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ORIGINAL RESEARCH ARTICLE

How Positive Activities Shape Emotional Exhaustion and Work-Life Balance: Effects of an Intervention via Positive Emotions and Boundary Management Strategies

Sarah Elena Althammer[1,2] · **Anne Marit Wöhrmann**[1] · **Alexandra Michel**[1,2]

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Abstract

The positive-activity model (PAM) proposes how and for whom positive activity interventions work best. This article evaluates the effectiveness of a web-based self-regulation intervention that teaches participants positive activities. Over six weeks, participants engage in different positive activities to meet the particular challenges in flexible work designs (FWD) such as remote work or mobile work. In line with the PAM, we expected the intervention to decrease emotional exhaustion and increase satisfaction with work-life balance via increases in both positive emotions and boundary management. Moreover, individuals' depressive symptoms were expected to moderate this relationship. In a randomized controlled trial, participants were assigned to a waitlist control group or an intervention group. Study participants received questionnaires before and after the intervention and at a four-week follow-up. The final sample included 288 participants (intervention group: $n = 105$; control group: $n = 183$). Results of mixed variance analyses were in line with our predictions. Findings indicate that the intervention is an effective tool for improving well-being and work-life balance for workers with FWD. Changes in positive emotions and boundary management explained intervention effects. The intervention was effective regardless of participants' baseline level of depressive symptoms.

Keywords Flexible work design · Emotional exhaustion · German sample · Positive activity intervention · Randomized controlled trial · Work-life balance

✉ Sarah Elena Althammer
Althammer.SarahElena@baua.bund.de; sarah.althammer@gmail.com

Alexandra Michel
Michel.Alexandra@baua.bund.de; Alexandra.Michel@psychologie.uni-heidelberg.de

[1] Federal Institute for Occupational Safety and Health (BAuA), Friedrich-Henkel-Weg 1-25, 44149 Dortmund, Germany

[2] Heidelberg University, Heidelberg, Germany

Flexible work designs (FWD) give workers at least some autonomy in choosing their work times and locations (Demerouti et al., 2014; Lewis, 2003). This includes various levels of spatial and temporal flexibility (e.g., working in an office with flexible hours, telecommuting part-time, or working completely remotely). In the European Union, more than a third of self-employed workers and 11% of employees worked from home at least sometimes in 2019 (Milasi et al., 2021). Every second employee worked at least partly in remote or changing workplaces in 2017 in Germany (Wöhrmann et al., 2020). The COVID-19 pandemic has increased the number of workers with FWD to more people working from home than ever before, with two out of ten employees teleworking in the European Union (Eurofound, 2022), and almost 25% of employees working from home at least occasionally and 10% working from home every day in Germany in 2021 (Destatis, 2022). The share of workers with FWD is expected to remain high in the post-pandemic future (Eurofound, 2022).

This personal flexibility can be associated with reduced work-family conflicts (Liao et al., 2019) and improved physical health (Shifrin & Michel, 2022). However, it challenges workers' self-regulation (ability to control thoughts, feelings, and actions; Bandura, 1991) as workers need to manage work routines according to their individual needs (Allen et al., 2013; Kubicek et al., 2015; Mellner et al., 2015). For example, it becomes more difficult to establish boundaries between work and private life and some workers feel they have to be constantly available and work more intensely than before, hampering work-life balance and psychosomatic health (Wöhrmann et al., 2020; Wöhrmann & Ebner, 2021). Another challenge comes with recovering from work, which is essential for well-being (Park et al., 2011).

Given these contradicting effects of FWD (Allen et al., 2013; Demerouti et al., 2014), it is important to support workers. We developed a web-based self-regulation toolkit intervention that teaches different positive activities, specifically, environmental (Kreiner et al., 2009) and cognitive-emotional boundary management strategies (Michel et al., 2014), self-regulation strategies (i.e., self-goal setting, self-monitoring, self-evaluation, and self-reward), and recovery strategies (Hahn et al., 2011; Steidle et al., 2017). Combining different positive activities has been found to increase well-being (Michel et al., 2021), and the specific positive activities of this intervention have been shown to increase well-being and work-life balance (Althammer et al., 2021; Hahn et al., 2011; Michel et al., 2014; Rexroth et al., 2016, 2017).

In this study, we evaluated the effectiveness of this toolkit intervention for decreasing emotional exhaustion and increasing satisfaction with work-life balance. The positive-activity model (PAM; Lyubomirsky and Layous, 2013) provides a framework for how positive activity interventions work, proposing activities to improve well-being via increases in positive emotions, thoughts, and behaviors, as well as need satisfaction. Moreover, it states that features of positive activities, person features, and person-activity fit moderate this relationship. Focusing on the mediation via positive emotions and behaviors, we explored whether positive emotions and boundary management, as a positive behavior, mediate the proposed intervention effects. Focusing on the moderation through person features stated in the PAM, we investigated whether participants' baseline level of depressive symptoms moderates intervention effectiveness (Fig. 1).

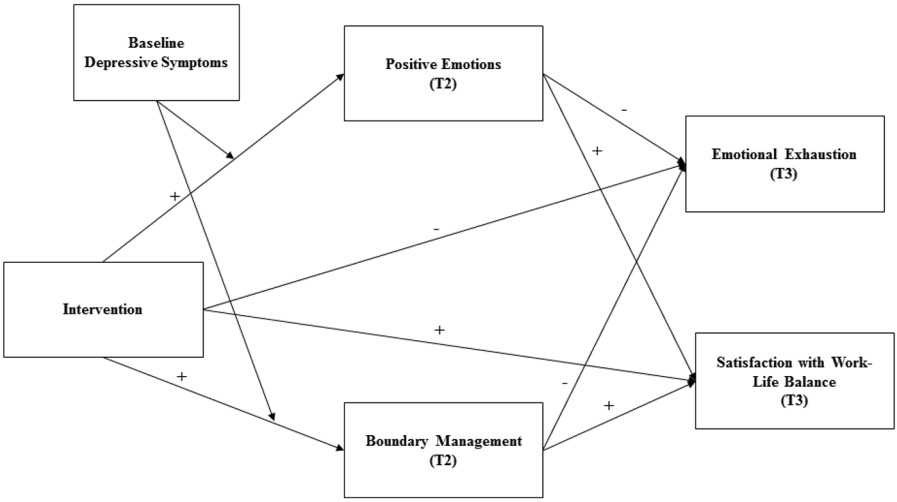

Fig. 1 Hypothesized Moderated Mediation Model

This study aims to contribute to the literature in several ways. First, by testing applicability of the PAM for the self-regulation toolkit intervention, we provide empirical evidence for the PAM's theoretical assumptions that positive emotions and behaviors mediate and depressive symptoms moderate intervention effectiveness, addressing Michel et al.'s (2015) call to identify intervention processes. Second, we explored depressive symptoms, one of the most prevalent workplace mental health issues, as a person feature that may affect intervention effectiveness. This research also answers calls to investigate the role of depressive symptoms as an important person characteristic in the PAM (Lyubomirsky & Layous, 2013). Using a randomized controlled trial with multiple measurement points follows the call for more high-quality research designs in work-specific well-being interventions (Michel et al., 2015; O'Shea et al., 2016). Third, we contribute to the PAM by proposing boundary management as a positive behavior, combining the PAM with elements of boundary theory (Ashforth et al., 2000; Kreiner, 2006). Evaluating an intervention that addresses specific challenges of FWD, we can now guide workers with FWD to reduce their emotional exhaustion and enhance their satisfaction with work-life balance.

Positive Activities Can Shape Well-Being

Positive activities are simple, intentional, and regular practices emulating thoughts and behaviors of happy people (Lyubomirsky & Layous, 2013), and require self-regulation (Lyubomirsky et al., 2005). Thus, positive activity interventions are intentional activities aimed at cultivating positive emotions, behaviors, or cognitions (Sin & Lyubomirsky, 2009). That is, they are brief self-administered exercises (Layous & Lyubomirsky, 2014) such as mindfulness or reflecting one's strengths, and are especially suited for application in the working context (Meyers et al., 2013; O'Shea

et al., 2022). The PAM (Lyubomirsky & Layous, 2013) illustrates (1) mechanisms underlying the improvement of well-being, (2) activity characteristics (i.e., features of the activity itself) and person characteristics (i.e., features of the person engaging in the activity) that make a positive activity optimally effective, and (3) the role of the fit between person and activity in the success of a positive activity. According to the PAM, people can enhance their well-being through positive activities. The PAM proposes that positive activities boost well-being by increases in positive emotions, positive thoughts, and positive behaviors. Moreover, need satisfaction (i.e., satisfaction of basic psychological needs such as autonomy, relatedness, and competence) may mediate the relationship between a positive activity and subsequent improvements. Further, it states that features of positive activities (e.g., type of behavior, variety, sequence, frequency and timing, social support), person features (e.g., motivation, effort, efficacy beliefs, baseline affective state, demographic variables), and person-activity fit (suitability of a certain activity for a certain individual) moderate the effect of positive activities on well-being.

Well-being includes both affective and cognitive aspects (Diener et al., 1999). We focus on emotional exhaustion indicating the absence of affective well-being, and satisfaction with work-life balance as an aspect of cognitive well-being. Emotional exhaustion develops from intense cognitive, affective, and/or physical strain and is a dimension of burnout (Demerouti et al., 2002). People feel emotionally exhausted when they are persistently exposed to specific working conditions or stressors. Cognitive well-being comprises global judgements of life and domain satisfactions (Diener et al., 1999). We focus on satisfaction with work-life balance as a domain that is highly relevant in the context of FWD. Workers are satisfied with their work-life balance when they meet both the demands of work and private life roles (Valcour, 2007).

Our multicomponent self-regulation toolkit intervention teaches several positive activities (Appendix A) which inherently require self-regulation (Lyubomirsky et al., 2005). Intervention participants learn to manage boundaries using environmental (e.g., positive activities such as performing a ritual before starting work) and cognitive-emotional segmentation strategies (e.g., mindfulness). Participants also learn recovery strategies, including positive activities such as taking work breaks, practicing respite exercises, and spending leisure time in recreational ways. Moreover, participants are taught self-regulation strategies to help organize their workday and maintain focus (e.g., rewarding themselves for completion of tasks), and to facilitate engagement in positive activities (e.g., setting specific goals when to implement them). Participants are encouraged to implement these positive activities into their daily lives, and to pursue activities they found most helpful (Pogrebtsova et al., 2022). This toolkit design follows the PAM in that it aims to increase the person-activity fit.

Previous studies of positive activities have shown that training boundary management can reduce emotional exhaustion and negative affect, enhance life satisfaction (Rexroth et al., 2017), improve satisfaction with work-life balance and reduce work-family conflicts (Binnewies et al., 2020; Michel et al., 2014). Recovery training can reduce negative affect and perceived stress (Hahn et al., 2011). The training of self-regulation positively affects well-being, as it reduces negative affect and stress, and improves life satisfaction (Mrazek et al., 2021). Moreover, progressing toward goals can improve well-being (Carver & Scheier, 1990), and the self-regulation strategy of

setting goals can increase affective and cognitive well-being (MacLeod et al., 2008; Ouweneel et al., 2013). Strategies to manage boundaries, recover, and self-regulate can also help people set boundaries between life domains and be more present in their private life, reducing role conflict. Overall, we expected the positive activities in our intervention to help participants reduce their emotional exhaustion and better balance work and private life roles:

Hypothesis 1 After the intervention, intervention group participants will report (a) reduced emotional exhaustion and (b) increased satisfaction with their work-life balance, compared to control group participants.

The Mediating Role of Positive Emotions and Boundary Management

According to the PAM, positive activities stimulate increases in positive emotions. As mentioned before, our multicomponent self-regulation toolkit intervention teaches positive activities to manage boundaries between work and private life, establish recovery periods from work, and self-organize the workday. The implementation of these activities should entail positive experiences as they enable people to organize their workday and boundaries to meet their needs. Thus, positive activities should lead to the experience of positive emotions. Indeed, earlier studies have shown that recovery (Througakos et al., 2008) and self-organization (e.g., task accomplishment or self-leadership; Sonnentag et al., 2018; Unsworth and Mason, 2012) can enhance positive emotions. Although there is little evidence on the effect of boundary management on positive emotions, both work-to-family and family-to-work conflicts increase negative affect (French & Allen, 2020), and boundary management interventions have the potential to reduce negative affect (Althammer et al., 2021; Rexroth et al., 2017). Thus, we hypothesized:

Hypothesis 2 After the intervention, intervention group participants will report increased positive emotions compared to control group participants.

According to boundary theory and its person-environment fit perspective (Ashforth et al., 2000; Kreiner, 2006), individuals create and maintain boundaries to separate life domains, such as work and private life. Some individuals prefer highly differentiated domains (segmentation), while others favor overlapping domains (integration). Matching segmentation preferences and possibilities can improve well-being and reduce work-family conflicts. Hence, individuals use segmentation strategies to manage boundaries, that is, they engage in boundary management (Kreiner et al., 2009). This is in line with the PAM, proposing the fit between person and activity to positively affect well-being, but expands this notion to the work and work-life balance context. As stated previously, participants in our intervention learn how to manage their life domains according to their segmentation preference (Kreiner et al., 2009; Michel et al., 2014), how to self-organize their workday (Bandura, 1991; Kanfer, 1977), and how to recover during work breaks and leisure time (Hahn et al., 2011;

Steidle et al., 2017). These skills may also help participants manage the boundaries between work and private life. Hence:

Hypothesis 3 After the intervention, intervention group participants will report increased boundary management compared to control group participants.

According to the PAM, positive emotions, thoughts, and behaviors, as well as need satisfaction mediate the effect of positive activities on well-being. Our intervention aims to stimulate positive emotions and, as a positive behavior, boundary management. Based on the PAM, we expected positive emotions and boundary management to mediate intervention effects on emotional exhaustion and satisfaction with work-life balance. Studies have shown the mediating role of positive emotions on well-being in a positive activity intervention (Meyers & van Woerkom, 2017). Integrating boundary theory and the PAM, we propose boundary management to be a positive behavior, likely to result in reduced emotional exhaustion and increased satisfaction with work-life balance. Earlier studies have shown that boundary management interventions can improve well-being and work-life balance (Althammer et al., 2021; Binnewies et al., 2020; Michel et al., 2014). Thus, we hypothesized:

Hypothesis 4 The intervention will affect (a) emotional exhaustion and (b) satisfaction with work-life balance through (I) positive emotions and (II) boundary management.

The Moderating Effect of Baseline Depressive Symptoms

Comparatively little is known about the conditions under which positive activity interventions are most beneficial. As outlined above, the PAM states that, amongst others, person features moderate the relationship between positive activities and well-being (Lyubomirsky & Layous, 2013). For example, baseline affective state is proposed to affect intervention effects (Lyubomirsky & Layous, 2013). As stated by the authors of them PAM, individuals with depressive symptoms might not have the energy or motivation to commit to an intervention, or they might feel discouraged if the intervention has no immediate effects (Layous & Lyubomirsky, 2014) which could limit or even reverse beneficial intervention effects. At the same time, the authors of the PAM also argue that it is reasonable to assume that interventions might be more effective for participants with higher levels of depressive symptoms. They might derive more benefits from an intervention because they have more room to improve (Lyubomirsky & Layous, 2013). In line with this, it has been argued that it is difficult to further enhance average or high levels of well-being (Briner & Walshe, 2015).

Empirical evidence with regard to the effectiveness of positive activity interventions dependent on participants' baseline affective state is mixed. For example, Sin et al. (2011) found certain positive activities to impair the well-being of dysphoric participants. They concluded that depressive symptoms can limit or even reverse the effects of positive activities. However, challenging the notion that participants

with higher levels of depressive symptoms might benefit less from positive activity interventions, positive activities have been shown to help those with depression (Seligman et al., 2005). Further, meta-analytical evidence has shown that in such interventions depressed individuals experienced more improvements in well-being and greater reductions in depressive symptoms than those without depression (Sin & Lyubomirsky, 2009).

Given conflicting findings, no clear expectation can be deduced from previous research for how baseline levels of depressive symptoms affect intervention effectiveness via positive emotions and boundary management. We, thus, posed the following research question:

Research Question Will depressive symptoms moderate the indirect effect of the intervention on emotional exhaustion and satisfaction with work-life balance via positive emotions and boundary management?

Method

Study Design and Procedure

From October 2020 to May 2021, during the COVID-19 lockdown in Germany, we conducted a randomized controlled trial with measurements before and after the intervention and four weeks later. Participants had two weeks to complete questionnaires. We used a snowball sampling approach, e-mail distribution lists, newsletters, online professional networking sites, and magazine articles to recruit participants. We promoted the study as a free web-based intervention to help workers cope with the challenges of FWD. Participation was not limited to a specific type of FWD because FWD involve different levels of flexibility (e.g., working in an office with flexible hours, telecommuting part-time, working remotely full-time, working in changing workplaces). Participants confirmed their jobs allowed them some flexibility (i.e., they confirmed they could - at least partially - work in a spatial- and time-flexible manner, including, for example, working at home, teleworking, working on the road, remote work, mobile work), that they were willing to complete the intervention and all questionnaires, and that they were of age. We asked participants to complete a baseline questionnaire (T1) before randomly assigning them to a waitlist control group or an intervention group. The latter started the intervention immediately. Participants knew that starting dates for the intervention varied, but they were unaware of their group assignment (i.e., single-blind). After the intervention group completed the six-week intervention, we sent the post-intervention questionnaire (T2) to all participants. Four weeks later, we sent them the follow-up questionnaire (T3). Then, the control group could access the intervention. As an incentive for active participation, we offered participation certificates and information about project results. We obtained ethical approval for this study from the ethics committee of the Federal Institute for Occupational Safety and Health in Germany.

The Intervention

We developed the intervention based on psychological theories and empirically validated trainings, which were combined into a new intervention toolkit and evaluated for the first time in this study. Our six-week web-based intervention was designed as a multicomponent self-regulation intervention with a toolkit of positive activities to cope with specific challenges of FWD: segmentation, mindfulness, self-organization, and recovery exercises. Different positive activities can be effectively combined in interventions (Michel et al., 2021). Participants were encouraged to keep engaging in activities and exercises from their toolkit they found most helpful and were in line with their preferences and needs (Pogrebtsova et al., 2022). Designing the intervention as a toolkit is in line with the PAM, that is, to increase the person-activity fit.

Between Thursdays and Sundays each week for six consecutive weeks, participants completed 45-minute online modules. In each module, participants received theoretical background information, self-reflection prompts, and practical exercises. To stimulate active learning and enhance training transfer (Burke & Hutchins, 2007), we introduced a 5- to 10-minute daily task to engage in different positive activities on the five workdays after each module. We sent three emails or text messages each week to remind participants to perform daily tasks. The training was pilot-tested and revised based on user feedback.

Moreover, we based the training on learning principles. Various sensory modalities and interactive multimedia elements were used to enable information processing and facilitate learning; online modules consisted of input in the form of written explanations, audio exercises, and videos of a trainer welcoming participants and providing theoretical background (Moreno, 2006). Interactive practical exercises prompted participants to self-reflect, write, or listen to guided imaginations. Audio exercises began with a brief mindfulness component to promote a sense of being in the moment (Michel et al., 2014; Steidle et al., 2017).

We adapted gamification techniques (Hoffmann et al., 2017) to facilitate training effectiveness (Johnson et al., 2016). Participants viewed an illustrated tree that bloomed as they completed each module. Blossoms reflected levels of learning and served as a visual reward. They also reminded participants of the resources they had acquired in each module. At the beginning of each module, participants could personalize a toolbox that they could access at any time, and that contained their favorite exercises from the previous week. To further increase behavioral modeling, learning, and transfer, four fictional characters shared their experiences and provided examples of how they responded to exercises (Burke & Hutchins, 2007; Moreno, 2006).

As the engagement in positive activities requires self-regulation (Lyubomirsky et al., 2005), each module concluded with a self-regulation exercise to facilitate practice, such as setting a specific goal for the next week or applying mental contrasting with implementation intentions (Gollwitzer & Oettingen, 2013). To promote positive experiences, we chose positive language that emphasized resources and strengths in all tasks.

Each module featured a focus topic (details provided in Appendix A, for the English version of a self-guided learning manual see (Michel et al., 2023). Module 1 gave an overview of the toolkit intervention and introduced goal-setting techniques. The

daily task was an adapted version of the 54321 exercise (Dolan, 1991). Modules 2 and 3 focused on managing boundaries between work and private life (Ashforth et al., 2000). Module 2 stimulated reflection on segmentation preference and introduced environmental boundary management strategies (Kreiner et al., 2009), of which two were to use as the daily task, including positive activities such as performing a ritual at the end of the workday. Module 3 introduced mindfulness practice as a cognitive-emotional boundary management strategy and positive activity (Michel et al., 2014). The daily task was an adapted version of the three-minute breathing exercise (Michel et al., 2014). Module 4 introduced the self-regulation strategies and positive activities of self-goal setting, self-monitoring, self-evaluation, and self-reward (Bandura, 1991; Kanfer, 1977). As a daily task, participants were to use these self-regulation strategies to organize their daily work. Module 5 focused on recovery in leisure time and work breaks. Participants reflected on spending leisure time in a recreational way (Hahn et al., 2011) and learned positive activities such as a respite exercise (Steidle et al., 2017). The daily task was to perform the respite exercise during work breaks. In Module 6, participants reflected on their personal and contextual resources (ten Brummelhuis & Bakker, 2012). The daily task was to use resources consciously.

Participants

Participants who completed the baseline questionnaire were randomly assigned to the intervention group (IG; $n=226$) or the control group (CG; $n=227$). Participants who dropped out at T2 (Fig. 2) were similar to non-dropouts with regard to all study variables. Participants who dropped out at T3 were younger, $F(1, 449)=7.91$, $p<.01$, and showed differences in professional qualifications[1], $\chi^2(7, 442)=19.71$, $p<.01$, than those who completed the follow-up questionnaire.

The final pre-post follow-up sample included 288 participants (n_{IG} = 105, n_{CG} = 183) who were 23 to 71 years old ($M=45.13$, $SD=10.49$). The sample was largely comprised of women (70.4% women, 29.6% men; nobody identified themselves as other), and 82.6% of participants held a university degree. Participants worked on average 38.76 ($SD=9.81$) hours per week. A majority of 90.9% reported being employees, 7.7% were self-employed and the remaining were employed atypically. About a quarter (25.4%) reported holding a leadership position. The extent of temporal and spatial flexibility varied across our sample, participants reported having the possibility to work from home or other locations on an average of 2.01 days ($SD=1.51$) per week, and working flexible hours on an average of 3.15 days ($SD=1.53$) per week. Overall, 60.6% worked flexible hours at least five days per week and 98.3% worked from home or in other locations for at least one day a week. Participants worked in various sectors such as law, business, administration, science, teaching, and financial services. The study was conducted during the COVID-19 pandemic, and 60.3% of participants stated that they worked from home more frequently in response to the pandemic, nearly a quarter (23.3%) had not worked from home before. Most participants were married (56.4% married; 19.5% in a perma-

[1] The omnibus chi-square test was significant, but post-hoc tests revealed no pairwise proportion difference to be significant.

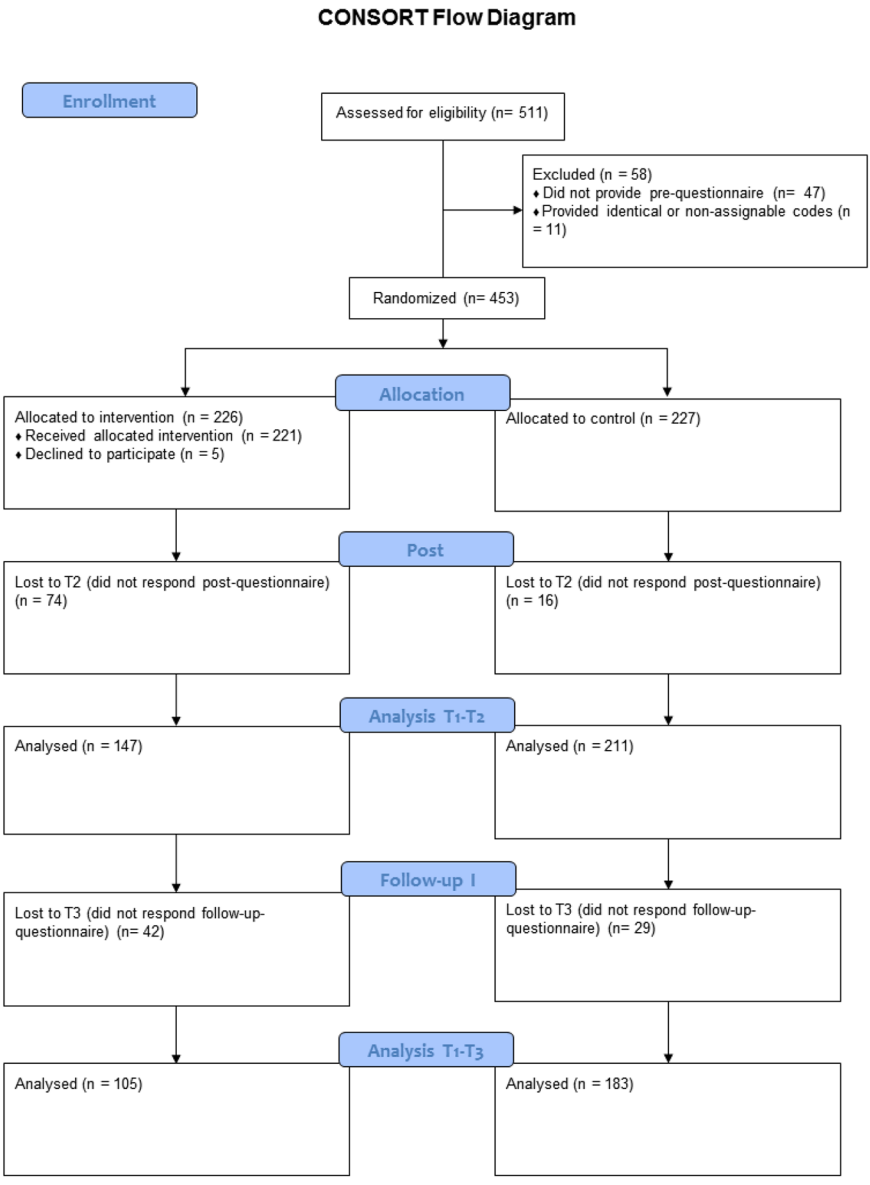

Fig. 2 CONSORT Flow Diagram

nent partnership; 18.5% single; 4.2% divorced; 1.4% widowed) and without children (62.0%). The average number of children among participants with children was 1.63 ($SD = 0.66$). Univariate ANOVAs and chi-squared tests revealed no pre-intervention differences between intervention and control group.

Measures

We assessed all variables at all measurement points, except for demographics and depressive symptoms, which were only measured at baseline. We included questions regarding evaluation of the intervention in the post- and follow-up questionnaire. Online questionnaires were in German. We used a translation/back translation procedure for items available only in other languages (Brislin, 1980; Graham & Naglieri, 2003). Unless otherwise indicated, we asked participants to answer items on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree) regarding the preceding two weeks.

Emotional exhaustion was measured using four items from the exhaustion subscale of the Oldenburg Burnout Inventory (Demerouti et al., 2002). For example, "After my work, I usually feel worn out and weary." This scale showed good reliabilities at all three time points ($\alpha_{T1} = 0.78$; $\alpha_{T2} = 0.78$; $\alpha_{T3} = 0.84$).

Satisfaction with work-life balance was assessed using four items from the Satisfaction with Work–Family Balance Scale (Valcour, 2007) that Michel et al. (2014) adapted to focus on private rather than family life to give the questionnaire broader applicability. Participants answered on a five-point scale (1 = very dissatisfied; 5 = very satisfied). For example, "How satisfied are you with how well your work life and your private life fit together?" This scale demonstrated very good reliabilities at all measurement points ($\alpha_{T1} = 0.91$; $\alpha_{T2} = 0.92$; $\alpha_{T3} = 0.94$).

Positive emotions were assessed using the German version (Rahm et al., 2017) of the SPANE (Scale of Positive and Negative Diener et al., 2010) to measure the frequency of positive emotions. Participants were asked to report on a five-point frequency scale (1 = rarely or never; 5 = often or always) how often they had experienced six different positive emotions, for example "happy" or "contented", in the past two weeks. The sum value varies between six and 30. This scale showed very good reliabilities at all three time points ($\alpha_{T1} = 0.91$; $\alpha_{T2} = 0.92$; $\alpha_{T3} = 0.94$).

Boundary management was assessed using three items (Rexroth et al., 2017). For example, "I can easily separate work and private life from each other, even when work demands are high." This scale demonstrated good reliabilities at all measurement points ($\alpha_{T1} = 0.86$; $\alpha_{T2} = 0.88$; $\alpha_{T3} = 0.87$).

Depressive symptoms were assessed using the German version (Löwe et al., 2005) of the Patient Health Questionnaire (PHQ-2; Kroenke et al., 2003). The items on the PHQ-2 inquire about the frequency of depressed mood ("feeling down, depressed or hopeless") and anhedonia ("little interest or pleasure in doing things") over the past two weeks and can be used as a depression screening. Participants rated the items on a four-point frequency scale (0 = not at all, 3 = nearly every day). The sum value can range from zero to six.

We conducted a confirmatory factor analysis (CFA) including emotional exhaustion, satisfaction with work-life balance, positive emotions, and boundary management measured at T1 using the R package lavaan (Rosseel, 2012). The CFA revealed an acceptable to good fit of the four-factor model: $\chi^2(113, 287) = 283.28$, $p < .001$, comparative fit index (CFI) = 0.95, Tucker–Lewis index (TLI) = 0.94, root mean square error of approximation (RMSEA) = 0.07; standardized root mean square residual (SRMR) = 0.04. A one-factor model revealed a worse fit: $\chi^2(119, 287) = 1316.84$,

$p < .001$, CFI = 0.62, TLI = 0.57, RMSEA = 0.19; SRMR = 0.12. A model comparison of the 4-factor model and the alternative 1-factor model was significant, with the 1-factor model (AIC = 11997, BIC = 12122) fitting the data significantly worse than the 4-factor model (AIC = 10976, BIC = 11122; $\chi^2_{diff} = 1033.6$, $df_{diff} = 6$, $p < .001$). Thus, the 4-factor model was selected.

Analysis Strategy

Analyses were performed in R 4.0.2 (R Core Team, 2021). To test Hypotheses 1, 2, and 3 regarding intervention effectiveness, we conducted univariate mixed analyses of variance (ANOVAs) with time (T1, T2, T3) as the within-subjects factor, and group membership (intervention vs. control) as the between-subjects factor using the R package ez (Lawrence, 2016). We used Bonferroni correction to account for Type I error (Field et al., 2012), resulting in an alpha threshold of 0.025 for a significant effect. Pairwise t-tests with Bonferroni adjustment were conducted as post-hoc analyses to investigate effectiveness at T2 and T3, respectively.

To examine whether positive emotions and boundary management at T2 acted as the mechanism of change for emotional exhaustion and satisfaction with work-life balance at T3 (Hypothesis 4), we performed a mediation analysis. We used bootstrap confidence intervals (CIs) for indirect effects (Hayes, 2017) with the R package lavaan (Rosseel, 2012), specifying 10,000 resamples and 95% bias-corrected CIs with CIs including zero indicating a null effect. To investigate the moderated mediation (Research Question), we estimated conditional indirect effects and bias-corrected 95% CIs from 10,000 bootstrapped samples. We standardized all variables and included T1 scores of the respective variables as covariates when predicting T2 scores of mediators and T3 scores of outcomes (i.e., ANCOVA model; Valente and MacKinnon, 2017). We operationalized low and high levels of the moderator as one standard deviation below and above the variable's mean score and examined how the conditional indirect effects changed under the condition of low and high moderator levels (Preacher et al., 2007). The dataset generated and analyzed during the current study is available in the OSF repository at https://osf.io/cj3sg/.

Results

Table 1 shows means, standard deviations, and intercorrelations for all study variables at all measurement points for the full pre-post follow-up sample. Table 2 provides descriptive information for the intervention and control groups. Figure 3 shows the mean scores of the intervention and control groups at all measurement points.

Effectiveness of the Intervention

We hypothesized participation in the intervention would improve both emotional exhaustion and satisfaction with work-life balance (Hypothesis 1), as well as positive emotions and boundary management (Hypotheses 2 and 3). As Table 3 shows, mixed ANOVAs revealed a significant group x time interaction for emotional exhaus-

Table 1 Means, Standard Deviations, and Correlations Over Both Groups

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Group	0.36	0.48													
2. EE.t1	3.10	0.87	0.08												
3. SWLB.t1	3.22	0.93	−0.08	−0.52**											
4. PE.t1	20.56	4.77	−0.03	−0.52**	0.48**										
5. BM.t1	2.95	0.91	−0.01	−0.56**	0.52**	0.37**									
6. DS.t1	1.69	1.33	−0.00	0.43**	−0.32**	−0.58**	−0.25**								
7. EE.t2	2.97	0.85	−0.15*	0.63**	−0.39**	−0.45**	−0.35**	0.33**							
8. SWLB.t2	3.36	0.92	0.14*	−0.47**	0.67**	0.46**	0.43**	−0.30**	−0.57**						
9. PE.t2	20.72	4.87	0.14*	−0.42**	0.35**	0.66**	0.31**	−0.46**	−0.54**	0.55**					
10. BM.t2	3.08	0.97	0.14*	−0.47**	0.51**	0.39**	0.63**	−0.33**	−0.50**	0.68**	0.46**				
11. EE.t3	2.99	0.86	−0.15*	0.61**	−0.40**	−0.41**	−0.39**	0.35**	0.74**	−0.54**	−0.53**	−0.52**			
12. SWLB.t3	3.37	0.96	0.12*	−0.46**	0.70**	0.45**	0.41**	−0.30**	−0.52**	0.77**	0.49**	0.58**	−0.61**		
13. PE.t3	20.80	4.96	0.17*	−0.34**	0.40**	0.64**	0.30**	−0.45**	−0.41**	0.48**	0.72**	0.42**	−0.56**	0.58**	
14. BM.t3	3.05	0.90	0.12*	−0.41**	0.49**	0.38**	0.61**	−0.27**	−0.41**	0.56**	0.45**	0.71**	−0.55**	0.63**	0.53**

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. * indicates $p < .05$. ** indicates $p < .01$. Group: 0 = Control Group; 1 = Intervention Group. t1 = Pre; t2 = Post; t3 = Follow-up; EE = Emotional Exhaustion; SWLB = Satisfaction with Work-Life Balance; PE = Positive Emotions; BM = Boundary Management; DS = Depressive Symptoms. $N = 288$

Table 2 Means and Standard Deviations for the Outcome Variables at Time 1 (Pre-Questionnaire), Time 2 (Post-Questionnaire), and Time 3 (Four-Week Follow-Up Questionnaire)

Variable	T1 (n=358)				T2 (n=358)				T3 (n=288)			
	IG		CG		IG		CG		IG		CG	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	M	SD	M	SD
Emotional Exhaustion	3.19	0.77	3.03	0.87	2.74	0.79	3.06	0.85	2.83	0.78	3.09	0.89
Satisfaction with Work-Life Balance	3.18	0.84	3.32	0.97	3.55	0.83	3.25	0.97	3.52	0.72	3.29	1.07
Positive Emotions	20.61	4.52	20.70	4.84	21.70	4.28	20.19	5.08	21.93	4.04	20.15	5.31
Boundary Management	2.95	0.92	2.99	0.93	3.34	0.89	2.97	0.99	3.20	0.75	2.97	0.97
Depressive Symptoms	1.69	1.31	1.68	1.27								

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. IG=Intervention Group; CG=Control Group

tion and for satisfaction with work-life balance, which supports Hypothesis 1. They also revealed a significant group x time interaction for positive emotions and for boundary management, which supports Hypotheses 2 and 3. Cohen's (1988) guidelines indicate that generalized eta squared (η^2) values of 0.01, 0.06, and 0.14 constitute small, medium, and large effect sizes respectively. By these categorizations, we found small effect sizes. Post-hoc analyses revealed significant pairwise differences between groups post-training (T2) and four weeks later (T3) for all outcome variables (Table 3). Because assumptions of homoscedasticity (for satisfaction with work-life balance and positive emotions) and homogeneity of covariances (for satisfaction with work-life balance) were violated, we applied the R package WRS2 (Mair & Wilcox, 2020) to run robust mixed ANOVAs as a robustness check. Results held for the significance of the interaction term for satisfaction with work-life balance and positive emotions, which adds to the robustness of the findings.

Testing the Mediating Role of Positive Emotions and Boundary Management

We hypothesized positive emotions and boundary management to mediate the relationship between group membership and both emotional exhaustion and satisfaction with work-life balance (Hypothesis 4). Results of the mediation analysis demonstrated that indirect effects of the intervention on emotional exhaustion (through positive emotions: effect = -0.04, *SE* = 0.03, 95% CI [-0.14, -0.03]; through boundary management: effect = -0.03, *SE* = 0.03, 95% CI [-0.12, -0.01]) and satisfaction with work-life balance (through positive emotions: effect = 0.03, *SE* = 0.02, 95% CI [0.02, 0.10]; through boundary management: effect = 0.03, *SE* = 0.03, 95% CI [0.01, 0.12]) were significant, as CIs did not include zero. Total effects on emotional exhaustion (effect = -0.21, *SE* = 0.10, 95% CI [-0.60, -0.23]) and satisfaction with work-life balance (effect = 0.20, *SE* = 0.09, 95% CI [0.21, 0.56]) were significant. The mediation was partial in that the intervention influenced emotional exhaustion and satisfaction with work-life balance independent of its effect on positive emotions and boundary management (as the direct pathways remained significant with the mediators in the model). These findings support Hypothesis 4.

Testing the Moderated Mediation of Baseline Depressive Symptoms

As a research question, we evaluated whether baseline depressive symptoms moderate the *a* paths (intervention group → positive emotions and intervention group → boundary management) of the mediation model, that is, whether there is an interaction between the moderator (depressive symptoms) and the intervention group because of differences in the *a* paths (Preacher et al., 2007). To assess this, we conducted a moderated mediation analysis and estimated conditional indirect effects with bias-corrected 95% CIs from 10,000 bootstrapped samples. The results (Table 4) revealed that the interaction of intervention group and baseline level of depressive symptoms was not significant for emotional exhaustion or for satisfaction with work-life balance. However, the conditional indirect effects on emotional exhaustion and satisfaction with work-life balance via positive emotions and boundary management were significantly different from zero when baseline levels of depressive symptoms were

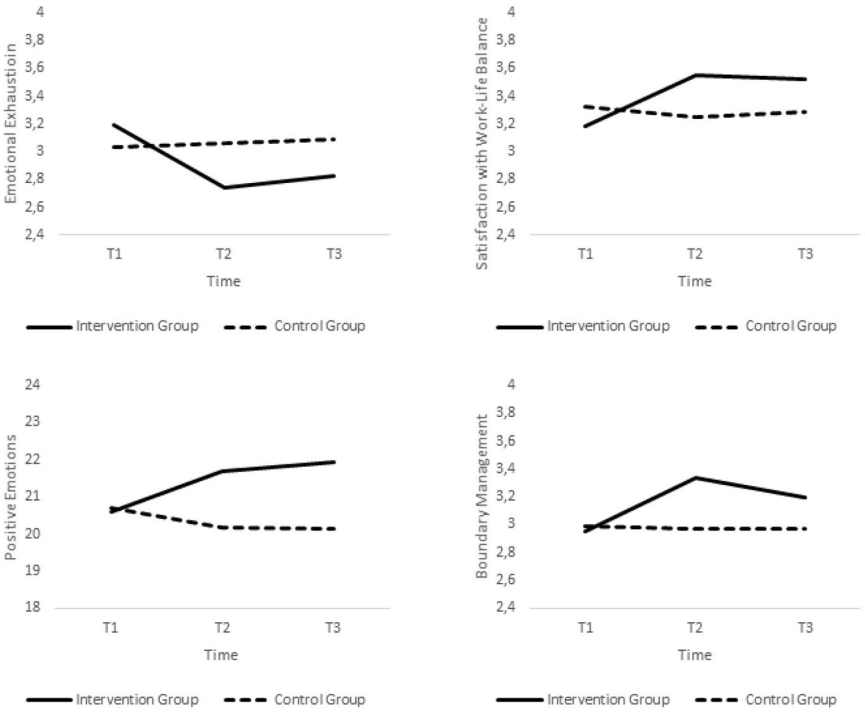

Fig. 3 Means of Outcome Variables for Intervention Group (IG) and Control Group (CG) Before (T1) and After (T2) Training Completion and at Four-Week Follow-Up (T3)

Table 3 Results of the Mixed ANOVAS and Bonferroni Adjusted Pairwise T-Test Comparisons Between Groups

Variable	Mixed ANOVA			T1	T2	T3
	F	*df*	η^2	*t*	*t*	*t*
Emotional Exhaustion [1]	17.57***	1.94, 525.28	0.014	1.74	-2.44*	-2.57*
Satisfaction with Work-Life Balance	18.19***	2, 542	0.012	-1.87	2.26*	2.25*
Positive Emotions	11.63***	2, 542	0.009	-0.90	2.11*	2.95**
Boundary Management	5.74**	2, 542	0.005	-0.41	2.17*	2.13*

Note. * indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$. [1]Mauchly's test indicated that the assumption of sphericity had been violated, thus degrees of freedom were corrected using Huynh–Feldt estimates of sphericity

moderate or high, but not when they were low. To rule out a moderated mediation, we also analyzed the moderated mediation indexes (i.e., difference between conditional indirect effects for a high versus a low score of the moderator). The moderated mediation indexes were also non-significant as CIs included zero. Thus, we did not find sufficient evidence that baseline levels of depressive symptoms moderate the indirect effect of the intervention.

Table 4 Results of the Moderated Mediation Analysis

Variables	Coefficient	*SE*	95% CI	
			Lower	Upper
DV: Emotional Exhaustion				
Intervention	-0.14**	0.09	-0.46	-0.11
Intervention x Depressive Symptoms	-0.06	0.09	-0.27	0.09
Positive Emotions	-0.24***	0.06	-0.35	-0.13
Boundary Management	-0.20**	0.06	-0.33	-0.08
Depressive Symptoms	0.03	0.07	-0.11	0.16
DV: Satisfaction with WLB				
Intervention	0.14**	0.09	0.11	0.45
Intervention x Depressive Symptoms	0.09	0.09	-0.03	0.31
Positive Emotions	0.18***	0.05	0.09	0.27
Boundary Management	0.20**	0.06	0.08	0.32
Depressive Symptoms	-0.03	0.05	-0.14	0.06
Indirect Effects				
Low Depressive Symptoms (−1 *SD*)				
Positive Emotions x Emotional Exhaustion	-0.01	0.03	-0.09	0.03
Positive Emotions x Satisfaction with WLB	0.00	0.02	-0.02	0.08
Boundary Management x Emotional Exhaustion	-0.02	0.03	-0.12	0.00
Boundary Management x Satisfaction with WLB	0.02	0.03	-0.00	0.11
Moderate Depressive Symptoms (*M*)				
Positive Emotions x Emotional Exhaustion	-0.04**	0.03	-0.14	-0.03
Positive Emotions x Satisfaction with WLB	0.03*	0.02	0.02	0.11
Boundary Management x Emotional Exhaustion	-0.03*	0.03	-0.12	-0.01
Boundary Management x Satisfaction with WLB	0.03*	0.03	0.01	0.12
High Depressive Symptoms (+1 *SD*)				
Positive Emotions x Emotional Exhaustion	-0.07**	0.05	-0.22	-0.04
Positive Emotions x Satisfaction with WLB	0.05*	0.04	0.03	0.17
Boundary Management x Emotional Exhaustion	-0.04*	0.04	-0.16	-0.01
Boundary Management x Satisfaction with WLB	0.04	0.04	0.01	0.15

Note. All coefficients are standardized slopes. Bias-corrected CIs of each indirect effect are based on 10,000 resamples[3]. DV = dependent variable. * indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$

[3] Zero is not included in the reported confidence intervals if the lower and upper bound of the confidence interval have the same sign. In these reported confidence intervals, numbers not equal to zero would appear if more decimal places were reported.

Additional Analyses

At T2, we asked intervention group participants whether they had engaged in the six weekly modules and daily tasks.[2] The majority of participants in the intervention group was compliant (88.6%, $n=93$). Regarding the specific activities, intervention participants reported to have used the daily task from Module 1 on an average of 3.03 days ($SD=1.62$), the daily task from Module 2 on 3.14 days ($SD=1.53$), the daily task from Module 3 on 2.81 days ($SD=1.72$), the daily task from Module 4 on 2.56 days ($SD=1.82$), the daily task from Module 5 on 2.27 days ($SD=1.87$), and the daily task from Module 6 on 1.95 days ($SD=1.73$). Daily tasks of each module were not practiced at all from respectively 10.1%, 9.1%, 14.1%, 19.2%, 27.3%, and 30.3% by intervention participants.

As a robustness check, we excluded the noncompliant participants (i.e., participants who reported only rudimentary or no compliance to modules, or practiced daily tasks fewer than two days per week) from analyses. Results held for intervention effectiveness regarding outcomes, as well as for the mediation and moderation mediation. These results add to the robustness of the findings.

Moreover, we tested whether the extent of engagement with intervention modules (i.e., completing modules and practicing daily tasks) predicted post-training levels of outcome variables in the intervention group. Results of a linear regression with post- or follow-up-intervention scores as dependent variables and engagement scores as predictors revealed effects of engagement with intervention content on training outcomes of intervention participants: level of engagement with Module 1 was related to satisfaction with work-life balance at T3, level of engagement with Module 2 and 3 was related to boundary management at T2, level of engagement with Module 4 was related to emotional exhaustion at T3. Moreover, level of practicing resource activation (Module 6) was related to satisfaction with work-life balance, positive emotions, and boundary management at T2.

Discussion

This article reports results of a randomized controlled trial evaluating a web-based self-regulation toolkit intervention to promote engagement in positive activities in the context of FWD. The intervention aims to encourage engagement in various positive activities, defined as simple, intentional, and regular practices, such as activities that help managing boundaries between work and private life, detaching from work, establishing recovery periods, and self-organizing the workday. Integrating boundary theory and the PAM, the intervention improved well-being, specifically reducing emotional exhaustion and increasing satisfaction with work-life balance, and provoked beneficial changes in positive emotions and boundary management. Changes in well-being were associated with changes in positive emotions and bound-

[2] As a compliance check we asked, "Have you worked through modules?" Participants answered on a five-point scale (1 = no; 5 = yes, completely). We also asked, "After you learned about the daily exercise, how many days a week did you practice it?"

ary management. Furthermore, we did not find depressive symptoms at baseline to affect intervention effectiveness.

FWD have challenges, such as establishing boundaries between work and private life, achieving work-life balance, managing work routines, and recovering from work (Demerouti et al., 2014; Kubicek et al., 2015; Wöhrmann et al., 2020). Participants in our intervention were introduced to various positive activities to cope with these challenges. As predicted in the PAM, the implementation of positive activities in our intervention stimulated positive emotions, and fostered boundary management as a positive behavior. Moreover, the intervention improved satisfaction with work-life balance and reduced emotional exhaustion, and these changes were associated with the changes in positive emotions and boundary management. The stimulation of positive emotions might be expected in any positive activity intervention. Increase in boundary management, however, is a specific positive behavior that we would expect only in specific interventions (such as ours) with a focus on strategies intended to enhance boundary management.

Because it can be assumed that participants' affective states play a role for intervention effectiveness as proposed in the PAM, we investigated whether differences in baseline levels of depressive symptoms had an effect on intervention effectiveness. No moderating effect was detected, which indicates that our intervention was effective for all participants regardless of their affective state at baseline. Specifically, we found no significant interaction of participation in the intervention and the moderator (baseline levels of depressive symptom) for emotional exhaustion or for satisfaction with work-life balance. This finding is encouraging as it suggests that all participants could benefit from engaging in different positive activities regarding their emotional exhaustion and work-life balance regardless of their baseline affective state.

However, we cannot rule out that a sample with more variability in depression screening scores would yield different results. PHQ-2 scores (i.e., the measure for depressive symptoms) ranged from zero to six with a mean of 1.69 ($SD = 1.33$) in our sample. When screening for depression, a score of three or greater is used as a cut-off. Hence, we can infer that our sample mainly consisted of participants who would not screen positive for depression. Overall, our study provides evidence that an intervention that promotes positive activities to cope with FWD can increase positive emotions and strengthen boundary management as a positive behavior, and these changes are associated with positive effects on reduced workers' emotional exhaustion and improved work-life balance. Our analyses do not support the reasoning that intervention effects are conditional on baseline levels of depressive symptoms.

Theoretical Contributions

This study contributes to literature by supporting the PAM's proposal that positive activities stimulate increases in positive emotions and behaviors, which are associated with changes in well-being. Conducting positive activities in the context of FWD over six weeks led to an increase of participants' positive emotions and boundary management as a positive behavior. This was associated with increased well-being, as indicated by reduced emotional exhaustion and enhanced satisfaction with

work-life balance. Demonstrating that increases in positive emotions are related with enhanced well-being is consistent with the proposition of the PAM.

Boundary theory states that workers engage in boundary management to create and maintain boundaries separating work from private life (Ashforth et al., 2000). In examining boundary management as a positive behavior stimulated by the intervention, we combined elements of boundary theory (Ashforth et al., 2000; Kreiner, 2006) with the PAM. This is, to the best of our knowledge, the first intervention showing boundary management as a positive behavior can partially explain intervention effectiveness. Thus, this study provides evidence for mechanisms explaining why performing the positive activities taught in our intervention was effective for achieving work-life balance. The improvement in well-being, associated with changes in boundary management, is consistent with propositions of the PAM and in line with previous empirical research (Althammer et al., 2021; Binnewies et al., 2020; Michel et al., 2014) showing that the training of boundary management enhances well-being indicated by affective well-being and work-life balance. By demonstrating that the enhancement of boundary management and positive emotions partially explains intervention effects, we follow calls to focus more on mechanisms that are impacted through engagement in an intervention, and through which interventions have effects (Michel et al., 2015).

By exploring depressive symptoms as a person feature that may affect intervention effectiveness, we tested the proposition of the PAM that person features, among other factors, moderate the relationship between positive activities and well-being. This also answers the call to explore whether positive activity interventions are particularly beneficial for individuals with specific baseline affective states (Lyubomirsky & Layous, 2013). We did not find sufficient evidence that baseline levels of depressive symptoms moderate intervention effectiveness. Overall, our results provide empirical evidence that the PAM is an applicable model for predicting how and why self-regulation toolkit intervention in the context of FWD is effective.

Limitations and Implications for Future Research

This study has several notable strengths, such as randomized groups, of which one is a waitlist control group, a longer-term follow-up questionnaire, and measurement of intervention mechanisms. This study design provides robust evidence for intervention effectiveness, and answers calls for more randomized controlled trials in work-specific well-being interventions (Michel et al., 2015; O'Shea et al., 2016). Yet, this study also has limitations. In our toolkit intervention, we combined multiple positive activities that address different challenges in the context of FWD. We believe that this comprehensive intervention approach is of high practical relevance because the challenges of FWD are not limited to one aspect, and people have different challenges that are of particular importance to them.

However, the research design does not allow for disentangling the effectiveness of particular intervention elements. Thus, future research could implement weekly questionnaires to investigate which parts of the intervention exert certain effects. Moreover, to test whether one of these positive activities is more effective than others, future research could test effects of separate positive activities against the com-

plete intervention. This would also clarify whether all positive activities are required to obtain benefits. If a subset of the positive activities proves equally effective, the intervention could be shortened accordingly; this could also affect dropout rates, assuming that participants may have dropped out because they perceived the training to be too time-consuming, especially in turbulent times such as the pandemic. However, researchers should then be careful not to vary the overall duration of intervention, because the intervention period of six weeks might have actively contributed to behavior change. Moreover, those who remained in the sample reported high compliance regarding module engagement and daily task practice, suggesting that there is no general need to question the length of the intervention. In addition, researchers could investigate subjective interpretations of the chosen positive activities to get a better idea how participants perceive certain exercises and if they are, indeed, emulating positive thoughts and behaviors.

Online interventions have many advantages, including high availability and accessibility to a large audience, flexible use for workers, and lower operating costs. Previous research has shown that self-instructed occupational web-based interventions can improve recovery, well-being, and work-life balance (Ebert et al., 2015; Michel et al., 2014, 2021; Phillips et al., 2019) and provide strategies to help workers self-regulate the challenges associated with FWD (Demerouti, 2023). Major shortcomings of online interventions are high and easy dropout and feelings of isolation (Eysenbach, 2005; Lehr et al., 2016). A major limitation in the present study is a high dropout rate, which often occur in web-based intervention studies (Heskiau & McCarthy, 2021; Hülsheger et al., 2013). However, dropout rates in our study differed between groups, with dropout being higher in the intervention group than in the control group (at T3, 54% dropout in intervention group, 19% dropout in control group). Such dropout patterns have been observed in similar intervention studies (Althammer et al., 2021; Michel et al., 2014, 2021), so we assume the control group might have been more committed to participate in questionnaires because they were still waiting to take part in the intervention, while the intervention group had already completed the intervention. Offering participation certificates and information about the project results did not seem to be a sufficient incentive for the intervention group to participate in questionnaires after the intervention was completed, so we suggest greater incentives. If researchers have scarce resources at their disposal, they might allocate more participants to intervention groups than to control groups to achieve balanced numbers at the end of the study.

Furthermore, participants self-selected into the intervention study resulting in an over-representation of women and participants with very high levels of education. However, interventions are most successful when participants elect to participate (Sin & Lyubomirsky, 2009). This study provided evidence for the general effectiveness of our intervention. As we cannot rule out the equivalence or superiority of alternative interventions, or that expectations regarding participation served as a demand characteristic evoking hypothesis-conforming behavior (Nichols & Maner, 2008), future studies could add a second control group that receives an alternative or placebo intervention (O'Shea et al., 2016).

In this study, we examined the application of the PAM for our intervention regarding positive emotions and behavior as intervention mechanisms. However, the

research design in which assignment to groups was randomized does not justify a causal interpretation of the results of the mediators on the outcomes. To infer causality to these variables as mediators, future research would need to manipulate mediators as well by assigning groups to mediators. Future research could further expand the literature on intervention mechanisms by investigating positive thoughts or need satisfaction as additional intervention mechanisms proposed in the PAM. Moreover, researchers could compare features of positive activities, such as dosage (e.g., number of modules), and the role of person-activity fit (e.g., whether participants with high segmentation preference profit more from boundary management exercises). From the present sample, we cannot conclusively say to what extent depressive symptoms affect intervention effectiveness, and thus suggest future samples should include a broader range of depressive symptoms to address this research question. Further, researchers may investigate whether other person features (e.g., self-efficacy, need for recovery) affect intervention effectiveness. To learn more about the relationship between participant engagement and outcomes, future studies should include objective measures, such as module completion status or time stamps, to measure actual and compliance with intervention modules and daily tasks.

Practical Implications

Workers with FWD face specific challenges such as blurring boundaries between work and private life, detaching from work, establishing recovery periods, and self-organizing their workday. We recommend interventions for workers with FWD teach strategies in a toolkit that includes different positive activities, specifically environmental (Kreiner et al., 2009) and cognitive-emotional boundary management strategies (Michel et al., 2014), self-regulation strategies (i.e., self-goal setting, self-monitoring, self-evaluation, and self-reward), and recovery strategies (Hahn et al., 2011; Steidle et al., 2017). In this study, we showed that conducting these exercises helped participants promote boundary management and positive emotions, which reduced their emotional exhaustion and improved satisfaction with work-life balance. Supervisors or occupational health managers can offer such a multicomponent self-regulation toolkit intervention to support workers with FWD in improving well-being and work-life balance. For doing so, they may either use the self-guided learning manual (for the English version see Michel et al., 2023) or develop a similar intervention based on the results of this study. Moreover, they can encourage workers to complete the modules and practice the daily activities while on the clock, so that work-life balance is not affected.

As traditional instruments of occupational health and safety cannot always be fully implemented when people work remotely or from home, web-based interventions can serve as a valuable addition to human resource practices and policies. However, individual interventions can only be complementary to appropriate working conditions such as supervisor and peer support, an encouraging workplace climate or corporate agreements on remote work (Kossek & Lautsch, 2012; Wöhrmann et al., 2020). Segmentation supplies provided by the workplace seem to be another important requirement for a successful work-life balance (Brauner et al., 2020).

Conclusion

In this study, we showed that a web-based multicomponent self-regulation toolkit intervention that aims to promote positive activities to cope with FWD, such as managing boundaries, recovering from work, and self-organizing the workday, is effective: In a randomized controlled trial, the intervention improved well-being. Specifically, it reduced emotional exhaustion and enhanced satisfaction with work-life balance, which was associated with changes in positive emotions and boundary management. It was effective regardless of participants' baseline levels of depressive symptoms. The COVID-19 pandemic dramatically increased the number of workers with FWD, and the share of workers with such flexibility is expected to remain high in the post-pandemic future. Because FWD come with certain challenges, interventions such as the one examined in this study can provide a helpful tool in supporting workers to maintain and better achieve well-being and work-life balance.

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Declarations

Competing Interests The authors have no relevant financial or non-financial interests to disclose.

Human and Animal Ethics and Ethics approval Ethical approval for this study was granted by the ethics committee of the Federal Institute for Occupational Safety and Health in Germany.

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

Consent to publish Not applicable as the manuscript contains no individual person's data in any form.

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