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# The implications of need-satisfying work climates on state mindfulness in a longitudinal analysis of work outcomes

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**Abstract** Literature on mindfulness in the workplace is scarce, and the antecedents of state mindfulness are not understood. This study sought to investigate antecedents and outcomes of state mindfulness in a self-determination theory model in the work domain. Specifically, the present study contributes to an understanding of mindfulness by examining the implications of managerial need support and subsequent need satisfaction on state mindfulness, as well as outcomes of state mindfulness among employees. Results from a longitudinal analysis using data from four time points over 15 months supported the prediction that a need-supportive work climate related positively to state mindfulness through satisfaction of basic psychological needs. Furthermore, higher levels of state mindfulness had positive implications on subjective well-being as well as work-related outcomes. Specifically, the results showed a positive relation to subjective well-being and goal attainment, while a negative relation to burnout. Lastly, need satisfaction had an indirect relation to these outcomes through state mindfulness. These findings contribute to creating a link between the literature showing the importance of need-supportive work climates for well-being and other work-related outcomes, and the emerging literature on the positive benefits of mindfulness in organizational settings.

**Keywords** Self-determination theory · Managerial need support · Basic psychological need satisfaction · State mindfulness · Subjective well-being · Goal attainment · Burnout

## Introduction

Mindfulness can be defined as a state were one is being attentive to and aware of what is taking place in the present (Brown and Ryan 2003). Research on mindfulness as an important indicator of human functioning and development has increased rapidly in recent years, and showed implications of mindfulness on human health and well-being (for reviews, see Brown et al. 2007; Glomb et al. 2011). Moreover, research has also showed positive implications of mindfulness on performance, such as judgment accuracy (Kiken and Shook 2011), insight-related problem solving (Ostafin and Kassman 2012), and academic performance (Shao and Skarlicki 2009). Scholars have explained the positive effects on psychological and physical well-being as stemming from mindfulness permitting the view of events more objectively and dispassionately (Shapiro et al. 2006; Weinstein et al. 2009), and by enabling effective regulation of thoughts, emotions, and physiological reactions (Lakey et al. 2007). Performance-related measures benefit from mindfulness by enhancing cognitive flexibility (Moore and Malinowski 2009) and executive functioning (Zeidan et al. 2010).

Given these findings, mindfulness seems beneficial also within workplace settings. Accordingly, Dane (2011) discussed the implications of mindfulness on task performance based on mindfulness enabling a wide attention breadth, and Glomb et al. (2011) argued for the implications of mindfulness on employee health by enabling self-regulation. In line with these theoretical suggestions and the general literature on mindfulness, empirical research on

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mindfulness in working contexts has shown implications of mindfulness on factors such as stress (Wolever et al. 2012), burnout (Hülsheger et al. 2013; Narayanan and Moynihan 2006), turnover intention (Dane and Brummel 2013), job satisfaction (Hülsheger et al. 2013), work engagement (Leroy et al. 2013), job performance (Dane and Brummel 2013), and a variety of health-related variables (Wolever et al. 2012). In addition, Narayanan and Moynihan (2006) suggested that supervisor support is related to employee mindfulness.

Despite these recent efforts, the existing research related to mindfulness in the work domain is scant (Hülsheger et al. 2013). With mindfulness being a promoter of wellness and functioning, contributing to the understanding of mindfulness also in working contexts is important as this typically is a domain where a lot of stressful events occur (Schultz et al. 2015). Moreover, in all of the mentioned work-related studies, mindfulness has been seen as a trait variable. That is, a stable dispositional characteristic of one's personality that varies between individuals (Brown and Ryan 2003). Subsequently, this line of research has mainly focused on the effects of employee mindfulness on certain work outcomes. Given the positive implications of mindfulness shown in this research, it would be beneficial for organizations to know if certain social-contextual conditions could have implications on employees' state mindfulness.

The effort of intervention studies suggest that mindfulness is something that can be developed, and different approaches to mindfulness training exist (e.g., mindfulness-based stress reduction, mindfulness-based cognitive therapy, acceptance and commitment therapy, dialectic behavior therapy). The methods used within these approaches range from meditative practices to nonreactive observation of thoughts, feelings, experiences, and so forth. What all approaches have in common is the use of labeling or noting of thoughts and feelings, and the encouragement to accept self-relevant events and experiences. The belief is that enhancing mindfulness will increase insight into one's actions and sources of suffering on one side and one's thoughts, feelings, and sensations on the other. This is believed to leverage enhancements of well-being or actions to facilitate it (Brown et al. 2007; Narayanan and Moynihan 2006).

Indeed, several studies have demonstrated the benefits of mindfulness training on both psychological and physical health outcomes, as well as on performance (for reviews, see e.g., Baer 2003; Chiesa and Serretti 2009, 2011). Given such findings, mindfulness can be thought of as a metacognitive skill that can be acquired through training and intervention (Narayanan and Moynihan 2006). It thus seems reasonable to distinguish between mindfulness as a trait and mindfulness as a state. In support, Reis et al.

(2000) argued for the independence of trait and state effects both conceptually and statistically, which was supported for trait and state mindfulness in particular in Brown and Ryan (2003). Although trait and state mindfulness were related in that individuals with a mindfulness disposition were more likely to experience momentary mindfulness, Brown and Ryan (2003) found that the effects of the two were independent, as momentary experiences of mindfulness predicted positive experiences independent of the disposition. The state of the mindfulness concept is also evident in the definition by Glomb et al. (2011) which defines mindfulness as "a state of consciousness characterized by receptive attention to and awareness of present events and experiences, without evaluation, judgment, and cognitive filters" (p. 119).

As noted by Dane (2011), mindfulness as a state is not a quality that some individuals possess and others lack but could, as argued by Kabat-Zinn (2005), rather be considered an inherent human capacity. This further implicates that there may be conditions under which mindful states are more prominent than others. However, the question of how mindfulness naturally develops in terms of what psychological and social conditions support or hinder this state level remains unanswered (Brown and Ryan 2003), as most of the existing research has been occupied with how mindfulness can explain other aspects of human functioning (Brown et al. 2007). As noted by Brown et al. (2007), there are also unknowns regarding how interventions designed to enhance mindful states work, in that the effects can stem from multiple components. Since mindfulness-based practices typically contain some form of social support (Brown et al. 2007), there is reason to examine whether social-contextual factors contribute to foster a mindful state and subsequent positive outcomes. In addition, although the existing work on the state of mindfulness seems to relate to state mindfulness as momentary experiences, the intervention studies presented are clearly designed to enhance mindfulness that last for more than just a moment. A state level mindfulness construct may hence also be captured over longer periods of time, however, still dependent on the social-contextual climate rather than being a pure individual disposition. In this study, the focus is on mindfulness as a state that is malleable according to the social-contextual climate at work.

In particular, the present study seeks to contribute to the literature on mindfulness in the work domain by looking into (1) if and how need-supportive work climates and subsequent need satisfaction relate to state mindfulness, and (2) how state mindfulness relates to subjective well-being and work-related outcomes (i.e., goal attainment and burnout). For these purposes, self-determination theory (SDT; Deci and Ryan 1985, 2000) is used as a theoretical framework. This framework is chosen because it represents

a well-validated theory assuming that awareness and attention are important for the maintenance of both psychological and behavioral functioning (Brown and Ryan 2003). Moreover, because state mindfulness is perceived as an inherent human capacity similar to the inherent active nature of the human organism described by SDT—which requires nutriments from the social context—SDT provides a theoretical framework for studying such implications of social-contextual and motivational mechanisms. In the following section, SDT will be presented and discussed in relation to mindfulness.

## Self determination theory

A well-established theory in the field of human motivation and personality is SDT. SDT is an organismic-dialectic approach to human motivation, emotion, and personality in social contexts that has been used to explain human motivation and functioning in a variety of domains such as health, sports, education, and work. A central concept within the SDT framework is the three psychological innate and universal needs for autonomy, competence, and relatedness. The need for *autonomy* entails acting with a sense of volition, choice, and willingness (e.g., deCharms 1968). The need for *competence* relates to feeling effective in one's ongoing interaction with the environment, but also being able to develop one's skills (e.g., White 1959). The need for *relatedness* involves feeling connected with, cared for, and respected by others, as well as caring for and respecting others (e.g., Baumeister and Leary 1995). According to SDT, satisfaction of the three basic psychological needs promote well-being, while frustration of the basic psychological needs leads to negative consequences (e.g., Vansteenkiste and Ryan 2013). These assertions have been empirically supported across life domains, also in working organizations (e.g., Baard et al. 2004; Deci et al. 2001)

Satisfaction of the three basic psychological needs is partly depending upon the social context in which the individual is situated. In a working context, the term 'managerial need support' is used to describe working environments that are informative as opposed to controlling, and how the environment is prone to either support or thwart the individuals' basic psychological needs. Specifically, managerial need support is defined as the supervisor understanding and acknowledging employees' perspectives, providing meaningful information and offering opportunities for choice, as well as encouraging self-initiation (Deci et al. 1994). Research in the workplace domain has shown that need-supportive work environments facilitate need satisfaction (e.g., Baard et al. 2004), whereas need-thwarting work environments are related to frustration of the basic psychological needs (e.g., Gillet et al. 2012).

## Self-determination theory and mindfulness

SDT is one of several theories assuming that awareness and attention are important for the maintenance of both psychological and behavioral functioning (Brown and Ryan 2003). Specifically, SDT posits that awareness might be beneficial in terms of facilitating the choice of behaviors that coincide with one's values, needs, and interests. As far as the author knows, the only article that has used the framework of SDT to examine the role of mindfulness in a working context is that by Schultz et al. (2015). Schultz et al. (2015) found that trait mindfulness moderated the relation from need support to basic need frustration, in the sense that people with higher levels of mindfulness were less harmed by a non-supportive work environment, and thus experienced less need frustration, and, in turn, higher well-being.

In more general terms, Brown and Ryan (2003) pointed to evidence from multiple studies demonstrating mindfulness as an important self-regulative function, and showed that measures of mindfulness were related to more autonomous regulation in behavior and to various indicators of psychological well-being. The same authors also showed evidence of differences in state mindfulness; individual variations in this state exhibited strong links to emotional and self-regulatory outcomes. These empirical findings indicate that mindfulness seems to have important implications for human motivation and functioning. However, Brown et al. (2007) pointed out that "while much of the existing literature has been focused on the directional pathway from mindfulness to other aspects of human functioning, it is highly plausible that cognitive, emotional, somatic, and behavioral factors can foster or inhibit mindful states …" (p. 229). This suggests that looking at mindfulness as a state paves the way for an investigation of how this state of consciousness develops.

The present study sets out to test a model in which the social climate is related to state mindfulness by satisfying the basic psychological needs to, in turn, explain work outcomes. Specifically, the aim here is to test a model where managerial need support is assumed positively related to state mindfulness through satisfaction of employees' basic psychological needs, and state mindfulness is assumed positively related to subjective well-being and goal attainment, and negatively related to burnout. Managerial need support is chosen as the social-contextual variable as this is the representation of how the environment impact fulfillment of the basic psychological needs within the theoretical framework used in the present study. The hypothesized model is illustrated in Fig. 1, and supporting literature and hypotheses are presented in the following.
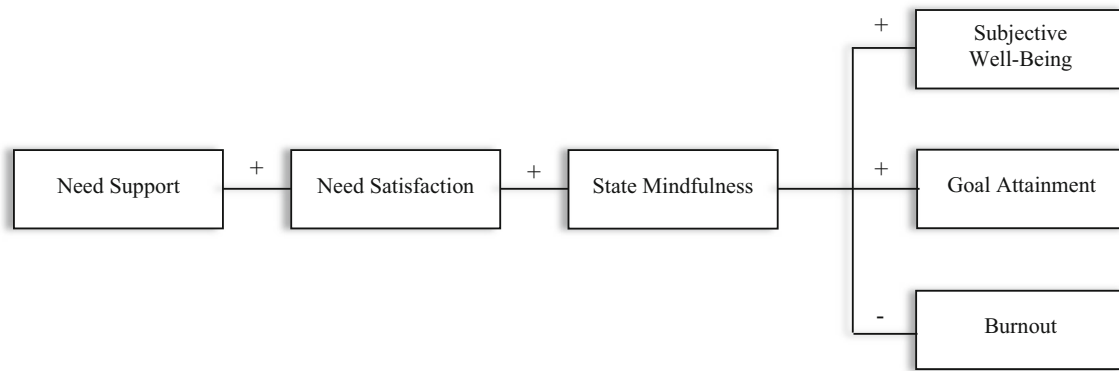
**Fig. 1** Theoretical model

## Social-contextual and motivational origins of state mindfulness

A relation between the social-contextual climate and mindfulness has previously been supported by Narayanan and Moynihan (2006), who showed a positive relation between supervisor support and employee mindfulness. A similar result was obtained in Reb et al. (2015) who showed a positive relation between organizational support and employee awareness. Such relations are explained by social support facilitating a reflective mode, which is a key aspect of mindfulness believed to build personal resources that foster resilience (Narayanan and Moynihan 2006). In the current study, this relation is hypothesized mediated by basic need satisfaction, as this is the mechanism shown to link social-contextual factors to employee health and functioning in previous research by being an energizer of activity and healthy functioning (Deci and Ryan 2000). Indeed a large body of literature has supported the notion of need satisfaction as essential for a large range of indicators of employee health and work adjustment, such as better job performance (e.g., Baard et al. 2004), decreased risk of burnout (e.g., Fernet et al. 2013), and global well-being (e.g., Van den Broeck et al. 2010).

By mindfulness being considered an indicator of healthy functioning, social contexts supporting the basic psychological needs may indeed relate positively to state mindfulness. In particular, need support can be perceived as the fuel that fulfil need satisfaction, which in turn produces the nutriment or the energy to focus on the present. When one's needs are not being satisfied it seems likely that the mind might wander to past situations causing this, or possibly to future events that may take you out of the present dissatisfaction. As stated by Reb et al. (2015): "When employees are constrained […] they will then also use more of their mental energy to deal with this constrained situation and, as a result, will have little resources left at their disposal to perform their work mindfully"(p.

113). In this vein, need satisfaction can be thought a resource to provide a state of balance that enables one to focus on what is happening in the current moment—to be mindful in other words.

Moreover, mindfulness is acknowledged as an important self-regulatory function (Glomb et al. 2011) and previous studies have pointed to the implications of social-contextual factors on need satisfaction and, subsequently, self-regulatory capacities (e.g., De Cooman et al. 2013; Trépanier et al. 2015). As such, satisfying employees' basic psychological needs through a need-supportive work climate enables awareness and attention by facilitating self-regulation, while in controlling work environments it is likely that employee's lose touch with their self-regulatory capacities. In fact, Langer (1989) suggested that feelings of choice and enjoyment increase mindfulness. Although, Langer (1989) differs from the predominant definition of mindfulness by defining mindfulness as drawing novel distinctions, it still is an emphasis on attention to present moment phenomena and maintaining a wide attentional breath (Dane 2011). Supporting employees' basic psychological needs at work may hence be important to enable the employees to view situations objectively and dispassionately, in turn, fostering employee health and work adjustment. This could especially apply in the work domain where one cannot to a full degree seek activities that are need satisfying, as the job has some inherent characteristics employees do not control. Thinking of state mindfulness as an inherent human capacity, this argumentation is also in line with the more underlying assumption of the SDT framework, seeing the individual's development and functioning as supported or thwarted by social-contextual factors.

**Hypothesis 1** There will be a positive indirect relation between changes in managerial need support and changes in state mindfulness through changes in basic psychological need satisfaction.

## State mindfulness, well-being and work outcomes

Indicators of well-being is probably the most studied in mindfulness research, where mindfulness has been related to a wide array of both psychological and physiological indicators of well-being (e.g., Brown and Ryan 2003). People benefit from being mindful because it permits more objective and dispassionate assessments of events (Shapiro et al. 2006; Weinstein et al. 2009) and enables effective regulation of emotions, thoughts, and physiological reactions (Lakey et al. 2007), and because conscious attention may override automatic thoughts and behavior patterns that may be unwanted in a particular situation (Baumeister et al. 1994). Moreover, there are also situations in which attention to psychological, somatic, and environmental cues is crucial for healthy regulation (cf. Brown 1998; Waldrup 1992). On the other hand, mindfulness is theorized to be negatively related to ill-being because a reflective and present state enables better coping with challenging and stressful situations. Further, because mindfulness fosters this none-evaluative open attention to the moment (e.g., Bishop et al. 2004; Brown et al. 2007; Goldin and Gross 2010) giving increased ability to recognize situations and thoughts as what they are and creating a more neutral reframe of one's experiences, mindfulness fosters the ability to maintain serenity and mental balance when confronted with provocative events. In other words, a reflective state provides resources to deal with demanding situations. In addition, when mindful, the focus is on current experiences rather than the past, making the individual in a better position to deal with and recover faster from stressful events. As such, the experience of chronic stress (Carmody et al. 2009; Kerr et al. 2011)—that may manifest in other indicators of ill-being—decreases.

In the current study, state mindfulness is theorized to be related to subjective well-being, which reflects a combination of affect and life satisfaction in line with previous research (e.g., Sheldon and Elliot 1999), and which mindfulness has been related to in previous studies in other contexts (e.g., Brown and Ryan 2003). In addition, burnout is included as an indicator of ill-being. A relation between mindfulness and burnout is demonstrated by Hülsheger et al. (2013) and Narayanan and Moynihan (2006), although they were primarily concerned with trait mindfulness.

**Hypothesis 2** There will be a positive relation between changes in state mindfulness and changes in subjective well-being.

**Hypothesis 3** There will be a negative relation between changes in state mindfulness and changes in burnout.

Research has also linked mindfulness to performance-related factors in various domains. In particular, Kiken and Shook (2011) showed that mindfulness increased judgment accuracy, Ostafin and Kassman (2012) demonstrated a positive relation between mindfulness and insight related problem-solving, Shao and Skarlicki (2009) found a positive relation between mindfulness and academic performance, Dane and Brummel (2013) showed a positive relation between mindfulness and task performance, and Brown and Vansteenkiste (2006) related mindfulness positively to goal attainment. Although only the study by Dane and Brummel (2013) was related to performance at work and most are studies of trait mindfulness, the findings are likely to maintain their relevance in a work context with an emphasis on state mindfulness. In the current study, state mindfulness is theorized to be related to perceived goal attainment at work by freeing employees from automatic responses resulting in cognitive flexibility and alertness (Moore and Malinowski 2009). Similarly, being in a mindful state may guard against distractions (Herndon 2008), which may make employees more aware of their goals and lead to less mistakes, hence contributing to higher perceived goal attainment.

**Hypothesis 4** There will be a positive relation between changes in state mindfulness and changes in perceived goal attainment.

As mentioned, previous research has shown important implications of need satisfaction on both employee health and functioning, at the same time acknowledging mindfulness as an important self-regulatory capacity and an indicator of wellness and, hence, also optimal functioning. Thus, in addition to the direct relations between state mindfulness and well-being and work correlates, it is theorized that need satisfaction has an indirect relation to subjective well-being, goal attainment, learning, and burnout through state mindfulness.

**Hypothesis 5a** There will be a positive indirect relation between changes in basic psychological need satisfaction and changes in subjective well-being, through changes in state mindfulness.

**Hypothesis 5b** There will be a negative indirect relation between changes in basic psychological need satisfaction and changes in burnout, through changes in state mindfulness.

**Hypothesis 5c** There will be a positive indirect relation between changes in basic psychological need satisfaction and changes in perceived goal attainment, through changes in state mindfulness.

## Method

### Procedures and participants

An invitation to an electronic questionnaire developed in Questback was sent out to all 428 municipalities in Norway with a request to distribute the link to the questionnaire to the unit leaders of their municipal health services. Such an online approach has several advantages pointed out by Evans and Mathur (2005). For the current study, these include, for instance, easily being able to reach all municipalities, ease of follow-up, and chance of less item-non response. Nevertheless, like most methodologies the online approach to survey distribution may also have weaknesses (Evans and Mathur 2005). For the present study, it can, however, be argued that these were not a major drawback due to the distinct sample that all have access to the Internet and presumably have experience with this medium as a part of their work. Moreover, as the questionnaire was distributed to the respondents by the municipalities themselves, it is unlikely to have been appearing in the junk mail. In addition, it was made sure that the answering procedures were clear and that confidentiality was assured, especially for the more sensitive questions. In particular, each questionnaire contained information about the study, a statement that participation was voluntary and confidential, guidelines for responding, information about duration, and contact information to the researchers. Beforehand, the project was approved by the Norwegian Social Science Data Service (NSD), which was also communicated to the participants.

A total of four data collections were undertaken during a 15-month period. The first questionnaire asked for participant's e-mail address to be used for the subsequent data collections. For the first questionnaire, 267 respondents from 133 municipalities participated. The subsequent data collections yielded 185, 152, and 115 respondents, respectively. Table 1 summarizes participant demographics across the 15-month study period.

### Dropouts

Of the 267 participants, 152 (56.9 %) dropped out between Time 1 and Time 4. Study continuation (completers = 0; dropouts = 1) was analyzed by logistic regression to assess possible differences in the study variables between groups. The results indicated that dropout was not due to Time 1 measures of need support ($B = .14$, SE $B = .15$, Wald $= .83$, $OR = 1.15$, $p > .050$), need satisfaction ($B = -.02$, SE $B = .47$, Wald $= .00$, $OR = 0.99$, $p > .050$), state mindfulness ($B = .56$, SE $B = .29$, Wald $= 3.67$, $OR = 1.75$, $p > .050$), subjective well-being ($B = .02$, SE $B = .09$, Wald $= .07$, $OR = 1.02$, $p > .050$), goal attainment ($B = -.41$, SE $B = .27$, Wald $= 2.43$, $OR = 0.66$, $p > .050$), or burnout ($B = .47$, SE $B = .38$, Wald $= 1.52$, $OR = 1.60$, $p > .050$).

### Measures

Scales that were not available in Norwegian (i.e., state mindfulness) were translated from English using a back-translation procedure, where the scales were first

**Table 1** Participant demographics across the 15-month study period

|  | Time 1 | Time 2 | Time 3 | Time 4 |
|---|---|---|---|---|
| Number of respondents | 267 | 185 | 152 | 115 |
| Gender | Female: 205 | Female: 141 | Female: 116 | Female: 88 |
|  | Male: 60 | Male: 42 | Male: 34 | Male: 26 |
|  | Unspecified: 2 | Unspecified: 2 | Unspecified: 2 | Unspecified: 1 |
| Age | 29 or younger: 2 | 29 or younger: 2 | 29 or younger: 2 | 29 or younger: 2 |
|  | 30–39: 33 | 30–39: 19 | 30–39: 13 | 30–39: 7 |
|  | 40–49: 89 | 40–49: 61 | 40–49: 49 | 40–49: 39 |
|  | 50–59: 109 | 50–59: 78 | 50–59: 67 | 50–59: 52 |
|  | 60 or older: 33 | 60 or older: 24 | 60 or older: 20 | 60 or older: 14 |
|  | Unspecified: 1 | Unspecified: 1 | Unspecified: 1 | Unspecified: 1 |
| Urban or rural municipality | Urban: 114 | Urban: 85 | Urban: 73 | Urban: 59 |
|  | Rural: 151 | Rural: 99 | Rural: 78 | Rural: 55 |
|  | Unspecified: 2 | Unspecified: 1 | Unspecified: 1 | Unspecified: 1 |
| Unit | Home-based care: 117 | Home-based care: 84 | Home-based care: 69 | Home-based care: 55 |
|  | Institution: 96 | Institution: 62 | Institution: 52 | Institution: 38 |
|  | Unspecified: 54 | Unspecified: 39 | Unspecified: 31 | Unspecified: 22 |

translated to Norwegian by the author and then back-translated into English by an academic trained in English. The back-translation was then compared with the original scales to ensure that the items reflected the same content.

### Need support

Managerial need support was assessed using the 6-item version of the Work Climate Questionnaire (Baard et al. 2004). The items (e.g., I feel understood by my manager) were measured on a scale ranging from 1 (completely disagree) to 7 (completely agree).

### Basic psychological need satisfaction

Autonomy satisfaction (three items; e.g., The tasks I have to do at work are in line with what I really want to do), competence satisfaction (three items; e.g., I really master my tasks at my job), and relatedness satisfaction (three items; e.g., At work I feel part of a group) were assessed with the Work-Related Basic Need Satisfaction Scale (Van den Broeck et al. 2010) on a scale ranging from 1 (totally disagree) to 5 (totally agree). An aggregated variable for total need satisfaction was composed in line with previous studies by adding the sum score for each need to a combined average score for total need satisfaction (e.g., Baard et al. 2004; Deci et al. 2001). The correlations between the three needs ranged from .245 to .473 $p < .01$ across the four time points.

### State mindfulness

State mindfulness was assessed with the State Mindful Attention Awareness Scale (Brown and Ryan 2003), and where the stem provided referred the respondents to rate their current experience. The five items (i.e., I find it difficult to stay focused on what is happening in the present; I rush through activities without being really attentive to them; I do jobs or tasks automatically, without being aware of what I'm doing; I find myself preoccupied with the future or the past; I find myself doing things without paying attention) were measured on a scale ranging from 1 (almost never) to 6 (almost always).

### Subjective well-being

Employee well-being was assessed using a shorter version of the Positive and Negative Affect Schedule (Watson et al. 1988) validated in Norwegian (Solberg 2013) and the Satisfaction with Life Scale (Pavot and Diener 1993).

Positive affect (seven items; e.g., Enthusiastic) and negative affect (seven items; e.g., Concerned) were measured on a scale ranging from 1 (very little) to 5 (very much), while satisfaction with life (five items; e.g., I am satisfied with my life) was measured on a scale ranging from 1 (not at all true) to 7 (very much true). As it is shown that a single factor underlies these measures of well-being (Diener 1994), the three scales were mean-adjusted and combined into an aggregated measure of subjective well-being by adding positive affect and life satisfaction while subtracting negative affect, in line with procedures employed in previous research (e.g., Sheldon and Elliot 1999).

### Perceived goal attainment

The Aspiration Index was used as a foundation to develop measures of the respondents' goal attainment of five identified working goals of this work population: growth (three items; e.g., Gaining increased insight in why I do the things I am doing), quality (three items; e.g., Ensure the safety of the patients), relations (three items; e.g., Gaining optimal usage of the personal resources), economy (two items; e.g., Having sufficient economic resources to face the demands that are set for the unit), and society (four items; e.g., Helping others to a better life). The items were assessed on a scale ranging from 1 (not at all) to 7 (to a large extent). To represent overall goal attainment, the five categories of goals were aggregated to a composed score. Note that due to the measurement representing attainment of goals rather than goal aspirations, the economy goal was included in the composed score. This was supported by positive correlations between attainment of the economic goal and the four other goals (i.e., ranging from .273 to .573, $p < .010$ between the economy goal and the other goals across the four time points).

### Burnout

Burnout from work was measured with the Maslach Burnout Inventory (Maslach et al. 1996). Emotional exhaustion (five items; e.g., I feel emotionally drained from my work), inefficacy (six items; e.g., I feel exhilarated when I accomplish something at work), and cynicism (five items; e.g., I doubt the significance of my work) were assessed on a scale ranging from 1 (never) to 7 (always). As the three dimensions combined are a representation of burnout (Maslach 1982), an aggregated variable where the two negative scales where added while the positive scale was subtracted was composed. The correlations between the three dimensions of burnout ranged from .135 to .531 $p < .050$ across the four time points.

# Results

## Preliminary analyses

### Missing values

Missing value analysis including each study variable (i.e., need support and state mindfulness) or the dimensions of the study variables (i.e., three dimensions for need satisfaction, three dimensions for subjective well-being, five dimensions for goal attainment, and three dimensions for burnout) showed that the missing completely at random (MCAR) test statistic was non-significant ($\chi^2$ [$df = 5368$] = 5412.61, $p = .331$), indicating MCAR data. An overview of item non-response and wave non-response at aggregated variable level is shown in Table 2.

### Descriptive statistics and reliability

Table 3 shows the means, standard deviations, ranges, and reliabilities for all variables at the respective points in time. The Cronbach's alpha coefficient represents internal consistency for the measures of each construct. The reliability for the variables is considered good because they exceed the threshold value of .7 defined by Nunnally (1978).

## Primary analysis

AMOS 22 was used to test the hypothesized model illustrated in Fig. 1. The analysis of the proposed model was estimated with Full Direct Maximum Likelihood (FIML) in order to impute the missing responses as recommended for SEM-analyses (Allison 2003). Based on available fit indices in AMOS, model fit evaluation was performed using the Chi square likelihood ratio ($\chi^2$), the Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI). These are recommended fit indices (Kline 2011) and represent a combination of absolute fit indices and incremental fit indices. The ratio of $\chi^2$ to degrees of freedom should be smaller than 3:1 (Gefen et al. 2000). Values close

to or lower than .08 for the RMSEA are considered good and should be accompanied by values close to or higher than .95 for the CFI (Hu and Bentler 1999).

Due to sample size, the hypothesized model was tested using path analysis containing observed variables. The autoregressive paths for each variable were set equal, as were each hypothesized path between the variables because the relations were assumed to be stationary (Cole and Maxwell 2003). Due to the zero-order correlations not being consistent with a pure simplex pattern (see Table 4), autoregressive paths were added from Time 1 to Time 3 and Time 4, and from Time 2 to Time 4 for all study variables (Little 2013). Age and gender were used as auxiliary variables in the FIML analysis, and were correlated with the Time 1 variables and the error term of the Time 2, Time 3, and Time 4 variables as recommended by Enders (2006).

The results showed support for the proposed model with adequate fit: $\chi^2$ ($df = 187$) = 307.424, $p < .001$, CFI = .954, and RMSEA (90 % CI) = .049 (.039, .059). As shown in Fig. 2, all the paths are significant. Specifically, need support at Time 1, 2, and 3, respectively, related positively to need satisfaction at Time 2 (B = .05, SE B = .01, $\beta$ = .14, $t = 3.48$, $p < .001$), Time 3 (B = .05, SE B = .01, $\beta$ = .12, $t = 3.48$, $p < .001$), and Time 4 (B = .05, SE B = .01, $\beta$ = .13, $t = 3.48$, $p < .001$). Further, need satisfaction at Time 1, 2, and 3, respectively, related positively to state mindfulness at Time 2 (B = .14, SE B = .06, $\beta$ = .09, $t = 2.44$, $p = .015$), Time 3 (B = .14, SE B = .06, $\beta$ = .08, $t = 2.44$, $p = .015$), and Time 4 (B = .14, SE B = .06, $\beta$ = .08, $t = 2.44$, $p = .015$). Lastly, state mindfulness at Time 1, 2, and 3, respectively, related positively to subjective well-being at Time 2 (B = .07, SE B = .03, $\beta$ = .07, $t = 2.12$, $p = .034$), Time 3 (B = .07, SE B = .03, $\beta$ = .07, $t = 2.12$, $p = .034$), and Time 4 (B = .07, SE B = .03, $\beta$ = .08, $t = 2.12$, $p = .034$); and goal attainment at Time 2 (B = .13, SE B = .04, $\beta$ = .12, $t = 3.17$, $p = .002$), Time 3 (B = .13, SE B = .04, $\beta$ = .12, $t = 3.17$, $p = .002$), and Time 4 (B = .13, SE B = .04, $\beta$ = .13 $t = 3.17$, $p = .002$); while related negatively to burnout at

**Table 2** Item non-response and wave non-response across the 15-month study period

| Variable | Item non response (of the indexed variable) | | | | Wave non response | | | |
|---|---|---|---|---|---|---|---|---|
| | Time 1 (%) | Time 2 (%) | Time 3 (%) | Time 4 (%) | Time 1 (%) | Time 2 (%) | Time 3 (%) | Time 4 (%) |
| Need support | 1.5 | 3.2 | 1.3 | 0.0 | 0.0 | 30.7 | 43.1 | 56.9 |
| Need satisfaction | 1.1 | 1.6 | 2.6 | 0.0 | 0.0 | 30.7 | 43.1 | 56.9 |
| State mindfulness | 2.6 | 2.2 | 1.3 | 0.0 | 0.0 | 30.7 | 43.1 | 56.9 |
| Subjective well-being | 8.6 | 6.5 | 9.2 | 0.0 | 0.0 | 30.7 | 43.1 | 56.9 |
| Goal attainment | 8.2 | 9.7 | 7.9 | 0.0 | 0.0 | 30.7 | 43.1 | 56.9 |
| Burnout | 15.0 | 13.0 | 13.8 | 0.0 | 0.0 | 30.7 | 43.1 | 56.9 |

**Table 3** Descriptives and alphaes

| Variables | M | SD | Range | Skew | Kurtosis | Alpha |
|---|---|---|---|---|---|---|
| 1. Need support$_{T1}$ | 5.63 | 1.18 | 5.83 | −1.07 | 1.01 | .95 |
| 2. Need support$_{T2}$ | 5.69 | 1.15 | 5.50 | −1.21 | 1.54 | .95 |
| 3. Need support$_{T3}$ | 5.47 | 1.31 | 5.50 | −.98 | .46 | .95 |
| 4. Need support$_{T4}$ | 5.53 | 1.26 | 5.00 | −.72 | −.44 | .95 |
| 5. Need satisfaction$_{T1}$ | 3.90 | .46 | 2.11 | .20 | −.38 | .76 |
| 6. Need satisfaction$_{T2}$ | 3.87 | .47 | 2.22 | −.07 | −.27 | .77 |
| 7. Need satisfaction$_{T3}$ | 3.92 | .48 | 2.22 | .06 | −.43 | .81 |
| 8. Need satisfaction$_{T4}$ | 3.92 | .49 | 2.33 | −.36 | −.19 | .81 |
| 9. State mindfulness$_{T1}$ | 4.51 | .67 | 3.80 | −.19 | −.01 | .76 |
| 10. State mindfulness$_{T2}$ | 4.41 | .76 | 3.60 | −.13 | −.45 | .82 |
| 11. State mindfulness$_{T3}$ | 4.53 | .77 | 3.40 | −.20 | −.61 | .85 |
| 12. State mindfulness$_{T4}$ | 4.44 | .78 | 3.80 | −.25 | −.41 | .85 |
| 13. Subjective well-being$_{T1}$ | −.01 | .80 | 3.93 | −.59 | .28 | .95 |
| 14. Subjective well-being$_{T2}$ | .00 | .78 | 3.73 | −.53 | .14 | .88 |
| 15. Subjective well-being$_{T3}$ | .00 | .79 | 3.43 | −.28 | −.74 | .91 |
| 16. Subjective well-being$_{T4}$ | .00 | .80 | 3.68 | −.77 | .13 | .91 |
| 17. Goal attainment$_{T1}$ | 5.64 | .77 | 3.93 | −.38 | .23 | .92 |
| 18. Goal attainment$_{T2}$ | 5.52 | .76 | 4.40 | −.62 | 1.27 | .92 |
| 19. Goal attainment$_{T3}$ | 5.60 | .77 | 3.60 | −.32 | .09 | .91 |
| 20. Goal attainment$_{T4}$ | 5.66 | .72 | 3.53 | −.61 | .49 | .91 |
| 21. Burnout$_{T1}$ | −.31 | .62 | 3.87 | 1.06 | 2.27 | .83 |
| 22. Burnout$_{T2}$ | −.37 | .63 | 3.26 | .85 | .52 | .86 |
| 23. Burnout$_{T3}$ | −.34 | .66 | 3.77 | .90 | 1.22 | .84 |
| 24. Burnout$_{T4}$ | −.32 | .76 | 3.91 | 1.32 | 1.99 | .89 |

Time 2 (B = −.12, SE B = .04, β = −.14, t = −3.42, p < .001), Time 3 (B = −.12, SE B = .04, β = −.14, t = −3.42, p < .001), and Time 4 (B = −.12, SE B = .04, β = −.12, t = −3.42, p < .001).

The indirect relations were evaluated using RMediation (Tofighi and MacKinnon 2011), where confidence intervals were calculated for each indirect relation. A significant indirect relation was found between need support and state mindfulness (B = .007; 95 % CI [.001, .015]). In addition, indirect relations were found between need satisfaction and two of the outcome variables (1) need satisfaction and goal attainment (B = .018; 95 % CI [.003, .039]), and (2) need satisfaction and burnout (B = −.017; 95 % CI [−.036, −.003]). However, the hypothesized indirect relation between need satisfaction and subjective well-being was not fully supported as the confidence interval contained 0 (B = .010; 95 % CI [.000, .026]).

## Discussion

The present study examined the relation between the social work climate and state mindfulness among employees. Based on the theoretical framework of SDT, which is concerned with human development and functioning as a result of interaction with the social environment (Deci and Ryan 2000), it is suggested that this relation can be explained by need-supportive work environments being positively related to need satisfaction, which subsequently is related to state mindfulness. Furthermore, the study tested the relation between state mindfulness and subjective well-being as well as work-related outcomes (i.e., goal attainment and burnout). The results showed support for the hypothesis of an indirect relation between need support and state mindfulness through need satisfaction, and for the hypotheses of direct relations between state mindfulness and subjective well-being, goal attainment, and burnout. The hypotheses of a indirect relation between need satisfaction and goal attainment, and between need satisfaction and burnout through state mindfulness were also supported. These results contribute to the relative scarce body of literature on mindfulness at work and, more importantly, shed light on the work environment as a factor that can foster (or potentially inhibit) state mindfulness. Looking into factors that may foster (or inhibit) this state at work is important for both theory and practice given the support for the beneficial implications of mindfulness for health and functioning. The findings will be discussed in the following.

**Table 4** Correlations among the study variables

| Variable | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Need support$_{T1}$ | — | | | | | | | | | | | | | |
| 2. Need support$_{T2}$ | .512*** | — | | | | | | | | | | | | |
| 3. Need support$_{T3}$ | .416*** | .607*** | — | | | | | | | | | | | |
| 4. Need support$_{T4}$ | .414*** | .523*** | .717*** | — | | | | | | | | | | |
| 5. Need satisfaction$_{T1}$ | .468*** | .333*** | .356*** | .312** | — | | | | | | | | | |
| 6. Need satisfaction$_{T2}$ | .404*** | .490*** | .328*** | .375*** | .700*** | — | | | | | | | | |
| 7. Need satisfaction$_{T3}$ | .375*** | .473*** | .482*** | .383*** | .576*** | .648*** | — | | | | | | | |
| 8. Need satisfaction$_{T4}$ | .312** | .354*** | .355*** | .525*** | .590*** | .700*** | .631*** | — | | | | | | |
| 9. State mindfulness$_{T1}$ | .177** | .081 | .208* | .123 | .476*** | .393*** | .438*** | .364*** | — | | | | | |
| 10. State mindfulness$_{T2}$ | .096 | .142 | .229** | .242* | .438*** | .440*** | .390*** | .431*** | .635*** | — | | | | |
| 11. State mindfulness$_{T3}$ | .213* | .272** | .325*** | .362*** | .528*** | .496*** | .487*** | .502*** | .616*** | .720*** | — | | | |
| 12. State mindfulness$_{T4}$ | .234* | .308** | .239* | .310** | .486*** | .480*** | .409*** | .469*** | .554*** | .619*** | .670*** | — | | |
| 13. Subjective well-being$_{T1}$ | .329*** | .210* | .258** | .222* | .503*** | .393*** | .372*** | .460*** | .464*** | .328*** | .434*** | .396*** | — | |
| 14. Subjective well-being$_{T2}$ | .228** | .346*** | .289*** | .375*** | .494*** | .608*** | .492*** | .608*** | .450*** | .493*** | .474*** | .472*** | .690*** | — |
| 15. Subjective well-being$_{T3}$ | .223** | .363** | .373*** | .377*** | .432*** | .472*** | .526*** | .567*** | .368*** | .310*** | .474*** | .445*** | .697*** | .749*** |
| 16. Subjective well-being$_{T4}$ | .258** | .305** | .413*** | .482*** | .463*** | .491*** | .483*** | .635*** | .340** | .405*** | .570*** | .561*** | .666*** | .779*** |
| 17. Goal attainment$_{T1}$ | .283*** | .252** | .226** | .177 | .551*** | .410*** | .386*** | .259** | .391*** | .255** | .259** | .258** | .475*** | .378*** |
| 18. Goal attainment$_{T2}$ | .260** | .365*** | .192* | .379*** | .422*** | .537*** | .449*** | .508*** | .328*** | .372*** | .387*** | .345*** | .414*** | .680*** |
| 19. Goal attainment$_{T3}$ | .283** | .340*** | .395*** | .376*** | .501*** | .504*** | .464*** | .471*** | .341*** | .353*** | .491*** | .409*** | .396*** | .495*** |
| 20. Goal attainment$_{T4}$ | .143 | .305** | .324*** | .431*** | .360*** | .446*** | .447*** | .475*** | .255** | .334*** | .434*** | .437*** | .265** | .474*** |

**Table 4** continued

| Variable | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21. Burnout$_{T1}$ | −.341*** | −.210 | −.268** | −.219* | −.557*** | −.481*** | −.494*** | −.463*** | −.555*** | −.492*** | −.528*** | −.450*** | −.667*** | −.539*** |
| 22. Burnout$_{T2}$ | −.243** | −.288*** | −.195* | −.223* | −.467*** | −.582*** | −.419*** | −.470*** | −.408*** | −.541*** | −.422*** | −.439*** | −.512*** | −.609*** |
| 23. Burnout$_{T3}$ | −.373*** | −.308*** | −.362*** | −.350*** | −.500*** | −.537*** | −.577*** | −.590*** | −.496*** | −.508*** | −.638*** | −.464*** | −.561*** | −.562*** |
| 24. Burnout$_{T4}$ | −.231* | −.285** | −.345*** | −.420*** | −.344** | −.424*** | −.426*** | −.573*** | −.392*** | −.434*** | −.559*** | −.583*** | −.459*** | −.477*** |

| Variables | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Need support$_{T1}$ | | | | | | | | | | |
| 2. Need support$_{T2}$ | | | | | | | | | | |
| 3. Need support$_{T3}$ | | | | | | | | | | |
| 4. Need support$_{T4}$ | | | | | | | | | | |
| 5. Need satisfaction$_{T1}$ | | | | | | | | | | |
| 6. Need satisfaction$_{T2}$ | | | | | | | | | | |
| 7. Need satisfaction$_{T3}$ | | | | | | | | | | |
| 8. Need satisfaction$_{T4}$ | | | | | | | | | | |
| 9. State mindfulness$_{T1}$ | | | | | | | | | | |
| 10. State mindfulness$_{T2}$ | | | | | | | | | | |
| 11. State mindfulness$_{T3}$ | | | | | | | | | | |
| 12. State mindfulness$_{T4}$ | | | | | | | | | | |
| 13. Subjective well-being$_{T1}$ | | | | | | | | | | |
| 14. Subjective well-being$_{T2}$ | | | | | | | | | | |
| 15. Subjective well-being$_{T3}$ | — | | | | | | | | | |
| 16. Subjective well-being$_{T4}$ | .771*** | — | | | | | | | | |
| 17. Goal attainment$_{T1}$ | .270** | .268** | — | | | | | | | |
| 18. Goal attainment$_{T2}$ | .450*** | .486*** | .592*** | — | | | | | | |
| 19. Goal attainment$_{T3}$ | .503*** | .505*** | .465*** | .545*** | — | | | | | |
| 20. Goal attainment$_{T4}$ | .451*** | .500*** | .477*** | .607*** | .602*** | — | | | | |
| 21. Burnout$_{T1}$ | −.536*** | −.517*** | −.441*** | −.469*** | −.405*** | −.300** | — | | | |
| 22. Burnout$_{T2}$ | −.470*** | −.527*** | −.309*** | −.514*** | −.356*** | −.437*** | .735*** | — | | |
| 23. Burnout$_{T3}$ | −.668*** | −.642*** | −.136 | −.394*** | −.473*** | −.470*** | .698*** | .705*** | — | |
| 24. Burnout$_{T4}$ | −.512*** | −.676*** | −.279** | −.352*** | −.386*** | −.452*** | .606*** | .539*** | .601*** | — |

*** $p < .001$; ** $p < .01$; * $p < .05$
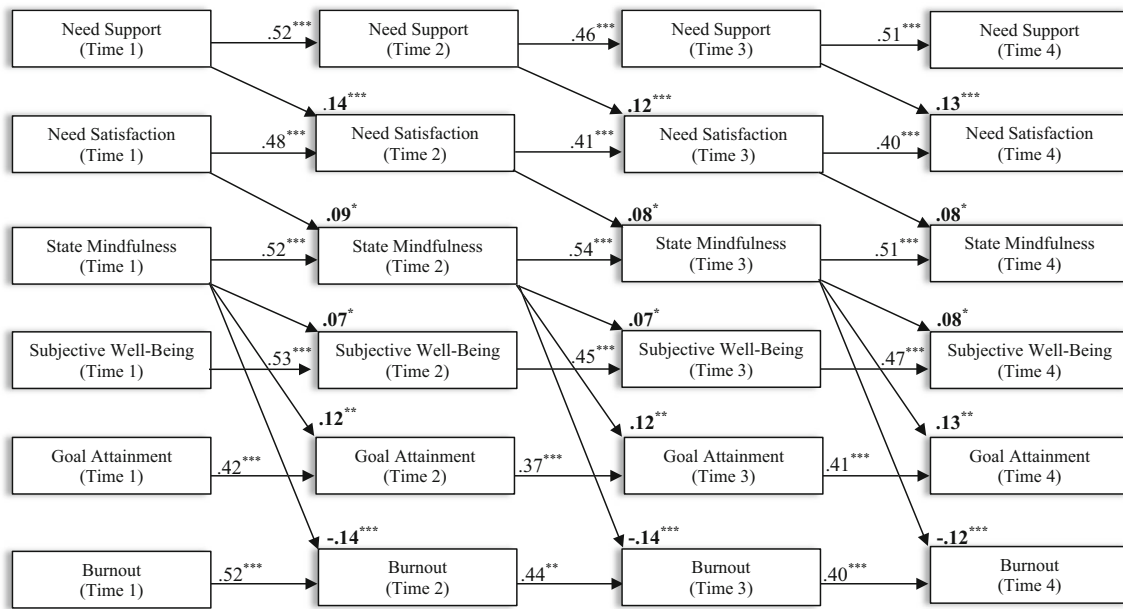
**Fig. 2** Results from the path analysis. *Note* All coefficients are standardized. For the sake of clarity, extra autoregressive paths and covariances among error terms are not shown. ***$p < .001$; **$p < .01$; *$p < .05$

### Theoretical implications

Although research on mindfulness has bloomed over the last two decades, mindfulness studies in the work domain are scarce. And the few studies of mindfulness in relation to work focus solely on mindfulness as an individual trait and, as such, different outcomes of mindful employees (e.g., Dane and Brummel 2013; Hülsheger et al. 2013; Leroy et al. 2013). Although this research has contributed with important findings, a crucial element for such outcomes is if and how the environment may foster (or inhibit) employee mindfulness and, in turn, positive work outcomes. However, as stated by Brown et al. (2007), factors that may foster or inhibit mindful states have not yet been identified. Interestingly, the results of the present study showed that managerial need support is indirectly related to state mindfulness through need satisfaction. This is a new and significant finding—both for the working context and for others. Although this finding indirectly supports the effort of intervention studies of mindfulness training as it suggests that mindfulness is something that can be influenced and developed, the present study has identified a potential antecedent of mindful states in the social context.

Indeed, such a social-contextual antecedent was identified in Narayanan and Moynihan (2006) and Reb et al. (2015) in terms of supervisor support, which bears similarities to managerial need support in the current study. However, the mechanism of how the social-contextual climate may foster mindfulness has not been identified. The

present study contributes to placing state mindfulness in the motivational process at work, in terms of how the work climate relates to human health and functioning by the psychological mechanism of need satisfaction. In particular, need satisfaction has been linked to greater self-regulation, health, and adjustment (e.g., Baard et al. 2004). Because mindfulness is an indicator of wellness, considered an important self-regulatory capacity, and is linked to optimal functioning, need satisfaction may provide the energy for such self-regulation, wellness and optimal functioning by affording an opportunity for relaxed nonjudgmental awareness of situations.

Furthermore, higher levels of state mindfulness showed a positive relation to subjective well-being and goal attainment, as well as a negative relation to burnout. A relation between mindfulness and subjective well-being has been found in previous research across contexts (e.g., Brown and Ryan 2003), but the replication of this relation in the present study contributes to the scarce body of literature in the work context as well as supports this relation for state mindfulness in particular. The same applies for the relation between state mindfulness and burnout, although supported in the work domain for trait mindfulness by Hülsheger et al. (2013) and Narayanan and Moynihan (2006). As subjective well-being and burnout both are indicators of psychological health, these findings are in line with the general notion of being present as enabling reflective and objective evaluations as well as better coping with challenges and stressful events that may present themselves, also in the work domain. This is important

because in the work place, stressful and challenging situations occur routinely (Schultz et al. 2015).

As for goal attainment, Brown and Vansteenkiste (2006) related mindfulness to this concept, but it has not been directly linked to mindfulness by previous research in the work domain; rather, mindfulness has been related to job performance in general (Dane and Brummel 2013). However, goal attainment may be considered a form of job performance. After all, most job performance is evaluated based on whether the organizations goals are reached or not. By mindfulness being recognized as increasing cognitive flexibility and alertness (Moore and Malinowski 2009; Zeidan et al. 2010), and potentially guarding against distractions (Herndon 2008), it seems reasonable that this contributes to increased attainment of goals by being aware of one's goals, keeping focus on these goals, and avoiding mistakes in reaching these goals when executing one's job. That state mindfulness is related to goal attainment in the work domain adds to the literature on the importance of this aspect of consciousness for work performance in general. However, it is important to bear in mind that goal attainment in the present study is not an objective measure, rather the employees' perception of whether the identified goals in the work of the specific population studied are met.

In sum, the results of this study demonstrate that state mindfulness has far-reaching implications, which together entails benefits for both employees and organizations. Moreover, these results do not only add to the literature by demonstrating relations to different outcomes in line with previous research. By looking at the implications of a need-satisfying work environment and subsequent need satisfaction for state mindfulness, a new dimension is added to the literature on mindfulness in the workplace in particular, and to the more general one on mindfulness. Further, by using a longitudinal design, mindfulness is studied over time, which is essential when looking at the state of this concept. In addition, the longitudinal design employed in the present study contributes to understanding the process between mindfulness and work outcomes more so than some of the cross-sectional studies in this domain have been able to so far.

### Practical implications

From an organizational perspective, the results of the present study underline the importance of the organizations' effort in developing state mindfulness among employees. At work, as in other domains, we are often influenced by our cognitive schemas, but a mindful state will make us more focused on the bare facts, keep us more in touch with reality, and stop us from acting automatically. As such, in an organizational context, mindful employees may benefit the organization by demonstrating more flexible and objective thoughts and

behaviors. Moreover, employee well-being is associated with factors such as performance (Wright et al. 2007), less absenteeism (Aldana 2001) and less turnover (Wright and Bonett 2007). The results of the present study also suggest that mindfulness is directly related to performance. Clearly, it should be in the organization's interest to influence their employees in a positive way, as this will also in turn benefit the organization. This can be achieved by fostering need satisfaction through a need-supportive work environment characterized by active listening, opportunities for choice, participation, development and growth, positive feedback, acknowledgements of employee's skills and efforts, and so forth (Stone et al. 2009).

### Limitations and future research directions

Appraising the results of the present study, the following limitations should be considered. First, self-reports were appropriate given the focal constructs of the study. However, in terms of goal attainment, objective measures could have been used to strengthen the results, although research on performance evaluations has shown that objective performance is significantly correlated with self-reported performance, and that the amount of bias does not vary across performance levels (Sharma et al. 2004). Future research could benefit from objective measures of these constructs. Second, although the items for state mindfulness are the five items indicated by Brown and Ryan (2003) to represent state mindfulness and referred to the respondents current experience, they were in the original article measured by a diary approach. Hence, future research could look into whether a onetime measure of these items at a specific time point adequately tap such a state. Third, the current sample is a convenience sample from a specific population of employees and was not selected to be representable for all employees, so caution must be taken in generalizing the results. However, since the basic psychological needs stem from innate and universal mechanisms (Deci and Ryan 2000) and mindfulness has shown benefits across different domains and contexts (Brown and Ryan 2003), it is expected that the findings would be replicable regardless of the employee's profession or type of organization. Future research could, however, explore this assumption more in depth. Fourth, 56.9 % of the respondents dropped out between Time 1 to Time 4, which is considered a drawback of the longitudinal design as a method. However, analyses indicated that the missing values were MCAR. Hence, recommended procedures for imputing missing data were used, which strengthens the results of the present study. Fifth, the analysis of the hypothesized model was performed as a path analysis containing only observed variables, a method that could provide more precision due to lower standard errors of the estimates (Ledgerwood and Shrout 2011). Nevertheless,

the use of latent variables would have been beneficial to account for bias by measurement error. Sixth, although the present study has a strength in its longitudinal design, the design is still not able to answer questions about causality. Hence, future research might look into intervention studies to establish causality for the relations studied. In addition, future research might want to consider the implications of need-thwarting work climates and subsequent need frustration as well as other social-contextual factors on state mindfulness, as the present study only considers a need-supportive work climate and subsequent need satisfaction in relation to state mindfulness.

## Conclusion

This study contributes to creating a link between the literature showing the importance of a need-supportive work environment for well-being and other work-related outcomes, and the emerging literature on the positive benefits of mindfulness in organizational settings. Specifically, the present study suggests that a need-satisfying work environment relates positively to state mindfulness, which in turn has positive implications on employees' well-being, goal attainment, and burnout. Given the large amount of people's lifetime that is spent at work, these findings appear important for organizations to consider in creating optimal work conditions for employees.

**Compliance with ethical standards**

**Conflict of interest** The author declares that there are no conflict of interest.

**Ethical approval** The data collection was approved by the Norwegian Social Science Data Services and participation was voluntary. This article does not contain any studies with animals performed by any of the authors.

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