25.7 |
| Distress | GHQ-12 | M=15.12 SD=6.02 | | M=16.17 SD=5.86 | | M=15.66 SD=5.92 | |

Notes. Ethnicity and course were explored via open questions. However, due to a strong majority category along with multiple underrepresented categories emerging in each variable, they have been summarised as binary variables for ease of presentation and onward analysis. One participant from the ACT group failed to provide any demographic information.

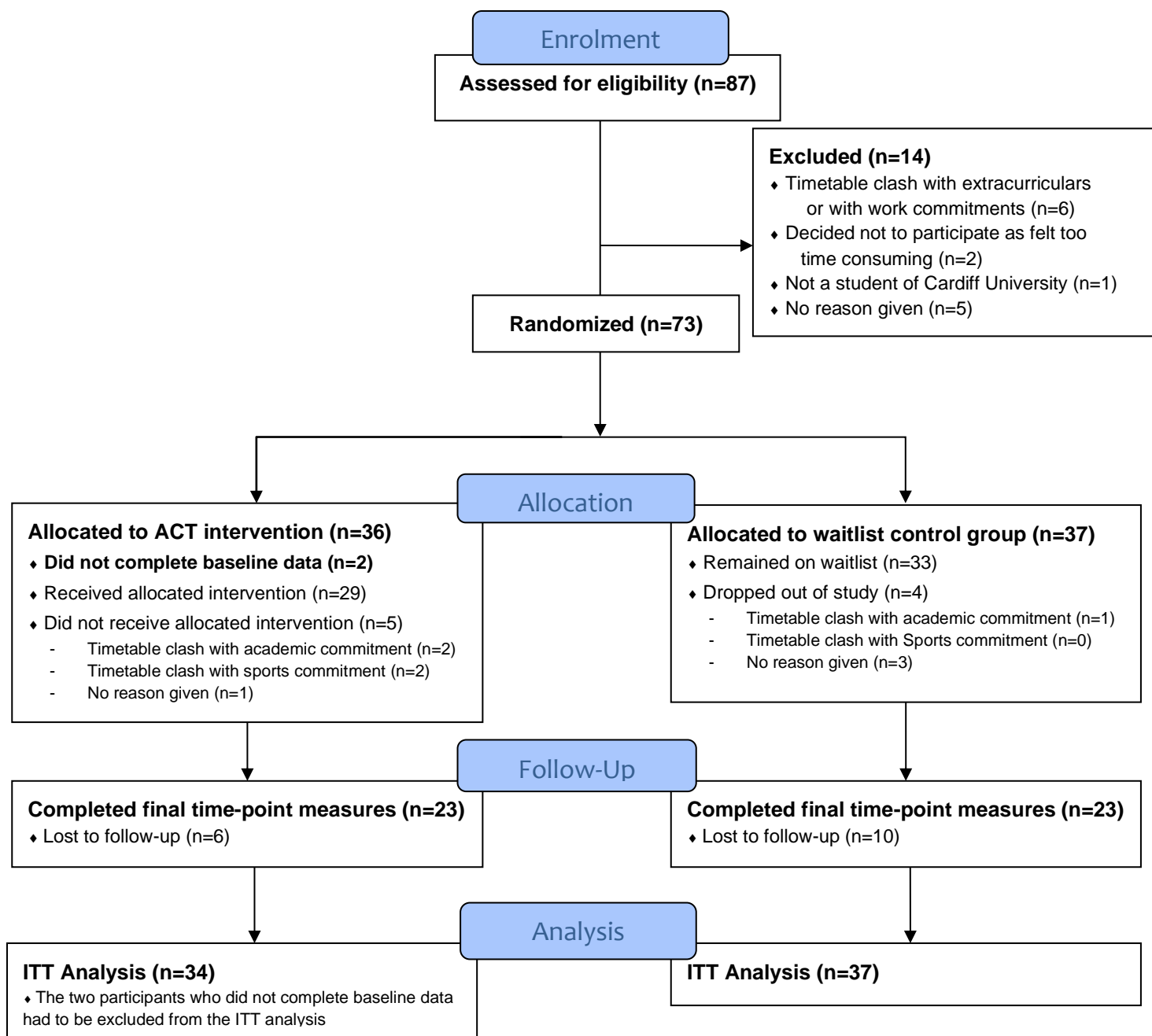


Figure 1. CONSORT participant flow diagram. ITT = intention-to-treat

Trial Design

This study adopted a two-arm, parallel, effectiveness, randomised control trial (RCT) design. Participants were randomly allocated, with a 1:1 ratio, to either the intervention arm – a 4-week ACT-based group intervention, termed *ACTivate Your Life* (AYL) – or to the waitlist control arm. Randomisation and allocation were performed using a computer-based random number generator by a research assistant blinded to participant baseline data. Due to the nature of psychological group interventions and self-report measures, participant blinding to treatment condition was not possible. Ethical approval was originally granted by the

School of Psychology, Cardiff University Ethics Committee. An amendment to allow for the lead author to join the research team and explore additional hypotheses from the data-set was subsequently approved (EC.18.03.13.5261R2A2, see Appendix 11 for documentation). The study was prospectively registered with the ISRCTN registry, trial number: ISRCTN92015724.

Intervention and Procedure

Activate Your Life (AYL) is a group-format psychoeducation training programme, delivered through 4-weekly sessions (Cartwright & Hooper, 2017). Since January 2015, over 200 presenters have been trained and the course is now being delivered regularly in primary care mental health services across Wales (Cartwright & Hooper, 2017). Each session was two hours in duration and facilitated by two assistant psychologists (one male/one female). Facilitators were trained in the AYL intervention and received weekly supervision from a chartered clinical psychologist. Model adherence was assessed by facilitators confirming each intervention component had been delivered, during this supervision. AYL draws on fundamental ideas and therapeutic strategies from ACT. The course is designed to be engaging, clear, and accessible, with many everyday examples used to illustrate core concepts. AYL is mainly didactic in nature, with Microsoft PowerPoint used to deliver content; but a series of interactive psychological coping skills are taught each week and participants are requested to practice these outside of sessions. An audio CD is provided free of charge to enable this. Intervention sessions were recorded live using Panopto software, and were made available online for participants that could not attend in person. Figure 2. details the themes of the weekly sessions, with supplementary information found in Appendix 12. The course was delivered over 4 weeks during the winter term, leading up to the Christmas break in 2018.

ACTivate Your Life – Overview of Sessions

The programme aims to promote psychological flexibility through educating participants on the six core ACT processes and how to apply them to their own lives. Each session lasts 2 hours, with a short 5–10-minute break in the middle for refreshments. The trained presenters are required to follow the text on the PowerPoint slides of the AYL programme on the screen closely, but can illustrate points with brief examples from their own personal or professional experiences. Additionally, the programme was lightly adapted for university students, by focusing on common difficulties faced in higher education and using appropriate cultural references within concept explanations.

- **Session 1: *You Are Not Your Mind*** – explores the concept of control and unconscious and conscious processes. Explains how automatic natural processes can cause suffering. Introduces mindfulness and promotes changes in the participants' relationship with their mind to reduce psychological distress.
- **Session 2: *Facing Up To Life*** – focuses on acceptance and educates on downsides of avoidance. Delineates between pain and suffering and uses the “passengers on the bus” metaphor to show valued actions can still be pursued in the presence of emotional or physical pain, to reduce suffering.
- **Session 3: *Being Mindful*** – has substantial time devoted to the practice of mindfulness and defusion activities. Explores differences between thoughts and reality, and between descriptions and evaluations.
- **Session 4: *Living Well, Living Wisely*** – differentiates between goals and values and helps participants identify the latter. Provides techniques for maintaining commitment to valued actions, in the face of setbacks, and synthesises and summarises the previous sessions.

Following each session, a 2-page summary and a 4-page activity sheet, for informing and documenting related skills practice, are provided so that participants can better embed ACT principles in their own lives. The session summary handouts can be found in Appendix 3.

Figure 2. Intervention description

Due to the nature of AYL, all participants allocated to the intervention-arm were able to attend the same group sessions, resulting in a maximum group size of 29. However, in-person attendance rates suggest an average group size of 15. The sessions were conducted in a quiet, private lecture theatre within Cardiff University that was familiar and accessible to the participants. This routine setting should have negligible impact on distress levels and has been acknowledged following guidelines set out in the Randomized Controlled Trial Psychotherapy Quality Rating Scale (RCT-PQRS; Kocsis et al., 2010). Participants in the waitlist-arm were invited to attend the AYL intervention following completion of the follow-up period of this study. Given psychological interventions always carry a risk of harm (Duggan et al., 2014) and to adhere to the British Psychological Society's (2018) code of ethics, proactive plans were put in place to manage participant distress. Information sheets informed participants of the right to withdraw from the study at any point, as well as providing contact details for local mental health services. Additionally, a debrief session was held after completion of the research.

Measures

All outcome data were captured through participants completing digital versions of questionnaires using the Qualtrics platform, with the exception of those in the ACT group who completed hard copies immediately before sessions 2 and 3. At eligibility screening, demographic information was captured pertaining to: sex, age, relationship-status, ethnicity, university course, and year of study. Copies of all forms completed by participants can be seen in Appendices 13 onwards.

University Rhode Island Change Assessment (URICA) scale (McConaughy et al., 1983)

The URICA was used to assess participants' stage of change at baseline. This measure can be scored in terms of "profiles" or "readiness". As the readiness scale generates a mean, it is more applicable across populations and samples, and can be used prior to treatment to predict outcomes (University of Maryland Baltimore County, n.d.). Therefore, this was the method chosen in this study. The questionnaire has good validity and reliability, with reports of Cronbach's alphas around 0.85 (Pantaloni & Swanson, 2003; Field et al., 2009).

Additional Moderator Variables

Participant engagement was explored by calculating two factors. Session attendance was recorded twice: once for sessions only attended in person and once for a total number of sessions "attended" including instances where participants accessed the online recordings. Between-session skills practice was logged by the participants themselves using a standardised recording diary. The overall mean number of times a participant practised mindfulness or defusion activities per week, between Session 1 and follow-up, was then calculated.

The General Health Questionnaire-12 (GHQ-12: Goldberg et al., 1997)

As a widely-used measure of transdiagnostic psychological distress, the GHQ-12 was used to measure the primary outcome. While Goldberg recommends the bimodal scoring approach for clinical use, the 4-point Likert scoring is more common in research (Anjara et al., 2020) and therefore was chosen here for ease of comparison to other studies. Additionally, this method produces a less skewed distribution and is recommended for longitudinal studies (Malt, 1989). This means total scores range from 0-36, with higher scores indicating greater psychological distress. The GHQ-12 has been shown to be both valid and reliable

(Donath, 2001; Goldberg et al., 1997), with Flaxman and Bond (2010) finding Cronbach's alpha coefficients of .90 and .93 at pre and post-test respectively, when using the Likert scoring method. Yaghubi et al. (2012) found a similar Cronbach's alpha of 0.91 in their study using Iranian medical students concluded that the GHQ-12 is valid and reliable for measuring psychopathology in university students. Participants in the ACT group completed this measure at baseline, immediately before the second session, immediately before the third session, 2 weeks after the fourth session for post-treatment results, and 2 months after the fourth session for follow-up results. Participants on the waitlist completed the GHQ-12 at the same time-points, with the exception of immediately before the second session, to minimise burden on the waitlist participants.

Sudden Gains (SGs: Shalom & Aderka, 2020)

For a participant to be classified as a SGr, their individual trajectory of GHQ-12 scores had to satisfy 3 criteria:

1. There had to be a decrease of more than 4.18 between two adjacent time-points. This figure was determined as the reliable change index on the GHQ-12 for the present sample. This was calculated by entering our data, along with a slightly conservative estimate of the GHQ-12's reliability as 0.90, given the above cited literature, into an online calculator (Psychoutcomes, n.d.).
2. The value of this decrease had to be >25% of their GHQ-12 score in the pre-gain session. (E.g. a drop from 26 to 21, would not suffice.)
3. 50% of the value of the decrease must be maintained thereafter. (E.g. if a participant dropped from 20 to 10, then no future score could rise above 15, for it to retain its SG status.)

If a participant's trajectory met these criteria, they were labelled as a SGr, and a note was made of the timing of the SG. The first two criteria remain unchanged since Tang & DeRubeis (1999)'s conception of the SG, but we have adopted one of the updated definitions for the third "stability" criterion, which is a better fit for briefer interventions and avoids Type I error inflation (Shalom & Aderka, 2020).

Statistical Methods

All analyses were computed in SPSS Version 25.0 (IBM Corp., 2017). Hypothesis 1 was explored through linear mixed modelling (LMM). This approach was deemed the most appropriate to explore the longitudinal

repeated-measures data. The previous common practice of using tests from the analysis of variance (ANOVA) family is now regarded as less acceptable in studies of this design. ANOVAs assume sphericity, in that the variances of all pairwise differences between variables are equal (Hedeker & Gibbons, 2006). Similarly, they require the spacing between all time-points to be equal (Krueger & Tian, 2004). ANOVAs also assume independence of observations, which is usually violated when examining longitudinal data due to higher-level clustering units (Shek & Ma, 2011). The present data would not have met these criteria.

Additionally, LMM allows several other advantages. While ANOVAs must exclude any participant with an incomplete dataset; LMM assume data to be 'missing at random' (Walker et al., 2019). Then applying Restricted Maximum Likelihood theory, LMM uses available data to estimate missing data, assuming it would follow the observed trajectories. This is akin to the multiple imputation method and prevents missing data from impacting the model fit. We note that we are assuming that our data are indeed 'missing at random'; but given, outside of obtaining follow-up data from non-responders, there is no method to test whether this assumption holds (Schafer & Graham, 2002), it is thought an acceptable practice. ANOVAs also lose individual trajectory profiles, assuming a similar trend for all participants; whereas LMM can quantitatively explore these individual differences, thus can better model predictors of variation in trajectories. And finally, LMM allows for several covariance structures to be considered for random errors and effects (West, 2009).

While sample sizes approaching 100 are preferred for LMM, models have successfully been fitted to samples as small as $n=22$ (Huttenlocher et al., 1991), providing rationale for use in this sample size of $n=71$. An alpha level of 0.05 was chosen and the Satterthwaite approximation was used for degrees of freedom.

Hypothesis 1 was explored with Model 1. This explored distress using time, group allocation, and a time*group interaction as fixed effects; a random intercept for participant-ID was included to account for individual differences at baseline, and a random slope for time included to allow for variation in participants' distress trajectories.

Hypothesis 2 was explored in Model 2. This used only the data from participants in the ACT group and began with the same parameters as described in Model 1, without the group allocation terms. The Akaike information criterion (AIC) was then used to explore changes in 'goodness of fit' while different numbers and

combinations of the hypothesised moderator variables, and their time-interaction terms, were added to the fixed effects of the model.

Hypothesis 3 was explored in Model 3. This was built by again starting with Model 1 without the group allocation terms and only using the ACT group data. Fixed effects for number of sessions attended in person and its time-interaction term were then added, while controlling for total number of sessions attended by adding this as a fixed effect without its interaction with time.

Hypothesis 4 was explored through logistic regression. Again, a logical stepwise approach was taken to add and combine potential predictor variables for SGs. The Hosmer-and-Lemeshow test, the Nagelkerke R^2 , and the resultant significance of the predictors, were used in concluding the model of best fit.

Hypothesis 5 returns to LMM and uses Model 4 that is based off Model 1, but uses SG status in place of group allocation, and examines the data from the ACT group only.

Results

Table 2. provides some descriptive context for the variables that feature in the hypotheses. Notably, there was a large range of skills practice, with the minimum being 0 practices and the maximum seen in in one week being 37. Additionally, 49% of treatment time was attended in person, 19% was attended via online recordings, and 32% was ultimately missed by participants. Further results are presented in relation to each hypothesis.

Table 2. Descriptive data

| Variable | ACT Group | | Waitlist | |
|--------------------|-----------|------|----------|------|
| | Mean | SD | Mean | SD |
| Baseline Distress | 15.12 | 6.02 | 16.17 | 5.86 |
| Readiness | 8.37 | 2.07 | 8.28 | 1.95 |
| Skills Practice | 4.21 | 3.00 | | |
| Sessions Attended | 2.73 | 1.45 | | |
| Attended in Person | 1.97 | 1.25 | | |
| Sudden Gainers | n=12 | | n=4 | |

Notes. ‘Sessions Attended’ refers to the total number of sessions a participant participated in, either by attending in person or by accessing the online recording of the session at a later date.

Hypothesis 1 – Intervention effectiveness

Hypothesis 1 proposed the ACT group would reduce in psychological distress faster than the waitlist group. This was supported and is reflected in the diverging linear trends and non-overlapping confidence intervals seen in Figure 3. A large effect size of $g=-0.97$ (calculated in the manner of Higgins and Green (2011)) was seen in favour of the ACT group at the final 2-month follow-up measurement.

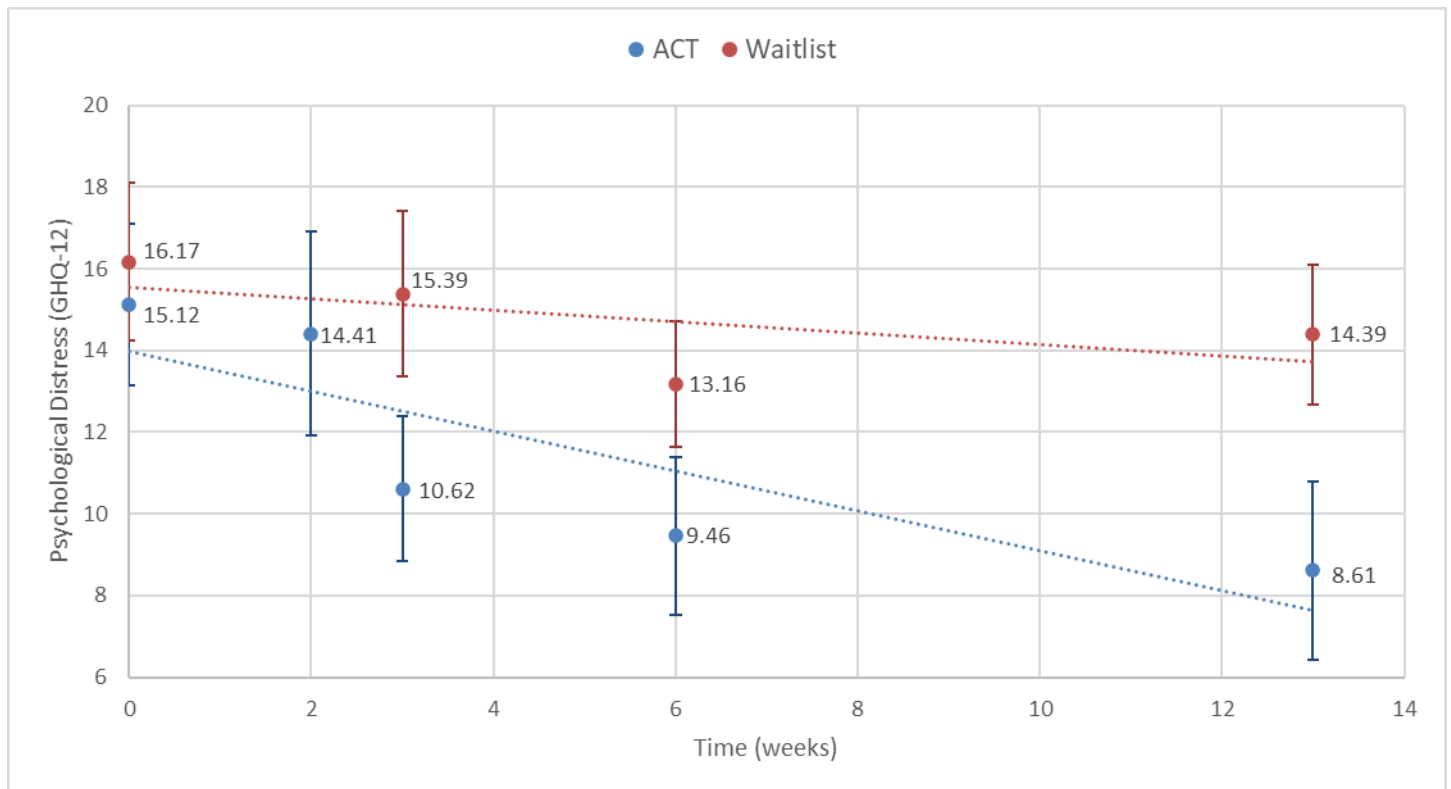


Figure 3. A graph plotting change in mean psychological distress over time for the two groups. Error bars represent 95% confidence intervals.

Table 3. shows the results of Model 1, which used linear mixed modeling to better understand differences in the rate of change between the groups.

Table 3. Estimates of fixed effects for Model 1 (linear mixed model).

| Parameter | Estimate | Std. Error | df | t | p |
|--------------|----------|------------|--------|--------|-------|
| Intercept | 15.8003 | 0.8865 | 76.839 | 17.822 | 0 |
| Time (weeks) | -0.2165 | 0.1008 | 56.934 | -2.149 | 0.036 |
| Group (AYL) | -1.7277 | 1.2581 | 71.069 | -1.373 | 0.174 |
| Time*Group | -0.2935 | 0.1417 | 52.433 | -2.071 | 0.043 |

Notes. An unstructured covariance matrix was employed to place the least amount of assumptions on the data.

There was a significant main effect of time ($\beta=-0.2165$, $p=0.036$), meaning that participants' distress decreased over time. The fixed effect of group was not a significant predictor of the intercept ($\beta=-1.7277$, $p=0.174$), showing that although participants in the ACT group were, on average, 1.73 units less distressed at baseline than their waitlist counterparts, this was not a significant difference. However, the interaction of these terms was a significant slope predictor ($\beta=-0.2935$, $p=0.043$). This demonstrates that the ACT group reduced in distress significantly faster than waitlist participants. While the waitlist group dropped an average of 0.22 points on the GHQ-12 each week, those in the ACT group dropped by 0.51. The rate of improvement more than doubled.

Hypothesis 2 – Moderators of distress trajectories

Figure 4. highlights that, despite an average linear trend for participants in the ACT group, there is still much variation in both slopes and intercepts between the individual participants. This indicates the need to continue using a random intercept and random slope design in Model 2, which explored potential moderators for the ACT group.

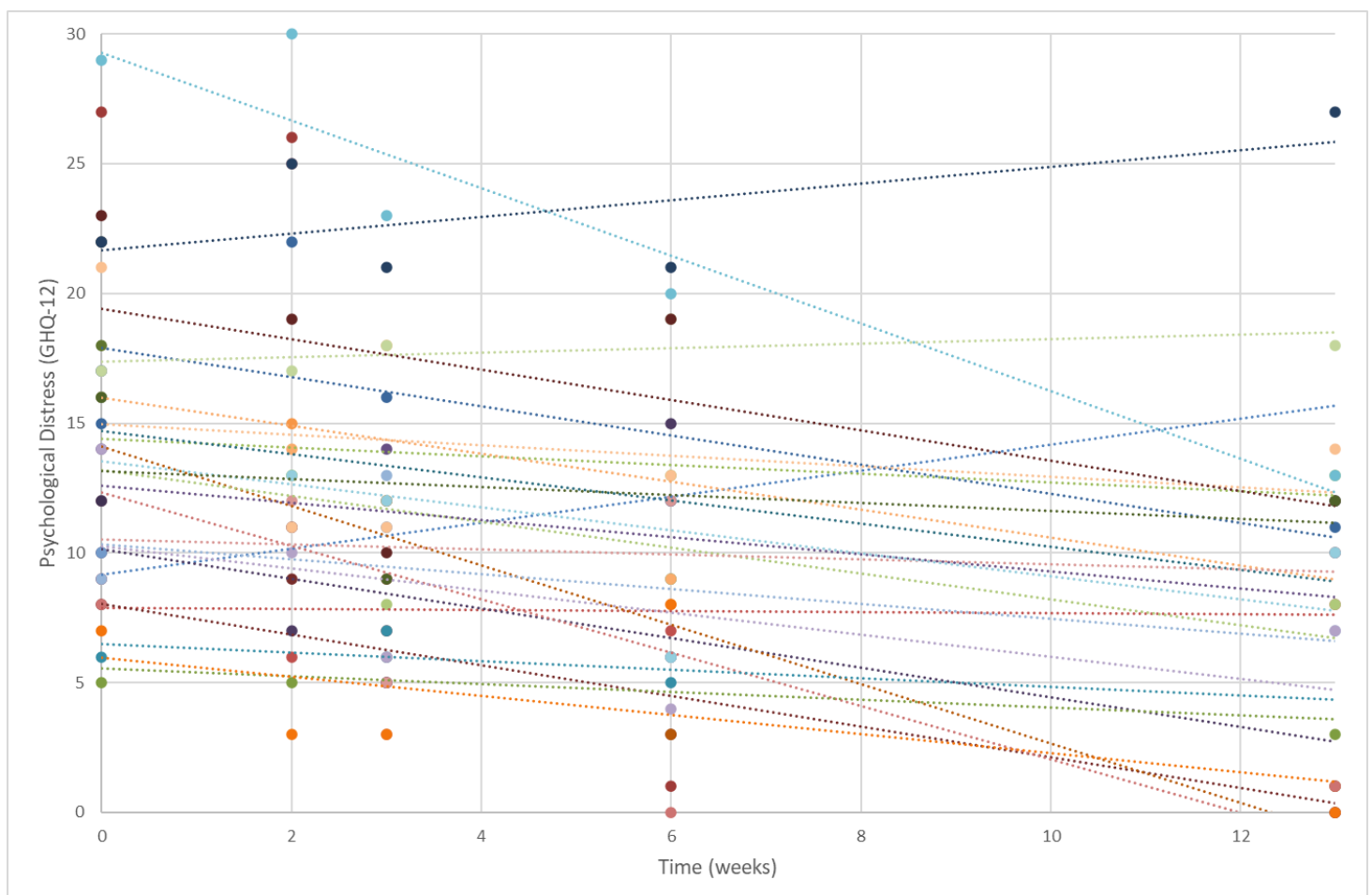


Figure 4. Individual psychological distress trajectories of ACT group participants

Hypothesis 2 proposed that baseline distress, readiness to change, and participant engagement (skills practice and session attendance) could be moderators of the intervention’s effectiveness. Table 4. shows the final model of best fit in explaining the variance in individual participant trajectories. This number and combination of variables was chosen for having the lowest AIC (651.970), while also not resulting in a singular-fit or overfitted model. This follows recommended practice where a maximal balance between predictive accuracy and type I error rates is sought (Barr et al., 2013; Matuschek et al., 2017).

Table 4. Estimates of fixed effects for Model 2 (linear mixed model).

| Parameter | Estimate | Std. Error | df | t | p |
|----------------------|----------|------------|---------|--------|--------|
| Intercept | 3.158 | 1.600 | 60.884 | 1.975 | 0.053 |
| Time (weeks) | -0.387 | 0.195 | 76.877 | -1.983 | 0.051 |
| Skills Practice | 0.023 | 0.220 | 37.603 | 0.102 | 0.919 |
| Time*Skills Practice | -0.027 | 0.038 | 80.024 | -0.720 | 0.474 |
| Baseline Distress | 0.700 | 0.078 | 113.406 | 8.948 | <0.001 |

Notes. An unstructured covariance matrix was employed to place the least amount of assumptions on the data.

The only statistically significant finding was that of participant’s baseline-distress on the intercept ($\beta=-0.7$, $p<0.001$), which is unsurprising given they are measuring and estimating the same concept. In LMM, due to debate over appropriate selection of denominator degrees of freedom, p -values should not be overly relied on, and informed interpretations should come from estimates and standard errors (Luke, 2017). Researchers can retain non-significant covariates that have theoretical explanations, especially when their inclusion in a model results better predictive accuracy, as evidenced by a lower AIC (Shmueli, 2010). Therefore the trends seen in this best-fit model should be interpreted. The model suggests that increasing skills-practice increases the rate at which psychological distress reduces, even when baseline distress is controlled for. The slope coefficient may seem small, but as a continuous variable, its potential moderating effect can be interpreted more clearly, when looking at participants who scored highly on it. For example, the highest skills practice recorded in one week by a participant was 37 practices. If a participant sustained this level of engagement, then the model suggests they would be realising an additional drop of 1 point ($37 \times 0.027 = 0.999$) on the GHQ-12 each week. Adding the time-interaction term of baseline distress, to explore its potential as a slope moderator, resulted in a higher AIC. Additionally, any terms regarding participant readiness or session attendance also rased the AIC, representing a worse fit. Therefore, this model does not support these as relevant moderators of the intervention’s effectiveness.

Hypothesis 3 – In-person versus online recording attendance

Model 3, depicted in Table 5., explored whether there was a difference in effectiveness between ACT sessions that were attended in person as opposed to accessing the online recording. This was achieved by analysing the slope estimate and significance for the effect of increasing number of sessions attended in person over time (*Time*Number that were in person*) while controlling for the total number of sessions attended (by including *Number of sessions attended* to the model).

Table 5. Estimates of fixed effects for Model 3 (linear mixed model).

| Parameter | Estimate | Std. Error | df | t | p |
|---------------------------------|----------|------------|--------|--------|-------|
| Intercept | 14.2368 | 2.2431 | 44.787 | 6.347 | 0 |
| Time (weeks) | -0.9767 | 0.2517 | 25.086 | -3.88 | 0.001 |
| Number of sessions attended | 0.3607 | 0.861477 | 35.06 | 0.419 | 0.678 |
| Number that were in person | -0.601 | 1.0007 | 31.266 | -0.601 | 0.552 |
| Time*Number that were in person | 0.1965 | 0.0973 | 24.444 | 2.02 | 0.055 |

Notes. An unstructured covariance matrix was employed to place the least amount of assumptions on the data

The hypothesis proposed that increasing in-person attendance would increase reductions in psychological distress. The result was borderline non-significance ($\beta=0.1965$, $p=0.055$). This suggests that there might be no difference in effectiveness for in-person versus online recording attendance. However, given the borderline result, it is important to note that the positive slope coefficient indicates a trend towards in-person attendance being less effective in reducing distress than accessing the recordings. The slope estimate suggests that each session attended online, rather than in person, could equate to an additional drop of 0.2 units on the GHQ-12 each week.

Hypothesis 4 – Predictors of SGs

There were significantly more SGs in the ACT group than the waitlist ($\chi^2(1, n=71) = 6.08$, $p=0.014$), with 12 compared to 4. This absolute number of events in the ACT group is important when considering how many predictors a logistic regression model can support. Although a standard rule of thumb has been the “one in ten” rule, Vittinghoff and McCulloch (2007) provide evidence for relaxing this to one predictor for every 5-9 events. Therefore, we sought the model of best fit, based on two out of our hypothesised predictors (baseline distress, readiness to change, and participant engagement [skills practice and session attendance]).

Table 6. shows the result.

Table 6. Logistic regression model results

| Variables | <i>B</i> | Std. Error | Wald | <i>df</i> | <i>p</i> | <i>Exp(B)</i> |
|-----------------------------|----------|------------|--------|-----------|----------|---------------|
| Number of sessions attended | 0.731 | 0.175 | 17.528 | 1 | <0.001 | 2.077 |
| Readiness | 0.314 | 0.095 | 10.393 | 1 | 0.001 | 1.369 |
| Constant | -5.397 | 1.08 | 24.959 | 1 | <0.001 | 0.005 |

Notes. This model was selected as the only two predictor model to achieve a non-significant Hosmer-Lemeshow test ($p=0.063$), which reflects non-significant differences between observed and expected events according to the model, thus a 'good fit'. It also resulted in two significant predictors, and had one of the highest Nagelkerke R^2 values (0.278).

This model suggests that for every additional session attended, whether in person or by recording, the chance of being a SGr is expected to double (holding all other variables constant). Additionally, for every 1-point increase in participants' readiness score on the URICA, the odds of being a SGr are expected to increase by a factor of 1.369 (holding all other variables constant.) Put another way, those scoring higher on readiness for change at baseline were significantly more likely to be classified as a SGr during treatment.

Table 7. shows the accuracy of this model in predicting SG status.

Table 7. Classification table for the logistic regression model

| | | Predicted | | Percentage Correct |
|--|---------|-----------|---------|--------------------|
| | | SGr | Non-SGr | |
| Observed | SGr | 11 | 1 | 91.7 |
| | Non-SGr | 8 | 13 | 61.9 |
| Overall Percentage Prediction Accuracy | | | | 72.7 |

Notes. Classification table for the logistic regression model. The cut-off was set at 0.35 to reflect the proportion of SGr to non-SGr in the sample. The model is better at predicting who will be a SGr than who will not be, but overall has a strong 72.7% accuracy.

It was noted that when baseline-distress was swapped into the model, in place of either variable, on both occasions, it resulted in a lower Nagelkerke R^2 value and a significant Hosmer-Lemeshow test. This suggests increasing baseline-distress was not a significant predictor of SGs, providing further evidence that SGs are a phenomenon more than just 'regression to the mean'.

Finally, the timings of the SG occurrences were summed. However, results showed that this was a completely even split across the possible time-points where a SG could be identified, with four occurring after Session 1, four after Session 2, and four after Session 4.

Hypothesis 5 – SGs influence on distress trajectories

Model 4 tested the hypothesis that being a SGr would be associated with a better outcome trajectory. Table 8. displays the output from this analysis.

Table 8. Estimates of fixed effects for Model 4 (linear mixed model).

| Parameter | Estimate | Std. Error | df | t | p |
|---------------|----------|------------|--------|--------|-------|
| Intercept | 13.5082 | 1.1606 | 43.728 | 11.639 | 0 |
| Time (weeks) | -0.35 | 0.1331 | 28.444 | -2.629 | 0.014 |
| Sudden Gainer | 1.5196 | 1.9012 | 40.559 | 0.799 | 0.429 |
| Time*SGr | -0.3534 | 0.197 | 29.109 | -1.794 | 0.083 |

Notes. An unstructured covariance matrix was employed to place the least amount of assumptions on the data

The result ($\beta=-0.3534$, $p=0.083$) is approaching significance and warrants interpretation. There is a trend suggesting that participants who experienced a SG improved at a rate of 0.7 units on the GHQ-12 per week on average, exactly twice as fast as the non-SGrS in the ACT group.

Discussion

Hypothesis 1

The first hypothesis of this study proposed that participants in the ACT group would improve faster than those on the waitlist, in terms of reductions in psychological distress. Model 1 supported this, evidencing a statistically significant increase in the rate of recovery; with the slope estimate suggesting a recovery rate for ACT participants just over twice that of the control group. Additionally, a large effect size $g=-0.97$ was calculated at 2-month follow-up. Session attendance results highlighted that only 68% of the treatment was actually received by the sample, either in person, or through recordings. Hence, there is scope for potentially seeing even greater effectiveness if participant engagement is increased and the full therapy ‘dosage’ is received. These findings add to the evidence that ACT-based treatments are effective in reducing psychological distress in students (Howell & Passmore, 2019); thus are an appropriate intervention model for UWSs. However, the focus of this paper is on the relationships of this effectiveness with moderators and sudden gains, discussed by their respective hypotheses.

Hypothesis 2

Hypothesis 2 tested three potential moderators of the effectiveness of the ACT intervention: baseline distress, readiness to change, and participant engagement. The resultant model of best-fit, Model 2, only supported one slope moderator: skills practice, this being one of the two variables used to operationalise participant engagement along with session attendance. Baseline distress was included in this model but without its time-interaction term; therefore functioning only as a variable to be controlled for, and not a moderator of the intervention's effectiveness over time. This suggests that the participants who were more dedicated or able to find more time in their daily-life for practising the mindfulness and cognitive defusion exercises experienced a greater benefit from the intervention. The model suggested that practising skills around 40 times a week could equate to an additional drop of 1 point on the GHQ-12 each week. This finding is consistent with previous literature. A meta-analysis of CBT found moderate to strong effect sizes for the quantity of homework undertaken and treatment outcome at both post-treatment and follow up ($g=0.79$ and $g=0.51$ respectively; Kazantzis et al., 2016). There is less Level I evidence regarding this relationship in ACT. However, as a third-wave cognitive-behavioural therapy it is likely that the same theoretical principle, that mastery of skills learned in therapy via practice of these skills, is important in achieving positive outcomes (Mausbach et al., 2010). Indeed, Waters et al., (2018)'s mediation analyses found that the reduction in distress from ACT was primarily associated with an increase in mindfulness skills. Implications from this finding could be for UWSs to highlight this relationship to group attendees, advocating for the importance of embedding skills practice in their daily routines. Additionally, the AYL program introduces the skills gradually, with only 2 mindfulness exercises introduced in the first session, and defusion exercises not being introduced until Session 3. Although logical to provide context and explanation behind the skills first, front-loading the introduction of all skills could greatly increase the amount of time students have for skills practice, given the brevity of the program. Future studies could explore this as an adaptation and see if greater effectiveness of the intervention is achieved. In a sense, increasing opportunity for skills practices can be seen as an inexpensive way of increasing 'therapy dosage' (Spielmanns & Flückiger, 2018). However, alternate explanations for this moderating relationship must be considered. Both psychological distress and skills practice were measured through self-report. Therefore, there is a possibility that participants, influenced by the social desirability bias, may have conflated the two measures, responding to give an impression of "I did all the homework, and I got a lot better".

Hypothesis 3

Model 3 explored whether the number of sessions attended in person, as opposed to through recordings, improved intervention effectiveness, while controlling for the total number of sessions attended. The finding was non-significant, indicating that the in-person attendance is not superior to accessing recordings. Therefore, the intervention is likely one that is suitable for virtual and remote therapy situations. This could be because the more didactic and psychoeducational nature of the AYL course lends itself to recordings, as group-processes that would otherwise be lost do not factor into the therapeutic process as much. Although the finding was non-significant, it strongly approached significance ($p=0.055$) and importantly, the slope coefficient was positive. This implies the model almost demonstrated a statistically significant effect in the reverse direction to the hypothesis: revealing a trend that participants who attended more sessions by accessing the online recordings improved faster than those that attended mostly in person. While potentially surprising, there are other recent studies reporting similar findings. For example, a meta-analysis found that therapist-supported electronic-CBT formats outperformed face-to-face CBT in reducing depression symptom severity ($SMD=-1.73$; Luo et al., 2020). Again, there is no Level I evidence of this finding in ACT, but an RCT has reported an effect size of $g=0.71$ for internet-ACT outperforming in-person ACT on the GHQ-12, at the 6-month follow-up period (Lappalainen et al., 2014). There are potential logical explanations for our finding. The ability to stop and start an online recording may allow participants to pick-up on and make notes of additional information that may be missed in person. It may also allow extra rehearsal of experiential exercises or to perform them with greater quality, undertaking them alone in the comfort of their own home, and when in the right mindset. The equal, if not potentially greater, effectiveness of the recording format provides rationale for UWSs to more regularly offer this format in future, especially as it could present other advantages to students and UWSs, even outside of COVID-19 restrictions. Students could face less pressures with transport, cost of travel, and most importantly timetabling issues, as this was the commonest cause for dropout and non-participation in the study. UWSs could see large savings in terms of required clinician time. Osborne et al. (2019) found that, while factoring in clinical-effectiveness, internet-CBT still proved to be more cost-effective than its face-to-face counterpart in treating OCD; and Wild et al. (2016) found that the internet version of cognitive therapy for PTSD was able to reduce therapist time to less than 25% while maintaining an efficacious treatment. Future, more highly-powered research certainly needs to explore this relationship further; as it must be noted that recordings of group sessions are different to a

live technology-based intervention, and so the evidence bases may not be comparable. Additionally, the fact that in our study participants had the option of attending in person, may have acted as a containing factor, that moderated the effectiveness seen from sessions attended by recording. Therefore, no conclusions should be drawn from this trend, but it provides preliminary rationale for future exploration of recordings of brief ACT-based interventions; for not only could they be more effective, their potential to alleviate the cost and burden to UWSs is substantial.

Hypothesis 4

There were significantly more SGr in the ACT group than the waitlist and baseline distress did not predict who became a SGr. Therefore, this study supports the idea that the phenomenon of the SG is one that occurs as a specific growth trajectory following intervention; rather than simply a statistical occurrence in those with high baseline scores, as suggested in some papers (Hofmann et al., 2006). The logistic regression model also supports some elements of the hypothesis: namely that increasing total number of sessions attended (in-person or by recording) and increasing participant readiness were both statistically significant predictors of which participants became SGr. The explanation behind increasing session attendance likely follows the logical approach that it increases the 'therapy dosage' (Reardon et al., 2002). The evidence from this study can be presented to future attendees at the UWS to promote the benefit of prioritising attendance at each and every session. Regarding readiness to change, although it has often been theorised to contribute to SGs (Tang & DeRubeis, 1999; Aderka et al., 2011), there appears a lack of studies evidencing this link. Future research should include measurement of a participant's readiness or stage of change at baseline, when exploring growth trajectories and sudden gains, to test the replication of our finding. In terms of clinical applications, UWSs could ask their attendees to complete the URICA questionnaire at assessment, so that their readiness status can be gauged. Students with high scores can proceed straight to a group intervention that focuses on providing psychological coping skills like AYL; whereas those with lower scores may benefit from a brief motivational interviewing intervention, to increase their readiness and so the likelihood that they can experience a SG from onward interventions. Brief two-session motivational interviewing interventions have been shown to increase readiness to change in student populations (Bolger et al., 2010). This could be a relatively resource-lite adjunct for UWSs to adopt to increase the effectiveness of their group interventions for this 'less-ready' subpopulation. However, it must be noted that there may be

some discordance between the URICA measure and ACT ethos. The language and items in the URICA are very problem-focused, and suggest a goal of working to remove the problem from one's life. However, ACT's primary aim is more about building a valued life alongside difficulties. Therefore being "ready" for therapy according to this measure may not perfectly map onto being "ready" for ACT. This is best exemplified by item 29, which states, "I have worries but so does the next person. Why spend time thinking about them?", where scoring highly on this would reduce a participant's readiness score, but this attitude could be interpreted as in line with acceptance and cognitive defusion, two cornerstones of ACT. Therefore, perhaps adaptations are required to the URICA, or use of an alternative measure, to ensure its fit with ACT in future studies. This could help strengthen the relationship between participant readiness and SGs uncovered here. Finally, no particular time-point was associated with more or fewer SGs, suggesting that factors outside of session content are more pertinent in influencing when a participant may experience a SG.

Hypothesis 5

LMM supported the hypothesis, able to model a trend between SGs and overall rate of improvement that suggested SGs recover twice as fast as participants who do not experience a SG. This echoes Keinonen et al. (2018)'s finding and so continues to build the evidence base that SGs are associated with better outcome in ACT-based interventions as well. However, the follow-up period in the current study was only two months. Andrews et al. (2020) have shown that the occurrence of a SG during a CBT treatment period still reliably predicts better outcomes at 12 months. Therefore, if future studies can show this long-term relationship exists for SGs in ACT too, it will provide even greater rationale for the identification of predictors of SGs in ACT interventions, like those discussed above.

Strengths and Limitations

This study has endeavoured to be of a good methodological quality by adhering to the Medical Research Council's guidelines (Craig et al., 2008), such as having the lead author conduct the analysis and write-up, who was not involved with the creation or facilitation of the intervention. Appropriate statistical analyses were employed, with sufficient sample size to allow their use. Ethical considerations were made, and approval was sought. Rationale for the research was driven by gaps in the literature and calls for research laid out by Holmes et al. (2018). Additionally, the waitlist control did allow for treatment-as-usual, which not

only is more ethical, but allowed evidencing of the difference the AYL program made above what help these students usually receive.

However, there are also some methodological limitations that require addressing. Firstly, the design is limited by lack of an active control condition. Consequently, non-specific intervention effects, such as a sense of belonging to a group, qualities of the facilitators, or the placebo of knowingly working on their mental health were not controlled for; and the extent to which these were involved in the reduction of distress is unknown. Secondly, model adherence was evaluated only through facilitator self-report to a supervisor. There is a chance that social desirability could bias the reporting to their superior, and it still does not produce an objective and quantitative measure, such as the independent reviewing of videoclips. This somewhat undermines the confidence with which we can say these findings are a result of the AYL program. Thirdly, as advocated for by the RCT-PQRS, a longer follow-up window of at least 12 months would have been of benefit. Without this, long-term interpretations about the influence of the identified moderators and the importance of being a SGr are unavailable. Fourthly, although there was an adequate sample size to accommodate LMM, with it being on the smaller side, there was less power in the models to support more moderator variables and better identify statistically significant relationships. Fifthly, although a valid and reliable measure, there are some limitations around the use of the GHQ-12 for this study. The GHQ-12 asks participants to answer items, while thinking back over the “past few weeks”. Given AYL is a brief 4-week intervention, asking participants to consider this vague but relatively long time-frame could blur results and effects from the intervention itself; for example if participants still reflect on how they felt during week 2, when completing post-treatment questionnaires. Additionally, the Likert scale used in the GHQ-12, uses relative terms, such as “same as usual” or “more/less than usual”, which reduce the measure’s ability to quantify change. Especially as any improvement seen on an item requires a score of 0, there is no way to scale this improvement week to week. A Likert scale of more absolute terms could better differentiate between participants and within their own trajectories, which would better suit the study’s hypotheses around moderators of the intervention’s effectiveness. Again, there is some incongruence with the language used in the measure and the ACT ethos; with items mentioning overcoming or facing up to problems and difficulties. As before, this may mean it is not the best measure to capture the effectiveness of an ACT-based intervention. However, it does help in showcasing that ACT may be effective in symptom-reduction, even if

not its aim, but as a side effect of the changes in thinking and behaviour that it encourages. This is important, as this data is often what drives UWSs to adopt the approaches they do. Finally, there are some issues regarding the external validity of these findings. The participants were predominantly female, white Europeans. This means it is harder for us to generalise to males and other ethnicities. Given UK universities are seeing increasing ethnic diversity in students year on year (Universities and Colleges Admissions Service, 2021), it is important that future research studies find ways to better match their samples to reflect the make-up of the student population. Additionally, the AYL intervention itself, although ACT-based, is more akin to a training, being more psychoeducational and didactic in nature than typical ACT interventions that are more experiential and might use more group-therapy processes. Therefore, care should be taken if generalising our findings to other ACT interventions, especially the discussion around use of recordings.

Conclusion

Despite these limitations, the study provides preliminary evidence in answering each hypothesis, regarding when and for which university students ACT-based interventions work best in reducing psychological distress. The amount of homework or skills practice that a student engages in was the most prominent moderator of effectiveness, suggesting that students who consistently engage in over 5 ACT skills a day, see an additional drop of 1-point on the GHQ-12 each week. Whereas it was students' readiness to change that, along with session attendance, functioned as significant predictors of which students would go on to experience a SG from the intervention, which in turn increased recovery rates. Additionally, a trend approaching significance was observed that suggested students accessing more recordings of the intervention sessions, rather than attending in person, could also see faster reductions in their distress. Further research is called for to replicate these findings; for if they persist, UWSs can make evidence-based changes to their practice to help alleviate the increasing demand they are currently facing.

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Appendices

Appendix 1 – British Journal of Psychology Author Guidelines

The main criteria are as following:

- 8000 word-limit (excluding abstract, diagrams, figures, tables and references)
- Double-spacing
- Numbered pages
- Abstract of up to 200 words
- APA style referencing and language

Full details can be found at:

<https://bpspsychub.onlinelibrary.wiley.com/hub/journal/20448295/homepage/forauthors.html>

Appendix 2 – Search Strings

| Database | Search String | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| CINAHL | (college N2 student* OR university N2 student*) AND (“group psychotherapy*” OR group N3 therap* OR group N1 intervention* OR group N3 counsell* OR group N1 train* OR “group wellbeing” OR “group well being” OR “group treatment*”) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MEDLINE | <table border="1"> <thead> <tr> <th data-bbox="236 360 252 376">#</th> <th data-bbox="256 360 879 376">▲ Searches</th> <th data-bbox="884 360 1528 376"></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>exp college students/ or exp college graduates/ or exp graduate students/ or exp postgraduate students/</td> <td>18 group psychotherapy/</td> </tr> <tr> <td>2</td> <td>(university adj2 student*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> <td>19 group therap*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>3</td> <td>1 or 2</td> <td>20 group training.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>4</td> <td>group psychotherapy/</td> <td>21 group wellbeing.mp. 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| 11 | (group adj3 therap*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 28 17 and 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | (group adj2 counselling).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 29 Universities/ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 4 or 6 or 7 or 8 or 9 or 10 or 11 or 12 | 30 exp Students/ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 3 and 13 | 31 29 and 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | exp college students/ or exp college graduates/ or exp graduate students/ or exp postgraduate students/ | 32 17 or 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | (university adj2 student*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 33 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 15 or 16 | 34 32 and 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PsycInfo | <table border="1"> <tbody> <tr> <td>1</td> <td>exp college students/ or exp college graduates/ or exp graduate students/ or exp postgraduate students/</td> </tr> <tr> <td>2</td> <td>(university adj2 student*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>3</td> <td>1 or 2</td> </tr> <tr> <td>4</td> <td>group psychotherapy/</td> </tr> <tr> <td>5</td> <td>group therap*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>6</td> <td>group training.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>7</td> <td>group wellbeing.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>8</td> <td>group well being.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>9</td> <td>group intervention*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>10</td> <td>group treatment*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>11</td> <td>(group adj3 therap*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>12</td> <td>(group adj2 counselling).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</td> </tr> <tr> <td>13</td> <td>4 or 6 or 7 or 8 or 9 or 10 or 11 or 12</td> </tr> <tr> <td>14</td> <td>3 and 13</td> </tr> </tbody> </table> | 1 | exp college students/ or exp college graduates/ or exp graduate students/ or exp postgraduate students/ | 2 | (university adj2 student*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 3 | 1 or 2 | 4 | group psychotherapy/ | 5 | group therap*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 6 | group training.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 7 | group wellbeing.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 8 | group well being.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 9 | group intervention*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 10 | group treatment*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 11 | (group adj3 therap*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 12 | (group adj2 counselling).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | 13 | 4 or 6 or 7 or 8 or 9 or 10 or 11 or 12 | 14 | 3 and 13 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | exp college students/ or exp college graduates/ or exp graduate students/ or exp postgraduate students/ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | (university adj2 student*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 or 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | group psychotherapy/ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | group therap*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | group training.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | group wellbeing.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | group well being.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | group intervention*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | group treatment*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | (group adj3 therap*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | (group adj2 counselling).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 4 or 6 or 7 or 8 or 9 or 10 or 11 or 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 3 and 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCOPUS | (((TITLE-ABS-KEY (college W/3 student*)) OR (TITLE-ABS-KEY (university W/3 student*)))) AND (((TITLE-ABS-KEY ("group psychotherap*")) OR (TITLE-ABS-KEY (group W/3 therap*)) OR (TITLE-ABS-KEY (group W/1 intervention*)) OR (TITLE-ABS-KEY (group W/3 counsell*)) OR (TITLE-ABS-KEY (group W/1 train*)) OR (TITLE-ABS-KEY ("group wellbeing")) OR (TITLE-ABS-KEY ("group well being")) OR (TITLE-ABS-KEY ("group treatment*"))))) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Web of Science | TS=(college NEAR/2 student* OR university NEAR/2 student*) AND TS=("group psychotherap*" OR group NEAR/3 therap* OR group NEAR/1 intervention* OR group NEAR/3 counsell* OR group NEAR/1 train* OR “group wellbeing” OR “group well being” OR “group treatment*”) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix 3 – Author Contact Chart

| Authors | Contact for Data | Reply? | Data received | Contact for Studies | Reply? | Studies received | Any Eligible? |
|--------------------------|-------------------|--------|---------------|-----------------------|--------|------------------|---------------|
| Ahmadi Forooshani et al. | Not needed | xxx | xxx | Yes | Yes | None | xxx |
| Bu et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Cao et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Cheng et al. | Confirm direction | No | xxx | Yes | No | xxx | xxx |
| Chinaveh | Confirm direction | No | xxx | Yes | No | xxx | xxx |
| Damião Neto et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Danitz et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Deckro et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Dereix-Calonge et al. | Not needed | xxx | xxx | Yes | Yes | None | xxx |
| deVibe et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Elemo et al. | Yes | No | xxx | Yes | No | xxx | xxx |
| Elstad et al. | Not needed | xxx | xxx | Yes | Yes | Yes | None |
| Goldman et al. | Not needed | xxx | xxx | Yes | Yes | Yes | None |
| Grégoire et al. | Not needed | xxx | xxx | Yes | Yes | None | xxx |
| Hatamzadeh et al. | Yes | No | xxx | No as no reply before | xxx | xxx | xxx |
| Kang et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Kim et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Mohammadi et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Mohammadian et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Phang et al. | Not needed | xxx | xxx | Yes | Yes | Yes | None |
| Post | Yes | Yes | No | Yes | Yes | None | xxx |
| Sezer | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Shapiro et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Soleimani et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Song et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Talakar et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Tobon et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |
| Yang et al. | Not needed | xxx | xxx | Yes | No | xxx | xxx |

Appendix 4 – Testing the robustness of the meta-analysis outcomes

In terms of non-overlapping confidence intervals with the overall estimate, three outliers were identified. Cao and Dong (2011) and Cheng et al., (2015) both report much stronger effect sizes ($g > -2$) and Damião Neto et al. (2020) is the only study to report an effect size in the reverse direction ($g = 0.05$). Removing these studies from the meta-analysis does result in reducing heterogeneity ($I^2 = 27.1\%$) to no longer significant levels ($Q(24) = 32.73$, $p = 0.11$). The resulting effect size $g = 0.552$ (95%CI: -0.64, -0.40) still remains a medium one, evidencing some robustness to the previous estimate. However, there are no obvious flaws in design that suggest why these studies would be outliers and warrant exclusion. Moreover, Cao and Dong (2011) and Cheng et al., (2015) are both Chinese studies and entailed lengthy and numerous sessions; whereas Damião Neto et al. (2020) had the largest group size and compared to an active control. Therefore, it was decided to retain these studies and proceed with subgroup and moderator analysis of covariates, to explore the heterogeneity.

It was noted that the Kang et al. (2009) paper had baseline differences in stress and anxiety, between patients in their intervention and control groups, that were not then controlled for via ANCOVA with pre-test scores as the covariate. Therefore, the resulting hedge's g calculation has reduced validity. However, the study's exclusion has a negligible effect on the overall estimate ($g = -0.623$ (95%CI: -0.80, -0.44)). Further sensitivity testing was performed through a 'one-study-omitted' influence analysis. This reported a combined estimate of $g = -0.559$ (95%CI: -0.64, -0.48), within the initial confidence window, suggesting our initial meta-analysis findings to be robust.

Appendix 5 – Meta-regressions undertaken to find model of best fit

The starting point in determining the model to best explain the heterogeneity was created by entering the suggested significant categorical covariates from Figure 10 into the meta-regression.

1. Starting point:

| | | | | | | |
|--|--------------------|-----------|-------|-------|----------------------|-----------|
| Meta-regression | Number of obs = 27 | | | | | |
| REML estimate of between-study variance | tau2 | = .09829 | | | | |
| % residual variation due to heterogeneity | I-squared_res | = 59.57% | | | | |
| Proportion of between-study variance explained | Adj R-squared | = 33.64% | | | | |
| Joint test for all covariates | Model F(4,22) | = 3.02 | | | | |
| With Knapp-Hartung modification | Prob > F | = 0.0398 | | | | |
| ----- | | | | | | |
| hedgesg | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
| -----+----- | | | | | | |
| control | .6457238 | .2640942 | 2.45 | 0.023 | .0980259 | 1.193422 |
| country | .0458974 | .0342559 | 1.34 | 0.194 | -.025145 | .1169398 |
| frequency | .0536217 | .1935266 | 0.28 | 0.784 | -.3477278 | .4549713 |
| training | .2009964 | .1069354 | 1.88 | 0.073 | -.0207741 | .4227669 |
| _cons | -1.392742 | .3883829 | -3.59 | 0.002 | -2.198199 | -.5872849 |

3. The adjusted R-squared rose, showing this was a better model. Figure 12 also suggested that 'measure' could likely be significant, so this was added, and the model run again:

| | | | | | | |
|--|--------------------|-----------|-------|-------|----------------------|-----------|
| Meta-regression | Number of obs = 27 | | | | | |
| REML estimate of between-study variance | tau2 | = .104 | | | | |
| % residual variation due to heterogeneity | I-squared_res | = 60.25% | | | | |
| Proportion of between-study variance explained | Adj R-squared | = 29.81% | | | | |
| Joint test for all covariates | Model F(4,22) | = 2.38 | | | | |
| With Knapp-Hartung modification | Prob > F | = 0.0827 | | | | |
| ----- | | | | | | |
| hedgesg | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
| -----+----- | | | | | | |
| control | .4805745 | .2471865 | 1.94 | 0.065 | -.0320589 | .993208 |
| frequency | .1386797 | .1904637 | 0.73 | 0.474 | -.2563178 | .5336771 |
| training | .1844242 | .1126817 | 1.64 | 0.116 | -.0492634 | .4181119 |
| measure | -.0056832 | .0487099 | -0.12 | 0.908 | -.1067013 | .0953349 |
| _cons | -1.234967 | .4168413 | -2.96 | 0.007 | -2.099443 | -.3704907 |

5. Adjusted R-squared rose to 59.45% showing that more of the heterogeneity was being explained, when controlling for number of covariates in the model. The model was run replacing 'time' with both its parent covariates: 'duration' and 'number'; but as expected this model had a lower adjusted R-squared, as so the single factor of time was kept in. Then all remaining covariates were added to this model one at a time to see if any improvement could be made. The only one that did was 'measure', now that time had been added:

| | | | | | | |
|--|--------------------|-----------|-------|-------|----------------------|-----------|
| Meta-regression | Number of obs = 27 | | | | | |
| REML estimate of between-study variance | tau2 | = .05001 | | | | |
| % residual variation due to heterogeneity | I-squared_res | = 45.50% | | | | |
| Proportion of between-study variance explained | Adj R-squared | = 66.24% | | | | |
| Joint test for all covariates | Model F(5,21) | = 4.80 | | | | |
| With Knapp-Hartung modification | Prob > F | = 0.0044 | | | | |
| ----- | | | | | | |
| hedgesg | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
| -----+----- | | | | | | |
| control | .6803354 | .2068952 | 3.29 | 0.004 | .2500732 | 1.110598 |
| training | .1817643 | .0929271 | 1.96 | 0.064 | -.0114882 | .3750167 |
| frequency | .2632946 | .1568878 | 1.68 | 0.108 | -.0629714 | .5895607 |
| time | -.0005918 | .0001845 | -3.21 | 0.004 | -.0009754 | -.0002082 |
| measure | .0735354 | .0447337 | 1.64 | 0.115 | -.0194935 | .1665643 |
| _cons | -1.242015 | .3315553 | -3.75 | 0.001 | -1.931522 | -.5525074 |

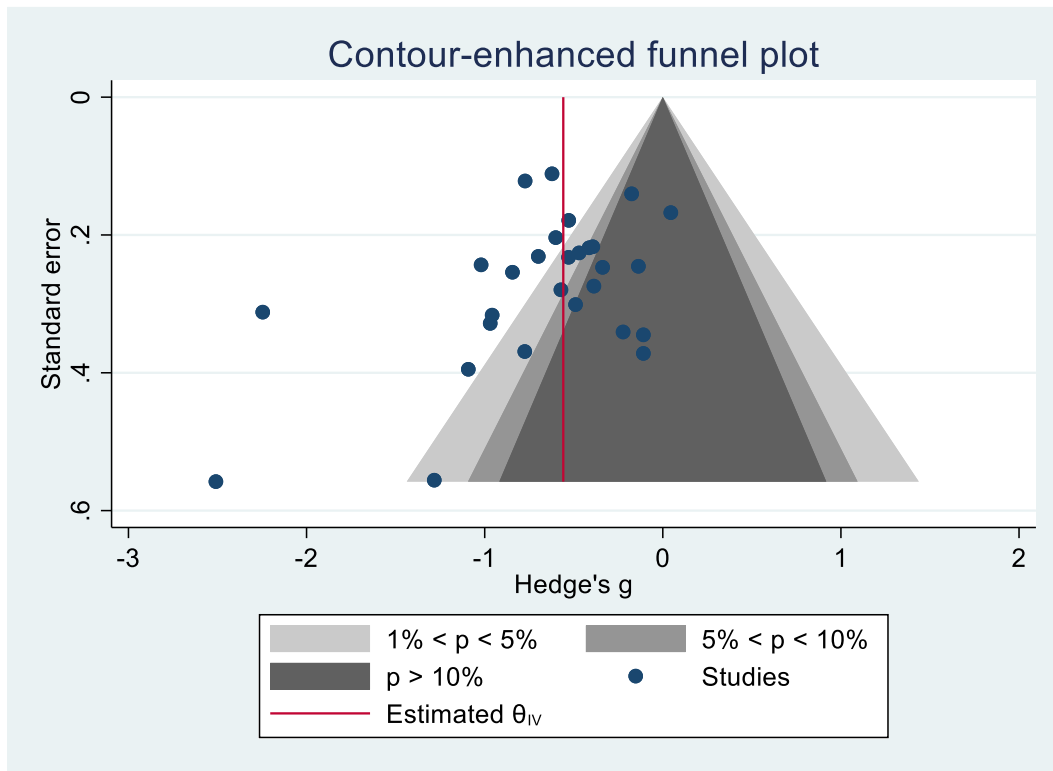
2. Noting that country was no longer significant when 'control' category was controlled for, as seen in Figure 12. Country was removed, and the model run again:

| | | | | | | |
|--|--------------------|-----------|-------|-------|----------------------|-----------|
| Meta-regression | Number of obs = 27 | | | | | |
| REML estimate of between-study variance | tau2 | = .09127 | | | | |
| % residual variation due to heterogeneity | I-squared_res | = 58.47% | | | | |
| Proportion of between-study variance explained | Adj R-squared | = 38.38% | | | | |
| Joint test for all covariates | Model F(3,23) | = 3.31 | | | | |
| With Knapp-Hartung modification | Prob > F | = 0.0379 | | | | |
| ----- | | | | | | |
| hedgesg | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
| -----+----- | | | | | | |
| control | .4728091 | .2333356 | 2.03 | 0.054 | -.0098824 | .9555006 |
| frequency | .1426451 | .1849243 | 0.77 | 0.448 | -.2398999 | .52519 |
| training | .1822756 | .1078047 | 1.69 | 0.104 | -.0407355 | .4052867 |
| _cons | -1.253301 | .3787767 | -3.31 | 0.003 | -2.03686 | -.4697415 |

4. The adjusted R-squared dropped showing this was not a beneficial covariate to add at this point, and the model itself lost significance. Therefore 'time' was added in its place as the most likely predictive continuous variable:

| | | | | | | |
|--|--------------------|-----------|-------|-------|----------------------|-----------|
| Meta-regression | Number of obs = 27 | | | | | |
| REML estimate of between-study variance | tau2 | = .06006 | | | | |
| % residual variation due to heterogeneity | I-squared_res | = 49.16% | | | | |
| Proportion of between-study variance explained | Adj R-squared | = 59.45% | | | | |
| Joint test for all covariates | Model F(4,22) | = 4.99 | | | | |
| With Knapp-Hartung modification | Prob > F | = 0.0051 | | | | |
| ----- | | | | | | |
| hedgesg | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
| -----+----- | | | | | | |
| control | .6911753 | .2165607 | 3.19 | 0.004 | .2420559 | 1.140295 |
| frequency | .2489838 | .1637907 | 1.52 | 0.143 | -.0906974 | .588665 |
| training | .1524003 | .0943566 | 1.62 | 0.121 | -.0432833 | .3480838 |
| time | -.00044 | .0001635 | -2.69 | 0.013 | -.0007791 | -.000101 |
| _cons | -1.087359 | .3338484 | -3.26 | 0.004 | -1.779718 | -.3949996 |

Appendix 6 – Contour Enhanced Funnel Plot



Appendix 7 – Remaining Variables Overview

| Variable | Limited information around this variable from the included studies |
|---|---|
| Intervention Style | This variable was initially created as a binary one where studies could be assigned to ‘training style’ – which is more skills-based, didactic, individual, and superficial; or ‘therapy style’ – which is more experiential, involving more content sharing from and interaction between group members. In the end, some studies were just too equitable and so a third ‘balanced’ category was created, suggesting that this variable is much more of a spectrum. Nevertheless, this meant it was a very subjective variable, dependent on the study’s description; so its power to detect a true effect was compromised. Future studies should report on the quantity of group therapy processes in a more standardised way so that the delivery of group interventions in UWS can be appropriately tailored for maximum effect. |
| Adjuncts | Similarly, due to insufficient information to form clear subcategories, often just referred to as “home practice” this became a binary variable. Therefore, it lost its power to detect an effect; especially as non-reporting of therapy adjuncts had to be interpreted as none were used. It is important that future studies more accurately document this, as those that did were able to note effects. de Vibe et al. (2013) recorded an average home practice of 1.5 times a week for 13 minutes and found that when controlling for distress and gender, this moderated intervention effect. Moreover, Phang et al., (2016) suggested that the reason that reductions in psychological distress did not persist at follow-up was because home-practice fell from ~4 days a week to ~3 days a week. These findings would fit with Conley et al. (2013)’s review, which found that interventions including supervised practice were 5 times more effective in reducing psychological distress. Future interventions could include booster sessions or email reminders to help maintain home practice. |
| Group Size | This was not found to be a moderator; but of note, the study with the largest group (n=45) (Damião Neto et al., 2020) was the one study to report a positive effect size, i.e. psychological distress increased. This is important as the focus of the study was to see whether a mindfulness-based intervention could be adapted for larger groups. However, it should be noted that this was a “required” intervention for all first-year medical students, and perhaps the compulsory nature contributed to the increasing distress. Future studies should continue to explore this, as increasing group size to a point before intervention effectiveness drops will allow UWS to maximise its cost-effectiveness. Additionally, whether size interacts with intervention style will be of benefit to know. |
| Setting | Only 5 studies commented on this in their papers and briefly at that. As noted by Damião Neto et al. (2020), in this population, there is a higher chance of cross-contamination of information between intervention and control group participants, given the set-up of universities, which could dilute effect sizes. To help with this, Kang et al. (2009) used a quiet place after school and Song and Lindquist (2015) asked that control students not be in contact with intervention students, regarding MBSR. This information is useful but as the RCT-PQRS suggests, it should be analysed statistically, or discussed through theory and appropriate measures to show how it might be involved in moderating the intervention’s effect. For example, we know that learning is contextual and in Tobon et al. (2020)’s study the intervention was carried out in two locations: UWS and a community setting; the university setting experienced greater reductions in distress. This group did have higher baseline distress, so it could be a matter of regression to the mean, but it could also be due to the familiarity of the classroom used. |
| Sample Distress | Defined in Appendix 4, this did not prove a moderator in this meta-analysis; but going forward studies should continue to identify this group and analyse for them separately, as they will more reliably reflect the students presenting to UWS. For example, Dereix-Calonge et al. (2019), acknowledging inclusion of healthy participants can dilute samples, redid their analyses and found larger effect sizes for the group of students who scored over 20 on the DASS at baseline. They also noted that this group were more likely to deteriorate in the control group, suggesting their group ACT intervention was very beneficial for these students. |
| Risk of Harm | Only 3 studies made any mention of risk of harms from their intervention. It is important future research address this: Jonsson et al., (2014) found that only 3% of these psychotherapy trials provided a description of adverse events as well as the methods used for collecting these data. |
| Facilitator Supervision & Model Adherence | The poor reporting on facilitator supervision and model adherence (k=6) is troublesome, as not commenting on model fidelity drastically undermines the validity of any result, as the active ingredients of psychological interventions cannot be so readily assumed as with medical treatments. For example, Elstad et al. (2020) noted this could have been an issue in their study, as instructors were new to the program and it was their first time instructing certain elements; their study returned non-significant results. |
| Participant Attendance | The way the data, from students with differing attendance was handled, varied. Deckro et al. (2002) included all students in their analysis, although only 43% attended all 6 sessions. Dereix-Calonge et al. (2019) required at least 4/6 sessions to be attended; Mohammadi et al. (2013) and (Soleimani et al., 2015) rated students as “dropout” if they did not attend 6/8 sessions. Yang et al., (2020) labelled dropouts if they missed 4 sessions in total, or 3 consecutive ones. This information is important as Phang et al. (2016) reported that a small negative correlation did exist between attendance and stress scores. Therefore, a standardised limit for a dropout should be set for future research. |
| Mediation Processes | This is always helpful information to suggest possible active ingredients for future interventions of that model to focus in on and emphasize. Cheng et al. (2015) found that knowledge of meaning was a mediator; through longitudinal mediation analysis, Dereix-Calonge et al. (2019) identified repetitive negative thinking; and Goldman and Wade, (2012) found it was forgiveness; each for their respective models. |

Appendix 8 – Recommendations for running groups in UWSs

This list of suggestions for UWSs, looking to employ group interventions, is based on trends and patterns identified in the review. It must be noted that outside of time spent in group interventions, none of these recommendations have been shown to have statistically significant effects. However, running and evaluating groups in line with some of these suggestions in future will help build the evidence base in future research.

- Allow for a transdiagnostic group, to reduce set-up time, and perhaps allow for additional therapeutic effects from more varied interpersonal learning.
- Use a transdiagnostic model to address all domains of distress both intra- and interpersonally.
- Use a (battery of) transdiagnostic psychological distress measure(s) to thoroughly assess holistic improvement of group members. Record any deteriorations or risk of harms.
- Repeat this on a number of occasions, ideally up to a year, to explore retention of benefits at follow-up.
- Identify a way to capture any time or cost savings to the UWS, due to the running of the group.
- Consider allowing the group significant therapy time, the averages seen here are 8 sessions of 1hr and 45 minutes.
- Run the group once a week
- Consider a group size of around 15 participants to balance clinical and cost-effectiveness
- Let group participation be voluntary
- Train group facilitators adequately, note that there may be benefit to using younger or trained, but less experienced facilitators (e.g. postgraduate or doctoral students).
- Provide supervision to facilitators and use a measure of model adherence.
- Consider an arts-based intervention, or if using a psychological model, deliver this in more of a 'training' or psychoeducational style.
- Assign home practice between sessions and identify a way to increase adherence to this, such as automated text or email reminders.
- Use a quiet setting within a familiar area of the university campus.
- Consider any appropriate sociocultural adaptations for your student population.

Appendix 9 – British Journal of Clinical Psychology Author Guidelines

The main criteria are as following:

- 5000 word-limit (excluding abstract, diagrams, figures, tables and references)
- Double-spacing
- Numbered pages
- Abstract of up to 250 words
- APA style referencing and language

Full details can be found at:


<https://bpspsychub.onlinelibrary.wiley.com/hub/journal/20448260/homepage/forauthors.html>

Appendix 11 – Evidence of Ethical Approval

Ethics Feedback - EC.18.03.13.5261R2A2 - Message (HTML)

File Message Help Tell me what you want to do

Ethics Feedback - EC.18.03.13.5261R2A2

 psychethics
To: Cerith Waters
Cc: John Butler; Helen Penny

Reply Reply All Forward ...

Tue 14/07/2020 13:14

Dear Cerith

The Ethics Committee has received the amendment to your project: Acceptance and Commitment Therapy and Cognitive Behavioural Therapy for Symptoms of Stress, Anxiety and Depression among University Students: Efficacy and Mechanisms of Action (EC.18.03.13.5261R2A2).

John Butler (PG) has now been added as a researcher.

Please note that if any further changes are made to the above project then you must notify the Ethics Committee.

Best wishes,
Adam Hammond

School of Psychology Research Ethics Committee

| | |
|--|--|
| Cardiff University Tower Building 70 Park Place Cardiff CF10 3AT | Prifysgol Caerdydd Adeilad y Tŵr 70 Plas y Parc Caerdydd CF10 3AT |
| Tel: +44(0)29 208 70360 Email: psychethics@cardiff.ac.uk | Ffôn: +44(0)29 208 70360 E-bost: psychethics@caerdydd.ac.uk |

<http://psych.cf.ac.uk/aboutus/ethics.html>

Appendix 12 – Handouts given to participants of the AYL intervention



ACTivate Your Life – At University

ACTivate Your Life is a psychology course that will help you to understand yourself better, and to understand your **Mind**. The course is based on a relatively new approach to therapy – ‘**Acceptance and Commitment Therapy**’ (ACT). ACT helps people to overcome their suffering using ‘**Mindfulness**’ and by helping them understand how to live in accordance with their own important values. The course is all about you having a better life.

The Course is in 4 sessions – we call these **ACT 1, ACT 2, ACT 3 and ACT 4**

ACT 1 – “You Are Not Your Mind”

Some of our actions are under **OUR OWN** (conscious, deliberate) control, but many of our actions are directly controlled by our **Mind**. Automatic actions such as breathing and walking are sometimes said to be “on autopilot”. It is useful if ordinary routine actions are carried out automatically so that we don’t have to think about them. But often it is better for us to think carefully about what to do – and to do things “thoughtfully” or “**Mindfully**”. For example, it is often better for us to shop **Mindfully** (or “wisely”) rather than impulsively. It is often a bad idea to allow our **Mind** to decide what we will do and this can lead to a lot of unnecessary suffering. **ACTivate Your Life** will help you to be more thoughtful about what you do – and to suffer less

HOW THE MIND WORKS

- 1 Your **Mind** does its own thing – you have no control over many of the things that it does
- 2 You can’t direct your **Mind** to **STOP** doing something, but you **CAN** direct it to **DO** something
- 3 Your **Mind** constantly judges, compares and searches for meaning and patterns
- 4 Your **Mind** always tries to figure out “what’s going on” and often jumps to conclusions
- 5 Your **Mind** wanders (it travels through time and space)
- 6 Your **Mind** is very clever (but it often gets things wrong)
- 7 Your **Mind** is always looking out for threats (and, to avoid danger, it is very cautious)
- 8 Your **Mind** is often highly critical (and it is likely to be very critical of **YOU**)
- 9 Your **Mind** always tries to maintain control (and it will resist **YOU** taking control)



Through the power of language and the ability to create detailed images, the **Mind** can make past events “happen again” – triggering powerful emotional responses including repeated (“endless”) suffering

The **Mind** ruminates

So the **Mind’s** wandering will often take your attention away from what’s going at the moment – and it may take you to places and issues that you find worrying and distressing. What can you do about this? You cannot switch your **Mind** off – and there’s little that you can do to divert it. The best thing to do is simply to “let it be” (while noticing what your **Mind** is up to).

ACTivate Your Life – At University – ACT 1

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The **Mind** constantly compares things – and it often makes negative comparisons which can bring us down. So even when things are fine, your **Mind** may well suggest that ...
 “It won’t last”
 “It could be a whole lot better”
 “It’s not as good as your sister’s”



The **Mind** often makes mistakes e.g. the Lines Illusion – and it often tells us that things are dangerous when we know that they are not – or that we should check something when we know that there is no real need to do so. So our **Mind** worries us unnecessarily and often holds us back from doing things that could make our life better

The key thing is what we DO
 When we know that our **Mind** has got it wrong, the sensible thing to do is to ignore our **Mind’s** silly warnings and to do the **WISE** thing. But this may not be easy and it may take a lot of courage



OUR MIND IS ALWAYS LOOKING OUT FOR DANGER
 Our **Mind** evolved to keep us safe, and this means that it is always on the lookout for any possible threat. But **Minds** tend to be over-sensitive – they may become alarmed too easily and may worry us and frighten us when there’s no real danger. And because it is very sensitive to any potential threat – now or in the future – the **Mind** tends to be very cautious (“*better safe than sorry*”) and often tries to hold us back from doing anything different or daring

THE MIND LIKES TO BE IN CONTROL, BUT ...

Your Mind doesn’t have the power to control what you do

YOU ARE NOT YOUR MIND

Your **Mind** travels here and there, and back and forth in time



But **YOU** – “the observer” – are always ‘here’ and in the present – for you it’s always ‘now’

NOW

We would be better off if we were more thoughtful and took over more control of our actions, so that they became ... less “automatic”, less “on autopilot”, less “**MINDLESS**” And ... **MORE MINDFUL** – this is possible!!

YOU are not **YOUR MIND**



Don’t Miss ... Next Week – **ACT TWO** – “Facing Up to Life”

ACTivate Your Life – At University – ACT 1

© Neil Frude, 2018



ACTivate Your Life – At University

ACT 2 – “Facing Up to Life”

SOME THINGS YOU CAN CHANGE AND SOME YOU CANNOT

THE SERENITY REQUEST

May I have the strength to change the things that I can change; the courage to accept the things I cannot change; and the wisdom to know the difference

YOU CANNOT CHANGE HOW YOU ARE FEELING BY “AN ACT OF WILL”

You CANNOT just ... “cheer up” “calm down” “pull yourself together” or “get over it” – we cannot switch our feelings on and off



Struggling just makes things worse! If we struggled in a quicksand, we’d sink faster. And when we dig down to get out of a hole – the hole just gets deeper – sometimes we need to be **Mindful** rather than just doing “what comes naturally”. There are dangers in relying too much on habit or “intuition”

INTRUSIVE THOUGHTS – Everyone has unwanted thoughts, and some people are very upset by the extreme thoughts that come to them. The best response is to accept that the thoughts are there and just let them come and go. If you try to avoid them or suppress them, they will get worse – stronger and more frequent. Just notice them; and let them naturally come and go

PAIN AND SUFFERING ARE NOT THE SAME

How much we suffer as a result of pain will depend a lot on how we respond to the pain. If the pain can’t be controlled, then it is best to accept it and – as far as possible - to “carry in as normal” rather than focussing on the pain and trying to “fight it” (because “pain fights back”!)

It is very unfortunate that our reactions to distress (including physical pain, depression, anxiety, fear, loss of confidence, etc.) often make things much worse for us – we can be our own worst enemy!

When you have an emotional problem – don’t put life on hold “until the problem is sorted”. Putting life on hold will often mean that the problem will continue for longer – while you’re having a really bad time



THE PASSENGERS ON THE BUS: As the driver of the bus, you will certainly have some undesirable passengers – life is like that. If you refused to let them on your bus, or tried to throw them off, there would be trouble. It’s best just to carry on with the journey and hope that they won’t be on board for too long. This is really about you and your journey through life – don’t let your suffering stop you from living your life – and recognize that it’s often better to accept things that cannot be changed – don’t struggle!



ACTivate Your Life – At University – ACT 2

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Our natural reactions to pain and distress often add to our suffering ... we often increase our distress when we try ... (1) to “fix” what can’t be fixed (2) to suppress unwanted thoughts and feelings (3) to put our life on hold until “things get sorted” & (4) to AVOID situations that we fear

Often, our avoidance is ‘unnecessary’ – there is no real danger. But avoiding the situation increases our belief that facing up to it would have terrible consequences – avoidance keeps this fiction going!

To overcome a needless fear... EXPOSE yourself to the thing you fear CONFRONT the feared object or situation And ACCEPT that when you do this ... you WILL experience fear and anxiety

FEEL THE FEAR AND DO IT ANYWAY

AVOIDANCE OF NEGATIVE EMOTIONS – we often use “Quick Fixes” to try to avoid unwanted emotions such as fear, depression, worry, guilt, anger and embarrassment ... these include ...



ACCEPTANCE OF DISCOMFORT, SADNESS, ANXIETY AND PAIN LEADS TO LESS SUFFERING – Being willing to accept discomfort and pain will mean that you don’t struggle against the pain, etc. The natural effect of such ‘exposure’ is often to reduce the fear, etc. – this is called ...
“The Acceptance Bonus”



Reacting is automatic, reflex, uncontrolled, and driven by impulse and emotion
Responding is more conscious and deliberate; it involves thoughtful consideration

RESPONDING TO PHYSICAL PAIN

Struggling to overcome physical pain can increase suffering. When pain is chronic, and there is no effective means of relief, then it is best to use ACCEPTANCE – this can reduce the suffering. MINDFULNESS is also useful, as is COMMITMENT to carrying on doing the things that matter

What needs to change? When we have a negative response to something, we often assume that for our response to change, the object of our fear, anger, etc. has to change. But this is not the case – our response can change even if the thing itself does not change

You don’t have to feel motivated to ACT motivated – And you don’t have to be “in the mood” to do what needs to be done

DOING WHAT NEEDS TO BE DONE – Our actions are often (too often) dictated by our feelings. We do what we feel like doing at the moment even if we know that it is not the best thing to do. If we are more **Mindful**, then we do what we have decided is the best thing to do – whether or not it fits with our current mood. It’s up to you to decide what **YOU** think is the best thing to do. And then the **WISE** course of action is to do “the right thing” – whether or not you feel motivated.

Don’t Miss ... Next Week – **ACT THREE** – “Being Mindful”

ACTivate Your Life – At University – ACT 2

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ACTivate Your Life – At University

ACT 3 – Being Mindful

DESCRIPTIONS and EVALUATIONS
Description Evaluation
 The woman is ... *aged 30 old*
 This chair is ... *blue comfortable*
 The price is ... *£50 expensive*
 Confusing descriptions and evaluations means that we confuse things that are factual or real with “mere opinion”. “She is 30” is either right or wrong. “She is old” can only ever be an opinion

Your **Mind** often confuses descriptions and evaluations – and invents judgements about you (often critical and cruel) which it puts forward as true descriptions – as facts!
 Your **Mind** would never say ...
 “You’re stupid – in my humble opinion”
 It states such opinions as true descriptions ...
 “You’re stupid – and that’s a fact!”
SO – DON’T BE FOOLED INTO ‘BUYING’ YOUR MIND’S EVALUATION OF YOU

THOUGHTS AND REALITY ... 1 - We often become very distressed by our own thoughts – our **Mind** will often frighten us and bring us down when there is nothing happening “here and now” to trigger such feelings. It may dredge up memories from the past, or worry us with thoughts and fantasies about what could happen in the future. Unfortunately, when we confuse thoughts and reality we get upset by many things that are not real (and the kind of confusion that we’re talking about here is what is often labelled “**FUSION**”).

THOUGHTS AND REALITY ... 2 – If I was shopping and I suddenly had the thought that I could steal something from the shop, it would be a **BIG MISTAKE** for me to feel that I have done something wrong – as if I’d stolen something. The thought is just a thought. Having a thought that just “pops into your head” is “**something that happens to you**” ... it is **NOT “something you DO”**

FUSION – We endure a lot of unnecessary suffering because our Mind confuses ...
THOUGHTS and REALITY, IMAGES and REALITY WORDS and REALITY
 Thus we sometimes confuse words and images with the things they represent. This is **COGNITIVE FUSION**

Many **ACT** strategies help people overcome **FUSION**. These are known as “**DE-FUSION**” techniques

MINDFULNESS – the ultimate defusion strategy – involves paying attention to what is happening now with openness, curiosity and detachment – without getting caught up in thoughts and feelings or being overwhelmed by them

Mindfulness involves simply noticing your own mental activity – noticing your thoughts, images, emotional feelings and the sensations from all five of your senses as they naturally come and go

Mindfulness doesn’t involve changing your **Mind** (or changing **WHAT** you think) It **DOES** involve changing **HOW YOU RESPOND** to your thoughts and feelings – so that you simply **NOTICE** your mental processes in a gentle, curious, detached way

There are **two ways of “being mindful”** – the first way involves working things out, making careful judgements, using our knowledge to inform our decisions and actions. So we can shop ‘mindfully’ (not just impulsively buying anything we fancy!), taking into account quality and price, etc. before deciding whether something is ‘a good buy’. The other way of being mindful is **NOT** to be judgemental or weigh up any pros and cons but just to notice what is happening right here and right now, without getting involved in any thoughts. This is **Mindfulness**.

Mindfulness is NOT ... A way of controlling our thinking (but it helps to prevent our thinking from controlling us) OR a way of finding peace or ecstasy, or of having a blank **Mind**, OR a relaxation technique (practicing some forms of **Mindfulness** may well relax you, but you can also practice **Mindfulness** when you are running, lifting weights or hanging out clothes!)

MINDFULNESS – History and Uses
Mindfulness has a 3000 year history. It has strong links with many different religious and spiritual traditions (especially Eastern) and also with martial arts. Over the past 25 years **Mindfulness** has been shown to be a powerful way of reducing the suffering generated by pain and emotional distress – So **Mindfulness** is now a key element in several psychological therapies – including **ACT**. It can be very useful as a way of helping people with depression, anxiety, chronic physical pain, sleep problems, intrusive thoughts, addictions, etc.

Mindfulness and Sleep
 When we can’t sleep at night, we may lie in bed and **TRY VERY HARD** to get to sleep. But such efforts may well keep us awake! On the other hand, truly **ACCEPTING** the fact that we are awake, and not fighting it, may help us to sleep. **Mindfulness** is good for us, and sleep is good for us. So practising **Mindfulness** when you want to sleep is a good thing – either way you win!

MINDFULNESS and ACT
Mindfulness increases our flexibility and extends the range of our responses, giving us greater freedom to do what we choose to do – and therefore helping us to lead a meaningful and fulfilling life
ACT aims to help people become wiser and more flexible in their actions – and **Mindfulness** is a **VERY** powerful way to do this



ACTivate Your Life – At University

ACT 4 – Living Wisely, Living Well

It’s best if, rather than just “going with the flow”, you know where you want your life to go – where you want to take it. It’s a bit like being a bus driver.

THE JOURNEY MAY NOT BE TROUBLE-FREE

DIRECTION OF TRAVEL – AND VALUES
 The best direction for your journey is in line with your personal values
The things you really care about
The things that matter to you
The things you value in life
 “They’re Talking About Me”

IDENTIFYING AND CHOOSING YOUR VALUES
 It can be very difficult for us to answer general questions such as :
 “What do I want my life to be about?” “What do I stand for?”
 But you can identify your values by using your **FEELINGS** as a guide

When something feels just right, that indicates one of your values. And when something feels wrong, that also indicates one of your values. The stronger your values, the more deeply you care about things. SO think about these questions ...
 “What gives me a warm feeling – and why?”
 “What really irritates me – and why?”
 “What makes me feel proud – and why?”

If you overheard people talking about you, what would you like to hear them say about you?

Having identified your values, you can then work out how to live in line with those values – and making a commitment to do this is the pathway to “Living Wisely, Living Well”

Living By Your Values
 Spending more time doing things that really matter to you and less time doing things that you don’t really care about will feel right. Time spent doing things that matter is “quality time”, although actions in line with your values may take courage and a good deal of effort. They may also be outside your comfort zone and may involve you “going the extra mile” or doing something “out of character”. But such actions often feel uplifting because you know that what you are doing is “The Right Thing To Do”

COMMITMENT
 When you decide the best thing to do, you need to make a ... **COMMITMENT** ... to “do the best thing” – even if it’s very difficult and even if it hurts

VALUES, COMMITMENT, ACTION
 Recognizing our values will often help us to identify ways of changing our life so that what we **DO** is in line with what we **VALUE** – we can then make a **COMMITMENT** to **ACT** in ways that best reflect our values

EXAMPLE - QUITTING SMOKING
 Suppose that one of Mark’s important values is “healthiness”
 To respect his own values, Mark needs to lead a healthy life
 But what if he smokes?

For his actions to reflect his values, Mark will need to stop smoking
What is needed here?
Acceptance (of the craving sensations)
And Commitment (to give up smoking)

THE ACCEPTANCE BONUS
 When a smoker **ACCEPTS** the craving sensations and remains fully **COMMITTED** to quitting (and doesn’t smoke!) the craving will gradually subside – And, after not smoking for several days or weeks, the discomfort will end. Maintaining a commitment to carry on with something that is distressing or uncomfortable may be very difficult at first. But if you persist (and **ACCEPT** the discomfort, distress, etc.), the negative feelings will usually markedly decrease

COMMITMENT PATTERNS
 Having made a commitment, you may break it. If this happens, make the same commitment again. It may take several attempts before you are successful. If you give up, you’re sure to lose out – but renewing a commitment can lead to eventual success

*Knowing your values, knowing how to live wisely, you need to make a commitment to change some of your actions. To live wisely and to live well you need to take over the reins – not just to do what the **Mind** suggests, or what comes easily or naturally – but to be **Mindful** – to think about the best thing to do – and then to **GO FOR IT** – to take control of what you do and how you live your life*

GREATER FLEXIBILITY
 To take control of your life, you need to overcome certain things that may be holding you back. Unnecessary fears and worries, avoidance of embarrassment, too much caution, and wanting to stay well within your comfort zone, may all be holding you back from having a better life. What you need is greater flexibility – and you can achieve this through deliberately doing things that are ‘different’, ‘challenging’ and ‘out of character’. **Increased flexibility** will mean that you are less constrained and able to do more of the things that really matter to you.

RESPONDING TO A SETBACK.
 Things don’t always go to plan – there will be disappointments and lapses. Although you can’t control the feeling of disappointment or of failure, you **CAN** control the actions that follow. Some people give up – but others know that it makes sense to carry on and try again. There are likely to be several temporary setbacks during a student’s time at Uni. – it’s ‘par for the course’!

“THIS IS MY LIFE” When you live more in the present moment, your **Mind** will have less influence over you. When you take conscious control of your actions, you will be able to live wisely – and you will have a better life, with less suffering

Be **WISE** to your **Mind** – appreciate that ...
 ... you don’t have to **BELIEVE** your **Mind** and ... you don’t have to **OBEY** your **Mind**
 This is a good time to tell your **Mind**:
 “enough is enough; thanks, but I’ll be taking over from now on” That’s your **“Declaration of Independence”** – take over the reins – move into the driving seat – pull your own strings!

What you **CHOOSE TO DO** plays a major part in shaping **WHO YOU ARE**. E.g. If you want to be a vegan ... don’t consume or use animal products – If you don’t want to be a thief ... Don’t steal!! – If you want to be a kind person ... Act in a kindly way!

LIVE WISELY: CHANGE what you can change
ACCEPT what you cannot change
 and have the **WISDOM** to know the difference

Appendix 14 - University of Rhode Island Change Assessment Scale (URICA)

University of Rhode Island
Change Assessment Scale (URICA):
Psychotherapy Version

Client ID# _____
Date: ____/____/____
Assessment Point: _____

EACH STATEMENT BELOW DESCRIBES HOW A PERSON MIGHT FEEL WHEN STARTING THERAPY OR APPROACHING PROBLEMS IN THEIR LIVES. PLEASE INDICATE THE EXTENT TO WHICH YOU TEND TO AGREE OR DISAGREE WITH EACH STATEMENT. IN EACH CASE, MAKE YOUR CHOICE IN TERMS OF HOW YOU FEEL RIGHT NOW, NOT WHAT YOU HAVE FELT IN THE PAST OR WOULD LIKE TO FEEL. FOR ALL STATEMENTS THAT REFER TO YOUR "PROBLEM", ANSWER IN TERMS OF PROBLEMS RELATED TO WHY YOU ARE IN THERAPY. THE WORDS "HERE" AND "THIS PLACE" REFER TO YOUR TREATMENT CENTER.

THERE ARE FIVE POSSIBLE RESPONSES TO EACH OF THE ITEMS IN THE QUESTIONNAIRE:

- 1=Strongly Disagree
- 2=Disagree
- 3=Undecided
- 4=Agree
- 5=Strongly Agree

CIRCLE THE NUMBER THAT BEST DESCRIBES HOW MUCH YOU AGREE OR DISAGREE WITH EACH STATEMENT.

| | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree |
|---|-------------------|----------|-----------|-------|----------------|
| 1. As far as I'm concerned, I don't have any problems that need changing. | 1 | 2 | 3 | 4 | 5 |
| 2. I think I might be ready for some self-improvement. | 1 | 2 | 3 | 4 | 5 |
| 3. I am doing something about the problems that had been bothering me. | 1 | 2 | 3 | 4 | 5 |
| 4. It might be worthwhile to work on my problem. | 1 | 2 | 3 | 4 | 5 |
| 5. I'm not the problem one. It doesn't make much sense for me to be here. | 1 | 2 | 3 | 4 | 5 |
| 6. It worries me that I might slip back on a problem I have already changed, so I am here to seek help. | 1 | 2 | 3 | 4 | 5 |
| 7. I am finally doing some work on my problems. | 1 | 2 | 3 | 4 | 5 |
| 8. I've been thinking that I might want to change something about myself. | 1 | 2 | 3 | 4 | 5 |
| 9. I have been successful in working on my problem but I'm not sure I can keep up the effort on my own. | 1 | 2 | 3 | 4 | 5 |
| 10. At times my problem is difficult, but I'm working on it. | 1 | 2 | 3 | 4 | 5 |
| 11. Trying to change is pretty much a waste of time for me because the problem doesn't have to do with me. | 1 | 2 | 3 | 4 | 5 |
| 12. I'm hoping this place will help me to better understand myself. | 1 | 2 | 3 | 4 | 5 |
| 13. I guess I have faults, but there's nothing that I really need to change. | 1 | 2 | 3 | 4 | 5 |
| 14. I am really working hard to change. | 1 | 2 | 3 | 4 | 5 |
| 15. I have a problem and I really think I should work on it. | 1 | 2 | 3 | 4 | 5 |
| 16. I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem. | 1 | 2 | 3 | 4 | 5 |
| 17. Even though I'm not always successful in changing, I am at least working on my problem. | 1 | 2 | 3 | 4 | 5 |
| 18. I thought once I had resolved the problem I would be free of it, but sometimes I still find myself struggling with it. | 1 | 2 | 3 | 4 | 5 |
| 19. I wish I had more ideas on how to solve my problem. | 1 | 2 | 3 | 4 | 5 |
| 20. I have started working on my problems but I would like help. | 1 | 2 | 3 | 4 | 5 |
| 21. Maybe this place will be able to help me. | 1 | 2 | 3 | 4 | 5 |
| 22. I may need a boost right now to help me maintain the changes I've already made. | 1 | 2 | 3 | 4 | 5 |
| 23. I may be part of the problem, but I don't really think I am. | 1 | 2 | 3 | 4 | 5 |
| 24. I hope that someone here will have some good advice for me. | 1 | 2 | 3 | 4 | 5 |
| 25. Anyone can talk about changing; I'm actually doing something about it. | 1 | 2 | 3 | 4 | 5 |
| 26. All this talk about psychology is boring. Why can't people just forget about their problems? | 1 | 2 | 3 | 4 | 5 |
| 27. I'm here to prevent myself from having a relapse of my problem. | 1 | 2 | 3 | 4 | 5 |
| 28. It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved. | 1 | 2 | 3 | 4 | 5 |
| 29. I have worries but so does the next person. Why spend time thinking about them? | 1 | 2 | 3 | 4 | 5 |
| 30. I am actively working on my problem. | 1 | 2 | 3 | 4 | 5 |
| 31. I would rather cope with my faults than try to change them. | 1 | 2 | 3 | 4 | 5 |
| 32. After all I had done to try and change my problem, every now and then it comes back to haunt me. | 1 | 2 | 3 | 4 | 5 |

| | Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree |
|---|-------------------|----------|-----------|-------|----------------|
| 9. I have been successful in working on my problem but I'm not sure I can keep up the effort on my own. | 1 | 2 | 3 | 4 | 5 |
| 10. At times my problem is difficult, but I'm working on it. | 1 | 2 | 3 | 4 | 5 |
| 11. Trying to change is pretty much a waste of time for me because the problem doesn't have to do with me. | 1 | 2 | 3 | 4 | 5 |
| 12. I'm hoping this place will help me to better understand myself. | 1 | 2 | 3 | 4 | 5 |
| 13. I guess I have faults, but there's nothing that I really need to change. | 1 | 2 | 3 | 4 | 5 |
| 14. I am really working hard to change. | 1 | 2 | 3 | 4 | 5 |
| 15. I have a problem and I really think I should work on it. | 1 | 2 | 3 | 4 | 5 |
| 16. I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem. | 1 | 2 | 3 | 4 | 5 |
| 17. Even though I'm not always successful in changing, I am at least working on my problem. | 1 | 2 | 3 | 4 | 5 |
| 18. I thought once I had resolved the problem I would be free of it, but sometimes I still find myself struggling with it. | 1 | 2 | 3 | 4 | 5 |
| 19. I wish I had more ideas on how to solve my problem. | 1 | 2 | 3 | 4 | 5 |
| 20. I have started working on my problems but I would like help. | 1 | 2 | 3 | 4 | 5 |
| 21. Maybe this place will be able to help me. | 1 | 2 | 3 | 4 | 5 |

Date: _____ Name: _____ SID: _____

| FOR OFFICE USE ONLY | | | | | |
|---|-------|-------------------|-------|------------|-------|
| URICA Scoring Form Transfer the client's answers from questionnaire. Obtain the average score per subscale using the following grid. | | | | | |
| Precontemplation (PC) | | Contemplation (C) | | Action (A) | |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 5 | 4 | Omit | 7 | 9 | Omit |
| 11 | 8 | | 10 | 16 | |
| 13 | 12 | | 14 | 18 | |
| 23 | 15 | | 17 | 22 | |
| 26 | 19 | | 20 | Omit | 27 |
| 29 | 21 | | 25 | | 28 |
| 31 | Omit | 24 | 30 | | 32 |
| TOTAL | | TOTAL | | TOTAL | |
| + 7 = | (avg) | + 7 = | (avg) | + 7 = | (avg) |
| MEAN | | MEAN | | MEAN | |
| To obtain the Readiness to Change score, first sum items from each subscale and divide by 7 to get the mean for each subscale. Then sum the means from the Contemplation, Action, and Maintenance subscales and subtract the Pre contemplation mean (C + A + M - PC = Readiness). | | | | | |
| Compare the Readiness for change score to the following group means. Choose the stage whose group average is closest to the computed Readiness Score. | | | | | |

| Stage | Group Average |
|----------------------|---------------|
| Pre contemplation | 8 or lower |
| Contemplation | 8 - 11 |
| Preparation (Action) | 11 - 14 |
| Maintenance | 14 and above |

Source: University of Maryland, Health and Addictive Behaviors lab, http://www.umbc.edu/psych/habits/content/ttm_measures/urica/readiness.html

Appendix 15 – General Health Questionnaire (GHQ-12)

We should like to know how your health has been in general, over the past few weeks. Please answer ALL the questions on the following pages simply by selecting the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

Have you recently?

- | | | | | |
|--|---|---|---|---|
| 1.) Been able to concentrate on whatever you're doing | Better than usual <input type="radio"/> | Same as usual <input type="radio"/> | Less than usual <input type="radio"/> | Much less than usual <input type="radio"/> |
| 2.) Lost much sleep over worry? | Not at all <input type="radio"/> | No more than usual <input type="radio"/> | Rather more than usual <input type="radio"/> | Much more than usual <input type="radio"/> |
| 3.) Felt you were playing a useful part in things? | More so than usual <input type="radio"/> | Same as usual <input type="radio"/> | Less useful than usual <input type="radio"/> | Much less useful <input type="radio"/> |
| 4.) Felt capable of making decisions about things? | More so than usual <input type="radio"/> | Same as usual <input type="radio"/> | Less so than usual <input type="radio"/> | Much less capable <input type="radio"/> |
| 5.) Felt constantly under strain? | Not at all <input type="radio"/> | No more than usual <input type="radio"/> | Rather more than usual <input type="radio"/> | Much more than usual <input type="radio"/> |
| 6.) Felt you couldn't overcome your difficulties? | Not at all <input type="radio"/> | No more than usual <input type="radio"/> | Rather more than usual <input type="radio"/> | Much more than usual <input type="radio"/> |
| 7.) Been able to enjoy your normal day to day activities? | More so than usual <input type="radio"/> | Same as usual <input type="radio"/> | Less so than usual <input type="radio"/> | Much less than usual <input type="radio"/> |
| 8.) Been able to face up to your problems? | More so than usual <input type="radio"/> | Same as usual <input type="radio"/> | Less so than usual <input type="radio"/> | Much less than usual <input type="radio"/> |
| 9.) Been feeling unhappy and depressed? | Not at all <input type="radio"/> | No more than usual <input type="radio"/> | Rather more than usual <input type="radio"/> | Much more than usual <input type="radio"/> |
| 10.) Been losing confidence in yourself? | Not at all <input type="radio"/> | No more than usual <input type="radio"/> | Rather more than usual <input type="radio"/> | Much more than usual <input type="radio"/> |
| 11.) Been thinking of yourself as a worthless person? | No at all <input type="radio"/> | No more than usual <input type="radio"/> | Rather more than usual <input type="radio"/> | Much more than usual <input type="radio"/> |
| 12.) Been feeling reasonably happy, all things considered? | More so than usual <input type="radio"/> | Same as usual <input type="radio"/> | Less so than usual <input type="radio"/> | Much less than usual <input type="radio"/> |

Appendix 16 – Skills Practice Record Example

Review of home practices over the past week

Please answer honestly as this will help us evaluate the usefulness of the between session activities.

Please put your participant ID number here: _____

Workshop number: **3**

1. Were you able to complete the home activities set at last week's sessions?

Please put a tick below the appropriate response

| Yes | No | In part |
|-----|----|---------|
| | | |

2. How was your experience doing the written parts of the home practices?

Please put a tick below the response which best fits how you found it

| Very Difficult | Difficult | Not difficult and not easy | Easy | Very easy | | Not sure | I didn't do them |
|----------------|-----------|----------------------------|------|-----------|--|----------|------------------|
| | | | | | | | |

3. At the last session you were provided with out of session mindfulness practices to try out between sessions. Please put a tick below the mindfulness exercise/s you practiced and note the number of times you practiced them in the second space

| Mindful Breathing | Mindful Body Scan | Mindful Arm Stretch | Mindful Candle Watching | Mindful Eating |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| | | | | |
| Number of times practiced: _____ | Number of times practiced: _____ | Number of times practiced: _____ | Number of times practiced: _____ | Number of times practiced: _____ |

4. Which days were you able to practice the mindfulness exercises?

Please put a tick below the days you were able to practice the mindfulness exercises

| Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday | Monday | Tuesday | | Not sure | I didn't do them |
|---------|-----------|----------|--------|----------|--------|--------|---------|--|----------|------------------|
| | | | | | | | | | | |

5. How was your experience doing the mindfulness exercises?

Please put a tick below the response which best fits how you found doing the practices

| Very Difficult | Difficult | Not difficult and not easy | Easy | Very easy | | Not sure | I didn't do them |
|----------------|-----------|----------------------------|------|-----------|--|----------|------------------|
| | | | | | | | |

Any other comments? E.g. did you practice any other mindfulness exercises? What time of the day was it easiest to practice mindfulness exercises?

Appendix 17 – Session Attendance Questions

| Session Number | Please tick if you attended in person | If you did not attend in person, then please tick if: | |
|----------------|---------------------------------------|---|---------------------------------|
| | | You watched the recording | You did not watch the recording |
| Session 1 | | | |
| Session 2 | | | |
| Session 3 | | | |
| Session 4 | | | |