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Burnout-Related Ill-Being at Work: Associations between Mindfulness and Acceptance Skills, Worksite Factors, and Experienced Well-Being in Life

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Abstract:

The aim of this paper was to investigate the associations between mindfulness and acceptance (MAA) skills and burnout-related ill-being at work (ILLB) after eliminating the impact of worksite (WS) and general well-being in life (WELLB) factors. The results were derived from data on employees (n = 168) of varying professional backgrounds, who experienced relatively high levels of burnout. Analyses were conducted using structural equation modelling (SEM) and the Cholesky decomposition method, since these allow for the investigation of multiple measures and multiple factors in relation to one another. In relation to ill-being at work, the analyses revealed a general MAA factor as well as a specific

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cognitive fusion factor. After controlling for WS factors, MAA factor shared a 38% variance and the fusion factor a 22% variance with burnout-related ILLB. The results also indicated that cognitive fusion had a strong and unique association with ILLB, even after controlling for WS factors, general well-being, and general MAA skills. Overall, these findings support the view that skills related to psychological flexibility play an important role in enhancing well-being at work.

Most often used abbreviations and their meanings:
ACT, Acceptance and Commitment Therapy; ILLB, Ill-being at work ; MAA, Mindfulness and acceptance ; SEM, Structural equation modelling; WELLB, Well-being in life ; WS, Worksite

Keywords:

mindfulness, acceptance, defusion, burnout, perceived stress, work ability, employee well-being, structural equation modelling (SEM)

The term psychological flexibility has been used to describe the proposed core change process in the Acceptance and Commitment Therapy (ACT) model. The commonly-used clinical model suggests that psychological flexibility is composed of six integrated psychological processes, and the ACT model is often illustrated using a hexaflex figure (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hofmann & Asmundson, 2008; Williams, Russell, & Russell, 2008). ACT interventions are targeted at improving well-being by (a) flexibly and purposefully remaining in the present moment and being mindful of thoughts, feelings, bodily sensations, and action potentials; (b) maintaining a perspective-taking attitude on thoughts and feelings; (c) clarifying hopes, values, and goals in life; (d) performing and cultivating actions in accordance with those identified hopes, values, and goals; (e) willingly accepting the unwanted feelings that are elicited when performing

actions that are consistent with those identified hopes, values, and goals; and (f) increasing defusion skills, such as observing and recognizing thoughts that interfere with experienced life events and valued actions, and seeing them as thoughts rather than literal truths (Flaxman, Bond, & Livheim, 2013; Hayes, Pistorello, & Levin, 2012). Each of these processes is a psychological skill that can be enhanced.

The six processes can be grouped into two broader skill sets: mindfulness and acceptance (MAA) skills and value-related skills. MAA skills consist of remaining in the present moment, maintaining a perspective on thoughts and feelings, a willingness to accept unwanted feelings, and better defusion skills. Value-related skills include the clarification of hopes, values, and goals in life by performing actions in accordance with the identified hopes, values, and goals. This paper focuses on MAA skills and the role they play in work-related well-being and ill-being in connection with self-reported experienced burnout, perceived stress, and work disability. Burnout characterized by symptoms such as exhaustion, cynicism and reduced professional efficacy (Maslach & Leiter, 2008) is a common problem affecting large number (13 to 25%) of the employed people (e.g. Norlund et al., 2010). Further, burnout related work disability is relatively persistent (e.g. Ahola, Toppinen-Tanner, Huuhtanen, koskinen & Väänänen, 2009).

A wide range of studies have demonstrated that MAA skills are connected to mental health conditions, such as depression, anxiety, somatic disorders, pain, and fears. Intervention studies have shown that changes in MAA skills are associated with changes in these symptoms (Chiesa & Serretti, 2009, 2010; Grossman, Niemann, Schmidt, & Walach, 2004; Powers, Vörding, & Emmelkamp, 2009; Ruiz, 2012). According to Howell, Digdon, and Buro (2010), MAA skills are connected to well-being in life (WELLB) factors, such as emotional, psychological, and social well-being. Christopher and Gilbert (2010) found also that MAA skills are associated with WELLB factors and negatively with ill-being

(depression) experiences. In addition to well-being and ill-being, MAA skills have also been associated with diverse work-related experiences. For example, studies have demonstrated that psychological flexibility is connected to better job performance (Bond & Bunce, 2003; Bond, Hayes, & Barnes-Holmes, 2006), lower job stress (Bond, Flaxman, & Bunce, 2008; Biron & van Veldhoven, 2012), and lower burnout levels (Di Benedetto & Swadling, 2014; Goodman & Schorling, 2012; Vilardaga et al., 2011). These empirical findings suggest a connection between MAA skills and general well-being and on the other hand, between MAA skills and burnout, stress-related ill-being at work (ILLB), and subjective work ability. Further, ILLB, characterized by burnout and perceived stress, is known to be associated with physical and psychological symptoms and work absences (Ahola et al., 2008; Hakanen, Schaufeli, & Ahola, 2008; Richardson et al., 2012) as well as with subjective work ability (Ahola, Toppinen-Tanner, Huuhtanen, Koskinen, & Väänänen, 2009; Airila et al., 2014; Hakanen, Bakker, & Schaufeli, 2006).

In sum, existing empirical studies demonstrate links between burnout, perceived stress, and subjective work ability and show that these symptoms are all connected to MAA skills. However, different work and organizational research models and empirical studies suggest that both person-related features (such as MAA skills) and worksite (WS) factors are important antecedents of ILLB and are experienced as burnout symptoms (Alarcon, Eschleman, & Bowling, 2009; Leiter, Bakker, & Maslach, 2014; Maslach & Leiter, 2008). In addition, in their meta-analytic study, Reichl, Leiter, and Spinath (2014) showed that reported WELLB is closely intertwined with well-being at work and vice versa. Thus, future studies exploring antecedents and factors influencing burnout and stress symptoms should pay attention to both person-related factors (such as MAA and WELLB) and WS factors.

These findings lead to the question of whether, after controlling for both WS and WELLB factors, there is a unique connection between MAA skills and burnout-related ILLB.

The assumed fundamental role of psychological flexibility in human functioning has generated scholarly interest in the importance of MAA skills in relation to WS factors. Should there be no possibility of affecting WS factors, would it be possible to impact burnout and stress symptoms by concentrating on skills related to psychological flexibility? This model was partly tested by Vilardaga et al. (2011), who used stepwise regression techniques to investigate the associations between psychological flexibility and WS factors and burnout among drug counsellors. They found that psychological flexibility had a stronger and more consistent relationship with burnout dimensions than with WS factors, such as job control, workload, and support from supervisors and co-workers. This is an important finding because it suggests that when attempting to impact burnout and stress, it might be easier to influence personal factors than it is to influence WS factors. Among the work and organizational approaches used (Leiter et al., 2014), burnout has typically been explained by WS factors, although other studies have acknowledged the role of individual factors (e.g., Alarcon, 2011) such as MAA skills.

A literature review revealed that there are no studies examining all these constructs (MAA skills, ILLB, WS factors, and WELLB) simultaneously.[2] Thus, this paper attempted to explore whether, after controlling for the role of WS and WELLB factors, MAA skills had a unique association with burnout-related ILLB. The goal was to extend the findings of Vilardaga et al. (2011) by investigating that association using a comprehensive battery of methods to assess the four factors.

Based on previous research, this study hypothesized that:

- Higher levels of MAA skills are connected to a higher level of well-being and a lower level of ILLB (burnout, stress, and work ability);

[2]

- Both person-related features (MAA skills and experienced well-being) and worksite factors (WS) factors are associated with ill-being at work (ILLB); and
- In addition to WS factors, MAA skills are connected to ILLB even after controlling for WS and well-being factors.

To obtain a reliable picture of the four investigated factors, this study employed several measures (questionnaires) and structural equation modelling (SEM) to construct each of the four factors and their associations with one another.

Method

Participants

This paper analyzed the findings of an existing research project (The Effectiveness of Mindfulness Practices in the Recovery of Burnout "Muupu"), which was funded by the HHHHHH Social Insurance Institution and registered with ClinicalTrials.gov. The research protocol was approved by the Ethical Committee of the HHHHHHHHHHHHHHHH. The participants comprised volunteers who responded to a recruitment announcement placed in local newspapers at employee healthcare locations and on the study's website. The inclusion criteria for the participants were that they had to: be 25–60 years old and currently working; have access to the Internet; and have burnout scores equal to or above the 75th percentile for their age group based on normative data, as measured by the Bergen Burnout Indicator (BBI-15) (Näätänen, Aro, Matthiesen, & Salmela-Aro, 2003). Individuals were excluded from the study if they had severe mental disorders (severe depression, bipolar disorder, psychosis, or other diagnosed disorders), a history of drug or alcohol abuse, or a somatic or other medical condition that hindered attendance, such as a physical handicap; if they were in current, regular psychotherapeutic treatment; or if they had experienced any major medical changes in the four months preceding the study.

Altogether, 331 applicants voluntarily applied and were screened for enrolment. The applicants first completed a short web-based application and a BBI-15 questionnaire (Näätänen et al., 2003). They were then interviewed via telephone using a structured interviewing procedure to inform them of the study and to verify that they had met the inclusion criteria. Following the interviews, 218 respondents were selected for participation, 50 of whom left the study before completing the pre-measurements. As reason for leaving most of them cited hectic life situations and difficulty committing to the study. The data for this paper were drawn from the 168 participants who voluntarily committed to the study, who met the inclusion criteria, and who fulfilled the study requirements. Prior to the analyses the study participants (n = 168) were compared to the drop-out cases (n = 50) in terms of their age, sex, education, income, and BBI-15 scores as assessed during the application phase. Significant differences were found between the BBI-15 scores of the study participants (M = 63.4; SD = 8.8) and of the respondents who left the study (M = 66.7; SD = 9.6), with t (215) = -2.134 and p = 0.034, indicating that those who left had higher burnout scores than those who remained. No other differences were found (chi-square or $p > 0.05$).

The participants' mean score for the BBI-15 was 57.3 (SD = 11.1), while the mean score of a Finnish normative sample is 39.13 (SD = 13.4) (Näätänen et al., 2003). Altogether, the measurements in the first stage of the study revealed that 36.9% of the participants had high burnout scores, 35.1% medium burnout scores, 10.7% mild burnout scores, and 17.3% close-to-normal burnout scores (in the recruitment phase, 89% of the participants had medium-to-high BBI-15 scores). The mean age of the participants was 46.9 (SD = 8.3). There were more female (79%) than male participants (21%); 65% of the participants had a polytechnic or university degree, 33% a vocational education, and 2% had taken shorter vocational courses. All participants were employed and worked approximately 39.9 hours per week (SD = 12.2). There was a large variation in professions. The majority (82%) of the

participants worked in the following fields: health and social services (31 %), education services (17 %), industry (11%), management and it-services (7 %), public administration services (5 %), scientific and information technology (4 %), information and communication (4 %) and financial and insurance (3 %) services. Among participants, 87% were married or cohabiting, 11% were divorced, 1% were single, and 1% were widowed. Economically, 12% of the participants reported their situation as very good, 57% as rather good, 28% reported that their economic situation was to some degree difficult, and 3% very difficult. Prior to the study, 46% had no experience with MAA practices, 35% had read about them, and 19% had limited experience (one to a few hours of practice experience) with them, and none of the participants practiced MAA regularly.

The Data Collection Procedure

All measures were taken using web-based questionnaires. Personal links to the questionnaires were delivered to the participants via e-mail. The fixed-order set of web-based questionnaires could be completed by the participants at their own pace across several sessions, though within one week of receiving the link. If the questionnaires were only partially completed, the participants were sent up to two e-mail and two telephone reminders.

Measures

Mindfulness and acceptance (MAA) skills, burnout-related ill-being at work (ILLB), worksite (WS) factors, and well-being (WELLB) were investigated using multiple measures. To increase confidence in the investigated factors, each of these four factors was present in several questionnaires. Table 1 presents detailed information about the measures used to assess these four factors. The scales, which were modified for the purposes of this study (perceived work ability and job characteristics), are presented in detail in this paper.

The outcome variable, i.e. the burnout-related ILLB factor was formed using three scales: the BBI-15, which measured burnout; the Perceived Stress Scale Questionnaire (PSS-

10), which measured perceived stress; and the Work Ability Questionnaire (WAQ), which measured perceived work ability (see Table 1 for detailed descriptions of these scales). These three measures were chosen because previous research demonstrated a relationship between burnout and perceived stress (Elo, Leppänen, & Jahkola, 2003; Malinauskas, Malinauskiene, & Dumciene, 2010) and between burnout and work ability (Ahola et al., 2009;Airila et al., 2014; Hakanen et al., 2006; Ilmarinen, 2009). A short-scale WAQ—a modified version based on scales created by Sipponen, Salmelainen, and Syrjäsuo (2011) (also see Rautio & Michelsen, 2013, which was not available at the start of the study)—was used to measure perceived work ability. This modified WAQ assessed seven areas of the participants' subjective evaluation of their own ability to work: belief in their ability to work in the same position for more than two years (1 = hardly; 2 = not sure; and 3 = fairly sure); estimation of their current work ability (from 1 = I am not able to work at all to 10 = I am able to do my best at work); experienced health (from 1 = poor to 5 = good); amount of stress experienced (from 1 = a lot to 5 = not at all); recovery from work (from 1 = poorly to 5 = well); worries about feelings of melancholy, depression, or hopelessness (1 = yes; 2 = no); and worries about lack of interest or having been disinclined during the past month (1 = yes; 2 = no). Individual scores were added and then divided by the number of questions to create a total score. Noteworthy, reversed WAQ scores were used in the analyses, thus reflecting work disability in the study.

MAA skills were assessed using four scales: the Five Facet Mindfulness Questionnaire (FFMQ); the Automatic Thoughts Questionnaire-Believability (ATQ-B); the Automatic Thoughts Questionnaire-Frequency (ATQ-F); and the Acceptance and Action Questionnaire-II (AAQ-II). These questionnaires measured mindfulness skills (FFMQ, including the five subscales); believability and frequency of automatic thoughts (ATQ-B and ATQ-F, which are thought to reflect defusion skills); and psychological flexibility skills

(AAQ-II, which is thought to reflect the relationship between acceptance and value-based actions). These measures are considered to represent the core processes of the ACT model (Hayes et al., 2006).

WS factors were measured using six scales: the Bern Illegitimate Tasks-Unreasonable (BITS-UR) Scale; the Bern Illegitimate Tasks-Unnecessary (BITS-UN) Scale; the Job Clarity, Fairness, and Community Scale (JOCHA 1, the Job Workload Scale (JOCHA 2); and the Job Control Scale (JOCHA 3). These scales were used to measure unreasonable and unnecessary illegitimate tasks (Semmer, Tschan, Meier, Facchin, & Jacobshagen, 2010) and job characteristics (JOCHA). Job characteristics were measured using the General Nordic Questionnaire of Psychological and Social Factors at Work (QPSNordic) (Elo et al., 2000) and the Work Stress Questionnaire (WSQ) (Elo, Leppänen, Lindström, & Ropponen, 2012). Because the above-mentioned scales included many items measuring different job characteristics, only a subset of the questions was used, and the information was summarized using exploratory factor analyses (EFA), which produced the JOCHA factors. The JOCHA scales are presented in detail in the Appendix.

WELLB was measured using three scales based on research by Kokko, Korkalainen, Lyyra, and Feldt (2013): the Life Satisfaction Questionnaire (LSQ), which measured life satisfaction; the Scales of Psychological Well-being (RYFF), which measured psychological well-being; and the Scales of Social Well-being (KEYES), which measured social well-being.

Statistical Analysis Strategy

The goal of this paper was to explore whether MAA skills were uniquely associated with burnout-related ILLB after controlling for the role of WS and WELLB factors. To obtain a reliable picture of the associations between these factors, SEM and the Cholesky decomposition method (de Jong, 1999) were used. SEM also revealed how strongly these

three key factors explained ILLB. SEM is especially useful for analyzing multiple correlated measures because the measurement error can be omitted and the relationships between the latent factors can be analyzed. The Cholesky decomposition method is a fixed-order regression application used with latent variables (de Jong, 1999), and it separates the unique variance of each step after accounting for previous steps. In the following analyses, the steps are referred to as the first, second, and third Cholesky components.

In the preliminary phase, analyses of the means, standard deviations, correlations (Pearson´s correlation coefficients), and reliabilities (Cronbach's alphas) were conducted for the known unidimensional scales (measures 1–3, 10–12, and 17–21 in Table 1). For the FFMQ (measures 4–9 in Table 1) and the JOCHA scales (measures 13–16 in Table 1), EFA was used to investigate their underlying sub-dimensions and to calculate their reliability scores. These analyses were performed using IBM SPSS Statistics 22. All analyses included the 168 participants, with no missing values.

In the first phase, a series of confirmatory factor analyses (CFA) were conducted to investigate whether the latent factors of burnout-related ILLB, MAA skills, WS factors, and WELLB could be identified on the basis of the formed scales (i.e. to test whether by researches a priory formed factors (ILLB; WS, MAA and WELLB) could be identified). The CFA and the associations between the study constructs were investigated using the Mplus statistical package (Muthén & Muthén, 1998–2012), along with the maximum likelihood estimation method, with a robust standard error and the Satorra-Bentler scale corrected chi-square value (using the MLR estimator in Mplus).

In the second phase (the correlated model), the correlative structures of the latent factors were analyzed. In the third phase (the combined model), SEM and the Cholesky decomposition method (de Jong, 1999) were applied so as to model the unique connections between the latent factors. This approach is equivalent to using a stepwise regression model.

The first Cholesky component (WS-C) was used to explain all the variance between the first predictive latent factor (WS factors), the related variance of the second factor (WELLB), the third factor (MAA skills), and the outcome factor of ILLB. The second Cholesky component (WELLB-C) was used to explain the remaining variance of the second factor (WELLB), the related residual variance of the third factor (MAA skills), and the residual variance of the ILLB factor, which could not be explained by the first Cholesky component (WS-C). Finally, the third Cholesky component (MAA-C) was used to explain the residual variance of the third factor (MAA skills) and the related residual variance of the ILLB factor. The background measures of gender, age, and education were regressed directly to the observed variables to try to control their effects.

In the fourth phase, to achieve greater comparative results with those of Vilardaga et al. (2011), the replication model (including only the predictive elements of WS and MAA skills factors) was explored using SEM and the Cholesky decomposition method. All the models were evaluated on the basis of goodness-of-fit indicators (RMSEA = root mean square error approximation; SRMR = standardized root mean square residual; CFI = Confirmatory Fit Index; and TLI = Tucker Lewis Index; see Muthén & Muthén, 1998–2012).

Results

Descriptive Statistics

In the preliminary phase of the analysis, the study constructs were formed on the basis of theoretically known structures (see expected factors and their scales in the section on measures) and were tested using CFA, except in the cases of FFMQ and JOCHA, whose items were analyzed using EFA to attain dimensionality and to build subscales. In further analysis, the FFMQ subscales were used to form the latent factor of MAA skills, together with ATQ-B, ATQ-F, and AAQ. The JOCHA subscales were used to form the latent WS factors, together with BITS-UR and BITS-UN, which were further analyzed using SEM. In

addition, LSQ, RYFF, and KEYS were used to form the latent WELLB factor, and the BBI-15, PSS-10, and WAQ were used to form the latent ILLB factor. The reliability scores for the scales are shown in Table 1. The means, standard deviations, and correlations of the study constructs (explored latent factors) are presented in Table 2.

Latent Factors

In the first phase, the results of the CFA showed that the theoretically formed latent factors of ILLB, MAA skills, WS, and WELLB could be identified (see Table 3). However, the analyses of the MAA-related scales revealed the emergence of a specific factor based on residual correlations, including mindfulness subscale observation (FFMQ-OBS), non-judgment (FFMQ-JUD), ATQ-B, and ATQ-F. In other words, some of the variation (especially in ATQ-F and ATQ-B) were independent from the variation in the MAA factor. This new factor was titled as Cognitive Fusion Factor (see Table 3), and it was estimated separately from the latent MAA factor and other predictive factors because the constructs were uncorrelated. The fusion factor was thought to be connected to the tendency to believe and react to ongoing thoughts since both ATQ-F and ATQ-B showed high loadings within that factor. Table 3 presents the scales used and their standardized factor loadings (λ) connected to the underlying latent factors. The fit indices (see Table 4) showed that the models for the latent factors (ILLB, MAA skills, WS, and WELLB) fit well and that their associations were worth studying.

Correlated Model

In the second phase, to explore how the latent factors correlated with one another, a correlated factor model was formed. Significant ($p < 0.05$) correlations were observed between ILLB and MAA skills (correlation between latent factors ψ= -0.77), ILLB and WS factors (ψ = 0.60), ILLB and WELLB (ψ = -0.65), and MAA skills and WELLB (ψ = 0.87).

The correlations between MAA skills and WS factors (ψ = 0.19) and between WS factors and WELLB (ψ = 0.03) were not significant. Thus, individual-related factors (MAA skills and WELLB) were not connected to WS factors. Further, MAA skills were connected to WELLB as well as to burnout-related ILLB. The fit indices (see Table 4) showed significant associations between the factors (ILLB, MAA skills, WS, and WELLB).

Combined Model

In the third phase, the Cholesky decomposition method was used to investigate whether there was a unique connection between the fusion skills factor and MAA skills and ILLB, after both the WS and WELLB factors were controlled for, and to investigate how strongly these key factors (WS, WELLB, MAA skills, and the fusion skills factor) explained ILLB. Figure 1 shows the results of the final combined model. WS-C reflects worksite factors and it was strongly connected to ILLB (β = 0.57, $p < 0.001$), thus explaining 32% of the variance with ILLB. WELLB-C (the well-being factor) was also a significant, albeit reversed, predictor of ILLB (β = -0.67, $p < 0.001$), explaining 45% of the variance after controlling for the proportion of WS factors. MAA-C reflects a unique connection between MAA skills and ILLB (after controlling for WS-C and WELLB-C). In the analyses, the connection was not significant (β = -0.21, *ns*). However, the cognitive fusion factor had a significant and independent connection to ILLB (β = 0.31, $p < 0.001$), explaining 9.6% of the variance with ILLB after controlling for WS-C, WELLB-C, and MAA-C. The combined model, which included MAA skills, fusion skills, WELLB, and WS factors, shared a 91% ($R^2 = 0.91$) variance with ILLB. It is notable that MAA skills and WELLB had a strong connections with each other (β = 0.88, $p < 0.001$), that is, they shared a large amount of common variance, whereas the connections between MAA skills and WS (β = -0.12, ns) and between WELLB and WS (β = -0.05, ns) were not significant. Overall, these results support the hypotheses set in this paper, indicating that WS factors and individual-related factors had unique

associations with ILLB. More precisely, the results show a unique connection between specific components (deriving information from MAA-related scales), i.e., the fusion skill factor and ILLB, after controlling for WS, WELLB, and MAA factors.

Replication Model

In the fourth phase, the purpose was to compare the data to previous findings by Vilardaga et al. (2011) as well as to apply a replication model using the Cholesky decomposition method. In this model, the relations between the fusion skills, MAA skills, and WS with ILLB were investigated (see Figure 2). WELLB was not included in the analysis. The model fit the data well (see Table 4). In this model, WS factors explained 29% (β = 0.54, $p < 0.001$) of the variance with ILLB. After controlling for WS factors, MAA skills still explained 38% (β = -0.62, $p < 0.001$) of the variance with ILLB, with a reverse connection. In addition, after controlling for both WS and MAA skills factors, the fusion skills factor had a 22% (β = 0.47, $p < 0.001$) unique explanation rate. The replication model, which included MAA skills, the fusion skills, and WS factors, shared an 88% ($R^2 = 0.88$) variance with ILLB. Overall, although the association between WS and ILLB factors was significant, MAA skills explained a higher proportion of ILLB than WS factors (60% vs. 29%).

Discussion

This paper investigated the association between mindfulness and acceptance (MAA) skills and burnout-related ill-being at work (ILLB) by considering the roles of worksite (WS) and well-being (WELLB) factors and using data from 168 employees with relatively high levels of burnout. The data suggested that MAA skills had a significant role in both ill-being and well-being at work. The results revealed that in addition to WS factors, MAA skills had an apparent connection to ILLB characterized by burnout symptoms, perceived stress, and workability. In addition, specific components of MAA skills associated with the cognitive

fusion had a unique association with ILLB after controlling for WS factors, WELLB, and MAA skills.

When cognitive fusion factors and MAA skills were investigated together in association with ILLB, they accounted for 60% of the variance with ILLB after controlling for WS factors. Thus, the results indicate that skills connected closely to psychological flexibility play a notable role in burnout-related ILLB, even after controlling for WS factors. The present study's findings are in line with previous findings by Vilardaga et al. (2011), who found that psychological flexibility had a stronger and more consistent relationship with burnout dimensions than with worksite factors such as job control, workload, and support from supervisors and co-workers. Further, the findings corroborate earlier findings that showed that psychological flexibility was associated with well-being in life and well-being at work (Bond et al., 2008; Hayes et al., 2006).

WS factors had a significant impact and explained 32% of the variance with ILLB. However, when WS factors were controlled, WELLB (life satisfaction, psychological and social wellbeing) still explained 45% of burnout-related ILLB. The connection between WELLB and burnout-related ILLB corresponds with earlier empirical research (Christopher & Gilbert, 2010; Gröpel & Kuhl, 2009; Howell et al., 2010; Reichl et al., 2014) and points to the importance of paying attention to life satisfaction and psychological and psychosocial well-being when dealing with burnout-related stress and work disability. However, the current data showed that well-being was strongly associated with MAA skills.

In line with several previous studies, the data presented in this paper indicate that WS factors (such as the clarity of the job and its tasks, fairness, a sense of community in the workplace, workload, and decent job features) were connected with work-related burnout, stress, and perceived work ability. Several studies (Airila et al., 2014; Alarcon, 2011; Maslach & Leiter, 2008) have suggested that WS factors, rather than individual-related

factors, make up the most important sources of burnout. However, the replication model presented in this paper showed that psychological flexibility related skills and fusion skills shared a 38% and 22% variance, respectively, with burnout-related symptoms after controlling for WS factors and demographic variables. In the study by Vilardaga et al. (2011), WS factors explained 16%–27% of the burnout symptoms compared to 29% in this study. Further, Vilardaga et al. (2011) reported that 10%–12% of the variance with burnout was explained by psychological flexibility after controlling for WS factors. It is notable that although the study by Vilardaga et al., (2011) used different and somewhat less rigorous statistical method they had much larger sample of over 700 addiction counselors. Thus, in line with Vilardaga et al. (2011), the present study drew a somewhat different picture of the predictors of burnout and suggested that individual attributes and attitudes (measured here as psychological flexibility skills and WELLB) may have a more constant and stronger relationship with burnout-related ILLB than with WS factors. This is supported by a study by McCracken and Yang (2008) who showed that acceptance, mindfulness and values measures are associated with stress and burnout.

The modeling showed that WS factors had no significant correlation with individual-related fators, flexibility skills, and well-being in life, although WS factors did have significant associations with work-related burnout. This finding indicates that the participants should have evaluated WS and individual factors separately. The results are in accordance with the many theoretical assumptions presented in existing work and organizational research, which suppose that the cause of burnout is a mismatch between individual features and a person's working environment (Leiter et al., 2014). The current findings deepen the understanding of the connection between individual-related factors and burnout, while pointing to the role of flexibility skills.

This paper presents the first study to model a combination of multiple measures when describing skills with psychological flexibility. The commonly used mindfulness and acceptance measures (AAQ-II, FFMQ, and ATQ) formed an expected latent factor, which represented mindfulness and acceptance skills, but they also revealed an additional factor named as cognitive fusion. Both of these factors were connected to psychological flexibility. We hypothesize that our data propose that some dimensions included in FFMQ and ATQ scales, associated with cognitive fusion, may form an important aspect of psychological flexibility skills associated with work related well-being. In line with the findings in this paper, Gillanders et al. (2014) regard cognitive fusion skills as central skills in the ACT model. Further research is required to more precisely describe skills relating to psychological flexibility.

Limitations

Several issues need to be clarified when drawing conclusions from this study. The cross-sectional data was derived from a sample of people with relatively high levels of burnout, as measured using the BBI-15 and its normative variation (Näätänen et al., 2003). The results can be generalized to individuals whose primary ill-being experience is related to burnout, perceived stress, and work disability. Further issues include the fact that 65% of the study participants were relatively highly educated, middle-aged women and they were motivated in participating the study. Also, the sample consisted of a variety of professions, which may decrease the generalizability of the results.

Multiple measures were used to form the latent factors representing the investigated variables, and the relationships between the variables were studied using SEM and the Cholesky decomposition method. These methods diminish the error variance between the modeled components, which, in turn, may increase the associations between the formed constructs. Handling the data using a sophisticated SEM technique has advantages and

disadvantages. SEM allows for the combination of multiple correlated measures to obtain a more vivid and confident picture of the outcome variables. However, it may limit the possibilities to draw precise conclusions from the used scales. The aim was not to claim that there was no need for specific measurements; rather, it was to acquire a reliable "big" picture of the analyzed factors and their connections with each other.

All the assessment methods used were based on self-reports. In future studies, it will be important to include other types of measurement tools. The large number of web-based questionnaires used were considered exhausting by some participants, even though the participants could complete the questionnaires in several sittings. It is possible that the results reflect the participants' answering styles and attitudes toward the questionnaires rather than their real experiences. This phenomenon, known as common method variance (Bagozzi, 2011), might have increased the associations between different factors in this paper. However, the data showed that several constructed factors, such as MAA skills and WS factors, had minimal associations with one another, even though their connections with the outcome factor were significant, which supports the reliability and validity of the results. Further, we want to direct readers´ attention to the fact that the MAA skill factor did not measure all the component of psychological flexibility such as committed action (except a few items in AAQ-II). Also, the reader need to observe that when the mindfulness and acceptance factor was studied in relation to ill-being at work, both the frequency (ATQ-F) and believability (ATQ-B) of self-critical thoughts were included in this factor. The future studies need to confirm our findings by using experimental or longitudinal designs.

Conclusions

The results in this paper support the view that skills associated with mindfulness, acceptance, and value-related activities are significantly connected to well-being in life and especially burnout-related ill-being at work. In accordance with earlier studies (e.g., Alarcon, 2011; Maslach & Leiter, 2008; Vilardaga et al., 2011), WS factors were shown to be significantly connected to well-being at work. However, WS factors and individual-related factors, such as psychological flexibility related skills, play a unique and independent role in burnout-related ILLB. The data suggest that, after controlling for the impact of WS factors, mindfulness, acceptance, and defusion skills are significant predictors of work-related well-being. In fact, the data suggests that by increasing these skills, it might be possible to influence work-related burnout and stress without modifying WS factors. However, this proposition needs to be tested empirically. Overall, the findings support the view that psychological flexibility is an additional relevant process for addressing burnout.

Authors' contributions

AP and RL defined the research theme and designed the study. AP and SK were responsible for recruitment, and the acquisition of data, AT analyzed data and interpreted the data and AP drafted the manuscript. AP, SK, and RL helped to interpret the data and revise the manuscript critically for important content. All authors read and approved the final manuscript

Compliance with Ethical Standards

This study was conducted in compliance with APA ethical standards and registered with ClinicalTrials.gov. Ethical approval was provided by research Ethical Committee of the Central Finland Health Care District. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interest

The authors declare that they did not have conflicts of interest.

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Informed Consent

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

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Table 1: *The Measures and Their Items, Scales, and Cronbach's Alphas*

		Abbreviation	Items	Scale	α	Reference
Ill-Being at Work		**ILLB**				
1	Bergen Burnout Inventory	BBI-15	15	Totally disagree (1) to totally agree (6)	.87	Näätänen et al., 2003

2	Perceived Stress Scale Questionnaire	PSS-10	10	Never true (1) to very often true (5)	.87	Cohen, Kamarck, & Mermelstein, 1983
***3**	Work Ability Questionnaire	WAQ	7	See the section on measures in this paper	.71	See the section on measures in this paper
Mindfulness and Acceptance Skills		**MAA Skills**				
	The Five Facet Mindfulness Questionnaire	FFMQ		Never or very rarely true (1) to very often or always true (5)		Baer et al., 2006
4	Describing	FFMQ-DES	8	-//-	.92	-//-
5	Non-Reactivity	FFMQ-REA	7	-//-	.84	-//-
6	Awareness1	FFMQ-AW1	4	-//-	.86	-//-
7	Awareness2	FFMQ-AW2	4	-//-	.87	-//-
8	Observing	FFMQ-OBS	8	-//-	.84	-//-
9	Non-Judging	FFMQ-JUD	8	-//-	.87	-//-
***10**	The Automatic Thoughts Questionnaire – Believability	ATQ-B	30	-//-	.96	Zettle & Hayes, 1986
***11**	The Automatic Thoughts Questionnaire – Frequency	ATQ-F	30	-//-	.96	Hollon & Kendall, 1980
12	Acceptance and Action Questionnaire-II	AAQ-II	10	Never true (1) to always true (7)	.87	Bond et al., 2011
Worksite Factors		**WS**				
13	Job Clarity, Fairness, and Community	JOCHA1	17	Never or very rarely true (1) to very often or always true (5)	.89	See the section on measures in this paper
14	Job Workload	JOCHA2	11	-//-	.83	-//-
15	Job Control	JOCHA3	8	-//-	.78	-//-
16	Bern Illegitimate Tasks-Unreasonable	BITS-UR	4	-//-	.86	Semmer et al., 2010
17	Bern Illegitimate Tasks-Unnecessary	BITS-UN	4	-//-	.83	-//-
Well-Being in Life		**WELLB**				
18	Life Satisfaction Questionnaire	LSQ	7	Very dissatisfied (1) to very satisfied (4)	.54	Kokko et al., 2013
***19**	Scales of Psychological Well-Being	RYFF	18	Strongly disagree (1) to strongly agree (4)	.76	Ryff, 1989
20	Scales of Social Well-Being	KEYES	15	-//-	.76	Keyes, 1998

Note. *Reversed scores were used; therefore, WAQ scores indicated work disability, ATQ-B and ATQ-F indicated less believability and frequency of automatic thoughts, and RYFF scales indicated psychological well-being. FFMQ-AW1 was formed using questions 5, 8, 13, and 18, and FFMQ-AW2 was formed using questions 23, 28, 34, and 38.

Table 2: *Descriptive Statistics and Pearson Correlations for the Measures (n = 168)*

	M	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ILLB																						
1	57	1																				
2	19	5.	.6																			
***3**	2.	0.	.5	.5																		
MAA Skills																						
4	28	6.	-	-	-																	
5	20	4.	-	-	-	.3																
6	11	3.	-	-	-	.2	.3															
7	12	2.	-	-	-	.1	.3	.6														
8	25	5.	-	-	.0	.2	.3	.1	.2													
9	28	5.	-	-	-	.0	.3	.2	.2	.0												
***10**	12	1	-	-	-	.2	.3	.3	.1	.0	.4											
***11**	12	1	-	-	-	.1	.4	.3	.2	-	.5	.6										
12	49	1	-	-	-	.2	.5	.4	.3	.1	.7	.5	.7									
WS Factors																						

1	2.	0.	.2	.2	.2	.0	-	-	-	.0	-	-	-	-										
1	3.	0.	.2	.2	.2	.0	.0	.0	-	.0	.0	-	-	.0	.0									
1	2.	0.	.1	.1	.1	-	.0	-	-	.1	-	-	-	-	.2	-								
1	11	3.	.3	.2	.1	.0	-	-	.-	-	-	-	-	-	.2	.3	.1							
1	13	2.	.2	.2	.1	.0	-	.-	-	.0	-	.0	-	-	.3	.1	.1	.3						
WELLB																								
1	19	2.	-	-	-	.1	.1	.2	-	.0	.2	.3	.4	.3	-	-	-	.0	-					
*****	53	6.	-	-	-	.3	.4	.4	.3	.2	.3	.4	.5	.6	-	-	.0	-	.0	.				
2	43	5.	-	-	-	.2	.3	.2	.2	.1	.2	.4	.5	.4	-	-	-	-	-	.	.5			
Backgroun																								
2			.1	.1	-	.2	.0	.0	.1	.0	.0	-	.0	-	.0	.0	.2	.0	.0	.	-	-		
2	46	8.	-	-	-	.0	.2	-	-	.0	-	.0	-	.1	-	-	.0	-	-	.	-	-	.1	
2			-	-	.1	.1	.0	-	.0	-	-	-	-	.1	-	.1	-	-	-	.	-	.1	-	-

Note. Numbers correspond to the names presented in Table 1. The mean scores of the scales were used in each measure. *Reversed scores were used; therefore, WAQ scores indicated work disability, ATQ-B and ATQ-F indicated less believability and frequency of automatic thoughts, and RYFF scales indicated psychological well-being. 21: Gender (1 = Male, 2 = Female); 22: Age; 23: Education (1 = Vocational, 2 = Polytechnic or University); *Significance:* [b] $p < 0.05$; [a] $p < 0.01$.

Table 3: *The Observed Measures and Their Standardized Factor Loadings (λ)—Values Connected to the Underlying Latent Factors*

Latent factor		Observed Measure		λ value
ILLB	Ill-Being at Work			
		1	BBI-15	0.69
		2	PSS-10	0.80
		*3	WAQ	0.72
WS	Worksite Factors			
		13	JOCHA 1	0.40
		14	JOCHA 2	0.58
		15	JOCHA 3	0.14
		16	BITS-UR	0.58
		17	BITS-UN	0.48
WELLB	Well-Being in Life			
		18	LSQ	0.53
		*19	RYFF	0.86
		20	KEYES	0.65
MAA	Mindfulness and Acceptance Skills			
		4	FFMQ-DES	0.31
		5	FFMQ-REACT	0.61
		6	FFMQ-AW1	0.53
		7	FFMQ-AW2	0.38
		8	FFMQ-OBS	0.21
		9	FFMQ-JUD	0.51
		*10	ATQ-B	0.79
		*11	ATQ-F	0.79

	12	AAQ-II	0.83
Cognitive Fusion Factor			
	8	FFMQ-OBS	-0.23
	9	FFMQ-JUD	0.17
	*10	ATQ-B	-0.35
	*11	ATQ-F	-0.60

Note. During the SEM analyses of MAA skills, a new latent factor emerged, which derived reversed information from the FFMQ facets of observation (FFMQ-OBS), the measures of ATQ-B and ATQ-F, and the FFMQ facets of non-judgment (FFMQ-JUD). This new factor was named as Cognitive Fusion Factor because, it was thought to reflect a tendency to believe and react to ongoing thoughts. Reversed scores were used in some cases, therefore, *WAQ scores indicated work disability, *ATQ-B and *ATQ-F indicated less believability and frequency of automatic thoughts, respectively, and *RYFF scales indicated psychological well-being.

Table 4: *Chi-square, Goodness-of-Fit Values, and Model Comparison Tests*

		χ^2	df	p value	RMSEA	SRMR	CFI	TLI	Note
	Cut-off score				< .06	<. .08	.95 >	.95 >	
Latent Factors									
* ILLB	Ill-Being at Work	-	-	-	-	-	-	-	Saturated
* MAA	Mindfulness and Acceptance Skills and Cognitive Fusion Factor	18.12	18	0.448	0.006	0.040	1.000	0.999	
* WS	Worksite Factors	7.74	4	0.102	0.075	0.038	0.948	0.869	
* WELLB	Well-Being in Life	-	-	-	-	-	-	-	Saturated
Correlated Four-factor Model[1]		208	1	0.0	0.04	0.0	0.9	0.9	
Final Models									
	Combined Model	207.225	155	0.003	0.045	0.051	0.958	0.932	
	Replicated Model	121.380	105	0.131	0.030	0.043	0.984	0.971	

Note. All of the latent (*) factor models were combined in the final combined model (in which worksite factors were used in the first step, well-being in the second step of the Cholesky decomposition method, and MAA skills in the third step). The replicated model was also explored (whereby worksite factors were used in the first step of the Cholesky decomposition method, and MAA skills were used in the second step). The cognitive fusion

factor was allowed to independently correlate with the ILLB factor in each model. The correlated four-factor model[1] included no covariates; however, in the final models, age, gender, and education were controlled for. The following pairs of residual covariance were suggested by Mplus modification indices, and, therefore, were allowed to covariate: AW1-AW2, OBS-REACT, OBS-DES, REACT-DES, and AAQ-JUD. All the models were evaluated based on goodness-of-fit indicators (RMSEA, SRMR, CFI, and TLI), and the cut-off scores of the well-fitted models are presented in the table above (Muthén & Muthén, 1998–2012). Saturated=The model fit perfectly to the data (i.e. chi-square value is zero with 0 degrees of freedom).

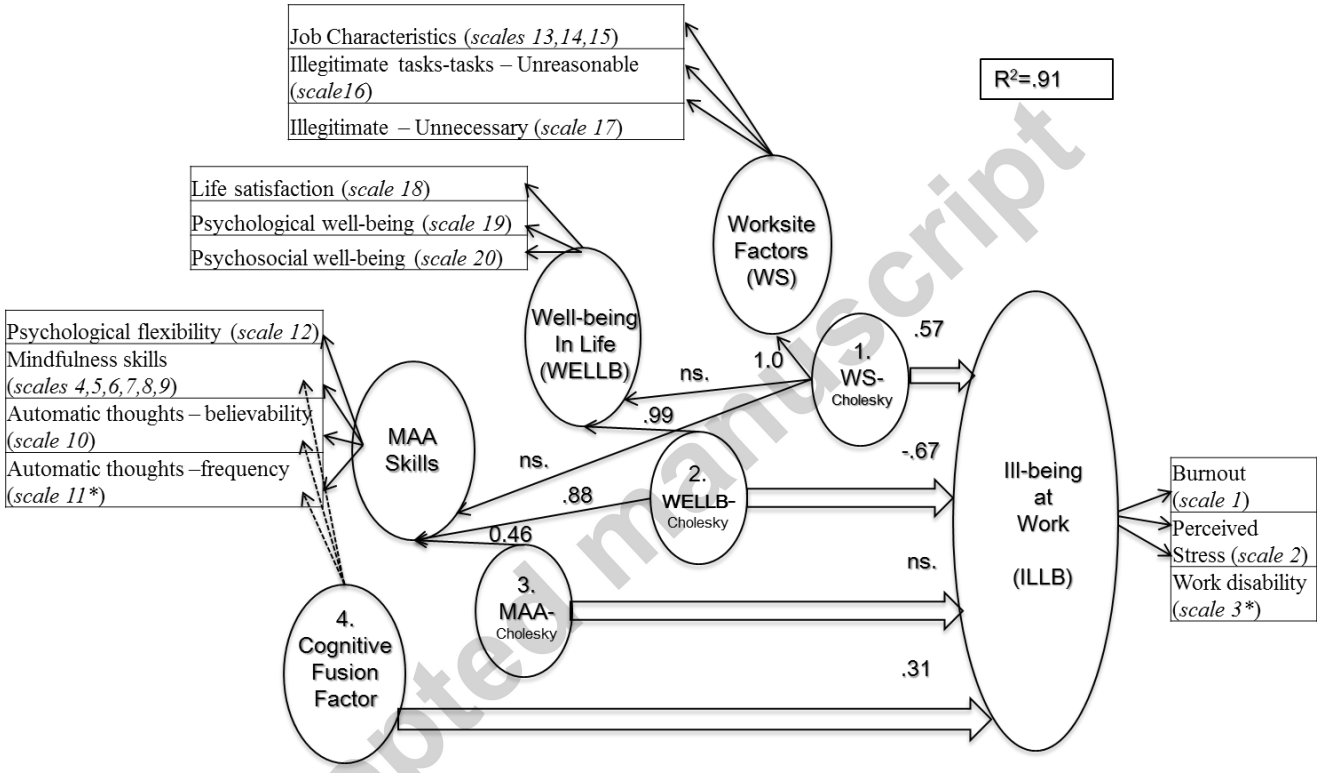

Figure 1. The Combined Model: The Roles of MAA Skills, Worksite, and General Well-Being Factors in Predicting Ill-Being at Work.

In this figure, the latent factors are named ill-being at work (ILLB), worksite factors (WS), well-being in life (WELLB), and mindfulness and acceptance (MAA) skills. The unique variance of MAA was explored using the Cholesky decomposition method and is presented as MAA-Cholesky in the figure. During the analyses, a new specific factor emerged. This factor was not connected to other predictive factors presented in the figure. However, it was thought to reflect cognitive fusion factors. The effects of age, gender, and education were controlled for (using scale variables) in the combined model presented in this figure. The model explained 91% of the variance with ILLB. N = 168. All shown paths except "ns." are significant. The scales used are: 1=BBI-15, 2=PSS-10, 3=*WAQ, 4–9 were FFMQ facets (4=DES, 5=REA ,6=AW1, 7=AW2, 8=OBS, and 9=JUD), 10=*ATQ-B, 11=*ATQ-F, 12=AAQ-II, 13=JOCHA 1, 14=JOCHA 3, 15=JOCHA 4, 16=BITS-UR, 17=BITS-UN,

18=LSQ, *19=RYFF, and 20=KEYES (*= scores are reversed; see Table 1 and Table 3 for more detail).

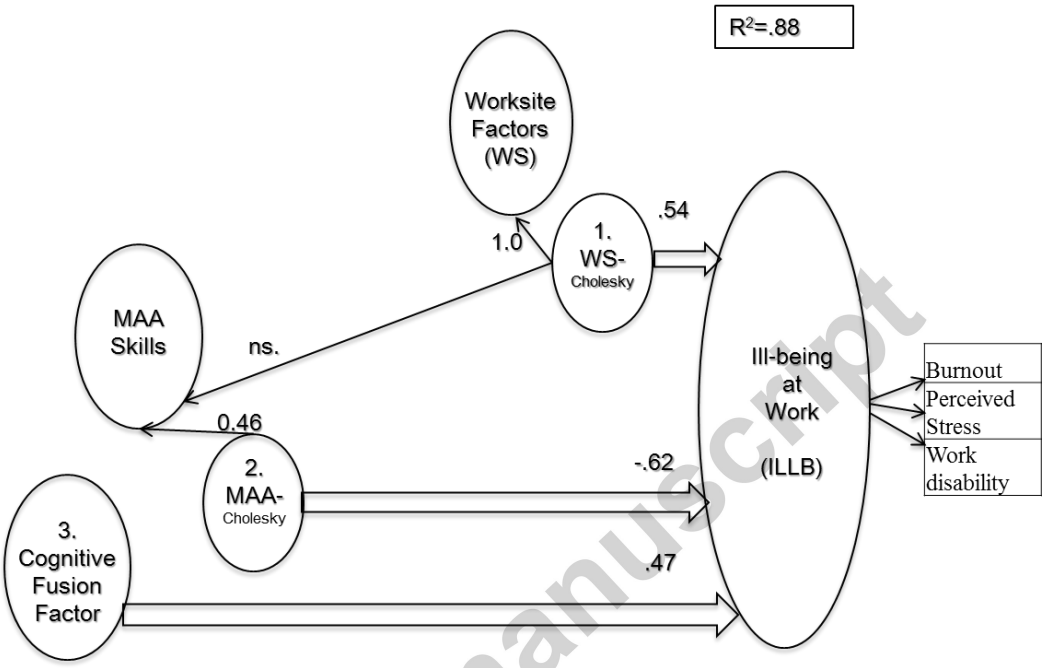

Figure 2. The Replication Model: The Roles of MAA Skills and Worksite Factors in Predicting Ill-Being at Work.

The latent factors are named ill-being at work (ILLB), worksite factors (WS), and mindfulness and acceptance (MAA) skills. The unique variance of MAA is presented as MAA-Cholesky in this figure. During the analyses, a new specific factor emerged that was thought to reflect cognitive fusion factors. The effects of age, gender, and education were controlled for (using scale variables) in the combined model presented in this figure. The model explained 88% of the variance with ILLB. N = 168. All shown paths except "ns." are significant. The scales used are the same as in Figure 1; however, the scales referring to the well-being factor (18=LSQ, 19=RYFF, and 20=KEYES) were not used in the analyses.

Appendix

JOCHA–The Job Characteristic-Assessment Tool. All the items were scored based on a five-point scale: 1 = always/a lot/very good or well … 5 = very little/not at all/bad or very bad.

Job Characteristic 1 (JOCHA 1): Job Clarity, Fairness, and Community

Number	Question	Loading
1	Do you receive incompatible requests from two or more people?	0.47
2	Are there rumors concerning changes at your workplace?	0.42
3	How are the social relationships between coworkers in your workplace?	0.46
4	If needed, can you get help from your coworkers?	0.29
5	Is your work valued in your work community?	0.43
6	The working atmosphere is charged, competitive, and self-serving in your workplace.	0.63
7	The working atmosphere is supportive and inspiring in your workplace.	0.65
8	Is the division of work tasks fair in your work unit?	0.55
9	How does your superior treat employees?	0.61
10	If needed, can you get help and support from your superior?	0.55
11	Is your superior taking account of your opinions in matters concerning your work?	0.58
12	Do you receive adequate instructions for your work?	0.54
13	In my workplace, decisions are based on true information.	0.72
14	The decisions made have been coherent in my workplace (equal rules for everyone).	0.81
15	Is there sufficient communication in your work unit?	0.72
16	Are the work tasks, goals, and ways of achieving them commonly discussed in your workplace?	0.69
17	Are there clear objectives in your work?	0.52

Reversed items: All. ($\alpha = 0.89$)

Job Characteristic 2 (JOCHA 2): Job Workload

Number	Question	Loading
1	Is your work load irregular so that the work piles up?	0.73
2	Do you have to work overtime?	0.63
3	Does your work require quick decisions?	0.43
4	Does your work require complex decisions?	0.48
5	Does your work require that you acquire new knowledge and skills?	0.40
6	Are you given assignments without adequate resources to complete them?	0.56
7	Do the demands of your work interfere with your home and family life?	0.42
8	How monotonous or alternating is your job?	0.38
9	Do you need to rush to get your job done?	0.62
10	Do you have to abort ongoing tasks due to interruptions such as other more urgent work tasks?	0.61
11	Is your job mentally straining?	0.44

Reversed item: 8 ($\alpha = 0.83$).

Job Characteristic 3 ( ): Job Control

Number	Question	Loading
1	Can you influence the amount of work assigned to you?	0.42
2	Can you set your own working hours (flexitime)?	0.79
3	Can you influence decisions concerning the persons you will need to collaborate with?	0.58
4	Can you set your own work pace?	0.62
5	How independent is your work?	0.54
6	Does your job include a risk of accidently harming someone?	0.40
7	Does your job include a risk of personal injury?	0.23
8	Is your job physically straining?	0.36

Reversed items: 4 to 8 ($\alpha = 0.78$)

The two-tailed Pearson correlations for the sub-scales were: JOCHA 1 with JOCHA 2 (0.04, ns), JOCHA 1 with JOCHA 3 (0.218**), JOCHA 2 with JOCHA 3 (0.19, ns).

Note: Significance: * $p < 0.05$; ** $p < 0.01$. Analyses were based on exploratory factor analyses (PAF method with promax rotation). They were conducted using SPSS statistics, with a sample size of 216 individuals. These analyses were performed using IBM SPSS Statistics 22.

Highlights:

- Psychological flexibility is significantly related to well-being at work
- This was observed even after controlling general well-being and worksite factors
- Cognitive fusion might have important role in work-related burnout