

Abstract

Introduction: Mindfulness-Based Cognitive Therapy (MBCT) and Mindfulness-Based Stress Reduction (MBSR) are effective in reducing distress amongst people with physical or mental health problems. However, implementation is limited by variable geographic provision, ability to travel and the need for remote service delivery during the COVID-19 crisis. Integration with internet-enabled technologies like videoconferencing potentially enhances access.

Objective: This paper reports a systematic review exploring the feasibility, acceptability, safety and efficacy of delivering MBCT/MBSR by videoconferencing (MBCT/MBSR-VC). No restrictions were made about population or study design.

Methods: Eleven online databases were searched and 10 studies met inclusion criteria. Narrative synthesis was used due to study heterogeneity.

Results: Papers featured physical health and non-clinical samples, but not mental health. Three studies had moderate-strong methodological quality. Results supported the feasibility and acceptability of MBCT/MBSR-VC. Considerations of safety were largely unreported. MBCT/MBSR-VC demonstrated medium positive effects on mental health outcomes compared to inactive controls ($d_s = 0.44 - 0.71$), and little difference compared to active controls like in-person delivery (all confidence intervals crossed zero). Evidence regarding mindfulness or self-compassion as potential mechanisms of action was inconclusive.

Conclusions: Future implementation research should target mental health populations using non-inferiority designs. Adapting MBCT/MBSR to remote delivery will require development of guidelines and training packages to ensure best practice in this medium and adherence to evidence-based MBCT/MBSR models.

Keywords: mindfulness, MBCT, MBSR, videoconferencing, systematic review

Systematic review of MBCT/MBSR via group videoconferencing: feasibility, acceptability, safety and efficacy

Mindfulness is the psychotherapeutic orientation predicted to increase the most over the next decade (Norcross et al., 2013). The most studied mindfulness-based intervention (MBI) (Chiesa et al., 2017) is Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1990), adapted by Segal, Williams, and Teasdale (2002) for patients with recurrent depression to become Mindfulness-Based Cognitive Therapy (MBCT). MBCT/MBSR is resource-intensive, however, and access is variable (Crane & Kuyken, 2013). Where MBCT/MBSR groups exist, access may be limited by rural location, perceived stigma, caring duties or mobility difficulties (Schoultz et al., 2016). Some patients experience access issues due to ‘transport poverty’ (Sustrans, 2012).

MBCT/MBSR has been integrated with online delivery methods (Spijkerman et al., 2016). However, changes to the traditional protocols risk reducing efficacy: early evidence suggests that the number of sessions and their degree of guidance moderates effect sizes (Spijkerman et al., 2016). Furthermore, fewer sessions limits opportunities for between-session mindfulness practice, which is positively related to outcome (Parsons et al., 2017).

Improving access to MBIs is challenging, but technologies like videoconferencing (VC) may provide a convenient, cost-effective solution. Most people have internet access and use it daily (Office for National Statistics, 2018), and there is a public willingness to use video consultations with health professionals (NHS England, 2019). The cancellation of in-person treatments due to the COVID-19 crisis attests to the need to review evidence for VC integration.

Reviews of individual interventions by VC attest to its equivalence to in-person treatments: it is as effective (Backhaus et al., 2012; Chakrabarti, 2015; Drago et al., 2016), and the therapeutic alliance is preserved (Simpson & Reid, 2014). However, translating traditional 8-

week group MBCT/MBSR to remote delivery presents unique challenges: sessions are long (2 – 2.5 hours), and as the central medium of effect is the skilful delivery of mindfulness practices and the guided inquiry that follows, synchronous communication with an experienced mindfulness instructor able to manage group dynamics remotely and technology is key.

Searches revealed no existing systematic reviews of MBCT/MBSR-VC. Five reviews of digitally delivered MBIs have evaluated diverse technologies; they did not focus solely on MBCT/MBSR (Krolikowski, 2013; Russell et al., 2018; Sevilla-Llewellyn-Jones et al., 2018; Spijkerman et al., 2016; Toivonen et al., 2017). All five touched on VC, but none examined issues specific to live VC groups, such as feasibility, acceptability and safety. Given the 19% yearly increase in mindfulness studies (Chiesa et al., 2017) and rapid developments in VC technology, a systematic review focusing specifically on MBCT/MBSR-VC is timely.

This paper therefore presents a systematic review of the literature evaluating the feasibility, acceptability, safety and efficacy of MBCT/MBSR-VC. Data on mental health outcomes (self-reported anxiety, depression or distress) will be extracted. Given evidence that mindfulness significantly mediates the effects of MBIs on mental health outcomes and that self-compassion also plays a role (Gu et al., 2015), data pertaining to both will also be extracted. MBCT, MBSR and their variants will be included due to their established evidence base.

Aim and Review Questions

This review aimed to describe current evidence about the feasibility, acceptability, safety and efficacy of delivering MBCT/MBSR via group VC. The review questions were:

1. How feasible and acceptable is delivering group MBCT/MBSR-VC?
2. What technical considerations are necessary to ensure safe delivery of MBCT/MBSR-VC?

3. How efficacious is MBCT/MBSR-VC compared to non-VC MBIs and other control condition (active and inactive) on mental health outcomes and potential mechanisms of action such as mindfulness and self-compassion?

Method

The review methods were established prior to its conduct and the protocol registered with PROSPERO, the International Register of Systematic Reviews (CRD42018081724). The scope and methods were adjusted when initial scoping searches revealed the limited nature of the evidence. Reporting followed PRISMA guidelines (Moher et al., 2009)

Design

A mixed methods design was utilised and data extracted from quantitative, qualitative and mixed methods studies was narratively synthesised (Popay et al., 2006).

Inclusion and Exclusion Criteria

Publications featuring adults participating in group MBCT/MBSR or variants delivered by videoconferencing were included. Only English language papers were searched due to resource limitations. Mindfulness practice and principles had to feature in at least 50% of sessions. Studies of interventions not explicitly based on MBCT/MBSR were excluded. Groups could consist of participants attending remotely, or mixed remote and in-person attendance. The location of the facilitator was not stipulated. Initial scoping searches revealed a modest body of literature and therefore no limit was made concerning population, setting or design.

Search Strategy

Electronic searches of the peer reviewed and grey literature were conducted by the first author (AMP) using a combination of free text and MeSH headings to find synonyms of the

terms MBCT, MBSR, mindful* and videoconferencing in title and abstract (see Online Resource 1). Databases searched were: Web of Science (CORE Collection including conference proceedings), SCOPUS, PubMed, BNI, CINAHL, EMBASE, HBE, HMIC, PsycINFO, MEDLINE and AMED. Searches were conducted on 27.03.2018 and then updated on 19.04.2019. In the interim the HBE database had ceased to be available through HDAS and therefore only papers to 27.03.2018 were included from this database. A final search was conducted on 23.11.2019. Publications from 1998 were included as this was the year when the first guidelines were published on videoconferencing (American Psychiatric Association, 1998). The International Trials Registry Platform was checked for studies registered between 2017-2019 but none met inclusion criteria. Reference lists from published papers were also consulted. Where reported data was incomplete, study authors were contacted. Two authors responded, one of whom provided sufficient further data to calculate effect sizes.

Procedure

Records identified through database searching were independently double screened on title and abstract by two authors (AMP and AJ). Full text articles were obtained and independently assessed for eligibility by AMP and AJ. Data was extracted using a tailor-made form (see Online Resource 2) by a member of the research team and checked by another (AMP or DM). Data pertaining to effect size calculations and quality appraisal was independently extracted and completed in duplicate by AMP and DM. Where disagreements arose, these were resolved through discussion with reference to a third party (CS and KC).

Analytic Strategy

Data on populations, interventions, comparators, outcome and the review questions were extracted, tabulated and narratively synthesized to draw conclusions about the similarities and

differences across studies. Where indices were unreported, these were calculated where possible. Feasibility was operationalised as the proportion of those approached who responded, were eligible, consented, and who were study completers (provided a complete dataset). Indices were calculated from the whole sample where a study was controlled and from the VC intervention where it was not. Acceptability was analysed according to intervention completer rate (participants completing at least 50% of the intervention) and patient satisfaction. Safety indices were extracted using guidelines for delivery of VC mental health services (Luxton et al., 2010).

The Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative studies (Thomas et al., 2004) was used to appraise the methodological quality of the included studies, a tool deemed reliable (Armijo-Olivio et al, 2012). Two raters independently completed the table and any discrepancies were resolved to arrive at an agreed overall rating of 'strong, 'moderate' or 'weak' for each paper.

Outcomes pertaining to mental health (distress, anxiety or depression), and potential mechanisms of action (mindfulness, self-compassion) were extracted. Mindfulness and self-compassion were considered potential mechanisms of action if they were shown to be impacted positively by the mindfulness intervention. No formal mediation analysis was conducted. Effectiveness was assessed by extracting relevant author-reported results showing statistically significant post-intervention group differences in controlled studies or pre-post improvement in uncontrolled studies. Where there were no significant differences, true null findings were not assumed unless studies employed a non-inferiority or equivalence study design.

In addition, individual study means, standard deviations and Ns were extracted and the Standardised Mean Difference (SMD) calculated separately for active controlled and inactive-controlled studies. Effect size d was calculated as the mean difference in post-intervention scores

between groups, divided by the pooled post-intervention *SD*, using an online calculator (Lenhard & Lenhard, 2016). Effect size was interpreted as small, medium or large ($d = 0.2, 0.5, \text{ or } 0.8$ respectively) according to Cohen's (1969) convention. Control conditions were categorised as active or inactive using the Cochrane handbook criteria (Higgins et al., 2019). To interpret non-significant effect sizes, 95% confidence intervals (CIs) were inspected. Where CIs crossed zero but were highly skewed around zero the possibility of lack of statistical power was considered. Since CIs represent not just a means of null hypothesis significance testing, but a 'range of plausible values for the true effect' (Finchet al., 2001, p. 204), CIs with a markedly asymmetric spread around zero were noted as evidence towards a possible effect requiring further research.

Finally, a 'vote counting' approach (Thomas et al., 2017) was applied to results as a 'descriptive tool' to summarise effectiveness across the two methods. Results were narratively synthesised in light of the quality appraisal using a positive deviance (Bradley et al., 2009) approach: studies with the best outcomes were identified and compared to those with the worst outcomes and shared features noted.

Results

In total, 1716 records were identified through database searching, and another nine through hand searches of reference lists (see Online Resource 3 for PRISMA diagram). After screening title and abstract and removing redundant records, 22 articles were assessed for eligibility on full text. Ten were excluded because they were not based on MBCT/MBSR or did not feature group videoconferencing (see Online Resource 4 for full details of articles excluded). Twelve articles representing 10 empirical studies were selected for the review.

Study Characteristics

Selected characteristics of the included studies are summarised in Table 1. Publication dates ranged from 2008 to 2019, with most 2014 or later. Included studies featured a total of 789 participants (median = 66.5). The majority focused on physical health populations, with the remainder covering non-clinical populations such as universities and the corporate sector. None targeted mental health populations.

Participants' mean ages ranged from 30 to 73. Most participants were female (range 47-88%), although three studies did not report age and gender. None reported socio-economic status, rural or urban residence, or transport poverty status. Regions represented were North America (N = 4), Australasia (N = 2) and Europe (N = 3), including one in the UK.

Comparators were utilised in the majority of studies: eight were controlled, of which four were RCTs. Two studies compared MBCT/MBSR-VC to the same face-to-face (F2F) intervention. Two featured active control conditions (2; Self-guided online MBI = 1; non-MBI = 1) and 6 inactive control conditions (Wait List Control (WLC) = 5; walking group = 1). Two studies featured both active and inactive controls.

Authors generally reported positive outcomes, with no statistically significant negative or adverse effects found. Of the seven comparisons of VC to non-MBI control (inactive or active), six reported statistically significant between-group differences in favour of VC on at least some of the outcomes. The three studies comparing VC with a mindfulness control found no significant differences between groups, whether that was self-guided, or F2F. However, given none were designed to test non-inferiority effects, we cannot assume this implies equivalence. Evidence regarding potential mechanisms of action (mindfulness or self-compassion) was inconclusive. For mindfulness, when VC was compared to a non-MBI control the results were contradictory: Zernicke et al., (2014) found no significant difference in four of the five FFMQ

(Five Factor Mindfulness Questionnaire) subscales, whereas Aikens et al., (2014) found all but one significant. Given that Zernicke et al., (2014) was rated ‘strong’ methodologically, greater confidence can be taken in their results. Self-compassion was measured in two studies: Johansson et al., (2015) found no significant difference between VC and F2F MBSR or a walking group, while Krägeloh et al. (2018) found a difference favouring VC.

[Insert Table 1: Selected characteristics of included studies]

Intervention characteristics are described in Table 2. Six studies were based on MBSR, two MBCT and two mixed MBCT/MBSR. Three studies adhered to the original manual in terms of intervention length (Farver-Vestergaard et al., 2018; Johansson et al., 2015; Zernicke et al., 2014), the latter two featuring an online retreat. MBCT/MBSR often include a one-day retreat during the 8-week course to give participants opportunity to deepen their mindfulness practice. Scant details were given about the online retreat other than stating it was held for a full day, and in the Johansson et al., (2016) qualitative evaluation that participants enjoyed it. Details regarding treatment integrity were also largely absent. Only Bogosian et al., (2015) monitored treatment integrity through listening to tapes in supervision. None of the studies used standardised tools such as the MBI:TAC (Mindfulness-Based Interventions: Teaching Assessment Criteria; Crane et al., 2013). Reporting of mindfulness practice, intended or actual, was incomplete or omitted in most cases, with only two studies reporting sufficient data to allow total recommended practice minutes to be calculated. Group sizes ranged from four to 22. Studies featuring the largest groups all followed a model whereby participants met as an in-person group whilst the facilitator joined remotely (N = 3). Study authors did not comment on how participants experienced these varying methods of delivery. Four studies failed to report group size.

[Insert Table 2: Interventions]

Feasibility and Acceptability

Feasibility results are presented in Table 3. Zernicke and colleagues (2014) were unique in reporting feasibility as their primary outcome measure, with a priori criteria. They met their targets in all indices except study completion (missed by 2%). Only two studies reported sufficient data to be able to calculate the majority of feasibility indices, making inferences difficult to draw. Differences in study design and recruitment strategy led to large variations in response rates (10% to 75%). Eligibility rates followed a similar pattern, with recruitment strategies designed to achieve a more representative sample generally experiencing lower rates (e.g. Zernicke et al., 2014: 37%) than those studies drawing from a more selective, and arguably less representative pool of participants (e.g. Krägeloh et al., 2018: 99%). Consent rates varied from 17% to 93%, although this variation is probably best explained by differences in recruitment strategies and reporting. Finally, the rate of study completion (participants completing post-intervention measures) ranged from 27% to 100%. Overall, however, study completion rates were high, with only three studies reporting rates below 75%.

[Insert Table 3: Feasibility and acceptability]

Acceptability results are shown in Table 3. Intervention completion rates (participants receiving at least half the intervention) could not be calculated in four studies; the remaining six ranged from 67% to 100%. Four studies included formal participant satisfaction measures and one reported informal participant comments. Two studies reported participant satisfaction rates, with most recommending it to others and 75-100% remarking it was beneficial or met their expectations. Two studies specifically probed satisfaction with VC in their questionnaire wording, with only Farver-Vestergaard et al., (2018) complementing this quantitative data with a

thematic analysis. Two themes were relevant to VC: ‘Practical aspects of attendance’ and ‘Relating’. Positive experiences included attending from home and reduced travel. For example, one participant said, “I have been glad that it is home-based. Otherwise I wouldn’t have been able to participate” (p.472). Some also felt the online nature of the group enhanced relating to others as it demanded more intense management of group dynamics, with one participant saying “Well the upside of using the tele-monitor...were that if someone raised their hand they got to say something. And it was not like the same people talked all the time, which is often the case on courses like these (p.472)”. Negative relational impacts of VC were focused on technical difficulties. Some participants felt this created a barrier to feeling safe enough to disclose personal experiences and feelings.

Safety

VC-specific safety issues were under-reported (see Online Resource 5). Preliminary planning was better reported than other safety indices like emergency planning, adverse events, deterioration or data security and privacy issues. About a third of studies provided pre-course technical instruction, personal equipment or featured clinic-based VC systems. Three did not report whether equipment was provided and one stipulated that participants should provide their own. At least two studies took place in ‘clinically unsupervised’ (Luxton et al., 2010) locations, without direct access to clinical support (see also Table 2); four further studies did not explicitly state the location of participants. Krägeloh et al. (2018) reported that participants had in-person access to a clinical psychologist and Gardner-Nix et al. (2008; 2014) used a telemedicine link from participants’ local hospitals. Of the six locations known or assumed to have been clinically unsupervised, only two reported providing ongoing technical support. None of the studies mentioned VC-specific good practice guidelines or facilitator training in conducting

psychological interventions online. Of these technological details, the most comprehensively reported was VC platform (see Table 2), with all but one study naming it. Few studies reported on frequency of technical problems, with only one quantifying it (Caravela et al., 2019).

Technical support was provided in four studies, although only Zernicke et al., (2014) indicated it was continuous and live.

None of the studies reported emergency plans for supporting remote participants.

Adverse events such as technical barriers to participation were cited in three studies. Farver-Vestergaard et al. (2018) reported that one participant suggested the provision of a hotline to contain worries at the end of the session or in the event of technical failure. This was also the only study to mention a significant deterioration in one of their participants. Data security and privacy issues were almost entirely unaddressed: only Zernicke et al., (2014) described procedures to ensure that only approved group members could attend.

Study Quality

Study quality was rated using Thomas and colleagues' (2004) EHPP tool (see Online Resource 6 for quality table and breakdown of ratings). Two of the RCTs were rated as 'Strong' and one as 'Moderate'. All other studies were rated as 'Weak'. Selection bias regarding recruitment method and lack of randomised controls compromised study quality in most cases.

Efficacy

A meta-analysis of study outcomes was not conducted due to study heterogeneity. Between-group post-intervention effect sizes for the three studies with active controls (Table 4) were statistically non-significant (95% confidence intervals crossing zero) for all outcomes except the depression subscale of the Hospital Anxiety and Depression Scale (HADs), where Caravela et al.'s (2019) MBSR-VC was superior to a self-guided non-MBI psychoeducation intervention with

a small effect ($d = 0.40$). Neither of the studies comparing VC to F2F found statistically significant differences. These findings cannot be regarded as conclusive as in most cases the 95% confidence intervals crossed zero asymmetrically in favour of the VC group, which could indicate lack of statistical power. Given that none of the **included studies conducted non-inferiority comparisons between MBCT/MBSR-VC and non-VC MBIs, we have not analysed them separately from comparisons with active controls.**

[Insert Table 4]

Of the four studies with inactive comparators (Table 5) all found small to medium, or medium effect size differences ($d = 0.44 - 0.71$) favouring VC on most distress measures, although not on the HADs anxiety subscale and the General Health Questionnaire in Bogosian et al.'s (2015) study. Results evidencing mindfulness as a potential mechanism of action were contradictory: Aikens et al., (2014) found a large effect on the FFMQ observe subscale and medium effects on the rest, while for Zernicke et al., (2014) confidence intervals for all subscales of the FFMQ crossed zero, suggesting no impact of the VC-MBI on this hypothesized mechanism of action. The evidence for self-compassion outcomes was also inconclusive: although confidence intervals on self-compassion crossed zero when VC was compared to F2F MBSR or a walking group by Johansson et al., (2015), the sample size was very small and therefore should be interpreted with caution.

[insert Table 5]

Discussion

This review aimed to describe the current evidence for the feasibility, acceptability, safety and efficacy of MBCT/MBSR-VC. We identified 10 studies, including 5 new studies not

found in previous reviews. MBCT/MBSR-VC appears effective for reducing psychological distress compared to inactive controls, with medium effect sizes evidenced. Effectiveness compared to active controls was less clear however, as were any effects on potential mechanisms of action. No studies were sufficiently powered to conduct non-inferiority analyses comparing MBCT/MBSR-VC to in-person treatment. Drawing firm conclusions about feasibility and acceptability was hampered by lack of reporting and general low study quality. However, in the three studies that were of strong/ moderate quality, results were promising, with high participant satisfaction and intervention completion rates. We were unable to draw conclusions about safety as few studies reported on adverse events or data security-privacy issues. Nevertheless, we believe the preliminary evidence for MBCT/MBSR-VC effectiveness recommends it as a remote alternative for people currently denied in person treatment by the COVID-19 crisis.

Characteristics of included studies

We found that physical health conditions amongst a largely female population were most frequently studied, echoing other mindfulness studies (Bodenlos et al., 2017). The most common intervention was MBSR, followed by adapted combined MBCT/MBSR, and the least common traditional MBCT. This is perhaps not surprising given MBSR was originally developed to help people cope with illness and pain. However, there is clear gap in the literature for VC delivery in mental health settings. Reporting of adherence and treatment integrity was largely absent.

None of the studies featured an average age below 30. This profile challenges assumptions about digital interventions suiting a young adult demographic and suggests that age may not be a barrier to healthcare technology (Banbury et al., 2018). We were unable to clarify participants' urban or rural location or transport poverty status. High income countries were

over-represented, although digital technologies are increasingly being recognised as a key to addressing the mental health needs of low- and middle-income countries (Naslund et al., 2017).

Feasibility and Acceptability

Given variable reporting of feasibility indices, study completion rates were the clearest indicator of feasibility of MBCT/MBSR-VC as they were calculable for all but one study. The only study to set a priori benchmarks was Zernicke et al., (2014). Using their 85% study completion rate target as a guide, it is promising that five of the nine studies reporting sufficient data met the target, with a sixth missing by a small margin. Using a positive deviance approach to identify characteristics of the highest performers, we found all had interventions of at least 8 sessions and smaller group sizes. Perhaps surprisingly, in all five studies the facilitator and all participants were in separate places, in contrast to the mixed nature of groups in other studies.

Given few studies specifically probed VC-specific participant satisfaction and nearly half failed to report intervention completion rates, only tentative conclusions can be made about acceptability. The data that is reported suggests good satisfaction and intervention completion. Where dissatisfaction occurred, it was generally connected to technical difficulties. These results reflect those of Banbury et al. (2018), who found that patients in nearly all studies valued being able to attend the group from home and otherwise would not have been able to participate.

Qualitative data was scant with only one study giving a rich picture of participants' experiences of MBCT/MBSR-VC (Farver-Vestergaard et al., 2018). None of the studies probed how participants found meditating in front of a screen. The extent to which technical issues like distortions in sound quality impacted on this experience is also unknown.

Safety

Safety reporting was markedly absent. None of the studies described facilitators being trained in VC groups or referred to practice guidelines. This is concerning, considering the first guidelines on delivering mental health services by VC were published 10 years before the oldest study in our review (American Psychiatric Association, 1998). While none of the studies involved a mental health population, facilitators may be ill-equipped to manage sessions safely without proper training and guidance, not least situations of lost connections and people becoming distressed or feeling abandoned (Luxton 2010).

Reporting of adverse events was rare, but only three studies appeared even to collect this data. Managing risk at a distance in a group VC setting was largely unexplored. Sansom-Daly et al., (2015) emphasises the importance of developing safety protocols and links with local services when working with distressed patients at a distance. Privacy concerns were not raised by participants in any of the studies, although it is not clear whether this was because researchers failed to ask, or participants were genuinely unconcerned. Banbury et al.,’s (2018) systematic review of home-based VC support groups showed few patients were concerned about others seeing into their homes. Due to limited reporting, few conclusions can be drawn about the technical aspects of safe MBCT/MBSR-VC delivery. We do not know how frequent technical difficulties were, typical bandwidths, levels of technical support or the impact of facilitator and participant location. A third of studies failed to describe the equipment used or the group size, other potentially important factors impacting call quality and therefore participant experience. For MBI-VC provision in response to COVID-19, we recommend usual risk procedures for F2F groups combined with facilitators having appropriate digital competencies (Pote et al., 2020).

Efficacy

The evidence for efficacy of MBCT/MBSR-VC is limited by the small number of studies and their inconsistent quality. The strongest evidence came from the four waitlist-controlled studies, in which five of the seven subscales measuring mental health outcomes showed statistically significant medium effects sizes favouring MBCT/MBSR-VC. Three of these effects were found in the two higher quality studies (Bogosian et al., 2015; Zernicke et al., 2014), increasing the confidence we can have in these results. Nevertheless, it should be noted that the three studies measuring anxiety failed to find statistically significant effects, echoing a meta-analysis which found effects of MBIs for depression but not for anxiety (Strauss et al., 2014).

Regarding active controls, there were no statistically significant differences found in studies comparing VC to face-to-face mindfulness groups. A small significant effect on depression was found when MBCT/MBSR-VC was compared with self-guided psychoeducation (Cavalera et al., 2019). However, only further research using robustly powered non-inferiority designs will be able to establish this definitively.

The two studies reporting mindfulness outcomes found contradictory results: Aikens et al. (2014) found significant differences between VC and control, whereas Zernicke et al. (2014) did not. When author-reported pre-post intervention results for the majority of mindfulness subscales were non-significant. This mirrors the heterogeneity found in the literature. Visted et al.,'s (2015) systematic review found a small effect of MBIs on mindfulness compared to a WLC. However, this obscured the fact that seven studies supported it and nine did not. Also, in a meta-analysis of mediation studies of MBCT and MBSR, Gu et al., (2015) found moderate but consistent evidence supporting mindfulness as a mediator of clinical outcomes.

Self-compassion featured in two studies included in our review. In the one controlled study (Johansson et al., 2015) there was no difference between the three groups (VC, F2F and

walking) on author-reported significance testing or SMDs calculated here. Gu et al.'s (2015) meta-analysis identified only three studies measuring self-compassion, only one supporting compassion as a mediator. None of our included studies conducted mediation analyses involving mindfulness or self-compassion outcomes, and therefore no conclusions regarding mechanisms of action can be drawn.

In summary, the evidence found in the present study lends tentative support to the efficacy of delivering mindfulness by VC. There was no evidence of deterioration and there were promising signs that VC groups may prove not to be inferior to traditional F2F MBCT/MBSR. Given that few studies were randomised or of moderate or strong methodological quality, our conclusions must be tentative. Given the lack of common measures of mindfulness or self-compassion, no conclusions about proposed mechanisms of action can be drawn.

Strengths and Limitations

This is the first review to focus on MBCT/MBSR by VC. Although the limited and heterogenous evidence base precluded meta-analysis, methods used for conducting this narrative synthesis were rigorous. Following good practice recommendations for systematic reviews (Karlsson & Bergmark, 2015) we separately extracted SMDs for the WLC and active controls. We applied a robust, flexible quality appraisal tool (Armijo-Olivo et al., 2012) allowing appraisal of a range of quantitative designs. However, this meant the strengths of the qualitative analysis in Farver-Vestergaard's (2019) mixed methods study were not recognised in the quality appraisal.

We were unable to aggregate data and instead extracted individual study SMDs within a narrative synthesis. Narrative synthesis, and vote counting particularly have been criticized for lacking transparency and introducing bias (Valentine et al., 2017). However, when used as an initial description of patterns across studies, vote-counting has defenders (Popay et al., 2006). In

the present review vote-counting was not used in isolation and conclusions were triangulated with the extraction of SMDs, which control for differing sample sizes. It has been argued that narrative synthesis is a realistic and useful method when limited evidence is available, provided the aims of the review are adjusted and the claims made tentative (Thomas et al., 2017).

Further Research

Clearly MBCT/MBSR-VC groups are under-researched. We were limited in our ability to draw conclusions regarding implementation. Only two studies compared videoconference-delivered mindfulness to the same dose of face-to-face mindfulness and neither measured adherence. Future implementation research should investigate the comparability of the two modes of delivery using a non-inferiority randomised controlled design. This should be informed by implementation science theoretical frameworks, such as the patient and provider barriers and facilitators to healthcare access presented by O'Connor et al.,'s (2016) digital model. Furthermore, intention to treat analyses should be employed, something rarely or even incorrectly used by study authors in the present review. Gold standard treatments should be employed as only one study in the present review featured full MBSR (Johansson et al., 2015) and none used classic MBCT. Given that MBCT is an evidence-based treatment for recurrent depression, there is a clear imperative for studying its delivery by VC for this population.

As yet the cost effectiveness of implementing MBCT/MBSR-VC is unknown. The need for technical support and potential need to provide equipment to participants to ensure social inclusion and equality may mean savings are reduced. Before services seek to implement MBCT/MBSR-VC, a full economic evaluation should be conducted to ensure financial viability.

Future research should follow telehealth research reporting guidelines (Abel et al., 2017) and study technology-specific aspects of VC mindfulness to better understand factors influencing

engagement and effectiveness (Russell et al., 2018). This may include software and hardware used, internet bandwidth, location of participants and facilitator and rural or urban setting. The needs of older clients should be considered, as age-related cognitive and sensory functioning changes may impact telemedicine engagement (Stronge, Rogers, & Fisk, 2007). It is concerning that the present studies paid so little attention to the equipment used. Future trials should consult a diverse range of service users regarding optimum equipment. Equipment should be offered, as Farver-Vestergaard et al., (2019) did, in order to promote social inclusion and equality of access.

Given the importance of minimising barriers to participants' mindfulness practice and group communication, trouble-free connections are essential. Facilitators should not provide live support during calls, as this distracts from supporting others. Banbury et al. (2018) describe how good technical support can significantly ease participants' anxiety. This will be especially important as researchers begin to work with mental health populations.

A better understanding of how cohesion in groups influences the effectiveness of VC group therapy is needed. Some evidence suggests VC group interactions may remain superficial due to participants' difficulty trusting each other (Kozlowski & Holmes, 2014). Measures such as the Group Therapy Alliance Scale (Pinsof & Catherall, 1986) would differentiate alliance to group and to leader.

Process variables such as therapeutic alliance and group cohesion may be influenced by VC telepresence. Bouchard et al., (2007) found the feeling of presence predicted the strength of the therapeutic alliance over a course of CBT for panic disorder. Better image and sound quality may promote greater presence (Lozano et al., 2015), and therefore the choice of VC platform and the internet connection quality will be important to consider carefully in future studies. Similarly, training programmes for online mindfulness instructors should be developed based on good

practice guidelines to meet the challenges of managing group dynamics remotely. An adapted form of the MBI-TAC (Crane et al., 2013) could be developed from the practice of innovatory programmes (e.g. Meissner, 2017; Sansom et al, 2020) in order to assess adherence and teacher competency when delivering MBSR/MBCT by VC. Recent calls for a digitally trained mental health workforce (Foley & Woollard, 2019) make this need clear.

The potential for harm was not addressed in the majority of included studies, yet literature suggests this is present across all populations, even in F2F settings (Baer et al., 2019). Safety should be a key consideration when working via VC with clinically unsupervised participants calling in from home. Risk management protocols for VC, such as those produced by professional bodies such as the American Psychological Society (2013) need to be urgently developed and evaluated so that potential risks can be mitigated (e.g. clients with suicidal risk having pre-established written instructions for seeking help). Safety planning should be prioritised in any future trial, considering technology-specific issues in risk assessment and emergency planning.

In conclusion, this review has provided an important overview of the work conducted thus far on delivering MBCT/MBSR via VC. Although the evidence provides preliminary support for the feasibility, acceptability and efficacy of disseminating MBCT/MBSR by VC, it has also highlighted significant gaps in our knowledge in all these domains, not least safety and the long term effects of MBSR/MBCT-VC. Given drivers such as the UK Mindfulness All-Party Parliamentary Group's (2015) recommendation that the provision of MBCT be radically upscaled, the growing call from patients for convenient digital options (Seres, 2015), and the prediction that online clinics will soon be the norm (Fairburn & Patel, 2017), the need to develop a robust base of evidence and clinical policy is clear and urgent.

References

- Abel, E. A., Glover, J., Brandt, C. A., & Godleski, L. (2017). Recommendations for the reporting of Telemental Health (TMH) literature based on a systematic review of Clinical Video Teleconferencing (CVT) and depression. *Journal of Technology in Behavioral Science*, 2(1), 28-40. <http://doi.org/dhpd>
- Aikens, K. A., Astin, J., Pelletier, K. R., Levanovich, K., Baase, C. M., Park, Y. Y., & Bodnar, C. M. (2014). Mindfulness goes to work: Impact of an online workplace intervention. *Journal of Occupational and Environmental Medicine*, 56(7), 721-731. <http://doi.org/f59fzp>
- American Psychiatric Association. (1998). *Telepsychiatry via videoconferencing resource document*. Washington, DC, USA: APA.
- American Psychological Association. (2013). Guidelines for the practice of telepsychology. Retrieved from <https://www.apa.org/practice/guidelines/telepsychology>
- APA Presidential Task Force on Evidence-Based Practice. (2006). Evidence-based practice in psychology. *American Psychologist*, 61, 271-285. <http://doi.org/ctsm4f>
- Armijo-Olivo, S., Stiles, C. R., Hagen, N. A., Biondo, P. D., & Cummings, G. G. (2012). Assessment of study quality for systematic reviews: A comparison of the Cochrane Collaboration Risk of Bias Tool and the Effective Public Health Practice Project Quality Assessment Tool: methodological research. *Journal of Evaluation in Clinical Practice*, 18(1), 12-18. <http://doi.org/b5xc6m>
- Backhaus, A., Agha, Z., Maglione, M. L., Repp, A., Ross, B., Zuest, D., Rice-Thorp, N. M., Lohr, J., & Thorp S. R. (2012). Videoconferencing psychotherapy: A systematic review. *Telehealth, Telepsychology, and Technology*, 9(2), 111-131. <http://doi.org/f32xj4>

- Baer, R., Crane, C., Miller, E., & Kuyken, W. (2019). Doing no harm in mindfulness-based programs: Conceptual issues and empirical findings. *Clinical Psychology Review*.
<http://doi.org/gf8wdd>
- Banbury, A., Nancarrow, S., Dart, J., Gray, L., & Parkinson, L. (2018). Telehealth interventions delivering home-based support group videoconferencing: Systematic review. *Journal of Medical Internet Research*, 20(2): e25. <http://doi.org/gcw9h2>
- Bodenlos, J. S., Strang, K., Gray-Bauer, R., Faherty, A., & Ashdown, B. K. (2017). Male representation in randomized clinical trials of mindfulness-based therapies. *Mindfulness*, 8(2), 259-265. <http://doi.org/f924hp>
- Bogosian, A., Chadwick, P., Windgassen, S., Norton, S., McCrone, P., Mosweu, I., Silber, E., Moss-Morris, R. (2015). Distress improves after mindfulness training for progressive MS: A pilot randomised trial. *Multiple Sclerosis Journal*, 21(9), 1184-1194.
<http://doi.org/f7kx3d>
- Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Chichester, West Sussex: John Wiley & Sons.
- Bouchard, S., Robillard, G., Marchand, A., Renaud, P., & Riva, G. (2007). *Presence and the bond between patients and their psychotherapists in the cognitive-behavior therapy of panic disorder with agoraphobia delivered in videoconference*. Paper presented at the Proceedings of the 10th Annual International Workshop on Presence, Barcelona.
Retrieved from <https://bit.ly/2Qeudg3>
- Bradley, E. H., Curry, L. A., Ramanadhan, S., Rowe, L., Nembhard, I. M., & Krumholz, H. M. (2009). Research in action: Using positive deviance to improve quality of health care. *Implementation Science*, 4(1), 25. <http://doi.org/crtb6v>

- Cavalera, C., Rovaris, M., Mendozzi, L., Pugnetti, L., Garegnani, M., Castelnuovo, G., Molinari, E., & Pagnini, F. (2019). Online meditation training for people with multiple sclerosis: A randomized controlled trial. *Multiple Sclerosis Journal*, 25(4), 610-617.
<http://doi.org/dhqd>
- Chakrabarti, S. (2015). Usefulness of telepsychiatry: A critical evaluation of videoconferencing-based approaches. *World Journal of Psychiatry*, 5(3), 286. <http://doi.org/ggbjwh>
- Chiesa, A., Fazio, T., Bernardinelli, L., & Morandi, G. (2017). Citation patterns and trends of systematic reviews about mindfulness. *Complementary Therapies In Clinical Practice*, 28, 26-37. <http://doi.org/dhqq>
- Cohen, J. (1969) *Statistical Power Analysis for the Behavioral Sciences*. NY: Academic Press.
- Crane, R.S., Eames, C., Kuyken, W., Hastings, R. P., Williams, J.M.G., Bartley, T., Evans, A., Silverton, S., Soulsby, J.G., Surawy, C. (2013). Development and validation of the Mindfulness-Based Interventions – Teaching Assessment Criteria (MBI:TAC). *Assessment*, 20, 681-688, doi: 10.1177/1073191113490790.
- Crane, R. S., & Kuyken, W. (2013). The implementation of Mindfulness-Based Cognitive Therapy: Learning from the UK health service experience. *Mindfulness*, 4, 246-254.
<http://doi.org/dhqh>
- Drago, A., Winding, T. N., & Antypa, N. (2016). Videoconferencing in psychiatry, a meta-analysis of assessment and treatment. *European Psychiatry*, 36, 29-37.
<http://doi.org/f8x7nd>
- Fairburn, C. G., & Patel, V. (2017). The impact of digital technology on psychological treatments and their dissemination. *Behaviour Research and Therapy*, 88, 19-25.
<http://doi.org/f9mrs6>

- Farver-Vestergaard, I., O'Connor, M., Smith, N. C., Løkke, A., Bendstrup, E., & Zachariae, R. (2018). Tele-delivered mindfulness-based cognitive therapy in chronic obstructive pulmonary disease: A mixed-methods feasibility study. *Journal of Telemedicine and Telecare*, 1357633X18780563. <http://doi.org/ggd3zv>
- Finch, S., Cumming, G., & Thomason, N. (2001). Reporting of statistical inference in the Journal of Applied Psychology: Little evidence of reform. *Educational and Psychological Measurement*, 61(2), 181-210.
- Foley, T., & Woollard, J. (2019). *Digital future of mental healthcare and its workforce: A report on a mental health stakeholder engagement to inform the Topol Review*. Health Education England. Retrieved from <https://bit.ly/36fEf6r>
- Gardner-Nix, J., Backmant, S., Barbati, J., & Grummitt, J. (2008). Evaluating distance education of a mindfulness-based meditation programme for chronic pain management. *Journal of Telemedicine and Telecare*, 14(2), 88-92. <http://doi.org/dkmbkh>
- Gardner-Nix, J., Barbati, J., Grummitt, J., Pukal, S., & Newton, R. R. (2014). Exploring the effectiveness of a mindfulness-based chronic pain management course delivered simultaneously to on-site and off-site patients using telemedicine. *Mindfulness*, 5, 223-231. <http://doi.org/f5995d>
- Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, 37, 1-12. <http://doi.org/f68zwk>

- Higgins, J. P. T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (2019). *Cochrane Handbook for Systematic Reviews of Interventions* version 6.0 (updated August 2019). Retrieved from www.training.cochrane.org/handbook.
- Johansson, B., & Bjuhr, H. (2016). Teaching Mindfulness-Based Stress Reduction (MBSR) live online to individuals suffering from mental fatigue - A qualitative evaluation. *International Journal of Social Science Studies*, 4(3). <http://doi.org/dhqq>
- Johansson, B., Bjuhr, H., Karlsson, M., Karlsson, J. O., & Rönnbäck, L. (2015). Mindfulness-Based Stress Reduction (MBSR) delivered live on the internet to individuals suffering from mental fatigue after an acquired brain injury. *Mindfulness*, 6(6), 1356-1365. <http://doi.org/f3n4x6>
- Kabat-Zinn, J. (1990). *Full catastrophe living: How to cope with stress, pain and illness using mindfulness meditation*. New York, NY: Dell Publishing.
- Karlsson, P., & Bergmark, A. (2015). Compared with what? An analysis of control-group types in Cochrane and Campbell reviews of psychosocial treatment efficacy with substance use disorders. *Addiction*, 110(3), 420-428. <http://doi.org/f247j6>
- Kozlowski, K. A., & Holmes, C. M. (2014). Experiences in online process groups: A qualitative study. *The Journal for Specialists in Group Work*, 39(4), 276-300. <http://doi.org/dhqm>
- Krägeloh, C. U., Medvedev, O. N., Taylor, T., Wrapson, W., Rix, G., Sumich, A., . . . Siegert, R. J. (2018). A pilot randomized controlled trial for a videoconference-delivered mindfulness-based group intervention in a nonclinical setting. *Mindfulness*, 10(4), 700-711. <http://doi.org/dhqp>

- Krolikowski, A. M. (2013). The effectiveness of internet-based mindfulness interventions for physical and mental illnesses: A narrative review. *International Journal of Cyber Behavior, Psychology and Learning*, 3(4), 84-96. <http://doi.org/dhqq>
- Lenhard, W., & Lenhard, A. (2016). Calculation of Effect Sizes. Psychometrica. Dettelbach, Germany. Retrieved from https://www.psychometrica.de/effect_size.html.
- Lozano, B. E., Birks, A. H., Kloezeman, K., Cha, N., Morland, L. A., & Tuerk, P. W. (2015). Therapeutic alliance in clinical videoconferencing: Optimizing the communication context. In P.W. Tuerk & P. Shore (Ed.), *Clinical Videoconferencing in Telehealth* (pp. 221-251). Switzerland: Springer.
- Luxton, D. D., Sirotn, A. P., & Mishkind, M. C. (2010). Safety of telemental healthcare delivered to clinically unsupervised settings: A systematic review. *Telemedicine and e-Health*, 16(6), 705-711. <http://doi.org/drkhdq>
- Meissner, T. (2017). Video Conferencing for Mindfulness Programs: Benefits, Experiences, and Recommendations. *International Journal of Whole Person Care*, 4(2), 4-15.
- Mindfulness All-Party Parliamentary Group (MAPPG). (2015). Mindful Nation UK. Retrieved from <https://www.themindfulnessinitiative.org/mindful-nation-report>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *PLoS medicine*, 6(7), e1000100. <http://doi.org/cw592j>
- Naslund, J. A., Aschbrenner, K. A., Araya, R., Marsch, L. A., Unützer, J., Patel, V., & Bartels, S. J. (2017). Digital technology for treating and preventing mental disorders in low-income

- and middle-income countries: A narrative review of the literature. *The Lancet Psychiatry*, 4(6), 486-500. <http://doi.org/gbhjsr>
- National Institute of Clinical Excellence (NICE). (2009). *Depression in adults: Full guidance (update)*. London: NICE.
- NHS England. (2019). *The NHS Long Term Plan*. Retrieved from <https://bit.ly/2SMHePF>
- Norcross, J. C., Pfund, R. A., & Prochaska, J. O. (2013). Psychotherapy in 2022: A Delphi poll on its future. *Professional Psychology: Research and Practice*, 44(5), 363. <http://doi.org/f5gttm>
- O'Connor, S., Hanlon, P., O'Donnell, C. A., Garcia, S., Glanville, J., & Mair, F. S. (2016). Understanding factors affecting patient and public engagement and recruitment to digital health interventions: A systematic review of qualitative studies. *BMC Medical Informatics and Decision Making*, 16(1), 120. <http://doi.org/f9bc4k>
- Office for National Statistics. (2018). Internet access. Households and individuals, Great Britain: 2018. Retrieved from <https://bit.ly/2FbWZI8>
- Parsons, C. E., Crane, C., Parsons, L. J., Fjorback, L. O., & Kuyken, W. (2017). Home practice in Mindfulness-Based Cognitive Therapy and Mindfulness-Based Stress Reduction: A systematic review and meta-analysis of participants' mindfulness practice and its association with outcomes. *Behaviour Research and Therapy*, 95, 29-41. <http://doi.org/gbqhgz>
- Pinsof, W. M., & Catherall, D. R. (1986). The integrative psychotherapy alliance: Family, couple and individual therapy scales. *Journal of Marital and Family Therapy*, 12(2), 137-151. <http://doi.org/bmtn75>

- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., . . . Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews. *A product from the ESRC methods programme Version, 1*, b92.
- Pote, H., Moulton-Perkins, A., Griffith, E., Latchford, G., Raczka, R., Cavanagh, K., . . . Laidlaw, K. (2020). *Digital competencies for psychological professions*. Digital Health Skills. Retrieved from <https://www.digitalhealthskills.com/>
- Russell, L., Ugalde, A., Milne, D., Austin, D., & Livingston, P. M. (2018). Digital characteristics and dissemination indicators to optimize delivery of internet-supported mindfulness-based interventions for people with a chronic condition: Systematic review. *JMIR Mental Health*, 5(3), e53. <http://doi.org/dhqs>
- Sansom, S., Crane, R., Karunavira, Koerbel, L. & Yiangou, A. (2020). Addendum to the Mindfulness-Based Interventions Teaching Assessment Criteria (MBI-TAC) for assessing online delivery of Mindfulness-Based Programmes. Retrieved from <http://mbitac.bangor.ac.uk/mbitac-tool.php.en>
- Sansom-Daly, U. M., Wakefield, C. E., McGill, B. C., & Patterson, P. (2015). Ethical and clinical challenges delivering group-based cognitive-behavioural therapy to adolescents and young adults with cancer using videoconferencing technology. *Australian Psychologist*, 50(4), 271-278. <http://doi.org/dhqv>
- Schultz, M., Macaden, L., & Hubbard, G. (2016). Participants' perspectives on mindfulness-based cognitive therapy for inflammatory bowel disease: A qualitative study nested within a pilot randomised controlled trial. *Pilot and Feasibility Studies*, 2(1), 3. <http://doi.org/dhqw>

- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford.
- Seres, M. (2015). Why can't patients receive blood results via text or use Skype for appointments? . *The Guardian*. Retrieved from <https://bit.ly/2ZREWR3>
- Sevilla-Llewellyn-Jones, J., Santesteban-Echarri, O., Pryor, I., McGorry, P., & Alvarez-Jimenez, M. (2018). Web-based mindfulness interventions for mental health treatment: Systematic review and meta-analysis. *JMIR Mental Health*, 5(3), e10278. <http://doi.org/gfcrfm>
- Simmons, G., & Redman, J. (2018). Teaching mindfulness online. *JANZSSA-Journal of the Australian and New Zealand Student Services Association*, 26(1), 3390.
- Simpson, S. G., & Reid, C. L. (2014). Therapeutic alliance in videoconferencing psychotherapy: A review. *Australian Journal of Rural Health*, 22(6), 280-299. <http://doi.org/f6xcs9>
- Spijkerman, M., Pots, W. T. M., & Bohlmeijer, E. T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clinical Psychology Review*, 45, 102-114. <http://doi.org/f8n94s>
- Strauss, C., Cavanagh, K., Oliver, A., & Pettman, D. (2014). Mindfulness-based interventions for people diagnosed with a current episode of an anxiety or depressive disorder: A meta-analysis of randomised controlled trials. *PLoS One*, 9(4), e96110. <http://doi.org/gfzsnj>
- Stronge, A. J., Rogers, W. A., & Fisk, A. D. (2007). Human factors considerations in implementing telemedicine systems to accommodate older adults. *Journal of Telemedicine and Telecare*, 13(1), 1-3. <http://doi.org/dh7rds>
- Sustrans. (2012). *Locked out: Transport poverty in England*. Retrieved from <https://bit.ly/2SHC6wg>

- Thomas, B., Ciliska, D., Dobbins, M., & Micucci, S. (2004). A process for systematically reviewing the literature: Providing the research evidence for public health nursing interventions. *Worldviews on Evidence-Based Nursing, 1*(3), 176-184.
<http://doi.org/ccs79d>
- Thomas, J., O'Mara-Eves, A., Kneale, D., & Shemilt, I. (2017). Synthesis methods for combining and configuring quantitative data. In D. Gough, S. Oliver, & J. Thomas (Eds.), *An introduction to systematic reviews* (2nd ed.). London: Sage.
- Toivonen, K. I., Zernicke, K., & Carlson, L. E. (2017). Web-based mindfulness interventions for people with physical health conditions: Systematic review. *Journal of Medical Internet Research, 19*(8). <http://doi.org/gbvgfx>
- Valentine, J. C., Wilson, S. J., Rindskopf, D., Lau, T. S., Tanner-Smith, E. E., Yeide, M., . . . Foster, L. (2017). Synthesizing evidence in public policy contexts: The challenge of synthesis when there are only a few studies. *Evaluation Review, 41*(1), 3-26.
<http://doi.org/dhqz>
- Visted, E., Vøllestad, J., Nielsen, M. B., & Nielsen, G. H. (2015). The impact of group-based mindfulness training on self-reported mindfulness: A systematic review and meta-analysis. *Mindfulness, 6*(3), 501-522. <http://doi.org/gdnd4q>
- Zernicke, K. A., Campbell, T. S., Specia, M., Carlson, L. E., McCabe-Ruff, K., & Flowers, S. (2014). A randomized wait-list controlled trial of feasibility and efficacy of an online mindfulness-based cancer recovery program: The eTherapy for cancer applying mindfulness trial. *Psychosomatic Medicine, 76*(4), 257-267. <http://doi.org/dhq2>
- Zernicke, K. A., Campbell, T. S., Specia, M., McCabe Ruff, K., Flowers, S., Tamagawa, R., & Carlson, L. E. (2016). The eCALM trial: eTherapy for cancer applying mindfulness.

Exploratory analyses of the associations between online mindfulness-based cancer recovery participation and changes in mood, stress symptoms, mindfulness, posttraumatic growth, and spirituality. *Mindfulness*, 7(5), 1071-1081. <http://doi.org/f83jkn>