Mindfulness
https://doi.org/10.1007/s12671-025-02589-6

ORIGINAL PAPER

The Effect of a Dyadic Support Intervention on Mindfulness Home Practice Adherence: A Pilot and Feasibility Study

Charlotte Borgers[1] · **Johan C. Karremans**[1,3] · **Anne Speckens**[2]

Accepted: 25 April 2025

Abstract

Objectives An important element of mindfulness-based interventions is daily at-home mindfulness practice. However, maintaining regular practice is a challenge for many participants. This study examined the influence of a dyadic support intervention—a "buddy intervention"—on adherence to mindfulness practice in terms of practice frequency and duration.

Method In this quasi-experimental study, 40 participants (age $M = 38.69$, $SD = 13.04$) participating in an 8-week mindfulness-based intervention (MBI) program were assigned to an intervention or control condition. From Session 3, intervention participants were paired with a buddy to support each other's practice throughout the course.

Results Participants in the dyadic support condition maintained a stable frequency of practice sessions per week across the intervention period, while those in the control condition showed a significant decline. This was reflected in a significant interaction between condition (dyadic support vs control) and time. Feedback from 17 participants indicated that most experienced the intervention as positive, though some reported challenges like fading contact and difficulty with texting. Contact frequency ranged from less than once a week to daily, with emotional support being the most common strategy.

Conclusions This pilot study highlights the potential of a dyadic intervention to enhance adherence to mindfulness practice, offering a promising and easily implementable strategy for MBI program. Further larger-scale research using proper randomisation is needed to explore the mechanisms underlying these effects.

Preregistration The study was preregistered using AsPredicted (https://aspredicted.org/52xt-4ywk.pdf; Aspredicted #168189).

Keywords Mindfulness · Practice adherence · Dyadic intervention · Social context

Mindfulness-based interventions (MBIs), such as the mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982) and mindfulness-based cognitive therapy (MBCT; Segal et al., 2002) programs, have been associated with a range of positive outcomes (Creswell, 2017; Galante et al., 2023; Goldberg et al., 2022). These include reduced distress levels (Galante et al., 2023), attenuations in depression and psychiatric symptoms, smoking and substance use (Goldberg et al., 2022), and improvements in cognitive functioning (Im et al., 2021), happiness and productivity (Coo & Salanova, 2018), and social functioning (Karremans et al., 2017). Consistent with such findings, mindfulness-based intervention programs have attracted a large number of participants worldwide (Creswell, 2017).

Both MBSR and MBCT are 8-week programs that teach participants mindfulness skills through various mindfulness practices. Essentially, mindfulness has been defined as paying non-judgmental attention to their moment-to-moment experiences, irrespective of their content or valence (Kabat-Zinn, 2003). In addition to weekly group sessions, the program encourages participants to engage in mindfulness exercises at home for 30 to 45 min daily (Santorelli et al.,

✉ Charlotte Borgers
charlotte.borgers@ru.nl

Johan C. Karremans
johan.karremans@ru.nl

Anne Speckens
anne.speckens@radboudumc.nl

[1] Behavioural Science Institute, Radboud University Nijmegen, Postbus 9104, 6500 HE Nijmegen, the Netherlands

[2] Department of Psychiatry, Radboud University Medical Centre Nijmegen, PO Box 9101, 6500 HB Nijmegen, the Netherlands

[3] Universitas Padjadjaran, Bandung, Indonesia

Published online: 10 May 2025

2017; Segal et al., 2018), including guided sitting meditations, body scans, or yoga exercises. These daily exercises are intended to enhance participants' mindfulness skills and facilitate the integration of mindfulness into everyday life (Baydoun et al., 2021). Studies have reported associations between higher levels of home practice and greater improvements in well-being, stress reduction, and interpersonal outcomes (e.g., Birtwell et al., 2019; Greenberg et al., 2018; Van der Schans et al., 2024). Although some studies did not find that the amount of home practice was associated with intervention outcomes (e.g., Ter Avest et al., 2021), and the exact optimum of practice duration is still unclear (Bambacus & Conley, 2024; Ribeiro et al., 2018), meta-analytic findings suggest that participants' engagement in home practice is generally associated with better treatment outcomes (Parsons et al., 2017).

However, despite the apparent importance of regular practice, it seems quite challenging for participants to actually do and maintain the mindfulness exercises at home. Regular home practice requires commitment, effort, and a fair amount of time investment in the often already busy lives of participants (Masheder et al., 2020). Indeed, research has indicated that participants struggle to complete the recommended practice (Lloyd et al., 2018; Parsons et al., 2017). The meta-analysis by Parsons et al. (2017) indicates that MBI participants, on average, complete about 60% of assigned amounts of practice, potentially missing out on some of the benefits of the program. Moreover, considerable variability between participants was found in the reported amount of home practice (Lloyd et al., 2018; Parsons et al., 2017).

While mindfulness trainers and practitioners widely acknowledge both the importance and the challenge of regular home practice, research on interventions designed to promote home practice in MBIs is sparse. One study found that making concrete action plans—e.g., planning exactly when and where to practice—could help stimulate home practice in MBIs, especially for participants who had a strong goal to adhere to home practice instructions (Galla et al., 2016).

In a theoretical reflection on the factors that should guide interventions to promote practice adherence, Masheder et al. (2020) argued that, theoretically, the level of social support that mindfulness trainees receive from their fellow group members might be a very prominent factor in facilitating and prompting home practice behaviour, as was also suggested by qualitative reports from their mindfulness trainees. Of relevance, health-behaviour change research has started to focus more strongly on the role of the social context, suggesting that interventions may be particularly successful when incorporating and capitalising on the social context (Di Maio et al., 2024; Holman et al., 2017; Kwasnicka et al., 2016; Szczuka et al., 2021). Mindfulness practice can be conceptualised as a health behaviour that, similar to for example dieting and physical exercise, is intended to promote health and wellbeing, but also demands effort (Miles et al., 2023). Hence, health behaviour research may help inform interventions to promote practice adherence within the context of MBIs (Canby et al., 2020).

One approach health behaviour change studies have used to incorporate the social context into interventions is through *dyadic* interventions (Carr et al., 2018; Di Maio et al., 2024). Rather than focusing on individual targets, dyadic interventions involve two individuals. Di Maio et al. (2024) defined dyadic interventions as "explicitly addressing both members of a dyad as part of the intervention, with a range of techniques targeting either one (focus person or partner) or both partners to change at least one dyad member's health behaviour… (p. 3)." For instance, the intervention can consist of one person supporting the other person to attain a specific goal (*cross-over technique*) or both dyad members striving to reach the same goal (*joint technique*; Scholz et al., 2020).

Di Maio et al. (2024) recently provided an overview of studies that demonstrate the effectiveness of a dyadic intervention approach for various health behaviours. For example, Rackow et al. (2014) found that participants increased their physical exercise across a period of 8 weeks after finding a companion to engage in physical exercise with, as compared to doing it alone. Similarly, studies have found that planning with a partner (versus making a plan alone) was associated with a stronger increase in physical behaviour and a stronger reduction in sedentary behaviour (Kulis et al., 2022; Szczuka et al., 2021). Another study showed that pursuing weight loss goals together (versus alone) improved healthy eating and reduced waist size more strongly (Prestwich et al., 2014). Such interventions are particularly effective when both partners share similar experiences and goals, as this fosters mutual understanding, commitment, and perceptions of well-intended support (Berli et al., 2018; Hong et al., 2005; Thoits, 1995). Additionally, "supportive equity," where partners can reciprocate support, contributes to positive mood outcomes (Berli et al., 2018; Gleason et al., 2003). These findings suggest that behaviour change is often more successful when pursued in a dyadic context rather than alone.

Dyadic interventions may employ various behaviour change techniques, which can trigger a cascade of effects due to the interplay between social interactions, cognition, and behaviour (Bandura, 1989; Scholz et al., 2020). One such technique is *collaborative planning*, which not only facilitates individual behaviour change but also leads to the creation of higher-quality plans and encourages social support and social control (Knoll et al., 2017; Prestwich et al., 2005). Another technique involves *emotional support*: receiving encouragement from a partner can boost an individual's sense of self-efficacy, empowering them to pursue their goals more effectively (e.g., Benight & Bandura, 2004;

Rackow et al., 2015). In addition, mutual support within the dyad enhances both *self- and social monitoring* (Abraham & Michie, 2008; Craddock et al., 2015), increasing the salience of health behaviours and serving as a reminder to engage in practices like mindfulness (Rackow et al., 2015; Riccio et al., 2019). These interactions around shared goals ultimately foster a sense of mutual responsibility and accountability between partners (Craddock et al., 2015; Riccio et al., 2019).

In short, through various psychological processes, dyadic interventions have been shown to be particularly effective in promoting behaviour change across various health behaviours. In a similar vein, a dyadic intervention could be an effective strategy to promote mindfulness home practice adherence.

While previous research on mindfulness home practice has focused primarily on its possible benefits for training outcomes, there little research that has examined the factors that promote practice adherence itself. With the current pilot study, we aimed to contribute to this literature by providing an initial test of the general prediction that a dyadic intervention enhances mindfulness home practice adherence compared to a no-intervention condition. About half of our participants—MBSR or MBCT trainees—were instructed to form dyads (which we refer to as "buddies") within their mindfulness training group. Buddies were encouraged to support each other during the MBI by keeping in touch through text messages via their phones and using various support types.

We pilot-tested whether the dyadic intervention group, compared to the control group, would show more practice adherence as indicated by a higher frequency and/or duration of practice. In addition to evaluating the intervention's effectiveness on mindfulness home practice, the study also explored its feasibility. Specifically, we explored participants' engagement in the intervention, the frequency of contact between members of the dyad (i.e., between buddies), and participants' subjective experiences in the dyadic intervention group.

Method

Participants

Participants were recruited from the Radboudumc Expertise Centre of Mindfulness in Nijmegen, the Netherlands. The centre offers MBSR courses for the employees at the hospital and the university as well as the general population, and MBCT courses for patients with psychiatric disorders such as depression and ADHD. As an initial step, mindfulness trainers employed at the centre were asked if they were willing to facilitate the study by allowing the researcher to approach their participants at the start of the training. Next, participants of two 8-week MBSR groups and four 8-week MBCT training groups were approached for the study. During the first training session, the researcher introduced the study. All participants were given the information letter and signed the informed consent form if they wanted to participate. It was stressed that participation was voluntary and declining had no consequences. Forty-one training participants agreed to take part in the study. One participant dropped out of the study during data collection, which led to a final sample consisting of $n = 40$ participants between 20 and 75 years old ($M = 38.69$, $SD = 13.04$). Thirteen participants identified as male, 24 as female, and one with the category "other." Two participants did not indicate their gender.

After the first two sessions, the training groups were divided into intervention and control conditions. Since the primary researcher joined one of the MBSR groups as a training participant, this group was assigned to the control condition, and data from the researcher was omitted. One MBCT group and one MBSR group served as control groups without intervention, while three MBCT groups and one MBSR group received the intervention.

This uneven allocation of MBCT groups was necessary to maintain a sufficient number of participants in the intervention condition, because, in this naturalistic setting, intervention participants were given the freedom to opt out of the intervention. Participants who chose to take part in the study but did not want to engage in the buddy system were subsequently reassigned to the control condition. Due to the partial self-selection of participants and the consequent lack of equivalence among the groups, the current study design is considered quasi-experimental.

The final sample consisted of 21 participants in the control condition and 19 participants in the intervention condition. For an overview of the study flow, see Fig. 1.

The study was approved by the ECSW (Ethics Committee of the Faculty of Social Sciences) with a full-track procedure (approval number ECSW-2024–032). Preregistration was done via AsPredicted.

Procedures

During the first session of the MBI, the researcher introduced the study. All MBI participants were given the information letter and an informed consent form to sign if they agreed to participate. Participants were assured that the mindfulness instructor would not see their responses. Participation in the study required only approximately 5 additional minutes per week, beyond the mindfulness course they had independently enrolled in.

From the first session onward, participants were asked to track their formal mindfulness practice in terms of frequency and duration. They did so by using a weekly registration

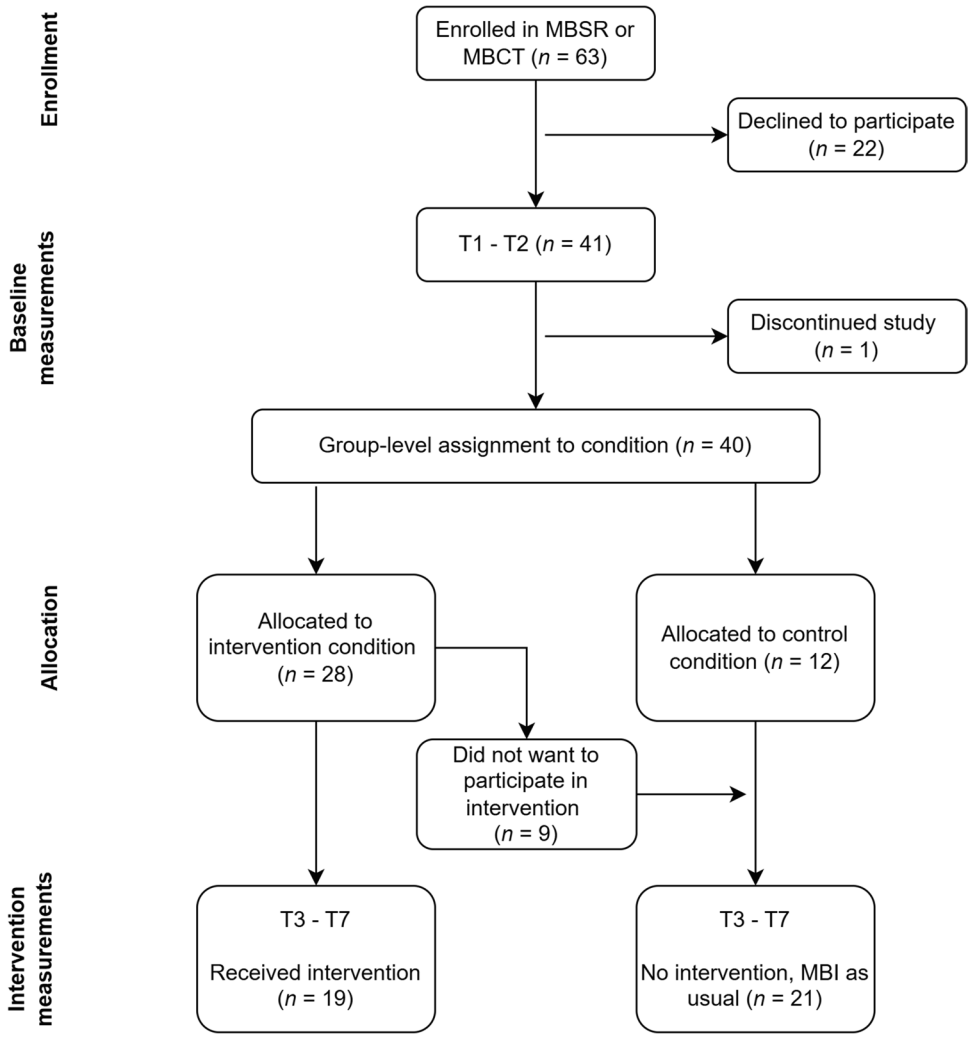

Fig. 1 Flow diagram of the progress throughout the study

form, which is the most common way of recording practice in previous studies (Parsons et al., 2017). Participants submitted their completed forms at the beginning of each subsequent session, ensuring seven measurement points for each individual, i.e., one for every session (Sessions 2 through 8). Participants who forgot to fill out the form at home were asked to do so retrospectively during the session.

In the intervention groups, the intervention started from the third session onward. Five additional participants joined the intervention in Session 4, as they had either missed the third session or needed more time to decide on their participation.

During the eighth session, participants provided demographic information (age and gender) and answered supplementary questions described below.

Mindfulness Program

The MBI programs adhered to the standardized protocol of mindfulness-based stress reduction (MBSR; Santorelli et al., 2017) and mindfulness-based cognitive therapy (MBCT; Segal et al., 2018). The programs were taught in groups of 8–14 participants by qualified teachers according to the advanced criteria of the Association of Mindfulness-Based Teachers in the Netherlands and Flanders (VMBN, n.d.). The audio files participants needed for their home practice were available on the mindfulness centre's website.

Dyadic Intervention

During the intervention session, participants were instructed by the researcher to form pairs or "buddies" (or a group of three if the training group size was uneven). They were free to choose a buddy themselves, but the researcher facilitated the formation where necessary by giving suggestions (e.g., when a group of three had to be formed). Buddies were asked to exchange contact information to keep in touch in between sessions through text messages on their mobile phones. Moreover, participants received oral and written

instructions on supporting and encouraging their buddies in their home practice.

This written guidance on social support was provided in the form of a flyer, which is depicted in Fig. 2. Information on different types of support they could provide was included, with examples of each strategy. This included (1) keeping each other updated; (2) providing emotional support; and (3) planning together. Additionally, the researcher encouraged participants to discuss preferred forms and support methods with their buddies.

Measures

Practice adherence was measured using a registration form (see Online Resource 1). This form consisted of a table with six rows, representing the days between sessions. For each day, participants were asked to indicate whether they engaged in the assigned formal mindfulness exercises, and if so, to report the duration of their practice (in minutes). The form was created for use in the current intervention setting and was designed to be practical and easy to use for

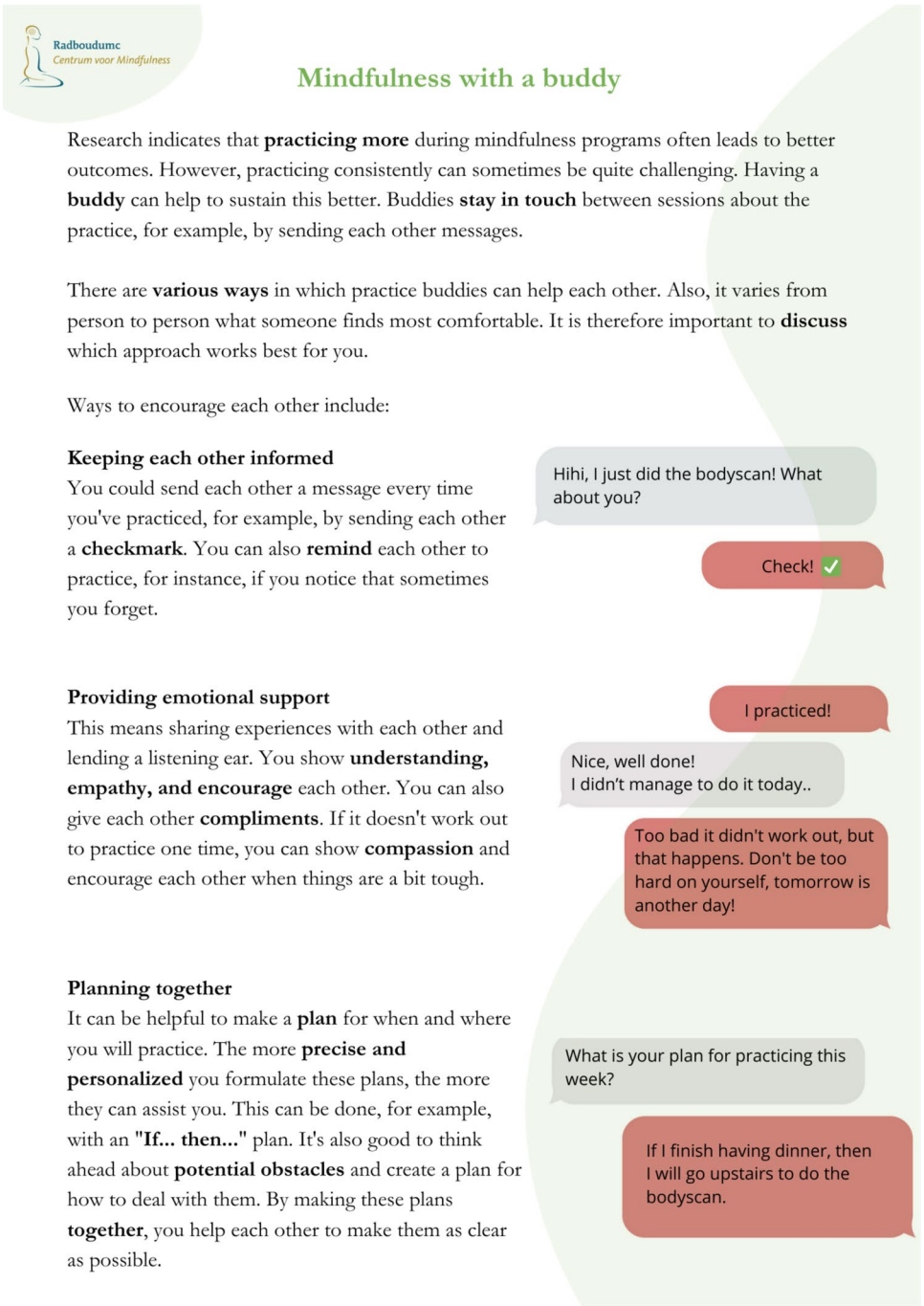

Fig. 2 Flyer with information on social support

participants. Although the registration form was not formally validated, it served as a straightforward self-report tool to monitor home practice adherence.

To further assess the feasibility of the intervention, participants in the intervention condition were asked during the final session to indicate to what extent they used each of the support strategies, on a scale of 0 (*not at all*) to 5 (*all the time*). Moreover, the frequency of contact between buddies was indicated, followed by an open question on the subjective experience of the intervention. For the full questionnaire, see Online Resource 1.

Data Analyses

Calculations were done using IBM SPSS statistics (version 28). Analyses were done on frequency (i.e., the number of times one engaged in formal practice per week) and average practice session duration per week. Before conducting the primary analyses, the data were visually inspected. Using histograms and Q-Q plots, the normality of the residuals of the variables was checked through visual inspection. Three outliers in the duration of practice were identified using a cut-off score of 3.00 *SD* from the mean, and they were excluded from the duration analysis.

First, a linear mixed-effects analysis (multilevel analysis) was performed to examine the effects of the intervention on mindfulness practice *frequency*. This analysis explicitly addressed the nested structure of the data, with participants (Level 1) nested within dyads (Level 2), which in turn were nested within training groups (Level 3). This approach mitigates the issue of non-independent observations, a common challenge in studies with hierarchical data structures (Carnero-Alcázar et al., 2022). Specifically, individuals within training groups may exhibit similarities due to shared mindfulness trainers, while individuals within dyads may influence each other's behaviours. The fixed factors of intervention (yes/no) and time (Sessions 1–7), and the interaction effect between intervention and time were included in the model. Random intercepts were included for participants, dyads and training groups to account for individual differences between persons, differences between dyads, and differences between training groups and/or trainers. Furthermore, random slopes were specified for these random factors, allowing for distinct patterns of change. The primary research question was addressed by examining the interaction effect between intervention and time, which evaluated the impact of the intervention on mindfulness practice frequency over time. In post hoc analyses, separate analyses were done for both the intervention and no intervention control conditions to see differences in the effects of time on the variables of interest.

Secondly, a linear mixed-effects analysis (multilevel analysis) was performed to examine the effects of the intervention on mindfulness practice *duration*, using the same procedure as the frequency analysis and examining the interaction effect between intervention and time. This evaluated the impact of the intervention on the duration of mindfulness practice over time.

Furthermore, as a significant difference in age was found between the intervention and the control group, age was included as a covariate in the primary analyses to control for its potential effects on the variables of interest, which did not change the conclusions of the results (see Online Resource 2).

Results

The multilevel analyses with *practice frequency* as a dependent variable showed no significant main effects of time on practice frequency, $t(201.99) = -0.90$, $p = 0.37$, nor of intervention on practice frequency, $t(95.86) = 0.72$, $p = 0.471$, indicating that neither time nor intervention were independently associated with frequency of practice. Importantly, the analysis revealed a significant interaction between time and intervention on frequency of practice, $t(206.11) = -2.31$; $p = 0.02$, indicating that the intervention group differed significantly from the control group over time in the frequency that participants practised.

To further examine the significant group × time interaction on the frequency of practice, post hoc analyses revealed that for the intervention group, there was no significant effect of time on the frequency of practice, $t(105.97) = -1.09$, $p = 0.28$. In contrast, for the control group, there was a significant decline in practice over time, $t(97.81) = -3.48$, $p < 0.001$. The significant interaction effect indicates that the frequency of practice remained relatively stable in the intervention group, whereas it declined significantly in the control group. Figure 3 shows the course of the practice frequency per time point for the intervention and control groups.

A similar analysis was done for average *practice duration*. A significant effect was found for the fixed effect of time, $t(191.63) = -4.20$, $p < 0.001$, on practice duration, suggesting that regardless of condition, all participants reduced the length of practice sessions. No significant effect on the duration of practice was found for the fixed effect of the intervention, $t(97.56) = -0.90$, $p = 0.37$. The time × intervention interaction effect on practice duration was not significant, $t(196.16) = 0.31$, $p = 0.76$. This indicates that the groups did not differ in their duration of practice over time, suggesting that the intervention did not influence practice duration. Figure 4 shows the course of the average practice duration for both groups. Table 1 shows the estimates of fixed effects for both dependent variables.

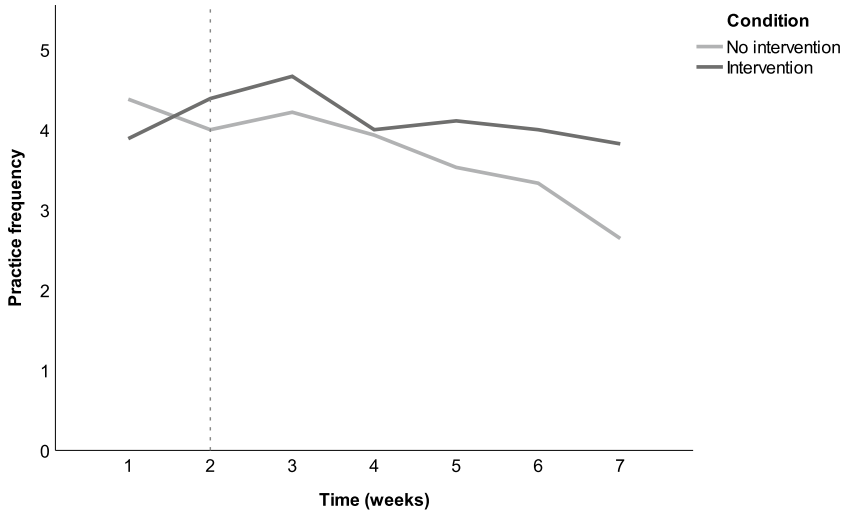

Fig. 3 Practice frequency after each session, by condition. The dotted line indicates the onset of the intervention in the intervention group, after the first two baseline measurements

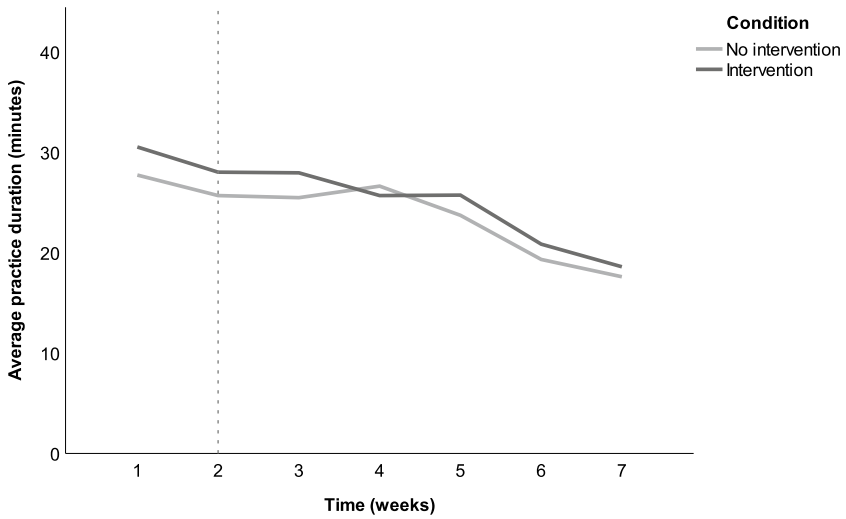

Fig. 4 Average practice duration after each session, by condition. The dotted line indicates the onset of the intervention in the intervention group, after the first two baseline measurements

Table 1 Estimates of fixed effects for frequency and duration of practice

	Estimate	*SE*	*p*-value	95% CI	
				Lower bound	Upper bound
Frequency					
Time	−0.54	0.06	0.37	−0.17	0.06
Intervention	0.40	0.57	0.47	−0.70	1.50
Time × Intervention	−0.20	0.09	0.02*	−0.37	−0.03
Duration					
Time	−1.87	0.45	< 0.001**	−2.75	−0.99
Intervention	−3.41	3.79	0.37	−10.94	4.11
Time × Intervention	0.20	0.65	0.76	−1.08	1.48

*$p < 0.05$; **$p < 0.01$

Next, we explored participants' experiences with the dyadic intervention, for which 17 of the 19 intervention participants provided additional information about their experience of the intervention, including the frequency of contact between buddies and which support strategies were used. Five participants reported having contact less than once a week; four others indicated contact 1–2 times per week; one indicated contact 1–4 times per week; four reported contact 3–4 times per week; and three indicated they were in touch 5–7 times per week. The extent

to which participants indicated the provision of each support strategy on a scale of 1–5 was, on average, $M = 3.13$ ($SD = 1.06$; median = 3.0, $IQR = 2.0–4.0$) for emotional support, $M = 2.69$ ($SD = 1.36$; median = 3.0, $IQR = 2.0–4.0$) for providing updates, and $M = 0.88$ ($SD = 0.99$; median = 0.5, $IQR = 0.0–2.0$) for planning together. This indicates that participants used the dyadic planning strategy relatively little compared to the other methods. Exploratory analyses revealed no significant associations between these strategies and the frequency over time with which participants practised, namely $F(1,73) = 3,92$; $p = 0.051$, for emotional support; $F(1,73) = 0.44$; $p = 0.51$, for providing updates; and $F(1,73) = 1,13$; $p = 0.29$, for planning together.

The open-ended question revealed information about participants' subjective experience of the dyadic intervention. Fourteen of the 17 participants indicated they experienced the intervention as positive or helpful. One participant stated: "It was nice, we could discuss the course and what we thought of it as well as the different exercises. It was nice going through all of that with someone", and another one wrote: "It provided some extra motivation, and sometimes some additional reflection." Conversely, four participants reported that the intervention did not help them. For instance, one participant mentioned: "I did not really put in the effort to stay in touch because I didn't think about it, and the times I remembered to do so, I did not practise." Moreover, one participant expressed a positive experience overall but felt the intervention had not been helpful. Three participants expressed negative aspects of the intervention, which included perceiving phone use as a burden and experiencing a feeling of failure when not doing the practice. Some additional comments included that the contact faded over time, one dyad indicated that they were both very bad at texting, and one participant indicated that he did not feel very connected to his buddy because of the age difference. The full list of answers can be found in Online Resource 3.

Discussion

The present study was designed to provide an initial test of the effectiveness of a dyadic support intervention on mindfulness practice adherence, in terms of practice frequency and duration, and feasibility and acceptance. The dyadic "buddy" intervention promoted practice frequency over time by buffering against the decline in practice frequency that was observed in the no-intervention group. This suggests that the intervention was effective in maintaining the frequency of mindfulness practice throughout the training. Furthermore, it was found that all participants declined in their duration of practice over time. No effects of the intervention on the duration of practice were observed, indicating that the intervention did not affect the amount of time that participants practised per exercise. In short, our findings demonstrate that a low-cost and easy-to-implement intervention of forming buddies enhanced the maintenance of mindfulness home practice frequency (but not average duration) across the whole period of the MBIs.

While the importance of companionship in mindfulness meditation practice has long been recognised, with ancient Buddhist scriptures emphasising the value of others in meditation practice (Masheder et al., 2020), the present study is the first to empirically examine the potential of dyadic support for mindfulness practice adherence. Its results align with previous research on dyadic social support interventions for the maintenance of health behaviours (Di Maio et al., 2024; Hunter et al., 2019; Scholz et al., 2020). For instance, very similar to the current findings, Rackow et al. (2014) found that participants who were assigned to a sports buddy were able to maintain regular exercise over time, while the control participants decreased their exercise after several weeks. Our findings extend this previous research to the domain of mindfulness practice, underscoring that dyadic interventions can be applied to various types of health behaviour (e.g., Miles et al., 2023).

The effects on practice frequency but not on practice duration suggest that the dyadic intervention was more effective in encouraging participants to initiate practice sessions regularly rather than sustain sessions for longer durations. Social support from a buddy may have served as a prompt to practise, increasing frequency, but it did not directly influence session duration. Several factors may explain this differential effect on frequency versus duration. In the MBSR and MBCT programs in our study, participants had the option of choosing either a longer or a shorter audio file for the formal practice exercises. Length of practice was found previously as a barrier for participants in MBIs (Banerjee et al., 2017), and in line with this, some participants in the current study indicated time constraints as a significant barrier and expressed a preference for shorter practice sessions. Choosing the longer exercise over the shorter exercise may require overcoming certain personal and logistical barriers, which could have remained an obstacle regardless of whether one has a buddy. However, recent research has indicated that participants who practised for a shorter period experienced similar outcomes to participants who practised for longer periods (Palmer et al., 2023; Strohmaier et al., 2020). Thus, frequency of practice might be a more important aspect in predicting outcomes than duration.

The initial findings of this pilot study offer several implications for practice. First, the findings suggest that the buddy system is feasible and can be relatively easily applied to MBI programs to help participants maintain a regular practice routine. Second, we noticed that not all participants were willing to engage in the buddy system, which may be an aspect to consider when applying the intervention. Research

indicates that keeping the intervention voluntary may be important for its effectiveness, as the motivation of dyad members to engage in a dyadic intervention is thought to be a significant enabling factor (Baucom et al., 2012; Scholz et al., 2020). To address this, the mindfulness trainer could explain the benefits of a dyadic approach to increase motivation (Baucom et al., 2012), but they should also keep in mind that the intervention may not be suitable for everyone. For instance, one participant mentioned in a personal communication that she did not want to be too focused on others, and another participant did not feel comfortable sharing her private number, which are reasonable arguments for not wanting to participate. Thus, while providing the buddy system as a voluntary option for MBI participants could be a helpful tool to promote home practice, mindfulness teachers should be aware of the personal reasons trainees might have for choosing not to participate.

The results of the post-intervention questionnaire showed that participants in the intervention group relied mainly on emotional support and on keeping each other updated as their main forms of support. Previous research suggests that these support strategies may increase self-efficacy, behaviour monitoring, and feelings of mutual responsibility (Benight & Bandura, 2004; Craddock et al., 2015; Rackow et al., 2015). The sparse use of joint planning makes it unlikely that joint planning significantly contributed to the observed effects, although it is possible that even a single instance of planning could have had an impact on adherence. Additional research is needed to better understand the underlying mechanisms that contribute to the present effects. A research design looking at these three strategies in isolation could provide valuable insights into the distinct influence of each approach.

Limitations and Future Directions

Despite several strengths of the study, including high ecological validity due to its naturalistic setting and its longitudinal design, some important limitations should be considered when interpreting the current findings. One key limitation is that the assignment of participants to the intervention and control conditions was not completely random. Although we started with group-level random assignment, participants who chose not to engage in the buddy system were placed in the control group, resulting in a quasi-experimental design. Therefore, selection effects cannot be ruled out. For example, participants who were more motivated to practise may have been more eager to engage in an additional intervention to help them practise. A larger study with a more strictly randomised design is needed to rule out such possible confounding factors. Furthermore, we only collected demographic data on gender and age. The lack of more detailed demographic information, such as education level, socioeconomic status, or cultural background, limits the ability to evaluate the generalisability of the findings. Future studies should address these factors.

Moreover, relying on self-report measures to assess mindfulness practice adherence may be subject to biases such as recall errors. Wahbeh et al. (2011), for instance, found discrepancies between subjective and objective measures of the practice of MBI participants. This suggests that our self-reported frequency and duration data may reflect participants' perceived rather than actual practice, potentially limiting the precision of our adherence estimates. Relatedly, because neither the participants nor the researcher were blind to the conditions, the results could also have been influenced by social desirability or demand characteristics. Future research could incorporate different measures of practice adherence, such as ecological momentary assessment or smartphone apps (e.g., Parsons et al., 2020), to provide more accurate and reliable data.

There are some important aspects of practice that we did not consider in the present study. For instance, the quality of practice is an aspect that plays an important role in the effects of MBI courses (Del Re et al., 2013), which may include receptiveness and perseverance during practice. It is interesting to see if dyadic social support influences practice quality through factors such as *mindfulness self-efficacy*, which refers to the confidence in maintaining a non-judgmental awareness in various situations (Chang et al., 2004). Moreover, we did not investigate participants' informal practices. Although some researchers did not find associations between informal practice and psychological outcomes (Crane et al., 2014), others did (Birtwell et al., 2019; Manigault et al., 2021). In future research, clarifying the impact of a dyadic intervention on informal practice and practice quality can yield valuable insights into optimising the effectiveness of MBIs.

Moreover, future studies could investigate potential moderators of dyadic intervention effects to help identify subgroups of participants who may benefit most from a dyadic intervention. Responses to our open-ended questions revealed variability in how participants experienced the buddy system. Most participants described the intervention as helpful and motivating, while others found it less helpful or even reported feeling more pressured. Factors such as personality, cultural background, and individual differences in coping strategies could be explored as potential moderators (Dunkel-Schetter et al., 1987; Scholz et al., 2020). For instance, Barańczuk (2019) found a positive association between extraversion and the perception of received social support. Understanding possible individual differences could help tailor dyadic interventions to optimise their effectiveness, minimise potential drawbacks, and enhance their applicability across diverse populations.

Finally, it would be interesting to conduct long-term follow-up assessments to examine the durability of dyadic

intervention effects on mindfulness practice adherence and related outcomes. This would provide valuable insights into the sustainability of behaviour change over time beyond the duration of the MBI, a period during which formal mindfulness practice often declines compared to the training period (Canby et al., 2020; Ribeiro et al., 2018). In our study, some participants indicated that they intended to keep in touch with their buddies about mindfulness-related activities, suggesting a potential for ongoing support.

In conclusion, this study investigated the effects of a dyadic support intervention on adherence to home mindfulness practice. We found initial support that teaming up with a buddy can help MBI participants sustain their home practice frequency throughout the program. The intervention can be effectively applied to MBIs due to its minimally invasive nature, ease of implementation, and the fact that most participants reported a positive experience. The current pilot results offer a foundation for larger studies with more rigorous methodologies with proper randomisation to validate these preliminary findings and explore the dyadic intervention in greater depth, helping to understand its effective components and boundary conditions.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12671-025-02589-6.

Author Contribution Charlotte Borgers: material preparation, data collection and analysis, writing—original draft preparation. Johan Karremans: supervision, writing—reviewing and editing. Anne Speckens: writing—reviewing and editing. All authors contributed to the study conception and design.

Data Availability The datasets are available from the corresponding author upon reasonable request.

Declarations

Ethics Approval The study was approved by the ECSW (Ethics Committee of the Faculty of Social Sciences) of the Radboud University with a full-track procedure (approval number ECSW-2024–032). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Use of Artificial Intelligence AI was occasionally used for editing the manuscript to improve English language.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of interest The authors declare no competing interests.

References

Abraham, C., & Michie, S. (2008). A taxonomy of behaviour change techniques used in interventions. *Health Psychology, 27*, 379–387. https://doi.org/10.1037/0278-6133.27.3.379

Bambacus, E. S., & Conley, A. H. (2024). The impact of dosage on a mindfulness intervention with first-year college students. *Journal of College Student Retention: Research, Theory and Practice, 25*(4), 979–1000. https://doi.org/10.1177/15210251211041695

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(9), 1175–1184. https://doi.org/10.1037/0003-066X.44.9.1175

Banerjee, M., Cavanagh, K., & Strauss, C. (2017). A qualitative study with healthcare staff exploring the facilitators and barriers to engaging in a self-help mindfulness-based intervention. *Mindfulness, 8*(6), 1653–1664. https://doi.org/10.1007/s12671-017-0740-z

Barańczuk, U. (2019). The five factor model of personality and social support: A meta-analysis. *Journal of Research in Personality, 81*, 38–46. https://doi.org/10.1016/j.jrp.2019.05.002

Baucom, D. H., Porter, L. S., Kirby, J. S., & Hudepohl, J. (2012). Couple-based interventions for medical problems. *Behavior Therapy, 43*, 61–76. https://doi.org/10.1016/j.beth.2011.01.008

Baydoun, M., Moran, C., McLennan, A., Piedalue, K. A. L., Oberoi, D., & Carlson, L. E. (2021). Mindfulness-based interventions in cancer survivors: A systematic review of participants' adherence to home practice. *Patient Preference and Adherence, 15*, 1225–1242. https://doi.org/10.2147/PPA.S267064

Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy, 42*(10), 1129–1148. https://doi.org/10.1016/j.brat.2003.08.008

Berli, C., Bolger, N., Shrout, P. E., Stadler, G., & Scholz, U. (2018). Interpersonal processes of couples' daily support for goal pursuit: The example of physical activity. *Personality and Social Psychology Bulletin, 44*(3), 332–344. https://doi.org/10.1177/0146167217739264

Birtwell, K., Williams, K., Van Marwijk, H., Armitage, C. J., & Sheffield, D. (2019). An exploration of formal and informal mindfulness practice and associations with wellbeing. *Mindfulness, 10*(1), 89–99. https://doi.org/10.1007/s12671-018-0951-y

Canby, N. K., Eichel, K., Peters, S. I., Rahrig, H., & Britton, W. B. (2020). Predictors of out-of-class mindfulness practice adherence during and after a mindfulness-based intervention. *Psychosomatic Medicine, 83*(6), 655–664. https://doi.org/10.1097/psy.0000000000000873

Carnero-Alcázar, M., Montero-Cruces, L., & Maroto-Castellanos, L. (2022). Mixed models: An essential tool for non-independent data analysis. *European Journal of Cardio-Thoracic Surgery, 62*(4), ezac462. https://doi.org/10.1093/ejcts/ezac462

Carr, R. M., Prestwich, A., Kwaśnicka, D., Thøgersen-Ntoumani, C., Gucciardi, D. F., Quested, E., Hall, L., & Ntoumanis, N. (2018). Dyadic interventions to promote physical activity and reduce sedentary behaviour: Systematic review and meta-analysis. *Health Psychology Review, 13*(1), 91–109. https://doi.org/10.1080/17437199.2018.1532312

Chang, V. Y., Palesh, O., Caldwell, R., Glasgow, N., Abramson, M., Luskin, F., Gill, M., Burke, A., & Koopman, C. (2004). The effects of a mindfulness-based stress reduction program on stress,

mindfulness self-efficacy, and positive states of mind. *Stress and Health, 20*(3), 141–147. https://doi.org/10.1002/smi.1011

Coo, C., & Salanova, M. (2018). Mindfulness can make you happy-and-productive: A mindfulness controlled trial and its effects on happiness, work engagement and performance. *Journal of Happiness Studies, 19*, 1691–1711. https://doi.org/10.1007/s10902-017-9892-8

Craddock, E., vanDellen, M. R., Novak, S. A., & Ranby, K. W. (2015). Influence in relationships: A meta-analysis on health-related social control. *Basic and Applied Social Psychology, 37*(2), 118–130. https://doi.org/10.1080/01973533.2015.1011271

Crane, C., Crane, R. S., Eames, C., Fennell, M. J., Silverton, S., Williams, J. M. G., & Barnhofer, T. (2014). The effects of amount of home meditation practice in mindfulness based cognitive therapy on hazard of relapse to depression in the Staying Well after Depression Trial. *Behaviour Research and Therapy, 63*, 17–24. https://doi.org/10.1016/j.brat.2014.08.015

Creswell, J. D. (2017). Mindfulness interventions. *Annual Review of Psychology, 68*, 491–516. https://doi.org/10.1146/annurev-psych-042716-051139

Del Re, A. C., Flückiger, C., Goldberg, S. B., & Hoyt, W. T. (2013). Monitoring mindfulness practice quality: An important consideration in mindfulness practice. *Psychotherapy Research, 23*(1), 54–66. https://doi.org/10.1080/10503307.2012.729275

Di Maio, S., Villinger, K., Knoll, N., Scholz, U., Stadler, G., Gawrilow, C., & Berli, C. (2024). Compendium of dyadic intervention techniques (DITs) to change health behaviours: A systematic review. *Health Psychology Review*, 1–36. https://doi.org/10.1080/17437199.2024.2307534

Dunkel-Schetter, C., Folkman, S., & Lazarus, R. S. (1987). Correlates of social support receipt. *Journal of Personality and Social Psychology, 53*(1), 71–80. https://doi.org/10.1037/0022-3514.53.1.71

Galante, J., Friedrich, C., Dalgleish, T., Jones, P. B., & White, I. R. (2023). Individual participant data systematic review and meta-analysis of randomised controlled trials assessing adult mindfulness-based programs for mental health promotion in non-clinical settings. *Nature Mental Health, 1*(7), 462–476. https://doi.org/10.1038/s44220-023-00081-5

Galla, B. M., Baelen, R. N., Duckworth, A. L., & Baime, M. J. (2016). Mindfulness, meet self-regulation: Boosting out-of-class meditation practice with brief action plans. *Motivation Science, 2*(4), 220. https://doi.org/10.1037/mot0000045

Gleason, M. E. J., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality and Social Psychology Bulletin, 29*(8), 1036–1045. https://doi.org/10.1177/0146167203253473

Goldberg, S. B., Riordan, K. M., Sun, S., & Davidson, R. J. (2022). The empirical status of mindfulness-based interventions: A systematic review of 44 meta-analyses of randomized controlled trials. *Perspectives on Psychological Science, 17*(1), 108–130. https://doi.org/10.1177/1745691620968771

Greenberg, J., Braun, T. D., Schneider, M. L., Finkelstein-Fox, L., Conboy, L. A., Schifano, E. D., Park, C., & Lazar, S. W. (2018). Is less more? A randomized comparison of home practice time in a mind-body program. *Behaviour Research and Therapy, 111*, 52–56. https://doi.org/10.1016/j.brat.2018.10.003

Holman, D., Lynch, R., & Reeves, A. (2017). How do health behaviour interventions take account of social context? A literature trend and co-citation analysis. *Health, 22*(4), 389–410. https://doi.org/10.1177/1363459317695630

Hong, T. B., Franks, M. M., Gonzalez, R., Keteyian, S. J., Franklin, B. A., & Artinian, N. T. (2005). A dyadic investigation of exercise support between cardiac patients and their spouses. *Health Psychology, 24*(4), 430–434. https://doi.org/10.1037/0278-6133.24.4.430

Hunter, R. F., De La Haye, K., Murray, J. M., Badham, J., Valente, T. W., Clarke, M., & Kee, F. (2019). Social network interventions for health behaviours and outcomes: A systematic review and meta-analysis. *PLoS Medicine, 16*(9), e1002890. https://doi.org/10.1371/journal.pmed.1002890

Im, S., Stavas, J., Lee, J., Mir, Z., Hazlett-Stevens, H., & Caplovitz, G. (2021). Does mindfulness-based intervention improve cognitive function?: A meta-analysis of controlled studies. *Clinical Psychology Review, 84*, 101972. https://doi.org/10.1016/j.cpr.2021.101972

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry, 4*, 33–47. https://doi.org/10.1016/0163-8343(82)90026-3

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*, 144–156. https://doi.org/10.1093/clipsy.bpg016

Karremans, J. C., Schellekens, M. P. J., & Kappen, G. (2017). Bridging the sciences of mindfulness and romantic relationships: A theoretical model and research agenda. *Personality and Social Psychology Review, 21*, 29–49. https://doi.org/10.1177/1088868315615450

Knoll, N., Hohl, D. H., Keller, J., Schuez, N., Luszczynska, A., & Burkert, S. (2017). Effects of dyadic planning on physical activity in couples: A randomized controlled trial. *Health Psychology, 36*(1), 8–20. https://doi.org/10.1037/hea0000423

Kulis, E., Szczuka, Z., Keller, J., Banik, A., Boberska, M., Kruk, M., Knoll, N., Radtke, T., Scholz, U., Rhodes, R. E., & Luszczynska, A. (2022). Collaborative, dyadic, and individual planning and physical activity: A dyadic randomized controlled trial. *Health Psychology, 41*(2), 134–144. https://doi.org/10.1037/hea0001124

Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. (2016). Theoretical explanations for maintenance of behaviour change: A systematic review of behaviour theories. *Health Psychology Review, 10*(3), 277–296. https://doi.org/10.1080/17437199.2016.1151372

Lloyd, A., White, R., Eames, C., & Crane, R. (2018). The utility of home-practice in mindfulness-based group interventions: A systematic review. *Mindfulness, 9*(3), 673–692. https://doi.org/10.1007/s12671-017-0813-z

Manigault, A. W., Slutsky, J., Raye, J., & Creswell, J. D. (2021). Examining practice effects in a randomized controlled trial: Daily life mindfulness practice predicts stress buffering effects of mindfulness meditation training. *Mindfulness, 12*(10), 2487–2497. https://doi.org/10.1007/s12671-021-01718-1

Masheder, J., Fjorback, L., & Parsons, C. E. (2020). "I am getting something out of this, so I am going to stick with it": Supporting participants' home practice in mindfulness-based programmes. *BMC Psychology, 8*(1), 91. https://doi.org/10.1186/s40359-020-00453-x

Miles, E., Matcham, F., Strauss, C., & Cavanagh, K. (2023). Making mindfulness meditation a healthy habit. *Mindfulness, 14*(12), 2988–3005. https://doi.org/10.1007/s12671-023-02258-6

Palmer, R., Roos, C., Vafaie, N., & Kober, H. (2023). The effect of ten versus twenty minutes of mindfulness meditation on state mindfulness and affect. *Scientific Reports, 13*(1), 20646. https://doi.org/10.1038/s41598-023-46578-y

Parsons, C., 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. https://doi.org/10.1016/j.brat.2017.05.004

Parsons, C. E., Madsen, M. A., Jensen, K. L., Kæseler, S., Fjorback, L. O., Piet, J., Roepstorff, A., & Linehan, C. (2020). Smartphone

monitoring of participants' engagement with home practice during mindfulness-based stress reduction: Observational study. *JMIR Mental Health, 7*(1), e14467. https://doi.org/10.2196/14467

Prestwich, A., Conner, M., Lawton, R., Bailey, W. L., Litman, J., & Molyneaux, V. (2005). Individual and collaborative implementation intentions and the promotion of breast self-examination. *Psychology and Health, 20*(6), 743–760. https://doi.org/10.1080/14768320500183335

Prestwich, A., Conner, M. T., Lawton, R. J., Ward, J. K., Ayres, K., & McEachan, R. R. C. (2014). Partner- and planning-based interventions to reduce fat consumption: Randomized controlled trial. *British Journal of Health Psychology, 19*(1), 132–148. https://doi.org/10.1111/bjhp.12047

Rackow, P., Scholz, U., & Hornung, R. (2014). Effects of a new sports companion on received social support and physical exercise: An intervention study. *Applied Psychology: Health and Well-Being, 6*(3), 300–317. https://doi.org/10.1111/aphw.12029

Rackow, P., Scholz, U., & Hornung, R. (2015). Received social support and exercising: An intervention study to test the enabling hypothesis. *British Journal of Health Psychology, 20*(4), 763–776. https://doi.org/10.1111/bjhp.12139

Ribeiro, L., Atchley, R. M., & Oken, B. S. (2018). Adherence to practice of mindfulness in novice meditators: Practices chosen, amount of time practiced, and long-term effects following a Mindfulness-Based intervention. *Mindfulness, 9*(2), 401–411. https://doi.org/10.1007/s12671-017-0781-3

Riccio, M. T., Shrout, P. E., & Balcetis, E. (2019). Interpersonal pursuit of intrapersonal health goals: Social cognitive–motivational mechanisms by which social support promotes self-regulatory success. *Social and Personality Psychology Compass, 13*(10), e12495. https://doi.org/10.1111/spc3.12495

Santorelli, S. F., Kabat-Zinn, J., Blacker, M., Meleo-Meyer, F. & Koerbel, L. (2017). *Mindfulness-based stress reduction (MBSR) authorized curriculum guide*. Center for mindfulness in medicine, health care, and society, University of Massachusetts Medical School. Retrieved March 19, 2024, from https://www.tarkustekool.ee/wp-content/uploads/2021/09/CFM-Teaching-UMass-MBSR-Curriculum-Teaching-Guide-2017.pdf

Scholz, U., Berli, C., Lüscher, J., & Knoll, N. (2020). Changing behavior using dyadic interventions. In M. S. Hagger, L. Cameron, K. Hamilton, N. Hankonen, & T. Lintunen (Eds.), *The handbook of behavior change* (pp. 632–648). Cambridge University Press.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. Guilford Press.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2018). *Mindfulness-based cognitive therapy for depression* (2nd ed.). Guildford Press.

Strohmaier, S., Jones, F. W., & Cane, J. E. (2020). Effects of length of mindfulness practice on mindfulness, depression, anxiety, and stress: A randomized controlled experiment. *Mindfulness, 12*(1), 198–214. https://doi.org/10.1007/s12671-020-01512-5

Szczuka, Z., Kulis, E., Boberska, M., Banik, A., Kruk, M., Keller, J., Knoll, N., Scholz, U., Abraham, C., & Luszczynska, A. (2021). Can individual, dyadic, or collaborative planning reduce sedentary behavior? A randomized controlled trial. *Social Science and Medicine, 287*, 114336. https://doi.org/10.1016/j.socscimed.2021.114336

Ter Avest, M. J., Greven, C. U., Huijbers, M. J., Wilderjans, T. F., Speckens, A. E., & Spinhoven, P. (2021). Prospective associations between home practice and depressive symptoms in mindfulness-based cognitive therapy for recurrent depression: A 15 months follow-up study. *Cognitive Therapy and Research, 45*, 250–261. https://doi.org/10.1007/s10608-020-10108-1

Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? what next? *Journal of Health and Social Behavior, 35*, 53. https://doi.org/10.2307/2626957

Van der Schans, K. L., Holland, R. W., van Damme, J., de Snoo, T. P., & Karremans, J. C. (2024). Exploring the interpersonal outcomes of mindfulness-based stress reduction training among police employees. *International Journal of Applied Positive Psychology, 9*(2), 1127–1151. https://doi.org/10.1007/s41042-024-00175-0

Vereniging Mindfulness Based Trainers Nederland (VMBN) (n.d.) *Criteria voor Lidmaatschap*. Retrieved February 22, 2025, from https://www.vmbn.nl/over-vmbn/lidmaatschap-vmbn/criteria/

Wahbeh, H., Zwickey, H., & Oken, B. (2011). One method for objective adherence measurement in mind–body medicine. *The Journal of Alternative and Complementary Medicine, 17*(2), 175–177. https://doi.org/10.1089/acm.2010.0316