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Recommended Citation

Howes, Shikara T.; Gorey, Kevin M.; and CHarron, Carly M.. (2021). Relative Effectiveness of Online Cognitive Behavioural Therapy with Anxious or Depressed Young People: Rapid Review and Meta-Analysis. *Australian Social Work*, Advanced access published.
<https://scholar.uwindsor.ca/socialworkpub/126>

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**Relative Effectiveness of Online Cognitive Behaviour Therapy with Anxious or Depressed
Young People: Rapid Review and Meta-Analysis**

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Acknowledgements

We gratefully acknowledge the library scientific support of Sharon Munro, Leddy Library, University of Windsor. We are also grateful for the research assistance of Gopika Punchhi and Kathryn Shum, Schulich School of Medicine and Dentistry (Windsor Campus), University of Western Ontario.

Disclosure Statement

No potential conflict of interest was reported by the authors.

ABSTRACT

Our interest in serving young people with increasingly prevalent mental health challenges amidst the COVID-19 pandemic caused concern about bolstering their access to online services. We wondered if online cognitive behavioural therapy (CBT) is as effective as offline or face-to-face CBT in working with young people beginning to exhibit symptoms of anxiety or depression. We responded with a rapid review and meta-analysis of eight randomized controlled trial outcomes. Great preventive potentials were observed in working with this at risk group online as well as offline. The sample-weighted, between-group effect size, the standardized mean difference (*d*), was essentially zero at longest follow-up, indicating that online and offline CBT were equally effective. In fact, both online and offline groups had quite large, anxiety and depression symptom alleviation rates of approximately 90% at nine-month follow-up. A future research agenda, culminating in a series of online-offline comparative meta-analyses across the most potentially vulnerable minoritized group members, would best help social workers and allied mental health providers support their diverse clients and decision makers navigate the troubled clinical and social policy waters of the pandemic and its aftermath.

IMPLICATIONS

- Online CBT seems every bit as effective as offline CBT in alleviating anxiety and depressive symptoms among young people, including emergent adults beginning to develop symptoms.
- A more socially, racially and sexually inclusive RCT-based synthetic research agenda is needed to steer online versus offline decisions in social work and allied mental health.
- Social work would likely have more influence in this field if it produced more of its RCTs.

KEYWORDS: Anxiety, Cognitive Behaviour Therapy, Computerized Treatment, Depression, Emerging Adults, Meta-Analysis, Online Therapy, Rapid Review, Telehealth, Young People

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Symptoms of anxiety and depression are not uncommon among young people. One of every three to four children, adolescents or young adults experience such symptoms (Johnson et al., 2018; Patel et al., 2007; Patton et al., 2009; Polanczyk et al., 2015). In fact, such young people may be at most risk and ultimately in need of social work or allied mental health services. Even preclinical symptoms of anxiety or depression can be quite consequential as they are significantly associated with myriad health problems, physical and mental, as well as with lower educational achievement, lower labour market participation rates and consequently, lower socioeconomic statuses (Liu et al., 2020; Loades et al., 2020; Mullaly, & Dupré, 2018; Salari et al., 2020). Though many emergent adults with prodromal anxiety or depressive disorders could benefit from early, essentially preventive interventions, such young people seem less prone to seek treatment than otherwise similar, but older people (Sethi, 2013; Spence et al., 2006; 2011). Our own practice-research interest in serving young people with increasingly prevalent mental health challenges amidst the COVID-19 pandemic caused concern about bolstering their access via online treatment offerings (Dozois, 2021; Ettman et al., 2020; Pfefferbaum & North, 2020). With the pandemic likely exacerbating pre-existing mental health care access problems, decision makers recommended expansions of mental health services, resulting in widespread shifts to Internet-based and telehealth treatment methods (Fischman & Irrazaval, 2020; Geller, 2020; Madigan et al. 2021; Rosen et al., 2021). With so much of our work going online, we naturally wondered if online psychotherapeutic work is as effective as traditional offline, face-to-face work with young people who are beginning to exhibit symptoms of anxiety or depression.

Review of Previous Reviews

Cognitive behavioral therapy (CBT), seeking to challenge biased cognitions and maladaptive patterns of behaviour through psychoeducation (Beck et al., 1987), has become the

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guideline preferred treatment for mild to moderate depression and anxiety. Extremely strong evidence in support of face-to-face CBTs effectiveness in such traditional offline clinical contexts has developed over the past generation. For example, such was well substantiated by an overview of 106 meta-analytic reviews published between 2000 and 2012 (Hofmann et al., 2012). Building upon this solid foundation, more tentative evidence about the effectiveness of otherwise similar, but online CBT in this field of practice has been developing over the past decade. Six previous systematic reviews and/or meta-analyses overviewed more than 150 relevant primary studies, the vast majority of which were randomized controlled trials (RCT; Carlbring et al., 2018; Ebert et al., 2015; Richardson et al., 2010; Sigurvinsdóttir et al., 2020; van Ballegooijen et al., 2014; Zhou et al., 2016). The overall effectiveness of online CBT with subclinical or clinically depressed or anxious people from childhood to emerging adulthood has been consistently substantiated, but nearly always the primary trials used nonactive, most typically, waiting-list control groups. Consequently, we presently have strong evidence on the overall effectiveness of both online and offline CBT, but we have little evidence about their relative effectiveness. Not surprisingly, as one's clinical focus narrows so too does the evidence. This field's synthetic evidence suggests that online CBT is effective with young people, but no study has yet synthesized the most rigorously controlled relevant research, allowing for the testing of a so-called noninferiority hypothesis. This meta-analytic study will do so. Focusing upon an at-risk group with great preventive potential, young people beginning to develop symptoms of anxiety or depression, we tested the null or noninferiority hypothesis. Specifically, we hypothesized that online CBT is not inferior to (i.e., as effective as) traditional, face-to-face offline CBT.

Methods

Selecting Studies

Within temporal and budgetary constraints, we performed a rapid review and meta-analysis (Deeks et al., 2021; Ganann et al., 2010; Tricco et al., 2015). The following published, peer-reviewed research literature databases were searched from January 1, 2010 until May 30, 2021: *CINAHL Complete*, *Cochrane Central Register of Controlled Trials*, *MEDLINE via PubMed*, *PsycINFO*, *Social Services Abstracts*, *Social Work Abstracts*, *Sociological Abstracts*. So-called unreviewed and unpublished, grey literature sampling frames that might guard against publication bias were also searched (de Smidt & Gorey, 1997; Grenier & Gorey, 1998): *ProQuest Dissertations and Theses Global*, *Web of Science Conference Proceedings Indexes* and *Google Scholar*. Article titles and abstracts were searched with diverse iterations of this broad keyword search scheme: (cognitive behave* therapy or cognitive-behav* therapy or CBT) and (online or Internet or computerized or virtual or telemedicine or remote care) and (anxiety or depression) and (symptoms or mild or moderate or initial or prodromal or preclinical or subclinical). Literature database age delimiters were applied to target the central inclusion criterion of young people ages 10 to 25; children, adolescents or emergent young adults. Eligible studies also had to meet these rigorous and restrictive criteria: (1) used a RCT design, (2) used an otherwise similar to the online CBT intervention group, but offline face-to-face CBT control group, (3) included those young people experiencing first episode, initial, mild to moderate or developing symptoms of anxiety or depression and (4) written in English. Then the bibliographies and authors of retrieved RCTs were snowball-searched for additional eligible RCTs. The study selection process, cross-validated by two cooperating reviewers, first screened studies based upon their titles and abstracts, and then observed and selected studies based upon a review of full manuscripts. By consensus six relevant RCTs were selected for this meta-analysis.

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They are noted with an asterisk in the reference list. A preferred reporting items for systematic reviews and meta-analyses (PRISMA) diagram outlining the study selection process is displayed in Figure 1 (Kelly et al., 2016; Moher et al., 2009).

Meta-Analysis

Cohen's d -index was the meta-analytic effect size statistic (Cohen 1988). Primary studies' diverse statistical outcomes were converted to this common metric to enable synthetic comparisons (Cooper, 2017). It is the standardized mean difference between the treatment (online CBT) and control group (offline CBT) at follow-up: $d = M_{\text{online}} - M_{\text{offline}} / ((SD_{\text{online}} + SD_{\text{offline}}) / 2)$. Though this noninferiority analysis hypothesized between-group equivalence or the null value of $d = 0.00$, that is, that online CBT is not inferior to offline CBT in working with anxious or depressed young people, to track effect directions, d s were recorded as positive or negative to indicate that online or offline CBT led to greater or lesser symptom decreases, respectively. Study random effects (d s) were weighted by their inverse variances to ensure that larger, more precise studies influenced the synthesis more than smaller studies (Deeks et al., 2021; Greenland, 1987). Each study contributed up to two data points in this pooled meta-analysis, one each, anxiety and/or depression at their longest period of follow-up. As the different conceptual outcomes of anxiety or depression did not significantly moderate the hypothesized effect size they were treated together as one coherent test of a CBT-symptom alleviation hypothesis; $\chi^2 (1) = 0.74, p = .39$. If a primary study provided multiple operational measures of anxiety or depression, they were sample-weighted and pooled so that each study would contribute only one data point for each meta-analytic hypothesis test of anxiety or depressive symptom alleviation. Statistical significance was estimated with 95% confidence intervals (CI). A CI not including the null value of 0.00 indicates statistical significance at $p <$

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.05. The effect distribution was then tested for heterogeneity with Cochran's Q_t and accompanying I^2 statistics (Cooper, 2017; Fleiss et al., 2003). With a chi square (χ^2) distribution, Q_t tested if the variability of effects was greater than could have been expected by sampling error alone, and I^2 estimates the proportion of that variability that is likely explainable by real study differences (e.g., differences in their participants, interventions, contexts or study designs) and not merely by random sampling error.

Data extraction of 25 study variables that are displayed in Table 1 were cross-validated by both reviewers, reaching 100% agreement after discussion. Two research assistants were enlisted and trained to code each primary RCTs risk of bias using the Cochrane Collaboration's risk of bias tool (Higgins et al., 2021). Independently extracting its 28 items (signaling questions, subscales [randomization, intervention fidelity, missing outcome data, outcome measurement validity and reporting of results] and overall categorization) across the six RCTs, the coders had very good initial agreement (83.3%) that reached consensus after discussion. The potential moderating influence of such risk of bias was then explored across its three categories (low risk, some concern or high risk) with Cochran's Q_b statistic which is again distributed as χ^2 . Finally, we similarly explored the potential moderating influence of all 25 of the RCT study characteristics displayed in Table 1.

To aid practical interpretations, sample-weighted ds were converted to U_3 statistics (Cohen, 1988). An intuitively appealing measure of practical significance, U_3 compares all the people (scores) in one group with the typical person (median score) in another group. In this way it tends to emphasize people, rather than statistics. For instance, imagine in descriptively synthesizing the online CBT arms of the trials we found substantial symptom diminishment characterized by a U_3 of 90%. Such would mean that at follow-up nine of every 10 of the young

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people who received online CBT score better, that is, they scored lower on measures of anxiety and depression than they *themselves typically* did at pre-test. This meta-analysis was accomplished with version 3 of Comprehensive Meta-Analysis (Borenstein et al., 2013). After two reviewers cooperatively taught and learned meta-analytic methods (one was experienced, the other naïve), this meta-analysis was cross-validated by two reviewers.

Results

Sample Description

Study contexts and participants. Descriptive characteristics of the eight symptomatic outcomes (five depression and three anxiety) of the six RCTs included in the meta-analysis are displayed in Table 1. The trials were published between 2006 and 2021 and most (six of eight outcomes) were accomplished in Australia or New Zealand. The 606 participants were predominantly female (68.3%), nearly all of whom ranged in age from 10 to 25, including mixed child-adolescent (2 studies), adolescent (3) and young adult samples (1). However, none of the trials provided gender categorizations beyond binary cisgender. The trials were also largely devoid of information on participants' racialized group or socioeconomic statuses. Only one study specified any particular racialized group in their description (24% Māori; Merry et al., 2012), another seemed racially inclusive (55% racialized; Sethi, 2013). The remaining studies either grouped all of their minoritized participants of colour into a single, almost certainly confounded, racialized category, did not report such racialized descriptions at all or predominantly studied non-Hispanic white people.

Study designs and interventions. On most parameters, the trials themselves seemed quite strong. All used fairly standardized interventions and validated measures of depression and/or anxiety to assess online CBT's effectiveness versus a conservative control group, that is,

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otherwise similar, but offline CBT. Furthermore, losses over typically nine months of follow-up were modest (range = 0% to 25%, median = 14%) and nondifferential. Other descriptors boded very well for the validity of the included RCTs. For instance, four of their analytic plans were intentions-to-treat, while only two were per protocol designs, based only upon treatment completers. Perhaps most tellingly, none of the trials was assessed as having a “high risk of bias” using the Cochrane tool: two were “low risk” and four suggested “some concern.” However, the trials were, for the most part quite small, their total analytic samples ranging from only 44 to 187 participants (median = 87).

As for the CBT interventions, one was group work while the others studied practices with individuals. And half of the online CBT conditions were provided in real time with professional supervision, while the other half were virtually guided self-help programs. The interventions’ intensities and durations ranged from 5 to 15 sessions over as many weeks, the CBT intervention programs most typically clustering around 7 to 8 CBT sessions. In this field scholastically dominated by psychologists, only one of the six RCTs’ 40 co-authors was a social worker and only one of the 15 interventionists in one of the trials was identified as a social worker (Aspvall et al., 2021; Merry et al., 2012). Finally, uncontrolled, pre-experimental symptom alleviation rates within the online intervention and offline control groups are displayed in the table’s furthest right column. The depression or anxiety symptom alleviation rate was quite large ($U_{3\text{pooled}} = 90.8\%$ [95% CI 84.3, 94.9]) and did not differ significantly between the intervention and control groups; $\chi^2(1) = 0.99, p = .32$. At nine-month follow-up, nine of every 10 of the young *people* who received online or offline CBT scored better on standardized measures of depression and anxiety than they *themselves typically* did at pre-test.

Meta-Analytic Findings

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The eight study effects at longest follow-up are displayed from the smallest ($d = -0.61$) to largest ($d = 0.40$) point-estimates in the, respective, top to bottom of Table 2. One will note that these extreme standardized mean differences tended to be associated with smaller trials, and that all six of the remaining trial outcomes were null. Furthermore, and in strong support of the main meta-analytic, noninferiority hypothesis that online CBT is not inferior to offline CBT in work with anxious or depressed young people, the synthetic estimate was null and fairly precise; $d_{\text{pooled}} = -0.11$ (95% CI - 0.35, 0.13). Next we performed a one-study-removed sensitivity analysis. That is, we tested the hypothetical impact of removing one each of the six RCTs. In each instance, the noninferiority hypothesis remained supported by a null d -index. Finally, the distribution of effects was observed to be significantly heterogeneous with more than half of the observed variability in effects probably being explainable by systematic study factors; $\chi^2(7) = 16.14, p = .02, I^2 = 56.6\%$. We therefore tested the potential moderating influence of all 25 participant, intervention, contextual and research design characteristics in our meta-analytic database. None were statistically significant.

Discussion

Amidst a worldwide pandemic our synthetic practice research interest converged with an Australia-based practice research agenda to produce important knowledge about the provision of mental health services via the Internet. Admittedly, we focused upon a very specific, but lesser studied risk group that was of interest to us, that is, young people with developing symptoms of anxiety or depression. Such developing mental health problems have become much more prevalent during the COVID-19 pandemic and effective work with such young people with pre-clinical or prodromal mental health problems offers huge preventive potentials.

For the sake of confidence, we selected and synthesized the most rigorous evidence on

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the most validated intervention, that is, RCTs of online CBT interventions with offline CBT control groups. The eight symptom outcomes, anxiety and/or depression, of six trials strongly supported this meta-analytic study's noninferiority or null hypothesis. Six of the eight trial outcomes were null, that is, they found no significant differences on symptom alleviation rates between online and face-to-face CBT study groups at, most typically, nine-month follow-up. Moreover, the sample-weighted, pooled standardized mean difference at follow-up was confidently estimated to be essentially zero. That central finding of this meta-analysis converged with two other synthetic findings to allow for the conclusion that online CBT is probably every bit as effective as offline CBT in alleviating anxiety or depressive symptoms. Recall from the introduction that more than 100 research syntheses, primarily using nonactive controls, strongly affirmed the effectiveness of both online and offline CBT in these clinical contexts. Recall also, that pre-experimental assessments of the eight trial outcomes we reviewed also affirmed that both online and offline CBT were highly effective in alleviating most such symptoms among young people who were only just beginning to experience them. Finally, it is important to note that young people seemed to tolerate such interventions, online or offline, equally well, as their modest clinical drop-out rates did not differ significantly. Moreover, these COVID-19-relevant findings will likely remain relevant into the pandemic's uncertain aftermath as well as in analogous circumstances where anxious or depressed young people are otherwise isolated, geographically or socially.

While this rapid review and meta-analysis was undergoing peer review we became aware of another, partially relevant systematic review and meta-analysis (Christ et al., 2020). Five of its 24 primary RCTs also tested the noninferiority of online CBT versus offline CBT in alleviating symptoms of anxiety and depression among young people. More than half of their sample of five

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trials overlapped with our sample of six trials, and our most recent trial (Aspvall et al., 2021) updated theirs by five years (Poppelaars et al., 2016). Most importantly, the findings of our respective synthetic studies were very close replicates of each other. Both found the field dominated by research in Australia and New Zealand, and both found consistent support for the noninferiority of online CBT (versus offline) with this important population of young people. Clearly, the earlier in the life course one can intervene with such developing mental health challenges, the greater may be the intervention's preventive impacts.

Implications for Social Work and Allied Mental Health Practice and Research

CBTs are prevalent intervention methods used across social work and allied mental health professions. They are commonly employed, for example, across diverse child welfare practices, in work with youths with substance abuse and related challenges and across numerous other fields of health, including diverse mental health practices with young people to older adults (Gregory et al., 2020; Hameed et al., 2020; Marsh et al., 2012; Narang et al., 2019; O'Neil et al., 2014; Pennant et al., 2015). Notwithstanding their clearly greater accessibility, potential efficiencies and convenience, online CBT seems every bit as effective as offline CBT in alleviating symptoms of anxiety or depression, common personal correlates of the experience of structural violence (Mullaly, & Dupré, 2018). This synthetic study supports this conclusion, but with a caveat. It applies most confidently to middle-class, non-Hispanic white, cis-gender women. Recall that men were grossly underrepresented in this field's trials. Also, the experiences of important minoritized groups members have not yet been powerfully analyzed: transgender people as well as racialized, ethnic or cultural minority group members, and people who live in poverty. Finally, all of this field's research has, thus far, been accomplished in high-income countries. Perhaps hopefully as it may facilitate future coalition formation and policy

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advocacy efforts, this has now been clarified for the entire world, that such minoritized group members are precisely those people who have suffered and died the most during the COVID-19 pandemic (Charron & Gorey, 2021; Hayward et al., 2021; Mackey et al., 2021; Wang et al., 2020). We surely ought not continue to exclude *them* from research aimed at bolstering *their* access to high quality mental health care.

Regrettably, despite the fact that we prevalently use CBT methods in our practices, it seems that social work has not yet had an influential scholarly voice in this field nor in some other important fields of practice and research, perhaps because of our seeming dismissal of RCTs (Gorey, 2001; Thyer, 2015). Recall that none of the trials reviewed here were principally or anchor-authored by a social worker and only one of the many study interveners, that is, those who provided the CBTs were social workers. However, one silver lining of the COVID-19 pandemic has been its emphasizing for the public the importance of giving science precedence over mere political ideology, for example, in making large cost-benefit decisions affecting the public's health or social welfare. Future social work researchers ought to use the keystone of the scientific method, the RCT, to create the most confident knowledge possible in working with the diverse people we aim to well serve. Specific trials are needed that powerfully examine the unique experiences of socioeconomically or otherwise vulnerable men (and women), black people, Indigenous peoples, transgender people and others. If we do not advocate for and accomplish such studies, who will?

Further Limitations and Future Research Needs

Overall, this field's typical primary study was an analytically valid, intention to treat RCT with a low risk of bias. Furthermore, given an aggregated meta-analytic sample of 699 participants across eight RCT outcomes, and the fact that three of the outcomes were based upon

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samples of more than 100 participants, the overall main noninferiority hypothesis test seems to have been adequately powered. However, the meta-analytic sample of only eight relevant study outcomes in this novel field were inadequate to examine moderations of the null main effect. Heterogeneity analyses indicated that the observed effects systematically varied and that much of that variability could probably be explained by certain characteristics of the participants, contexts, interventions and or research designs. Importantly, a related synthesis recently suggested that gender and race probably matter, men perhaps preferring and doing better in more anonymous online contexts and certain racialized minority group members perhaps preferring the intimacy of face-to-face work for cultural reasons (Charron & Gorey, 2021). Based upon clinical social work and related research experience one could relatedly surmise that socioeconomic factors such as income and health insurance statuses probably also matter very much. These remain important, but exploratory hypotheses for future synthetic research testing as this study, essentially with an n of 8 for these analyses lacked the meta-analytic power to confidently test them. Future research syntheses ought to do so.

Perhaps as this field develops and with greater social work involvement we may ultimately be able to examine the interesting and important intersections of gender and race and class by building meta-regression models (Bowleg, 2008; Crenshaw, 1989; Gorey, 1996; Videka-Sherman, 1989). Future noninferiority as well as more standard, superiority trials in this field ought to be powered by samples sufficient to allow the confident detection of quite small to modest group differences between, for example, majority and minoritized subsamples. Using standard statistical criteria ($\alpha = 0.05$; $\text{power}_{1-\beta} = 0.80$ to $.95$), subsamples of between 100 and 600 participants each would be required to detect differences characterized by d s of 0.20 to 0.50 (Cohen, 1988; Faul et al., 2007; Fleiss et al., 2003). It will admittedly take huge investments to

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accomplish such well-endowed RCTs that powerfully examine the experiences of the most vulnerable among us. We believe that the time is long overdue to make those investments necessary to make our practices with diverse clients who stand the greatest risk of being oppressed in society's structures the centerpieces of our research, not apparent mere afterthoughts. If not now, when?

As with all rapid reviews this one was subject to, and probably limited by, certain fiscal and temporal constraints. For example, this study began as an undergraduate course-based project. Consequently, we could not follow all PRISMA recommendations (Kelly et al., 2016; Moher et al., 2009). For our lack of resources we could not have multiple reviewers independently search for and analyze the relevant RCTs. As there was much concomitant teaching and learning throughout the review process, we tended to work cooperatively. Also, we were not blind to the primary studies' findings. However, other steps in the review process; data extraction, risk of bias assessment and the final meta-analytic run, were reliably cross-validated by two reviewers or research assistants. Therefore, we believed that despite its rapid nature, our rapid review findings would be systematically replicated by a full systematic review. In fact, it was. Recall that one aspect of Carolien Christ and her colleagues' full systematic review and meta-analysis (2020) reached nearly the same main conclusion as we did. Finally, one may wonder if publication bias, that is, the tendency for peer-reviewed journals to preferentially publish "significant" findings, could be a potent alternative explanation for this synthetic study's findings. This seems improbable for the following reason. The grey literature was searched, but no eligible studies were found there. Despite this, publication bias seems unlikely for these reasons. Most of the primary study outcomes were null and, consequently, the meta-analytic review's key synthetic finding was also null. Those are precisely the sorts of findings one would

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not expect to retrieve if publication bias, that is, a preference to publish significant findings, was potent. Clearly, this field's editorial boards are open to publishing null findings. Publication bias concerns may actually be relatively moot with noninferiority trials. As they essentially hypothesize the null, their null findings, in a sense, correspond to "significant" results.

Conclusion

Our rapid review and meta-analysis synthesized the best available evidence on the relative effectiveness of online CBT with young people beginning to develop symptoms of anxiety or depression. Synthesis of eight RCT outcomes demonstrated that such online treatments are probably as effective as offline. In fact, both are highly effective in alleviating symptoms of anxiety and depression. Presently, this knowledge probably applies most confidently to middle-class, non-Hispanic white women. What is clearly needed now are amply powered RCTs that oversample the most potentially vulnerable who have been at this field's margins: men, transgender people, racialized minority group members, those who live in poverty and any others at relatively great risk of being isolated and or oppressed. Such would go a long way toward informing clinical and policy decisions well into the pandemic's aftermath.

References

Studies included in the meta-analysis are noted with an asterisk.

- * Aspvall, K., Andersson, E., Melin, K., RN, Norlin, L., Eriksson, V., Vigerland, S., Jolstedt, M., Silverberg-Mörse, M., Wallin, L., Sampaio, F., Feldman, I., Bottai, M., Lenhard, F., Mataix-Cols, D., & Serlachius, E. (2021). Effect of an internet-delivered stepped-care program vs in-person cognitive behavioral therapy on obsessive-compulsive disorder symptoms in children and adolescents: A randomized clinical trial. *Journal of the American Medical Association*, 325(18), 1863-1873. <http://doi:10.1001/jama.2021.3839>
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1987). *Cognitive therapy of depression*. New York, NY: The Guilford Press.
- Borenstein, M., Hedges, L., Higgins, J., & Rothstein, H. (2013). *Comprehensive meta-analysis, version 3* [Computer software]. Englewood, NJ: Biostat.
- Bowleg, L. (2008). When Black + lesbian + woman \neq Black lesbian woman: The methodological challenges of qualitative and quantitative intersectionality research. *Sex Roles*, 59(5-6), 312-325. <https://doi.org/10.1007/s11199-008-9400-z>
- Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Hedman-Lagerlöf, E. (2018). Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: An updated systematic review and meta-analysis. *Cognitive Behaviour Therapy*, 47(1), 1-18. <https://doi:10.1080/16506073.2017.1401115>
- Charron, C. M., & Gorey, K. M. (2021). Virtual versus face-to-face cognitive-behavioral treatment of depression: Meta-analytic test of a noninferiority hypothesis and exploration of men's experiences. Manuscript submitted for publication. *SSM Mental Health*.
- Christ, C., Schouten, M. J., Blankers, M., van Schaik, D. J., Beekman, A. T., Wisman, M. A.,

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- Stikkelbroek, Y. A. J., & Dekker, J. J. (2020). Internet and computer-based cognitive behavioral therapy for anxiety and depression in adolescents and young adults: Systematic review and meta-analysis. *Journal of Medical Internet Research, 22*(9), e17831. <https://doi:10.2196/17831>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum, 1988.
- Cooper, H. (2017). *Research synthesis and meta-analysis: A step-by-step approach* (5th ed.). Thousand Oaks, CA: Sage, 2017. <https://doi:10.4135/9781483348858>
- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. *University of Chicago Legal Forum, 1989*(1), 139-167.
<http://chicagounbound.uchicago.edu/uclfvol1989/iss1/8>
- de Smidt, G. A., & Gorey, K. M. (1997). Unpublished social work research: Systematic replication of a recent meta-analysis of published intervention effectiveness research. *Social Work Research, 21*(1), 58-62. <https://doi:10.1093/swr/21.1.58>
- Deeks, J. J., Higgins, J. P. T., & Altman, D. G. (2021). Analysing data and undertaking meta-analyses. In J. P. T. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page, & V. A. Welch (Eds.), *Cochrane handbook for systematic reviews of interventions, version 6.2* (Chapter 10). The Cochrane Collaboration. Available at <https://www.training.cochrane.org/handbook>. Accessed May 16, 2021.
- Dozois, D. J. A., & Mental Health Research Canada. (2021). Anxiety and depression in Canada during the COVID-19 pandemic: A national survey. *Canadian Psychology/Psychologie canadienne, 62*(1), 136–142. <https://doi.org/10.1037/cap0000251>

Online CBT with Young People

- Ebert, D. D., Zarski, A. C., Christensen, H., Stikkelbroek, Y., Cuijpers, P., Berking, M., & Riper, H. (2015). Internet and computer-based cognitive behavioral therapy for anxiety and depression in youth: A meta-analysis of randomized controlled outcome trials. *PLoS ONE*, *10*(3), e0119895. <https://doi:10.1371/journal.pone.0119895>
- Ettman, C. K., Abdalla, S. M., Cohen, G. H., Sampson, L., Vivier, P. M., & Galea, S. (2020). Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Network Open*, *3*(9):e2019686. <https://doi.org/10.1001/jamanetworkopen.2020.19686>
- Faul, F., Erdfelder, E., & Lang, A. G. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175-191. <https://doi:10.3758/bf03193146>
- Fischman, P., & Irarrazaval, M. (2020). Debate: Mental health, social crisis and the COVID-19 pandemic in Chile. *Child and Adolescent Mental Health*, *25*(4), 256-257. <https://doi.org/10.1111/camh.12424>
- Fleiss, J. L., Levin, B., & Paik, M. C. (2003). *Statistical methods for rates and proportions (3rd ed.)*. Hoboken, NJ: Wiley.
- Ganann, R., Ciliska, D., & Thomas, H. (2010). Expediting systematic reviews: Methods and implications of rapid reviews. *Implementation Science*, *5*, 56. <https://doi:10.1186/1748-5908-5-56>
- Geller, J. D. (2020) Marshall McLuhan and the therapeutic importance of the telephone. Advanced access published. *Counselling Psychology Quarterly*. <https://doi:10.1080/09515070.2020.1801385>
- Gorey, K. M. (2001). Early childhood education: A meta-analytic affirmation of the short- and

Online CBT with Young People

- long-term benefits of educational opportunity. *School Psychology Quarterly*, 16(1), 9-30.
<https://doi:10.1521/scpq.16.1.9.19163>
- Gorey, K. M. (1996). Effectiveness of social work intervention research: Internal versus external evaluations. *Social Work Research*, 20(2), 119-128.
<https://doi:10.1093/swr/20.2.119>
- Greenland, S. (1987). Quantitative methods in the review of epidemiologic literature. *Epidemiologic Reviews*, 9, 1-30. <https://doi:10.1093/oxfordjournals.epirev.a036298>
- Gregory Jr., V. (2020). Cognitive-behavioral therapy for relationship distress: Meta-analysis of RCTs with social work implications. *Journal of Evidence-Based Social Work*, 18(1), 49-70.
<https://doi:10.1080/26408066.2020.1806164>
- Grenier, A. M., & Gorey, K. M. (1998). Effectiveness of social work with older people and their families: A meta-analysis of conference proceedings. *Social Work Research*, 22(1), 60-64. <https://doi:10.1093/swr/22.1.6023>
- Hameed, M., O'Doherty, L., Gilchrist, G., Tirado-Muñoz, J., Taft, A., Chondros, P.,...Hegarty K. (2020). Psychological therapies for women who experience intimate partner violence. *Cochrane Database of Systematic Reviews*, 7(7), CD013017.
<https://doi:10.1002/14651858.CD013017>
- Hayward, S. E., Deal, A., Cheng, C., Crawshaw, A., Orcutt, M., Vandrevalla, T. F., Norredam, M., Carballo, M., Ciftci, Y., Requena-Méndez, A., Greenaway, C., Carter, J., Knights, F., Mehrotra, A., Seedat, F., Bozorgmehr, K., Veizis, A., Campos-Matos, I., Wurie, F., & Hargreaves, S. (2021). Clinical outcomes and risk factors for COVID-19 among migrant populations in high-income countries: A systematic review. *Journal of Migrant Health*, 3, 100041. <https://doi:10.1016/j.jmh.2021.100041>

Online CBT with Young People

- Higgins, J. P. T., Savović, J., Page, M. J., Elbers, R. G., & Sterne, J. A. C. (2021). Assessing risk of bias in a randomized trial. In J. P. T. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page, & V. A. Welch (Eds.), *Cochrane handbook for systematic reviews of interventions, version 6.2* (Chapter 8). The Cochrane Collaboration. Available at <https://www.training.cochrane.org/handbook>. Accessed May 16, 2021.
- Johnson, D., Dupuis, G., Piche, J., Clayborne, Z., & Colman, I. (2018). Adult mental health outcomes of adolescent depression: A systematic review. *Depression and Anxiety, 35*(8), 700-716. <https://doi:10.1002/da.22777>
- Kelly, S. E., Moher, D., & Clifford, T. J. (2016). Quality of conduct and reporting in rapid reviews: An exploration of compliance with PRISMA and AMSTAR guidelines. *Systematic Reviews, 5*, 79. <https://doi:10.1186/s13643-016-0258-9>
- Liu, C. H., Zhang, E., Wong, G. T. F., Hyun, S., & Hahm, H. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for U.S. young adult mental health. *Psychiatry Research, 290*, 113172. <https://doi:10.1016/j.psychres.2020.113172>
- Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., Linney, C., McManus, M. N., Borwick, C., & Crawley, E. (2020). Rapid systematic review: The impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *Journal of the American Academy of Child and Adolescent Psychiatry, 59*(11), 1218-1239. <https://doi:10.1016/j.jaac.2020.05.009>
- Mackey, K., Ayers, C. K., Kondo, K. K., Saha, S., Advani, S. M., Young, S., Spencer, H., Rusek, M., Anderson, J., Veazie, S., Smith, M., & Kansagara, D. (2021). Racial and ethnic disparities in COVID-19-related infections, hospitalizations, and deaths: A systematic

Online CBT with Young People

- review. *Annals of Internal Medicine*, 174(3), 362-373. <https://doi:10.7326/M20-6306>
- Madigan, S., Racine, N., Cooke, J. E., & Korczak, D. J. (2021). COVID-19 and telemental health: Benefits, challenges, and future directions. *Canadian Psychology/Psychologie Canadienne*, 62(1), 5-11. <https://doi:10.1037/cap0000259>
- Marsh, J. C., Rutgers, B. A., Andrews, C. M., & Curry, A. (2012). Client-provider relationship and treatment outcome: A systematic review of substance abuse, child welfare, and mental health services research. *Journal of the Society for Social Work and Research*, 3(4), 233-267. <https://doi:10.5243/jsswr.2012>
- * Merry, S. N., Stasiak, K., Shepherd, M., Frampton, C., Fleming, T., & Lucassen, M. F. G. (2012). The effectiveness of SPARX, a computerised self help intervention for adolescents seeking help for depression: randomised controlled non-inferiority trial. *British Medical Journal*, 344, e2598. <http://doi:10.1136/bmj.e2598>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *British Medical Journal*, 339, b2535. <https://doi:10.1136/bmj.b2535>
- Mullaly, B., & Dupré, M. (2018). *The new structural social work: Ideology, theory, and practice* (4th ed.). Toronto, ON: Oxford University Press.
- Narang, J., Schwannauer, M., Quayle, E., & Chouliara, Z. (2019). Therapeutic interventions with child and adolescent survivors of sexual abuse: A critical narrative review. *Children and Youth Services Review*, 107, 104559. <https://doi:10.1016/j.childyouth.2019.104559>
- O'Neal, P., Jackson, A. & McDermott, F. (2014). A review of the efficacy and effectiveness of cognitive-behaviour therapy and short-term psychodynamic therapy in the treatment of major depression: Implications for mental health social work practice. *Australian Social*

Online CBT with Young People

Work, 67(2), 197-213. <https://doi:10.1080/0312407X.2013.778307>

Patel, V., Flisher, A. J., Hetrick, S., & McGorry, P. (2007). Mental health of young people: A global public-health challenge. *The Lancet*, 369(9569), 1302-1313.

[https://doi:10.1016/S0140-6736\(07\)60368-7](https://doi:10.1016/S0140-6736(07)60368-7)

Patton, G. C., Coffey, C., Sawyer, S. M., Viner, R. M., Haller, D. M., Bose, K.,...Mathers, C. D. (2009). Global patterns of mortality in young people: A systematic analysis of population health data. *The Lancet*, 374(9693), 881-892. [https://doi:10.1016/s0140-6736\(09\)60741-8](https://doi:10.1016/s0140-6736(09)60741-8)

Pennant, M. E., Loucas, C. E., Whittington, C., Creswell, C., Fonagy, P., Fuggle, P., Kelvin, R., Naqvi, S., Stockton, S., & Kendall, T. (2015). Computerised therapies for anxiety and depression in children and young people: A systematic review and meta-analysis.

Behaviour Research and Therapy, 67, 1-18. <https://doi:10.1016/j.brat.2015.01.009>

Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New England Journal of Medicine*, 383(6), 510-512. <https://doi:10.1056/nejmp2008017>

Polanczyk, G. V., Salum, G. A., Sugaya, L. S., Caye, A., & Rohde, L. A. (2015). Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *Journal of Child Psychology and Psychiatry*, 56(3), 345-365. <https://doi:10.1111/jcpp.12381>

* Poppelaars, M., Tak, Y. R., Lichtwarck-Aschoff, A., Engels, R. C. M. E., Lobel, A., Merry, S. N., Lucassen, M. F. G., & Granic, I. (2016). A randomized controlled trial comparing two cognitive-behavioral programs for adolescent girls with subclinical depression: A school-based program (Op Volle Kracht) and a computerized program (SPARX). *Behaviour Research and Therapy*, 80, 33-42. <https://doi:10.1016/j.brat.2016.03.005>

Richardson, T., Stallard, P., & Velleman, S. (2010). Computerised cognitive behavioural therapy

Online CBT with Young People

for the prevention and treatment of depression and anxiety in children and adolescents: A systematic review. *Clinical Child and Family Psychology Review*, 13(3), 275-290.

<https://doi:10.1007/s10567-010-0069-9>

Rosen, C. S., Morland, L. A., Glassman, L. H., Marx, B. P., Weaver, K., Smith, C. A., Pollack, S., & Schnurr, P. P. (2021). Virtual mental health care in the veteran's health administration's immediate response to coronavirus disease-19. *American Psychologist*, 76(1), 26-38. <https://doi:10.1037/amp0000751>

Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., Rasoulpoor, S., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Globalization and Health*, 16, 57. <https://doi:10.1186/s12992-020-00589-w>

* Sethi, S. (2013). Treating youth depression and anxiety: A randomised controlled trial examining the efficacy of computerised versus face-to-face cognitive behaviour therapy. *Australian Psychologist* 48(4), 249-257. <https://doi:10.1111/ap.12006>

Sigurvinsdóttir, A. L., Jensínudóttir, K. B., Baldvinsdóttir, K. D., Smáráson, O., & Skarphedinsson, G. (2020). Effectiveness of cognitive behavioral therapy (CBT) for child and adolescent anxiety disorders across different CBT modalities and comparisons: A systematic review and meta-analysis. *Nordic Journal of Psychiatry*, 74(3), 168-180. <https://doi.org/10.1080/08039488.2019.1686653>

* Spence, S. H., Donovan, C. L., March, S., Gamble, A., Anderson, R. E., Prosser, S., & Kenardy, J. (2011). A randomized controlled trial of online versus clinic-based CBT for adolescent anxiety. *Journal of Consulting and Clinical Psychology*, 79(5), 629-642. <https://doi:10.1037/a0024512>

Online CBT with Young People

- * Spence, S. H., Holmes, J. M., March, S., & Lipp, O. V. (2006). The feasibility and outcome of clinic plus internet delivery of cognitive-behavior therapy for childhood anxiety. *Journal of Consulting and Clinical Psychology, 74*(3), 614-621.
<https://doi:10.1037/0022-006X.74.3.614>
- Thyer, B. A. (2015). A bibliography of randomized controlled experiments in social work (1949–2013): Solvitur ambulando. *Research on Social Work Practice, 25*(7), 753-793.
<https://doi:10.1177/10497315155599174>
- Tricco, A. C., Antony, J., Zarin, W., Striffler, L., Ghassemi, M., Ivory, J., Perrier, L., Hutton, B., Moher, D., & Straus, S. E. (2015). A scoping review of rapid review methods. *BMC Medicine, 13*, 224. <https://doi:10.1186/s12916-015-0465-6>
- van Ballegooijen, W., Cuijpers, P., van Straten, A., Karyotaki, E., Andersson, G., Smit, J. H., & Riper, H. (2014). Adherence to internet-based and face-to-face cognitive behavioural therapy for depression: A meta-analysis. *PLoS ONE, 9*(7): e100674.
<https://doi:10.1371/journal.pone.0100674>
- Videka-Sherman, L. (1988). Metaanalysis of research on social work practice in mental health. *Social Work, 33*(4), 325-338. <http://www.jstor.org/stable/23715584>
- Wang, Y., Kala, M. P., & Jafar, T. H. (2020). Factors associated with psychological distress during the coronavirus disease 2019 (COVID-19) pandemic on the predominantly general population: A systematic review and meta-analysis. *PLoS One, 15*(12), e0244630.
<https://doi:10.1371/journal.pone.0244630>
- Zhou, T., Li, X., Pei, Y., Gao, J., & Kong, J. (2016). Internet-based cognitive behavioural therapy for subthreshold depression: A systematic review and meta-analysis. *BMC Psychiatry, 16*(1):356. <https://doi.org/10.1186/s12888-016-1061-9>

Figure 1—PRISMA flow diagram for the rapid review process

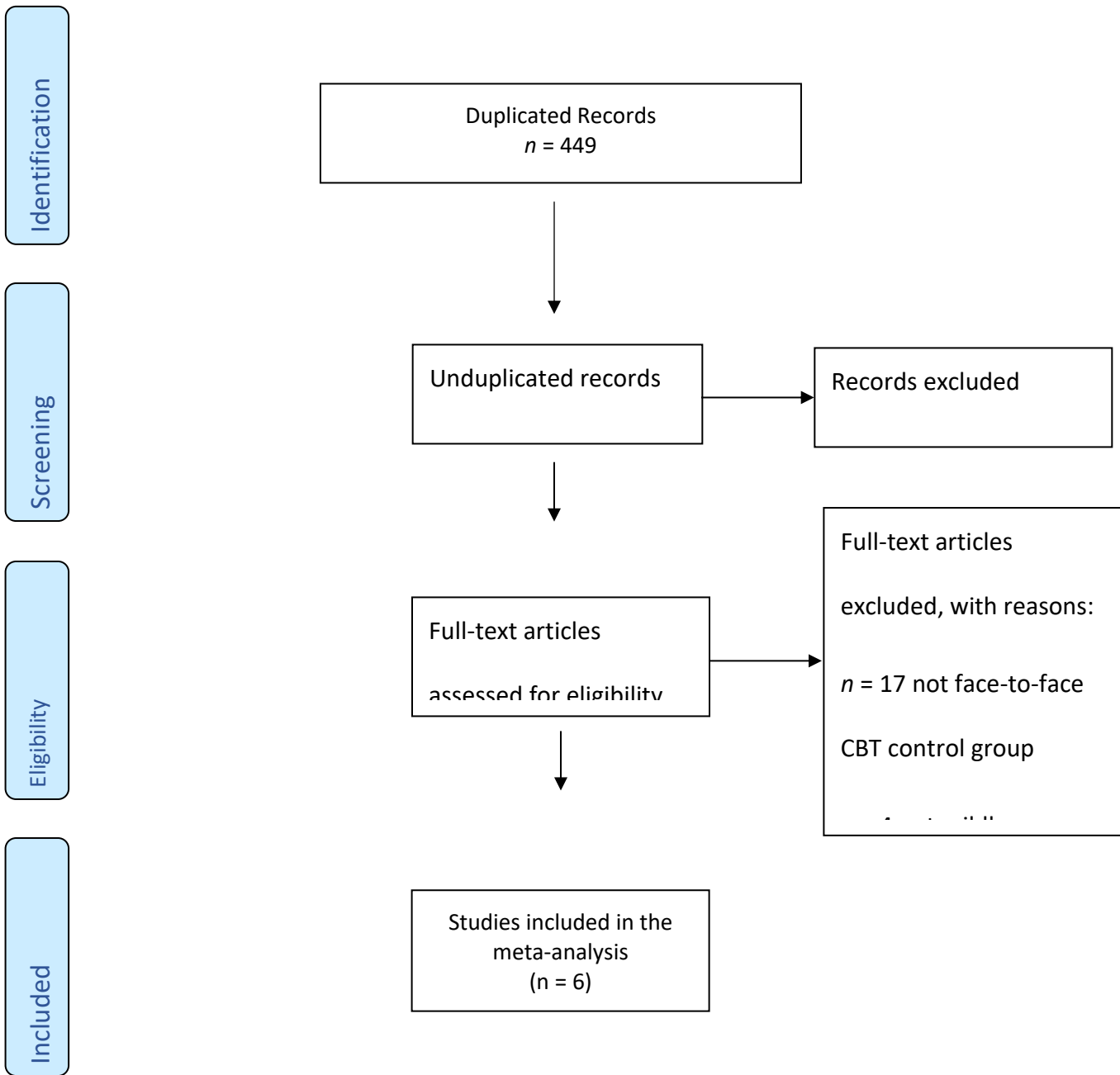


Table 1 Descriptive Characteristics and Pre-Experimental Improvement Rates Among the Six Randomized Controlled Trials Included in the Meta-Analysis

Citation Country	Sample Characteristics	Analytic Design Risk of Bias (RoB) Length of Follow-Up Lost to Follow-Up Measures	Interventionists Intervention Group Control Group Intensity & Duration	Analytic Samples	<i>U</i> ₃ Statistic (%) Within-Intervention Within-Control
Spence et al., 2006 Australia	Ages 7 to 14 41% female Anxiety disorders Symptoms of depression	Per protocol Some concern 12 months, 11% RCMAS, SCAS & CDI	Psychologists	27	Anxiety 72.9
			Group CBT, half online	22	Anxiety 92.2
			Face-to-face group CBT	27	Depression 68.7
			10 weekly sessions ^a	22	Depression 81.9
Spence et al., 2011 Australia	Ages 12 to 18 59% female Mild to moderate anxiety	Per protocol Some concern 12 months, 17% ADIS-C/P & CGAS	Psychologists		
			Online real-time CBT		
Merry et al., ^c 2012 New Zealand	Ages 12 to 19 66% female, 24% Māori Symptoms of depression	Intention-to-treat Low RoB 3 months, 9% CDRS-R & RADS-2	Psychologists & counselors		
			Online, virtual & real-time, CBT ^d		
Sethi, 2013 Australia	Ages 18 to 25 73% female, 55% racialized Symptoms of anxiety Mild to moderate depression	Intention-to-treat Some concern 5 weeks, 0% DASS21 & K10	Face-to-face CBT	94	Depression 77.3
			7 sessions, 4 to 7 weeks	93	Depression 73.2
			Psychologists	23	Anxiety 97.2
			Online CBT, virtual self-help ^e	21	Anxiety 99.4
			Face-to-face CBT	23	Depression 90.5
			5 weekly sessions	21	Depression 99.5

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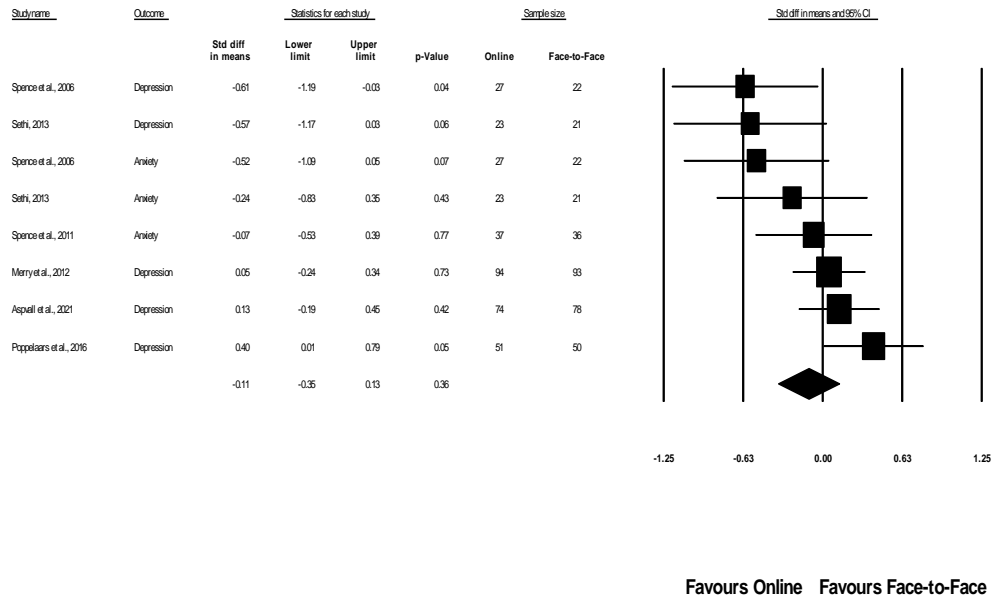
Poppelaars et al., 2016 Netherlands	Ages 11 to 16	Intention-to-treat	Psychologists		
	100% female	Some concern	Online virtual CBT ^d		
	Subclinical depression	12 months, 25%	Face-to-face, school-based CBT ^f	51	Depression 86.2
		RADS-2	7 to 8 weekly sessions	50	Depression 77.3
Aspvall et al., 2021 Sweden	Ages 8 to 17	Intent-to-treat	Psychologist, nurses & social workers ^g		
	62% female	Low RoB	Online CBT		
	OCD symptoms	6 months, 17%	Face-to-face CBT	74	Depression 89.2
		MFQ-C & MFQ-P	14 sessions, 16 weeks	78	Depression 88.7

Note. ADIS-C/P, Anxiety Disorders Interview Scale (child & parent); CBT, cognitive behaviour therapy; CDI, Children's Depression Inventory; C CDRS-R, Children's Depression Rating Scale-Revised; GAS, Children's Global Assessment Scale; DASS21, Depression Anxiety Distress Scale; K10, Kessler Psychological Distress Scale; MFQ-C, Mood and Feelings Questionnaire-Child; MFQ-P, Mood and Feelings Questionnaire-Parent; OCD, obsessive-compulsive disorder; RADS-2, Reynolds Adolescent Depression Scale-Second Edition; RCMAS, Revised Children's Manifest Anxiety Scale; SCAS, Spence Children's Anxiety Scale. ^a Ten weekly child sessions and six parental sessions plus booster sessions at one and three months post-treatment.

^b Ten weekly adolescent sessions and five parental sessions (BRAVE program-based). ^c One co-author was affiliated with a school of social work.

^d SPARX program-based. ^e MoodGYM program-based. ^f OVK-based program. ^g One of 15 of the study's interventionists was a social worker.

Table 2 Online versus Face-to-Face Cognitive Behaviour Therapy: Symptom Diminishment at Longest Follow-Up



Meta Analysis