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RESEARCH ARTICLE

The Effectiveness of a Job Crafting, Strengths Use, and Deficit Correction Intervention: A Randomized Controlled Trial

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Abstract

The present study evaluates the effectiveness of a mixed job crafting, strengths use, and deficit correction intervention on the proactive behaviors, work engagement, life satisfaction, and work-life balance of employees working in a home office setting. A two-armed (intervention vs. wait-list control group) randomized controlled trial with three measurement moments (pre-, post-intervention, and one-month follow-up) was designed to reach the study's goal. A sample of 80 participants part of a large multinational pharmaceutical company was randomly assigned to the intervention (n = 45) or wait-list control condition (n = 35). Mixed factorial analyses of variance showed that the combined job crafting, strengths use, and deficit correction intervention positively impacted life satisfaction (d = .47) and seeking challenging job demands (d = .44) in the short-term. There were no significant differences between the two groups regarding the other proactive behaviors, work engagement, or work-life balance. Moderator analyses revealed that autonomy and workload were moderators of the relationship between the intervention effectiveness and several outcomes (e.g., the intervention had a positive effect on the work-life balance of participants with low autonomy). Theoretical and practical implications are discussed.

Keywords

job crafting, strengths use, deficit correction, work engagement, life satisfaction, work-life balance, randomized controlled trial

Introduction

In order to succeed in a competitive environment, organizations must ensure a motivated workforce as it has been demonstrated that high work engagement leads to better work performance (Bakker, Demerouti & Sanz-Vergel, 2014; Gallup, 2020). Engaged employees are more energized and resilient when facing adversity; they are willing to go the extra mile in achieving work objectives and feel enthusiastic, deeply involved, and absorbed in their work (Schaufeli et al., 2002). Studies

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have shown that one way to increase employee engagement is by designing and implementing different bottom-up interventions (Knight et al, 2019), such as job crafting (Thomas et al., 2020) or strengths-based (Bakker & van Wingerden, 2021) interventions. One of the frameworks under which bottom-up organizational interventions have developed is the Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2014; 2017). Employees can adjust their levels of job resources and job demands by engaging in job crafting, a proactive bottom-up strategy aimed at increasing structural job resources, social job resources, challenging job demands, or decreasing hindering job demands (Tims et al., 2012). Teaching employees how to craft their jobs in order to balance their job resources and job demands leads not only to work engagement but also to work performance (van Wingerden et al., 2017; 2017a).

Like in job crafting, employees can adjust their personal or job resources using their strengths at work, strengths use being another proactive bottom-up strategy through which employees can indirectly affect their work engagement and performance in a positive manner (Bakker & van Woerkom, 2018; Peláez et al., 2020). A strength can be defined as *"a natural capacity for behaving, thinking or feeling in a way that allows optimal functioning and performance in the pursuit of valued outcomes"* (Linley & Harrington, 2006, p. 88). Alongside strengths use, looking for opportunities to correct one's weaknesses, defined as deficit correction, is another proactive behavior that could energize employees and ensure a higher work engagement (van Woerkom et al., 2016). Deficits can be defined as *"ways of behaving, thinking, or feeling that do not come natural to an individual, which he or she does not enjoy doing, but in which he or she can achieve competent functioning if trained accordingly"* (Meyers et al., 2015, p. 52).

Given the complexity of the work environment and the development of today's new ways of working, characterized by flexibility in choosing the work schedule, workplace, and media technology tools (Demerouti et al., 2014), it proves to become a challenge for organizations to understand the broad spectrum of resources and demands that characterize each employee's work environment. At the same time, employees face their own challenges working in this new context as the line between work and personal life narrows. Learning how to balance job resources and job demands by using strengths or correcting deficits could lead to increased levels of work engagement, life satisfaction, and work-life balance. Therefore, the aim of the present study is to investigate this expectation by employing a randomized controlled trial designed to test the effectiveness of an intervention program that blends and capitalizes on job crafting, strengths use, and deficit correction.

Job Crafting and Job Crafting Interventions

From its first conceptualization as a form of ensuring a better person job-fit through task, relational and cognitive alteration of work boundaries (Wrzesniewski & Dutton, 2001), and more recently integrated within the JD-R theory as a method to balance job demands and resources (Bakker & Demerouti, 2014), job crafting behavior has been increasingly studied in organizations during past years. Meta-analysis results (Rudolph et al., 2017) show that overall job crafting behavior and separate forms of job crafting, except decreasing hindering demands, are associated with job satisfaction, work engagement, and in-role and contextual performance. Building on Tims et al.'s (2012) conceptualization of job crafting, Lichtenthaler and Fischbach (2018) differentiate between promotion-focused job crafting (increasing job resources and challenging job demands) and prevention-focused job crafting (reducing hindering job demands). They conclude that the first form of crafting is positively associated with job performance and health, whereas the second form is negatively associated with the two outcomes. Focusing on reduction-oriented job crafting, Demerouti and Peeters (2018) distinguish between optimizing demands, a job crafting form in which employees engage to make their work more efficient, and minimizing demands, a job crafting method used by employees to decrease the intensity of

their work. This new form of reduction-oriented job crafting was positively related to work engagement (Demerouti & Peeters, 2018), being also successfully used in an intervention that decreased participants' exhaustion levels, increased their safety behavior, and improved their attitudes towards change (Demerouti et al., 2020).

Another conceptualization of job crafting is given by Kooij et al. (2017), who studied job crafting in relation to strengths and interests. The authors defined two new types of job crafting: crafting towards strengths, the proactive changes employees initiate in order to make better use of their strengths at work, and crafting towards interests, searching for activities in line with one's interests, discovering that their intervention was effective in increasing the strengths crafting behavior among older workers. Kuijpers et al. (2020) studied a third form of crafting alongside crafting towards strengths and crafting towards interests, namely crafting towards development, defined as a proactive behavior in which the employee is looking for development and growth opportunities.

The majority of job crafting interventions are based on the Michigan Job Crafting Exercise (JCE; Berg et al., 2010) and operationalized based on JD-R theory principles (Knight et al., 2021; van Wingerden et al., 2017), but could also comprise elements of goal-setting theory (van Wingerden et al., 2017a, 2017b) or experiential learning theory (Demerouti et al., 2020). Most studies have focused on increasing structural job resources, social job resources, and challenging job demands (van Wingerden et al., 2016), while others have included decreasing hindering job demands as well (Knight et al., 2021). Concerning changes in job crafting behavior as a result of the intervention, regardless of the job crafting conceptualization, studies report mixed results, from no changes in any job crafting behavior (Kuijpers et al., 2020; van den Heuvel et al., 2015) to changes in some job crafting behaviors, but not in others (Demerouti et al., 2020; Kooij et al., 2017). Furthermore, the effects of job crafting interventions on work engagement and performance are also heterogeneous. Some studies register significant effects on work engagement (Thomas et al., 2020; van Mersbergen, 2012; van Wingerden et al., 2017b) and performance (Gordon et al., 2018; van Wingerden et al., 2017a), while others report non-significant results for at least one of the two outcomes (van Wingerden et al., 2017; 2017a). However, meta-analysis results reveal that job crafting interventions can positively impact overall job crafting behavior, seeking challenging job demands, decreasing hindering job demands, work engagement, and contextual performance (Frederick & VanderWeele, 2020; Oprea et al., 2019).

Strengths Use, Deficit Correction, Strengths-Based and Deficit Interventions

Applying the strengths-based approach in an organizational context has registered increasing attention in the past years (Bakker & van Woerkom, 2018; Ghielen et al., 2017; Quinlan et al., 2012). A recent literature review (Miglianico et al., 2020) describes the three schools of thought that have developed the definitions, measurements, and classifications of strengths, highlighting the fact that the majority of researchers consider strengths as natural attributes that can be developed in time and which tend to energize and foster individual performance. Strengths use has been associated with well-being, work engagement as well as self- and other-ratings of performance (Bakker & van Woerkom, 2018). Researchers discovered that the correlation between the use of strengths and the positive experiences at work increases when the number of applied strengths is higher, regardless of the strengths' content (Harzer & Ruch, 2013).

Designing and implementing interventions that help employees to identify, develop and use their strengths has positive outcomes both at individual and organizational level, as strengths interventions have proven to increase life satisfaction (Dubreuil et al., 2016; Forest et al., 2012; Harzer & Ruch, 2016), work engagement (Bakker & van Wingerden, 2021), and reduce employee turnover (Cable et al., 2013). Meyers and van Woerkom (2017) developed an intervention in which participants identified, developed, and used their strengths; as a result, their positive affect

increased in the short-term, while their levels of psychological capital increased in the short- and long-term. Using a similar design, van Woerkom and Meyers (2019) discovered that their intervention on educational professionals targeting the identification, development, and use of strengths was more effective in stimulating growth initiative for employees with low to medium initial levels of self-efficacy. Another strengths intervention implemented in an Italian pharmaceutical company used the FAMILY (framing, attitudes, meaningfulness, identity, leading self, yoked together) approach and registered significant increases in work engagement and employees' perceptions as valuable contributors within the organization (Constantini et al., 2019).

Although strengths interventions have been viewed as a response to the previous deficit approach, recent findings suggest that a balanced approach where both building on strengths and correcting deficits could be energizing and motivating for employees and even lead to effective performance (Quinlan et al., 2012; van Woerkom et al., 2016). Rust et al. (2009) developed an intervention program in which two groups, one working on two character strengths and one working on one character strength and one weakness, were compared with a control group. The results showed that the first two groups experienced more life satisfaction after the intervention than the control group. Moreover, there were no significant differences between the two experimental groups, the results suggesting that focusing on both weaknesses and strengths could increase, not reduce life satisfaction. Another study (Minhas, 2010 as cited in Quinlan et al., 2012) identified that working on unrealized strengths led to higher levels of work engagement and life satisfaction, but not to significant changes in psychological well-being, while working on realized strengths increased psychological well-being and work engagement, but not life satisfaction. Furthermore, although not in an organizational setting, Meyers et al. (2015) conducted two experiments in which university students were assigned to either a strength or a deficit intervention. While in the first experiment only the strengths group registered short increases in the personal growth initiative, in the second experiment that contained post-intervention assignments, personal growth initiative increased in both groups, with stronger effects in the strengths one.

Considering the above-mentioned findings, a holistic approach to employees' strengths and weaknesses seems to strengthen their well-being and work-related outcomes. Thus, the present study was developed for testing this assumption.

The Present Study

The systematic review on work engagement interventions performed by Knight et al. (2019) suggests that job crafting interventions that address both personal and job resources could be more effective than those focusing on either personal or job resources. This assumption is in line with the JD-R theory (Bakker & Demerouti, 2014), in which job and personal resources positively influence each other and lead to higher levels of work engagement. A relevant JD-R intervention was designed by van Wingerden et al. (2016) and aimed to increase personal resources (hope, resilience, optimism, and self-efficacy), job resources and challenging job demands, registering positive effects on both work engagement and performance. Furthermore, the first study that simultaneously compared a job crafting intervention, a personal resources intervention, and a combined job crafting and personal resources intervention has been conducted by van Wingerden et al. (2017). The results showed that while work engagement increased only for the employees who attended the personal resources intervention, only the combined job crafting and personal resources intervention led to increases in employees' in-role performance levels.

Typically, strengths-based interventions are designed to increase personal resources. For example, van Woerkom and Meyers (2019) identified increased levels of general self-efficacy after teaching participants how to identify and use their strengths. Another study by Bakker and van Wingerden (2021) developed a strengths use intervention

addressing assertiveness, self-efficacy, and resilience, concluding that the intervention effectively increased participants' personal resources, strengths use, and work engagement. Kooij et al. (2017) consider that employees craft their jobs to align them with their personal resources, namely strengths and interests, to which Kuijpers et al. (2020) later add development. Building on their conceptualization of job crafting, we believe that employees use their strengths or deficits to craft their jobs. For example, a person with sociability as a strength could use it to ensure higher levels of social job resources such as peer support or mentoring or even in searching for job challenges to ensure more interesting work and higher work engagement. Similarly, a person could correct a weakness by seeking social resources, for example, coaching or supervisory support. This is in line with crafting towards development, defined as a proactive behavior in which the employee is looking for development and growth opportunities, including working on deficits (Kuijpers, 2020).

Our study focuses on assessing the effectiveness of a combined job crafting, strengths use, and deficit correction intervention on the proactive behaviors, work engagement, life satisfaction, and work-life balance of employees working in a home office setting. We believe that employees will feel more confident and engaged in crafting their jobs when using their strengths or correcting their deficits. To our knowledge, this is the first study that combines strengths use, job crafting, and deficit correction elements in a single intervention under the umbrella of the JD-R theory (Bakker & Demerouti, 2014; 2017). We argue that a holistic approach of the three proactive behaviors could lead to even stronger effects than previously reported. As displayed in Figure 1, to test the effectiveness of the proposed program we focused on two categories of dependent variables: (1) main outcomes – the proactive behaviors tackled through the intervention program (i.e., job crafting, strengths use, and deficit correction behaviors); and (2) secondary outcomes – the work engagement, life satisfaction, and work-life balance of the employees. Therefore, we formulated the following hypotheses:

Primary outcomes hypotheses

Hypothesis 1: Employees' levels of job crafting behaviors, i.e., seeking structural job re-sources (1a), seeking social job resources (1b), and seeking challenging job demands (1c), will significantly increase after the mixed intervention (T2 and T3), both compared to their level before the intervention (T1) and compared to the wait-list control group.

Hypothesis 2: Employees' levels of strengths use will significantly increase after the mixed intervention (T2 and T3), both compared to their level before the intervention (T1) and compared to the wait-list control group.

Hypothesis 3: Employees' levels of deficit correction will significantly increase after the mixed intervention (T2 and T3), both compared to their level before the intervention (T1) and compared to the wait-list control group.

Secondary outcomes hypotheses

Hypothesis 4: Employees' levels of work engagement will significantly increase after the mixed intervention (T2 and T3), both compared to their level before the intervention (T1) and compared to the wait-list control group.

Hypothesis 5: Employees' levels of life satisfaction will significantly increase after the mixed intervention (T2 and T3), both compared to their level before the intervention (T1) and compared to the wait-list control group.

Hypothesis 6: Employees' levels of work-life balance will significantly increase after the mixed intervention (T2 and T3), both compared to their level before the intervention (T1) and compared to the wait-list control group.

Finally, interventions have considered several possible moderators of the interventions' effectiveness over the desired outcomes. One of the moderators that has been recently studied in relation to job crafting interventions is workload (Knight et al., 2021; Kuijpers et al., 2020). The authors discovered that employees are more likely to get involved in the intervention if they have a high

workload (Kuijpers et al., 2020), and an increased workload would lead to decreasing hindering job demands crafting. In contrast, a low workload would target the acquisition of more resources (Knight et al., 2021). Building on the limits of their study, the authors (Knight et al., 2021; Kuijpers et al., 2020) suggest that alongside workload, another possible moderator worth investigating could be the level of control or autonomy employees have to cope with the demands. In a daily diary study, Petrou et al. (2012) identified that active jobs (high in work pressure and high in job autonomy) are associated with job crafting behaviors (higher seeking resources and lower reducing demands). Studies also suggest that employees who experience high autonomy within their jobs are more likely to engage in job crafting activities (van Wingerden et al., 2017; 2017b). Hence, in the present study we also considered workload and autonomy as possible moderators of the intervention's effectiveness and addressed the following research questions:

Research question 1: Will the effectiveness of the intervention on (4a) job crafting, (4b) strengths use, (4c) deficit correction, (4d) work engagement, (4e) life satisfaction, and (4f) work-life balance be moderated by autonomy?

Research question 2: Will the effectiveness of the intervention on (5a) job crafting, (5b) strengths use, (5c) deficit correction, (5d) work engagement, (5e) life satisfaction, and (5f) work-life balance be moderated by workload?

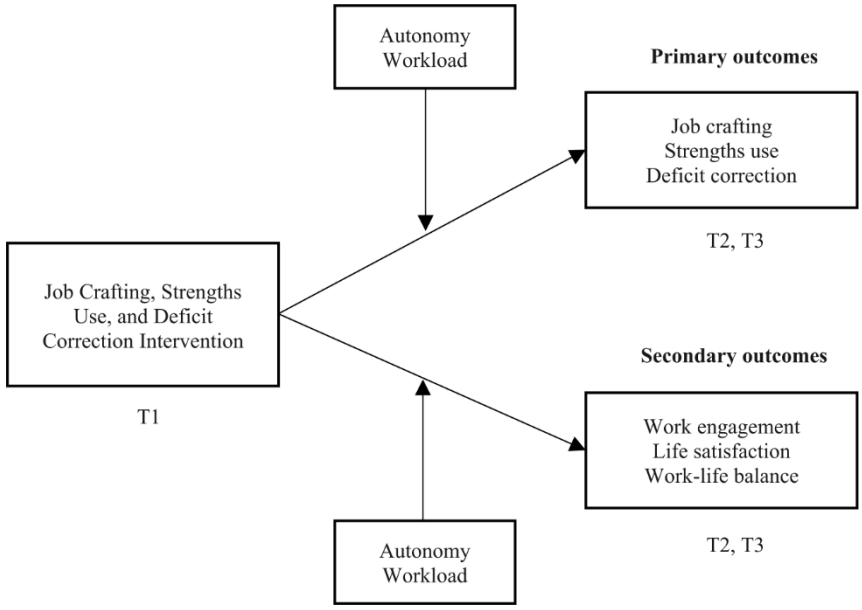

Figure 1. Research model

Method

Trial Design

In order to test the effectiveness of the proposed intervention program, we used a randomized controlled trial with a factorial designed: (1) two independent arms (intervention group vs. wait-list control group), and (2) three measurement moments (pre-test – one week before the intervention; post-test – one week after the intervention; and follow-up test – four weeks after the post-test). Participants were randomly assigned between groups with an unbalanced ratio (biased in favor of the intervention to overcome presumed higher attrition – see

Randomization section for details). The trial was guided by the CONSORT standards (Boutron et al., 2017). Study ethical approval was granted by the Board of Research and Creation of the West University of Timisoara (24846/ 31.05.2021).

The study took place over 12 weeks. Participants received an e-mail containing a link to fill in the outcome questionnaires at each of the three measurement occasions. As all the collected information was anonymous, employees used a unique code for all questionnaires to ensure the possibility of linking the information reported by each participant in the pre-test, post-test, and follow-up. The intervention started one week after the initial measure. The post-test questionnaire was sent one week after the end of the intervention, leaving eight weeks between the two measurement points, while the follow-up questionnaire was completed one month after the post-test. Figure 2 contains an overview of the research design.

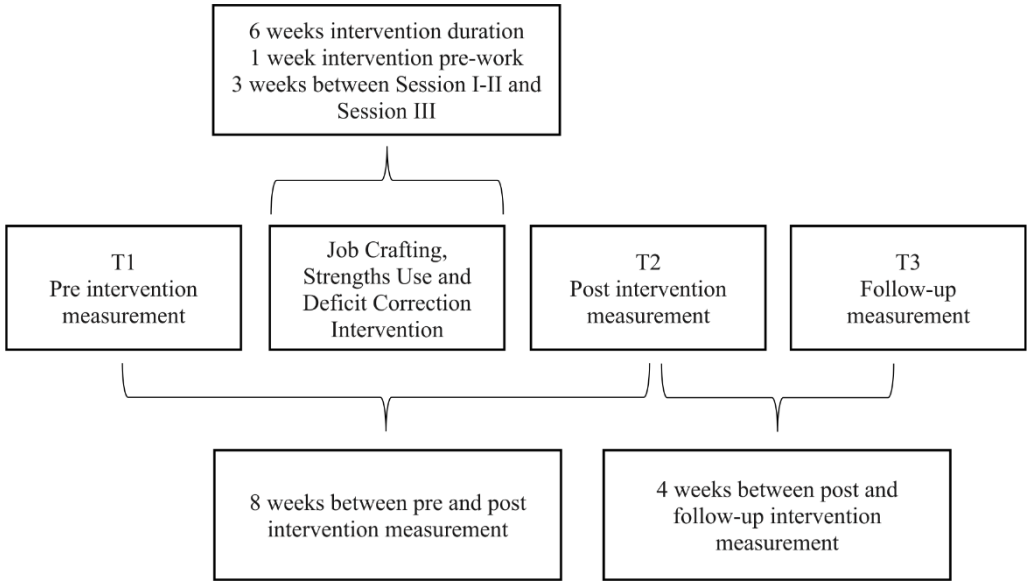

Figure 2. Overview of the research design and flow

Participants

The sample consisted of employees working within the global shared services departments of a large multinational pharmaceutical company. Because of the COVID-19 pandemic, the employees temporarily worked in a home office setting for about a year prior to the study deployment. Upon the approval of the department managers, an online meeting was organized with all the employees of the target departments with the scope of presenting the project and enrolling the participants. Since participation was voluntary, the employees received the information that they could withdraw from the task at any moment. We used two types of incentives to motivate employees' participation throughout all intervention stages. First, the project was presented as a learning and development opportunity from which participants would benefit personally and professionally. Second, all participants who were actively involved in all project stages participated at the end of the study in a raffle for winning one of 23 book or sports vouchers, ranging in value between 20 and 100 EUR.

Job Crafting, Strengths Use, and Deficit Correction Intervention

The present intervention program has been developed based on the JD-R theory (Bakker & Demerouti, 2014; 2017) and goal-setting

theory (Latham & Locke, 2007) to teach the participants how to increase their job crafting (i.e., structural and social resources, challenging job demands), strengths use, and deficit correction behaviors.

The content of the intervention was divided into three workshop sessions delivered online by the first author. The first two sessions had two hours each, while the third session had a duration of one hour and a half (see Figure 3 for details related to the intervention design). To stimulate active participation in the online setting, the groups had a maximum of 14 participants. The first two sessions had four time slots, out of which three were during working hours and one after working hours, while the last session had three time slots, all during working hours, based on the fact that the after working hours session had only a few participants enrolled.

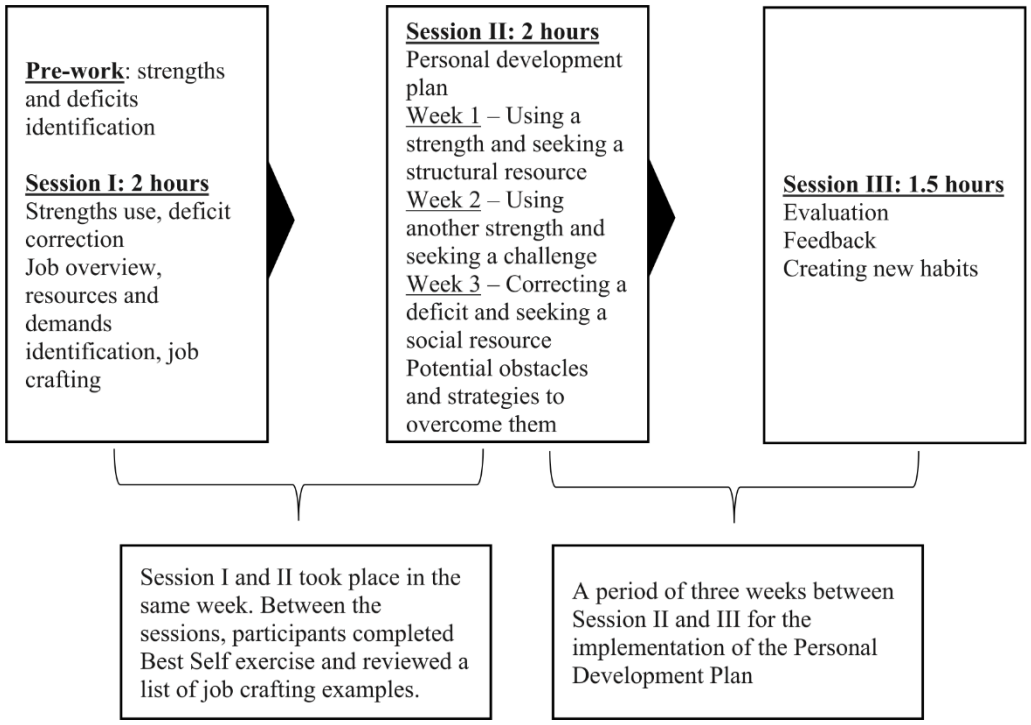

Figure 3. Job crafting, strengths use, and deficit correction intervention design

As a pre-work, one week before the first and second training sessions, participants completed the DECAS questionnaire, a personality assessment tool based on the Big Five model, developed by Sava (2008). Based on the business report, which contained a detailed personality profile and a presentation of the development degree of 16 professional competencies, the participants identified two of their top strengths and one deficit during the intervention. The first training session took place a week after the pre-work, focused on strengths and deficits theory, and continued with an interactive exercise where participants worked in smaller groups within breakout rooms. The scope of the practice was to discuss their strengths, how they apply them at work, and in what types of activities, as well as to identify new ways to use them. They also discussed their deficits and what benefits would bring their development. The training continued with the job crafting part designed based on the Job Crafting Exercise (Berg et al., 2010) and the JD-R theory (Bakker & Demerouti, 2014; 2017). Employees reviewed their jobs by dividing their activities into three categories: tasks that required a high amount of energy and time, tasks that required a medium amount of energy and time, and tasks that required low energy and time to be

performed. Based on the overview, they debriefed on how they feel about the way their energy and time are spent at work.

Furthermore, the JD-R theory was presented, and participants worked in smaller groups to identify the resources and demands of their jobs and working environments. Finally, employees received Burt's Bees case study (Berg, Kahn & Dutton, 2010) to help them understand what job crafting is and what benefits could bring to individuals and organizations. At the end of the session, everyone received two activities to perform until the next session. First, each participant had to identify a colleague who knows him or her very well and ask them to describe a situation in which the participant was at his/ her best self. This qualitative method of identifying strengths was used in addition to the personality report provided to participants, as the five-step integrative model proposed by Miglianico et al. (2020) in developing strengths interventions suggests that a combination of methods leads to more accurate results in strengths identification. Second, each of them had to study a list of job crafting examples (Knight et al., 2021) and identify a social resource, a structural resource, and a challenge they would like to seek in their job.

The second training session was dedicated to bringing all the elements together and building the personal development plan. Employees received a working file based on which they established three actions to perform in the following three weeks: 1) Use a strength to seek a structural resource; 2) Use another strength to seek a challenge; and 3) Develop a deficit by seeking a social resource. In line with goal-setting theory principles (Latham & Locke, 2007), which states that specific and challenging goals motivate individuals to do their best in achieving them, we instructed participants to define SMART (Specific, Measurable, Achievable, Realistic, Timely) actions that are relevant for them. After the plan development, employees were divided into smaller groups, discussed potential obstacles and barriers in implementing the plan, and shared strategies to overcome them. During the following three weeks, the participants received an e-mail at the beginning of each week reminding them about the week's objective. At the end of each week, they received a short evaluation measuring the level of task implementation. In the final session, which took place three weeks after the first two training sessions, employees shared their experience and feedback and learned about forming new habits and integrating the newly acquired information in their lives.

Measures

Primary Outcomes Measures

Job crafting. Job Crafting Scale (Tims et al., 2012) was used to measure the three dimensions of job crafting: *seeking structural resources* (e.g., "I try to develop myself professionally"), *seeking social resources* (e.g. "I ask my supervisor to train me"), and *seeking challenging job demands* (e.g., "When an interesting project comes up, I proactively involve as a project team member"). All items were evaluated on a 5-point Likert scale, where 1 = *totally disagree* and 5 = *totally agree*. The Cronbach's α results were good across the three measurement points, their levels ranging between .73 and .80 for *seeking structural resources*, between .71 and .83 for *seeking social resources*, and between .70 and .73 for *seeking challenging job demands*.

Strengths Use. Strengths use behavior was measured using the dedicated subscale of the Strengths Use and Deficit COrrection (SUDCO) Questionnaire developed by van Woerkom et al. (2016). The six items were assessed on a 7-point Likert scale, the answers ranging from 1 = *almost never* to 7 = *almost always*. One example is, "I use my strengths at work". Reliabilities were excellent, their values ranging between .93 and .95 for all measurement points.

Deficit Correction. The dedicated subscale of the Strengths Use and Deficit COrrection (SUDCO) Questionnaire (van Woerkom et al., 2016) was used to measure deficit correction behavior. The subscale comprised six items measured on a 7-point Likert scale (1 = *almost never*; 7 = *almost always*), one example being, "At work, I look for training opportunities to improve my weaknesses". Cronbach's α ranged between .86 and .89 across the three measurement points.

Secondary Outcomes Measures

Work Engagement. To measure work engagement, we used the shortened version of the Utrecht Work Engagement Scale (UWES-9) developed by Schaufeli et al. (2006) and adapted to the Romanian population by Vîrgă et al. (2009). All nine items were assessed on a 7-point Likert scale, where 1 = *never* and 7 = *daily*. An example of a work engagement item is, "I am proud of the work I do". Reliabilities were good, ranging between .87 and .92, across the three measurement points.

Life Satisfaction. Life satisfaction was measured with the five items of the Satisfaction with Life Scale developed by Diener et al. (1985). All items were assessed on a 7-point Likert scale (1 = *totally disagree*; 7 = *totally agree*), one item example being, "I am satisfied with my life". Cronbach's α ranged between .83 and .89 for the three measurement points.

Work-Life Balance. Work-life balance was assessed using the Work-life balance measure developed by Brough et al. (2014). The four items are evaluated on a 5-point Likert scale (1 = *totally disagree*; 5 = *totally agree*). An example of an item is, "I currently have a good balance between the time I spend at work and the time I have available for non-work activities". Cronbach's α were very good, their levels ranging between .90 and .94 across the three measurement points.

Moderator Variables

Autonomy. Autonomy was assessed at baseline using the Experience and Evaluation of Work scale (Van Veldhoven & Meijman, 1994). The three items were assessed on a 5-point Likert scale (1 = *never*; 5 = *very often*), an item example being, "Do you have flexibility in performing your work?". Cronbach's α was .55.

Workload. Workload was assessed at baseline using the Experience and Evaluation of Work scale (Van Veldhoven & Meijman, 1994). The five items were assessed on a 5-point Likert scale (1 = *never*; 5 = *always*), one item example being, "Do you have too much work to do?". Cronbach's α was .80.

Sample Size

Since previous meta-analyses on the effectiveness of interventions for increasing work engagement (Vîrgă et al., 2019) or job crafting interventions (Oprea et al., 2019) revealed effect size estimates ranging in the interval of small magnitude, we took $d = .35$ (midpoint between .20 and .50) as a reference ES. Hence, for the aforementioned effect, with an α error probability of .05, an estimated power (1-β) of .80, and a correlation amongst repeated measures of $r = .50$, the total sample needed for testing our hypotheses was 52 participants. Considering a 20% attrition rate, the overall sample we aimed at recruiting was 65 participants. The sample size estimation was performed with the aid of GPower 3.1 software (Faul et al., 2007).

Randomization

The randomization was achieved by alphabetically organizing the employees of each of the four departments, numbering every person, and dividing the group into even and odd numbers. Since the odd group was slightly larger, it was decided to form the experimental condition. As we expected a higher dropout rate in the experimental group, we moved additional participants from the control group to the experimental one, using the online application www.random.org (Haahr, 2021), to achieve a 56% vs. 44% distribution of the participants. They were instructed not to discuss the intervention before the end of the study to prevent cross-contamination from one group to another. Employees who comprised the wait-list control group attended the workshop sessions after the end of the study.

Statistical Analyses

As being the "gold standard" approach for randomized controlled trials, the data were analyzed based on the intent-to-treat principle (ITT; McCoy, 2017). This method shields the internal validity of the study by preserving the benefits of randomization. Also, it yields higher external validity since in a real-life setting, rarely the entire client population will completely adhere to an intervention protocol. The ITT was performed based on the last

observation carried forward principle in which data missing from one measurement point were completed using the previous measurement information. For transparency and comparison, we also performed the primary analyses on pre protocol data (only on those participants who adhered to the intervention and filled in the post-test, respectively follow-up measures). In addition, we reported the correlation matrices between all studied variables at all-time points for future meta-analyses or other inquiries.

We applied chi-square to test for baseline differences between the two groups on categorical variables, as well as independent-samples t-tests to assess for differences at baseline for the numerical ones. To investigate the effects of the mixed intervention on the participants' levels of job crafting (H1a, H1b, H1c), strengths use (H2), deficit correction (H3), work engagement (H4), life satisfaction (H5), and work-life balance (H6), we conducted mixed factorial analyses of variance (ANOVA) with time (T1 vs. T2; T1 vs. T3) as a within-subjects factor and group (experimental group vs. wait-list control group) as a between-subjects factor. As an effect size estimate, we computed Cohen's *d* for each comparison point (T2 and T3) by considering the T1 means, the between measures correlation, and the change score SD. Hence, the effect size reflects the between-groups standardized comparisons in outcome improvement relative to baseline. Furthermore, we conducted moderation analyses using multiple linear regression with centered interaction terms to investigate the possible moderator effect of autonomy (Research question 1) and workload (Research question 2) between the intervention (dummy coded: 1 – intervention vs. 0 – control) and all the outcomes, at both T2 and T3 occasions. In each regression model, we controlled for the baseline (T1) scores of the investigated outcome. Significant moderation effects were further analyzed by means of the Johnson–Neyman technique. This approach avoids using arbitrary points for the moderator variable (e.g., +/- 1SD) to conduct slope analysis and identifies the exact region of the moderator within or outside of which the relationship between the predictor and the outcome is significant (Preacher et al., 2006).

We used IBM SPSS Statistics 27 (IBM Corp, 2020) to check the baseline equivalence and test the main hypotheses and the SPSS custom dialog PROCESS (Hayes, 2017) to perform the moderation analyses.

Results

Participant Flow

Out of the 86 eligible employees, 80 agreed to participate in the intervention and were randomly assigned to the intervention or the wait-list control condition (see Figure 4).

All 80 participants completed the pre-test questionnaire (100% response rate), 74 participants completed the post-intervention questionnaire (92% response rate), and 69 participants completed the follow-up questionnaire (86% response rate). Six employees from the experimental group dropped out during the intervention, the registered dropout rate for this group being 13% at post-test. Of the five additional employees who dropped out after the post-test, three were from the experimental condition and two from the wait-list control condition. The extra five participants increased the total dropout rate to 20% for the experimental group and 5% for the wait-list control group.

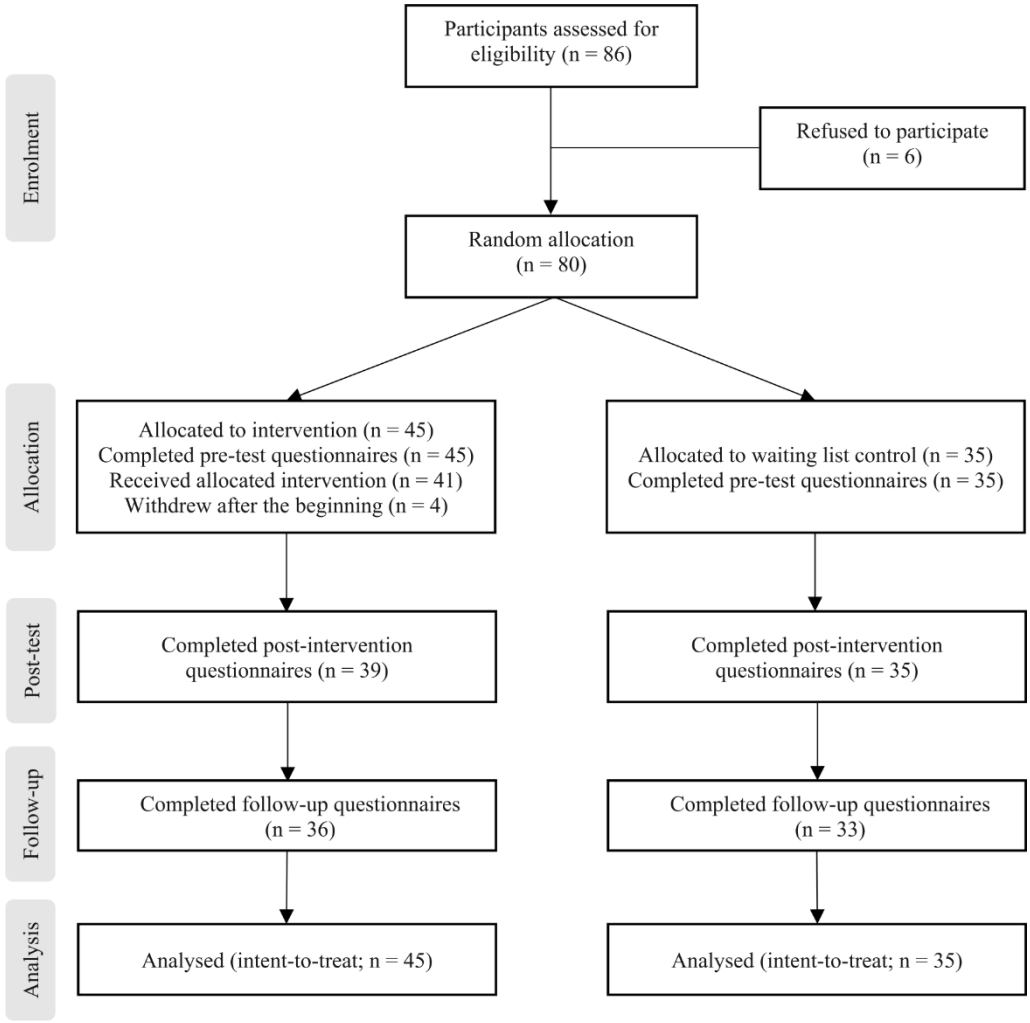

Figure 4. The flowchart displaying participants' cycle throughout the study

Descriptive Statistics and Preliminary Analysis

Table 1 contains more details regarding the demographic aspects investigated for the two groups. Of the 45 employees who formed the experimental group, 38 (84%) were women; the average age was 30.18 years (SD = 5.06); 100% held a bachelor's degree or a higher educational degree; 76% were in a relationship, married or divorced. Concerning the control group, out of the 35 participants, 30 were women (86%); the average age was 30.71 years (SD = 5.07); 89% held a bachelor's degree or a higher educational degree; 17% were single. The average working time per week was 40.27 (SD = 1.49) hours for the experimental group and 40.94 (SD = 2.86) hours for the control group. Finally, concerning organizational tenure, 78% of the experimental group participants and 71% of the wait-list control group participants worked for more than one year within the company.

Table 1. *Demographics differences between the experimental and wait-list control group*

Demographic	Group	Description	Mean / Count (SD / %)	Comparison test
Participants	Experimental	Number	n=45 (56%)	--
	Control		n=35 (44%)	
Gender	Experimental	Male	7 (16%)	
		Female	38 (84%)	$\chi^2 = 0.03$,
	Control	Male	5 (14%)	$p = .88$
		Female	30 (86%)	
Average age	Experimental	Years	30.18 (5.06)	$t = 0.47$,
	Control		30.71 (5.07)	$p = .64$
Average tenure	Experimental	< 1 year	10 (22%)	
		1 – 3 years	25 (56%)	
		> 3 years	10 (22%)	$\chi^2 = 0.98$,
	Control	< 1 year	10 (29%)	$p = .61$
		1 – 3 years	20 (57%)	
		> 3 years	5 (14%)	
Average working time/ week	Experimental	Hours	40.27 (1.49)	$t = 1.37$,
	Control		40.94 (2.86)	$p = .18$
Marital status	Experimental	Single	11 (24%)	
		In a relationship	15 (33%)	
		Married/ Divorced	19 (43%)	$\chi^2 = 3.05$,
	Control	Single	6 (17%)	$p = .38$
		In a relationship	17 (48%)	
		Married/ Divorced	12 (35%)	

In order to identify if there were any significant differences between the experimental and wait-list control group at pre-test (T1) we conducted independent-samples t-test analyses on all study variables. The results showed non-significant differences between the two groups for each study variable: $t(78) = 0.80$, $p = .42$ (seeking structural job resources), $t(78) = -0.54$, $p = .59$ (seeking social job resources), $t(78) = -0.01$, $p = .98$ (seeking challenging job demands), $t(78) = -0.39$, $p = .69$ (deficit correction behavior), $t(78) = -0.52$, $p = .60$ (strengths use behavior), $t(78) = -1.21$, $p = .22$ (work engagement), $t(78) = -0.45$, $p = .65$ (life satisfaction), $t(78) = 0.13$, $p = .89$ (work-life balance), $t(78) = 0.57$, $p = .74$ (autonomy), and $t(78) = 0.32$, $p = .74$ (workload).

Table 2 displays the correlation coefficients between all research variables on Time 1-3, for both intent-to-treat and per protocol data.

Intervention Effectiveness on Primary Outcomes

Our first hypothesis was that the intervention would result in increased levels of seeking structural job resources (H1a), seeking social job resources (H1b), and seeking challenging job demands (H1c). We performed mixed factorial ANOVAs to test for the group by time interactions. Specifically, we investigated if the mean changes from Time 1 to Time 2, as well as from Time 1 to Time 3 for the intervention group, outperformed those reported in the control condition. The results showed no significant group by time interaction regarding neither the Time 2 (F (1, 78) = .56, $p = .45$) and nor the Time 3 (F (1, 78) = .48, $p = .49$) increasing structural job resources. Similarly, there were no group by time interactions regarding increasing social job resources at Time 2 (F (1, 78) = .06, $p = .80$) or Time 3 (F (1, 78) = .42, $p = .51$). Regarding increasing challenging job demands, this time, we registered a significant effect at Time 2 (F (1, 78) = 3.85, $p = .05$), the Cohen's d value being .44, which suggests a small to medium effect size. However, this significant effect was not maintained at Time 3 (F (1, 78) = .13, $p = .71$). This result partially supports our first hypothesis.

Table 2. *Correlation coefficients between all research variables on Time 1-3 (intent-to-treat data above the main diagonal and per protocol data below)*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1. Intervention	-	-.07	-.04	-.09	.06	.01	.05	.06	.14	.05	-.02	-.02	.04	.18	-.03	.05	.15	.21	.04	-.16	.00	.04	-.09	-.07	.10	.15	.03
2. Autonomy T1	-.09	-	-.20	.14	-.04	.17	.25*	.54**	.20	.40**	.33**	.18	.01	.24*	.27*	.33**	.18	.17	.31**	.21	-.01	.24*	.26*	.41**	.19	.17	.21*
3. Workload T1	-.05	-.17	-	.20	-.21	.10	-.02	-.07	-.15	-.14	-.38**	.02	-.22*	-.01	-.17	-.24*	-.18	-.19	-.37**	.09	-.22*	-.01	-.04	-.13	-.16	-.25*	-.36*
4. Structural resources T1	-.13	.08	.19	-	.26*	.59**	.55**	.25*	.22*	.07	-.09	.63**	.27*	.38**	.52**	.18	.18	.07	-.02	.62**	.22*	.31**	.46*	.17	.20	-.04	-.06
5. Social resources T1	.06	-.03	-.22	.26*	-	.21	.45**	.01	.16	-.06	-.04	.22*	.71**	.09	.32**	.07	.19	.06	-.09	.04	.67**	-.09	.23*	.15	.11	-.04	-.09
6. Challenging job demands T1	-.03	.08	.11	.58**	.23*	-	.59**	.23*	.17	.29**	.05	.48**	.36**	.68**	.74**	.21	.21	.19	.02	.40**	.31**	.59**	.44**	.20	.09	.05	.04
7. Deficit correction T1	.01	.18	.00	.53**	.47**	.56**	-	.39**	.33**	.35**	.07	.56**	.39**	.45**	.61**	.27*	.27*	.29*	.08	.48**	.38**	.40**	.65**	.23*	.24*	.16	.12
8. Strengths use T1	.03	.51**	-.05	.22	.03	.18	.35**	-	.34**	.28**	.05	.32**	.13	.18	.23*	.58**	.30	.14	.08	.37**	.16	.29*	.29*	.59**	.42**	.11	.13
9. Work engagement T1	.11	.26*	-.19	.21	.12	.17	.33**	.36**	-	.21	.13	.32**	.23*	.27*	.27*	.33**	.78**	.33**	.26*	.24*	.18	.18	.21	.29**	.73**	.24*	.28*
10. Life satisfaction T1	.03	.31**	-.08	.05	-.08	.23*	.30**	.23*	.23*	-	.46**	.06	-.09	.23*	.16	.26*	.14	.74*	.38*	.17	.03	.30**	.22*	.20	.06	.74**	.48**
11. Work-life balance T1	.00	.33**	-.38**	-.09	-.01	.02	.05	.01	.14	.45**	-	-.05	-.17	.05	-.02	.19	.09	.35**	.75**	-.09	-.09	.07	.01	.12	.05	.44**	.79**
12. Structural resources T2	-.07	.12	-.01	.60**	.22	.46**	.54**	.28*	.31**	.02	-.06	-	.38**	.54**	.65**	.51**	.35**	.09	.06	.75**	.39**	.47**	.57**	.45**	.33**	.02	.06
13. Social resources T2	.03	.01	-.22	.27*	.68**	.39**	.39**	.15	.19	-.11	-.14	.39**	-	.40**	.55**	.27*	.42**	.11	-.13	.20	.86**	.10	.38**	.26*	.26*	-.06	-.20
14. Challenging job demands T2	.14	.16	-.00	.35**	.11	.65**	.41**	.12	.27*	.16	.02	.52**	.43**	-	.57**	.39**	.42**	.35**	.19	.43**	.36**	.76**	.51**	.32**	.29**	.22*	.14
15. Deficit correction T2	-.08	.19	-.15	.50**	.33**	.43**	.57**	.18	.27*	.08	-.04	.63**	.57**	.53**	-	.50**	.40**	.23*	.09	.53**	.47**	.39**	.74**	.38**	.33**	.11	.04
16. Strengths use T2	.00	.26*	-.25*	.13	.10	.15	.22	.54**	.35**	.21	.16	.49**	.31**	.33**	.46**	-	.50**	.26*	.25*	.40**	.34**	.41**	.50**	.77**	.46**	.23*	.25*
17. Work engagement T2	.12	.23*	-.22	.17	.16	.21	.27*	.32**	.77**	.14	.09	.35**	.40**	.43**	.40**	.53**	-	.35**	.22	.29*	.38*	.31**	.32**	.39**	.82**	.23*	.17
18. Life satisfaction T2	.22*	.05	-.13	.06	.05	.14	.24*	.09	.37**	.71**	.35**	.07	.10	.31**	.17	.22	.38**	-	.40**	.11	.19	.29**	.19	.21	.23*	.85**	.46**
19. Work-life balance T2	-.03	.31**	-.37**	-.02	-.06	-.01	.05	.04	.27*	.37**	.73**	.04	-.11	.16	.06	.22	.23*	.40**	-	.03	.04	.17	.11	.21	.18	.44**	.84**
20. Structural resources T3	-.23	.16	.02	.63**	.12	.41**	.50**	.35**	.25*	.19	-.11	.75**	.33**	.43**	.54**	.40**	.32**	.14	.00	-	.29**	.51**	.59**	.39**	.34**	.07	-.02
21. Social resources T3	.05	.06	-.18	.28*	.64**	.33**	.45**	.22	.22	.01	-.08	.52**	.83**	.42**	.55**	.38**	.37**	.18	.10	.43**	-	.19	.40**	.33**	.23*	.05	-.07
22. Challenging job demands T3	-.03	.16	.01	.30*	-.07	.57**	.42**	.26*	.23	.25*	.03	.48**	.12	.72**	.36**	.36**	.30*	.22	.16	.51**	.24*	-	.47**	.30**	.24*	.25*	.13
23. Deficit correction T3	-.15	.17	-.02	.45**	.25*	.42**	.62**	.23	.21	.15	-.03	.67**	.45**	.50**	.73**	.47**	.36**	.17	.07	.59**	.50**	.47**	-	.49**	.32**	.07	.07
24. Strengths use T3	-.14	.37**	-.10	.14	.19	.12	.18	.53**	.31**	.12	.05	.45**	.31**	.27*	.37**	.74**	.43**	.15	.14	.38**	.41**	.24*	.45**	-	.46**	.18	.22*
25. Work engagement T3	.11	.27*	-.19	.23	.13	.13	.24*	.41**	.68**	.04	.05	.38**	.28**	.36**	.44**	.54**	.85**	.21	.11	.38**	.25*	.30*	.35**	.49**	-	.21	.20
26. Life satisfaction T3	.13	.07	-.15	-.00	-.02	.00	.16	.04	.22	.73**	.49**	.00	-.14	.13	.04	.15	.16	.80**	.40**	.10	.00	.17	.02	.12	.19	-	.58**
27. Work-life balance T3	-.04	.21	-.36**	-.03	-.04	.05	.11	.05	.23	.46**	.82**	.02	-.21	.11	.00	.20	.14	.44**	.82**	-.03	-.03	.12	.02	.16	.14	.57**	-

Note. Intent-to-treat $N = 80$; per protocol N = 74 (T1, T2); N = 69 (T3). Intervention (1 – intervention group vs. 0 – control group); T1 = Time 1 (first survey, pre-test), T2 = Time 2 (second survey, post-test), T3 = Time 3 (third survey; follow-up).
* $p < .05$, ** $p < .01$;

Our second and third hypotheses were that the intervention would result in increased levels of strengths use (H2) and deficit correction (H3). The mixed factorial ANOVA showed non-significant group by time interactions for Time 2 (F (1, 78) = .01, p = .89) and Time 3 (F (1, 78) = 1.56, p = .21) strengths use. Similarly, there were no changes on deficit correction at Time 2 (F (1, 78) = .60, p = .43) and Time 3 (F (1, 78) = 1.94, p = .16). Thus, our second and third hypotheses were not supported by the data.

Intervention Effectiveness on Secondary Outcomes

Our central assumption was that the intervention would lead to higher levels of work engagement (H4), life satisfaction (H5), and work-life balance (H6) for the experimental group in comparison with the wait-list control group. The mixed factorial ANOVA results showed non-significant group by time interactions at Time 2 (F (1, 78) = .08, p = .77) and Time 3 (F (1, 78) = .14, p = .70) for work engagement. In contrast, a significant effect was registered for life satisfaction at Time 2 (F (1, 78) = 4.68, p = .03), reflected through a Cohen's d value of .47, suggesting again a small to medium effect size. As for Time 3, the group by time interaction was not statistically significant regarding participants' life satisfaction (F (1, 78) = 1.70, p = .19). Concerning work-life balance, the results showed no significant effects, neither for Time 2 mean changes (F (1, 78) = .40, p = .52) nor Time 3 (F (1, 78) = .40, p = .52). In conclusion, our fifth hypothesis (H5) was partially supported, while the other two hypotheses (H4 and H6) were rejected.

Table 3 summarizes the descriptive statistics, comparison results, and effects size estimates for each outcome, while Table 4 reports the summary of analyses of variance on data per protocol.

Table 3. *Summary of analyses of variance for study outcomes*

Variable		Experimental (n = 45)		Control (n = 35)		ANOVA	*d* [95%CI]
	Time	*M*	*(SD)*	*M*	*(SD)*	*F* Values	
Structural resources	T1	4.11	(0.48)	4.19	(0.43)	--	--
	T2	4.02	(0.47)	4.03	(0.46)	F (1, 78) = 0.56, p = .45	.17 [-.27, .61]
	T3	3.97	(0.48)	4.12	(0.44)	F (1, 78) = 0.48, p = .49	-.16 [-.60, .29]
Social resources	T1	3.29	(0.68)	3.21	(0.65)	--	--
	T2	3.28	(0.77)	3.23	(0.71)	F (1, 78) = 0.06, p = .80	-.06 [-.50, .39]
	T3	3.33	(0.65)	3.33	(0.72)	F (1, 78) = 0.42, p = .51	-.15 [-.59, 3.0]
Challenging job demands	T1	3.39	(0.58)	3.39	(0.61)	--	--
	T2	3.40	(0.58)	3.19	(0.61)	F (1, 78) = 3.85, p = .05	.44 [.01, .88]
	T3	3.38	(0.52)	3.34	(0.58)	F (1, 78) = 0.13, p = .71	.08 [-.36, .52]
Deficit correction	T1	4.96	(1.10)	4.86	(0.97)	--	--
	T2	4.79	(0.99)	4.86	(0.97)	F (1, 78) = 0.60, p = .43	-.18 [-.62, .27]
	T3	4.71	(0.88)	4.88	(1.02)	F (1, 78) = 1.94, p = .16	-.31 [-.75, .14]
Strengths use	T1	5.38	(1.06)	5.25	(1.08)	--	--
	T2	5.13	(0.92)	5.03	(1.17)	F (1, 78) = 0.01, p = .89	-.03 [-.47, .41]
	T3	4.97	(0.85)	5.11	(1.14)	F (1, 78) = 1.56, p = .21	-.28 [-.72, .17]
Work engagement	T1	5.32	(0.93)	5.04	(1.14)	--	--
	T2	5.30	(1.04)	4.98	(1.20)	F (1, 78) = 0.08, p = .77	.07 [-.38, .51]
	T3	5.23	(1.08)	5.03	(1.11)	F (1, 78) = 0.14, p = .70	-.09 [-.53, .36]
Life satisfaction	T1	5.40	(1.07)	5.29	(0.95)	--	--
	T2	5.79	(0.95)	5.33	(1.21)	F (1, 78) = 4.68; p = .03	.47 [.02, .92]
	T3	5.75	(1.02)	5.42	(1.11)	F (1, 78) = 1.70, p = .19	.29 [-.15, .74]
Work-life balance	T1	3.89	(0.85)	3.91	(0.86)	--	--
	T2	3.87	(0.79)	3.81	(0.83)	F (1, 78) = 0.40, p = .52	.14 [-.30, .59]
	T3	3.83	(0.88)	3.78	(0.93)	F (1, 78) = 0.40, p = .52	.14 [-.30, .58]

Note. M = mean; SD = standard deviation; The F tests the Group x Time interaction effect to detect significant difference between the conditions in the mean change across time (from T1 to T2, and from T1 to T3 respectively); T1 = Time 1 (first survey, pre-test), T2 = Time 2 (second survey, post-test), T3 = Time 3 (third survey; follow-up)

Table 4. *Summary of analyses of variance on data per protocol*

Variable		Experimental (N = 39; T3 = 36)		Control (N = 35; T3 = 33)		ANOVA RM	*d* [95%CI]
	Time	M	*(SD)*	M	*(SD)*	*F* Values	
Structural resources	T1	4.07	(0.47)	4.19	(0.42)	--	--
	T2	3.96	(0.46)	4.03	(0.45)	F (1, 72) = 0.30, p = .58	.13 [-.33, .59]
	T3	3.92	(0.48)	4.13	(0.44)	F (1, 67) = 1.31, p = .25	-.26 [-.73, .22]
Social resources	T1	3.28	(0.66)	3.21	(0.65)	--	--
	T2	3.27	(0.75)	3.22	(0.71)	F (1, 72) = 0.06, p = .80	-.06 [-.51, .40]
	T3	3.37	(0.56)	3.30	(0.72)	F (1, 67) = 0.27, p = .60	-.02 [-.50, .45]
Challenging job demands	T1	3.34	(0.58)	3.38	(0.60)	--	--
	T2	3.36	(0.58)	3.19	(0.61)	F (1, 72) = 3.39, p = .06	.42 [-.04, .88]
	T3	3.30	(0.48)	3.33	(0.59)	F (1, 67) = 0.00, p = .95	.01 [-.46, .49]
Deficit correction	T1	4.88	(1.12)	4.86	(0.97)	--	--
	T2	4.70	(0.98)	4.85	(0.97)	F (1, 72) = 0.70, p = .40	-.20 [-.65, .26]
	T3	4.60	(0.86)	4.89	(1.05)	F (1, 67) = 3.83, p = .054	-.36 [-.84, .12]
Strengths use	T1	5.32	(1.08)	5.25	(1.07)	--	--
	T2	5.02	(0.89)	5.02	(1.17)	F (1, 72) = 0.08, p = .77	.07 [-.39, .52]
	T3	4.87	(0.76)	5.14	(1.15)	F (1, 67) = 2.11, p = .15	-.34 [-.82, .14]
Work engagement	T1	5.25	(0.93)	5.04	(1.13)	--	--
	T2	5.23	(1.06)	4.97	(1.20)	F (1, 72) = 0.06, p = .80	.06 [-.40, .52]
	T3	5.25	(0.95)	5.03	(1.05)	F (1, 67) = 0.07, p = .79	.00 [-.47, .47]
Life satisfaction	T1	5.34	(1.03)	5.29	(0.95)	--	--
	T2	5.80	(0.89)	5.32	(1.20)	F (1, 72) = 5.67; p = .02	.53 [.07, .99]
	T3	5.73	(0.95)	5.48	(1.04)	F (1, 67) = 1.65, p = .20	.28 [-.19, .75]
Work-life balance	T1	3.83	(0.88)	3.91	(0.86)	--	--
	T2	3.81	(0.82)	3.80	(0.82)	F (1, 72) = 0.32, p = .57	.15 [-.31, .60]
	T3	3.78	(0.92)	3.85	(0.88)	F (1, 67) = 0.10, p = .75	-.01 [-.47, .60]

Note. N = 39 (T1, T2) and N = 36 (T3) for the experimental group and 35 (T1, T2) and N = 33 (T3) for the waiting list control group; M = mean; SD = standard deviation. * $p < .05$, ** $p < .01$; The F tests the Group x Time interaction effect to detect significant difference between the conditions in the rate of change across time; T1 = Time 1 (first survey, pre-test), T2 = Time 2 (second survey, post-test), T3 = Time 3 (third survey; follow-up)

Moderation Analyses

The moderator analyses revealed three significant interaction effects. Namely, autonomy acted as significant moderator for the relationship between the intervention and seeking social resources job crafting behavior measured at follow-up (interaction effect: b = -.33, p = .04; regression model: F (4, 75) = 17.36, p < .01). The Johnson-Neyman approach showed that the intervention had a significant but negative impact (bs > -.45; ps < .05) on follow-up seeking social resources for those participants who reported higher levels of autonomy (> 1.24). Autonomy also significantly interacted with the intervention in predicting work-life balance at post-intervention (interaction effect: b = -.34, p = .05; regression model: F (4, 75) = 26.47, p < .01). In this case, the intervention was effective in increasing the work-life balance (bs > .42, ps < .05) of participants with lower scores on autonomy (< -0.98). Finally, participants' workload interacted with the intervention regarding its impact over the follow-up strengths use levels (interaction effect: b = -.68, p = .01; regression model: F (4, 75) = 13.68, p < .01). For participants with higher levels of workload (> .23) the intervention had a significantly negative impact (bs > -.37, ps < .05).

Treatment Adherence and Satisfaction

We have also assessed the active implementation of the personal development plan by analyzing the weekly questionnaires filled in by the experimental group's participants. We discovered that 10 participants (26%) completed all three actions,

9 participants (23%) completed two out of three activities, while 14 participants (36%) completed only one of the three actions. Six participants (15%) completed partially or did not complete any action. Furthermore, the implementation rate registered a decreasing trend as during the first week, 23 participants (60%) reported they had implemented the assigned activity, while during the second week the number dropped to 20 participants (51%), and finally to 19 participants (49%) during the third week. We had the opportunity to investigate how participants perceived the intervention during the final training session. The feedback received was positive; the participants mentioned they appreciated the opportunity to learn about their strengths and actively change different aspects of their jobs, which they were not previously aware of. However, some participants reported that three weeks were too short for implementing the personal development plan, considering their workload, and they would have preferred a longer period.

Discussion

Our study makes three key theoretical contributions to the literature. The first theoretical contribution of our study is related to the unique intervention design that combines three types of proactive behaviors: job crafting, strengths use and deficit correction. To our knowledge, this study is the first one that investigates the effectiveness of a mixed personal strategies (job crafting, strengths use, and deficit correction) program on employee proactive behaviors, work engagement, life satisfaction, and work-life balance, using a randomized controlled trial design. The intervention consisted in identifying participants' strengths and deficits, two sessions on the theory of job crafting, strengths use, and deficit correction, the development and implementation of a personal development plan over three weeks, and an evaluation session. We encouraged employees to choose relevant aspects to them in terms of structural and social resources, challenging job demands, strengths, and deficits. Moreover, we asked the employees to define SMART actions that could be implemented in a short period, one activity per week, combining a job crafting form with using a strength or correcting a deficit. Previous studies have focused solely on job crafting (Kooij et al., 2017; Knight et al., 2021) or on combining job crafting with personal resources (van Wingerden et al., 2017). Concerning strengths-based interventions, a study that combined the strengths and deficits approach was conducted by Rust et al. (2009) and found evidence that focusing on both strengths and weaknesses effectively increases life satisfaction. Our study combines three personal strategies: job crafting, strengths use, and deficit correction, and registers positive increases in employees' life satisfaction.

Our first assumption was that the mixed intervention would increase the targeted proactive behaviors (primary outcomes). We registered one significant result for seeking challenging job demands job crafting behavior, while for the other job crafting facets, strengths use, and deficit correction behaviors, the results were not significant. In terms of job crafting, previous research reported mixed results. While in some studies, none of the job crafting forms significantly changed after the intervention (Kuijpers et al., 2020; van den Heuvel et al., 2015), other studies reported changes in some job crafting behaviors (but not in all). For example, Demerouti et al. (2016) reported significant changes in decreasing hindering job demands, but no modifications for increasing job resources and challenging job demands, while Demerouti et al. (2020) found significant changes in optimizing demands and seeking challenges, but not in seeking resources.

Furthermore, meta-analytical results (Oprea et al., 2019) revealed that job crafting interventions are effective in increasing the overall job crafting, seeking challenging job demands, and decreasing hindering job demands. Although we registered significant differences between the two groups concerning seeking challenging job demands after the intervention, we consider this outcome should be interpreted with caution, as the seeking challenging job demands behavior remained constant for the experimental group. At the same time, it decreased for the wait-list control group, hence the significant difference. One possible explanation for the

mixed results across studies could be related to contextual factors, such as organizational culture, leadership style, or type of work, which may affect the research effectiveness (Kuijpers et al., 2020; Thomas et al., 2020). In our study, employees reported that due to the high workload and the short period to implement the personal development plan, they did not manage to carry out all assigned actions. A similar explanation was given by Demerouti et al. (2020), as in their study the intervention was not efficient in increasing job resources due to participants' perceived pressure to fulfill work assignments. In addition, van Wingerden et al. (2017b) mention that longer periods are required to increase structural resources at work and that frequent interaction with colleagues is needed to increase social resources.

Concerning strengths use behavior, most interventions reported increases in strengths use as an effect of the intervention (Bakker & van Wingerden, 2021; Dubreuil et al., 2016; Forest et al., 2012). In contrast, the intervention designed and delivered by van Woerkom and Meyers (2019) did not result in increased strengths use levels. The authors suggested the participants might have overestimated the use of their strengths before the workshop in which they learned about the theory on strengths. This explanation could be valid in the case of the present study as well, as participants identified their strengths after the pre-test measurement and built a plan to use their strengths to craft their jobs. Another possible explanation could be that more time is needed for employees to practice what they have learned and perceive a change since only 26% of employees completed the personal development plan. This is the case for deficit correction as well, since the participants reported during the evaluation session that a longer period would have helped them to implement the plan.

Regarding our secondary outcomes' hypotheses, only one of the three hypotheses was partially confirmed, while the other two were rejected. Our prediction was that the mixed job crafting, strengths use, and deficit correction intervention would lead to increased levels of work engagement, life satisfaction, and work-life balance. The second main theoretical contribution of our study is that it proves that a mixed job crafting, strengths use, and deficit correction intervention is effective in increasing employees' life satisfaction in the short term – immediately after the intervention. In our literature search, we did not identify any other intervention in which life satisfaction was measured as an outcome of job crafting interventions. On the other hand, strengths-based interventions have found strong links with life satisfaction (Dubreuil et al., 2016). Furthermore, mixed strengths use and deficit correction studies have discovered that focusing on strengths or balancing strengths with deficits successfully leads to life satisfaction (Rust et al., 2009). Our results contrast with the study conducted by Meyers and van Woerkom (2017), which did not register significant effects on life satisfaction as a result of their three-week online strengths intervention, arguing that longer interventions could be needed for influencing participants' well-being.

However, our study did not lead to increased work engagement or work-life balance. Concerning work engagement, our result is in line with several other studies that reported non-significant changes after job crafting interventions (van Wingerden et al., 2017; 2017a) or strengths interventions (Meyers & van Woerkom, 2017). One possible explanation of the fact that the intervention did not result in positive outcomes regarding work engagement could be related to the initial high levels of this variable. Van Woerkom et al. (2021) state that not everyone benefits the same from positive psychology interventions. Those scoring high on well-being or personal resources benefit less as they do not have as much room for improvement as those with lower scores. Another possible explanation for not registering increases in employee engagement is related to the job resources and demands awareness generated by the job overview exercise part of the intervention. Van Wingerden et al. (2017) suggest that the motivational process can be affected if, during the process in which participants analyze the resources and challenges that characterize their jobs and work environment, they

evaluate the job demands as being more than they were aware of before the process. As it concerns work-life balance, DeLongchamp (2020) registered a similar result, as work-life balance did not improve following the implementation of a job crafting intervention.

Finally, the third theoretical contribution of our study is related to the moderating role of autonomy and workload. We explored if the effectiveness of the intervention would be moderated by autonomy and workload, and we registered three significant interactive relationships. First, we found that autonomy is a significant moderator of the intervention effectiveness on seeking social resources one month after the intervention – medium-term, respectively, work-life balance immediately after the intervention – short term. Specifically, when autonomy levels were high, the intervention decreased seeking social resources job crafting behavior. A possible explanation could be that when participants have high autonomy, the job crafting/strengths use focus of the intervention supports them in feeling more empowered, and therefore, they do not feel the need to seek external help, such as social support, coaching or mentoring. In the case of the other significant effect, participants who reported low levels of autonomy increased their work-life balance as a result of the intervention. A possible explanation for this positive result could be that the intervention increased participants' awareness regarding their opportunities to balance their job resources and demands, influencing their work-life balance. This result is of particular interest in the current context marked by the COVID-19 pandemic. The switch of many jobs to a work-from-home setting generated new challenges for couples and multi-member families. The fact that the program seems effective in improving the work-life balance for those with low job autonomy draws attention to the impactful contribution that such interventions can have in this newly emerged context.

The last significant moderation effect is given by workload. When participants' levels of workload were high, the mixed intervention led to a decrease in strengths use in the medium term. This negative effect could have been the consequence of the fact that participants identified their strengths and ways to use them during the intervention. Still, the high workload did not permit them to put the set actions into practice, leading to the perception of lower strengths use. This idea is also supported by the qualitative feedback received at the end of the intervention. Participants explained they would have preferred a longer period to implement the personal development plan because their demanding schedule impeded them to successfully do so.

Strengths, Limitations, and Avenues for Future Research

One of the strengths of our study is the use of a randomized controlled trial type of design that ensures an elevated degree of experimental control and thus the causal interpretation of the results. Such designs are not so often used in organizational settings, researchers often opting for less controlled designs for practical reasons. Moreover, we used a post-test and a follow-up to understand our intervention's short- (at post-test) and medium-term (at follow-up) effects. Another strength and practical contribution is related to the detailed presentation of the intervention that allows future researchers to replicate the current study.

However, the first limitation of our study is related to the research design. Since we had only one intervention combining the three proactive behaviors, we cannot assess if the combination of the proactive strategies led to the results or if one strategy is more efficient than the others. Hence, future studies should consider our study a pilot and aim to compare several independent arms (e.g., a strengths condition, a strength and deficit condition, a job crafting condition, and a mixed group) to better understand the effects of the intervention on the outcome variables. As it concerns the intervention design, the first two training sessions dedicated to the theory and activities regarding job crafting, strengths use and deficit correction had a short duration (four hours). Other organizational interventions report different workshop durations, from two hours (Kuijpers et al., 2020) to eight hours (van Wingerden et al., 2017b). Since we combined three proactive behaviors, it might have been useful to

dedicate a longer period for the activities related to the theory and practice of proactive behaviors. Future studies could evaluate the optimal duration of the workshops, the combination of activities and the delivery of training sessions (e.g. by training professionals). Even though bottom-up interventions have emerged, more studies are needed to fully understand when employees craft their jobs, what crafting strategies they choose and in which context, and the underlying psychological mechanisms that influence the effectiveness of the interventions on the desired outcomes.

Some aspects related to the sample could be considered limitations. First, all the participants were employees of the same organization working in the global shared services departments, and the majority were females. Thus, the generalizability of our findings is limited. Future studies should replicate our study among different industries and organizations, including employees working in several departments and occupations. Moreover, even though we took all possible measures to avoid cross-contamination between the experimental and wait-list control groups, there may still be the possibility that this has happened. Also, the fact that our participants had moderate to high initial levels on most outcomes represents another limitation that future studies should address. A recommendation would be to include only participants with deficits regarding such variables (e.g., low levels of well-being) in similar programs.

Finally, another limitation of our study could be related to the methods and measurements used throughout the study. First, as our research contained only quantitative methods, it could be useful for future studies to include qualitative research methods as well. For example, by organizing structured interviews (van Wingerden et al., 2017), researchers can have a more accurate picture regarding the study results and understand participants' experiences better, including how relevant or useful were different aspects of the intervention. Another limitation related to the measurements used is the low reliability of the autonomy scale. Therefore, all the results regarding autonomy should be interpreted with caution. Second, all study variables were measured using self-ratings. Future studies should consider including peer or manager ratings and ensuring a more objective overview of results. This can be achieved by adapting the used scales so that colleagues or managers evaluate the degree to which the employee manifests the targeted proactive behaviors before and after the intervention.

Practical Implications

The present study is the first to test a mixed proactive strategies intervention. Given the limited significant effects, our experiment could be considered a starting point. While the intervention could be further developed and tested, the results show potential in stimulating positive organizational outcomes. In addition to the theoretical contributions, our study suggests that organizations can invest in bottom-up interventions in order to increase employees' levels of life satisfaction in the context of remote work, in the short term. With the support of Human Resources specialists, managers could enroll employees in programs that target their job crafting, strengths use, and deficit correction behaviors.

Furthermore, organizations could consider a balanced approach regarding strengths and deficits in addressing employee development programs. Having a holistic approach in terms of employee strengths and deficits can support the employee in ensuring acceptable levels of performance when addressing weaknesses and enhancing his/her strengths. By delivering this type of bottom-up intervention, employers also engage employees in their own development. This shared responsibility has the potential to ensure more individually tailored learning and development plans and more empowerment at the employee level in taking over the responsibility of further developing himself or herself.

As previously emphasized, the degree of autonomy and workload moderate the effectiveness of the intervention. The results indicate that employees with low autonomy could benefit from a mixed job crafting, strengths use, and deficit correction intervention in increasing their work-life

balance. Nevertheless, to ensure long-term effects, organizations must develop practices to support proactive behaviors and adjust employees' workload levels to help them integrate the newly acquired information into their daily work life.

Conclusion

This study has revealed that a mixed job crafting, strengths use, and deficit correction intervention can positively influence the life satisfaction of employees working in a home office setting in the short-term. We also discovered that the level of seeking challenging job demands is maintained as a result of the intervention. Additionally, autonomy and workload play a moderating role for the intervention effectiveness. As such, this study indicates that it might be useful for organizations to adopt a holistic approach regarding employees' strengths, deficits, job resources, and job demands, as it could lead to an increased feeling of satisfaction with their lives, an aspect that is beneficial both for the employee and for the organization.

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