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## From relation to intervention: how supervisors' health-focused intervention behavior relates to employees' sickness absenteeism

Stephan A. Boehm, Mahshid Khademi and Miriam K. Baumgaertner

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### ABSTRACT

Sickness absenteeism represents a pressing challenge for employees, organizations, and societies. Although leadership is widely recognized as a determinant of employees' health, the relationship between leaders' Health-Focused Intervention Behavior (HFIB) and sickness absenteeism remains insufficiently understood. HFIB denotes leaders' purposeful actions to support employees' recovery, such as initiating health-related dialogue, adapting work conditions, and facilitating access to organizational and medical resources in case of ill-health. Grounded in Conservation of Resources theory, this research pursues three objectives: (1) to examine absenteeism as a theoretically and practically significant outcome of HFIB above and beyond (leader-member exchange) LMX, (2) to investigate pre-existing health impairments as an underexplored boundary condition shaping HFIB effectiveness, and (3) to explore the longitudinal development of sickness absenteeism trajectories by assessing individual differences in initial absenteeism (intercept) and change over time (slope) in relation to HFIB. Drawing on multi-source data collected over 18 months, including six waves of sickness absenteeism following the baseline survey, we find that HFIB is negatively associated with sickness absenteeism, even after controlling for LMX, physical strain and respiratory diseases. Moreover, impairment severity moderates this relationship: contrary to expectations, employees with stronger impairments exhibit smaller reductions in sickness absenteeism than those with less severe impairments.

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### KEYWORDS

Health-focused intervention behavior (HFIB); sickness absenteeism; health impairment severity

Sickness absence is rising globally and poses challenges for individuals, organizations, and societies alike (IWD, 2024; OECD, 2021). For instance, in Germany, workforce members averaged 22 lost workdays in 2023 (IWD, 2024). Employees with health impairments face personal hardship, organizations lose productivity, and healthcare and welfare systems bear growing costs (Hoefsmits et al., 2012; Virtanen et al., 2006; Wilford et al., 2008). Demographic trends such as ageing populations and higher retirement ages further exacerbate these developments, increasing the prevalence of chronic illness and sickness absenteeism (Hultin et al., 2012; United Nations, 2019; WHO, 2011). As a result, identifying effective strategies to reduce workforce absenteeism is increasingly urgent and essential.

While sickness absenteeism in organizations is influenced by multiple factors, including various demands and resources such as workload, job control, or individual resilience (Bakker et al., 2003), leaders play a central role in employees' health (Dietz et al., 2020; Miraglia & Johns, 2021). Studies and systematic reviews have shown that high-quality leader-member exchange (LMX) relationships strongly predict employees' health, while other

leadership constructs, such as transformational leadership, add only limited exploratory power (Gregersen et al., 2014; Skakon et al., 2010). However, these general leadership models have been criticized for being "too vague about specific health-related actions of leaders" (Franke et al., 2011, p. 140). In response, targeted health-related leadership approaches have emerged over the past decade, which aim to delineate "the processes whereby leadership affects follower well-being in terms of specifying precise mechanisms" (Macik-Frey et al., 2007, p. 825). Key approaches in this respect comprise health-promoting leadership (Eriksson, 2011; Jiménez et al., 2017), health-oriented leadership (Franke & Felfe, 2011; Franke et al., 2015; Pundt & Felfe, 2017), health-specific leadership (Gurt et al., 2011), or health- and development-promoting leadership (Vincent-Höper & Stein, 2019). We take up this line of research and examine how leadership can help mitigate sickness absenteeism by focusing on health-focused intervention behavior (HFIB) as a key dimension of healthy leadership.

We define HFIB as leaders' deliberate actions to directly address employees' health constraints, such as initiating health-related conversations, adjusting work

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conditions, or facilitating access to organizational and medical resources (Boehm & Baumgaertner, 2014, 2016; Boehm & Dwertmann, 2015). Leaders' early interventions have been shown to effectively improve employees' health and well-being (Dannheim et al., 2021). Over the past decade, research on healthy leadership has expanded considerably, with particular growth in studies on health-oriented leadership (HoL), arguably the most elaborated concept in the field. Authors have demonstrated the effectiveness of HoL for both general outcomes, e.g., job satisfaction (Lutz et al., 2023; Pundt & Felfe, 2017) or work engagement (Arnold & Rigotti, 2021; Kaluza et al., 2020, 2021) as well as health-specific outcomes, e.g., overall employee health (Klug et al., 2022; Lutz et al., 2023; Pundt & Felfe, 2017) and work ability (Friedrich et al., 2024).

Although these findings have yielded important insights for the health and absenteeism literature, several salient research questions remain insufficiently addressed. First and foremost, existent studies on healthy leadership, and particularly on health-oriented leadership (HoL) as the most dominant approach, have investigated an array of health-related outcomes including well-being (Santa Maria et al., 2021), strain (Hauff et al., 2022; Pundt & Felfe, 2017), burnout/exhaustion (Arnold & Rigotti, 2021; Grimm et al., 2021; Horstmann, 2018; Kaluza & Junker, 2022; Kaluza et al., 2020, 2021; Klebe et al., 2021), as well as physical and psychosomatic health complaints (Klug et al., 2022; Pundt & Felfe, 2017). However, despite its relevance, research on the link between healthy leadership and absenteeism remains notably scarce within the literature. As Rudolph and colleagues (2020, p. 18) recommended in their influential review, "the impact of *healthy leadership* could be gauged against tangible behavioral (e.g., sickness absenteeism) and economic metrics". To date, such research is largely missing, potentially because of the difficulties in obtaining objective absence data from organizations to test such hypotheses. By exploring if HFIB explains unique variance in absenteeism, beyond LMX and objective controls such as physical strain, we more closely integrate the healthy leadership stream into absenteeism research and underscore its organizational relevance for both cost management and workforce sustainability (Johns, 1994; Steel, 2003).

Second, most research on healthy leadership has focused on average effects in the general working population, without differentiating between employees' health states. While this approach strengthens external validity, it leaves open the question of whether, and to what extent, healthy leadership is effective for individuals with pre-existing health impairments, a group that comprises roughly 16% of

the population (WHO, 2022). To address this issue, we examine how HFIB affects sickness absenteeism across employee groups with varying health levels, shedding light on differential effects and focusing on a vulnerable, yet understudied segment of the workforce. To do so, we draw from Conservation of Resources (COR) theory (Hobfoll, 1989) and argue that the relationship between healthy leadership and absenteeism depends on employees' initial health resources. By examining objectively defined groups of employees with differing health levels, we extend existing absenteeism research and refine our understanding of how leadership influences employee outcomes under varying conditions of resource availability (i.e., health status). By shifting the focus towards employees whose health challenges may put them at heightened risk of absenteeism, our study not only broadens the external validity of healthy leadership theories but also provides critical insights into how HFIB can mitigate disadvantages faced by these employees.

Third, our study is among the first to examine the longitudinal effects of healthy leadership behaviours. We employ a multi-source, time-lagged design spanning 18 months to assess how initial levels of HFIB influence absenteeism in both the short and long term, and across employees with and without pre-existing health impairments. More specifically, we aim to predict both individual differences in the intercept (starting point) and in the slope (rate of change) – based on HFIB intensity and severity of prior impairments. To further enhance the robustness of our findings and minimize common method bias, we integrate multiple data sources: employee surveys, HR absenteeism records, physician assessments of health impairments, and epidemiological surveillance data. Such comprehensive, multi-method approaches remain rare in both the health literature (Beatty et al., 2019) and leadership research (Rudolph et al., 2020), yet they are crucial for mitigating bias and capturing the temporal dynamics of absenteeism.

Taken together, we specify three central objectives for the present study: (1) the investigation of absenteeism as a theoretically and practically significant outcome of HFIB, (2) pre-existing health impairments as a neglected boundary condition, and (3) the longitudinal development of sickness absenteeism trajectories by assessing individual differences in initial absenteeism (intercept) and change over time (slope) in relation to HFIB. Our study advances and complements existing leadership – health frameworks by positioning leadership as a critical factor in sickness absenteeism research, addressing the distinct challenges of employees with

health impairments, and enhancing methodological rigour through the use of multi-source, longitudinal, and objective data.

## Theory

### *The role of leadership in sickness absenteeism – a COR perspective*

Sickness absenteeism is a multifaceted phenomenon shaped by both individual and contextual factors. It represents not only withdrawal from work but also a response to health limitations and organizational demands (Gustafsson & Marklund, 2014; Johns, 2008). Meta-analyses identify health impairments and strain as primary drivers, while organizational norms, job demands, and work design also play decisive roles (Miraglia & Johns, 2016). Thus, sickness absenteeism results from the interplay of employees' health, workplace conditions, and organizational norms rather than medical factors alone.

Building on this idea, research has increasingly recognized leadership as a key social determinant of sickness absenteeism. Attendance behaviours are embedded in a broader social context where leaders shape expectations, provide resources, and signal the legitimacy of absence or presence (Miraglia & Johns, 2021). Leaders influence employees' resources and workplace demands and can therefore either mitigate or exacerbate sickness absenteeism (Lohaus & Habermann, 2019; Miraglia & Johns, 2016). In line with this, leadership has been shown to be crucial for sustaining employees' health (e.g., Harms et al., 2017; Inceoglu et al., 2018; Meyer et al., 2016). Creating what Dietz and Zacher (2023) call "resource-enriching work environments" is thus a critical leadership task with direct implications for absenteeism. Moreover, employees' decision to attend work while being ill is shaped not only by health status but also by relational and contextual factors such as supervisors' signals and perceived organizational support (Johns, 2011; Ruhle & Süß, 2020). Targeted leader interventions - conceptualized as HFIB in this study - comprise behaviours such as initiating early conversations about health, legitimizing recovery absences, and adjusting workload expectations. By signalling that "health comes first," leaders may reduce pressure to engage in presenteeism while fostering commitment and satisfaction that discourage unnecessary withdrawal. Leadership may thus function both as a relational resource and as a structural condition influencing absence behaviour.

Looking at leadership from this resource perspective aligns with the core premises of Conservation of

Resources (COR) theory, which serves as the main theoretical framework for this study. COR posits that individuals strive to acquire, protect, and maintain valued resources and that stress results when resources are threatened, lost, or insufficient to meet demands (Hobfoll, 2011). Importantly, resources can transfer across domains and substitute for one another (Ten Brummelhuis & Bakker, 2012). From this perspective, leadership affects sickness absenteeism by shaping employees' resource pools: LMX mainly supplies relational or social resources (attention, support, sympathy), whereas HFIB supplies more specific, structured, and potentially enduring contextual resources (e.g., concrete workplace adaptations in task, time, or location). Such structured resources can buffer health losses and interrupt loss spirals, reducing the risk of sickness absenteeism. Thus, when investigating HFIB effects on sickness absenteeism, LMX should be routinely tested as a baseline/control (because it supplies broad social resources) while HFIB is examined as a distinct intervention that provides targeted structural resources to support employees' health.

### *The role of LMX for employees' sickness absenteeism*

Since LMX relationships are among the strongest predictors of employees' health and absenteeism (Gegersen et al., 2014; Skakon et al., 2010), and our study aims to demonstrate HFIB's relevance beyond relationship quality, we explicitly consider LMX as a baseline control. High-quality LMX relationships are characterized by trust, emotional support, open communication, and job-related guidance (Dulebohn et al., 2012; Furtado & Sobral, 2023; Gerstner & Day, 1997; Wayne et al., 1997), which foster close interaction and enable supervisors to detect and respond to early signs of strain (Graen & Uhl-Bien, 1995). Leaders are also more likely to invest in in-group members' well-being and recovery, while taking a more critical stance towards out-group members (Liden et al., 1997; Uhl-Bien & Maslyn, 2003; Dwertmann & Boehm, 2016).

From a conservation of resources (COR) perspective (Hobfoll, 1989), LMX represents a contextual social resource that buffers stress and promotes health (Halbesleben, Neveu, et al., 2014). By providing support and recognition, it can initiate gain spirals that strengthen personal resources such as confidence and resilience (Hobfoll et al., 2018; Xanthopoulou et al., 2009), ultimately enhancing wellbeing and reducing absenteeism (Liang et al., 2022; Ten Brummelhuis & Bakker, 2012).

Empirically, high-quality LMX has been linked to better physical and psychological health (Epitropaki & Martin, 2005; Gregory & Osmonbekov, 2019; Rousseau

et al., 2008; Thomas & Lankau, 2009) and to lower absenteeism, largely through social support and work embeddedness (Halbesleben, 2006; Harris et al., 2011; Moser et al., 2023; Tremblay et al., 2021). Given that LMX is a robust predictor of employees' health outcomes compared to other leadership constructs (Gregersen et al., 2014), it should be considered a baseline factor when examining the effects of HFIB on sickness absenteeism. Accordingly, we propose:

*Hypothesis 1. LMX is negatively related to employees' sickness absenteeism.*

### **The role of healthy leadership approaches for employees' sickness absenteeism**

While general leadership theories provide broad insights, domain-specific leadership approaches focus on behaviours aimed at particular organizational outcomes, such as employees' health or safety (Barling et al., 2002). By emphasizing targeted actions and competencies directed at employees' health, such approaches offer more precise mechanisms for explaining how leaders influence their employees' sickness absenteeism. For the field of health promotion, at least 13 different leadership concepts have been developed and tested in the field, with health-promoting (Eriksson, 2011) and health-oriented leadership (Franke & Felfe, 2011) being the most widely cited approaches (Rudolph et al., 2020).

Health-promoting leadership, rooted in the Nordic public health literature, emphasizes creating supportive, health-promoting workplaces through dimensions like supportive leadership, health-focused activities, and strategic workplace development (Eriksson, 2011; Hanson, 2007). While Jiménez et al. (2017) expanded the concept to include organizational factors, their circumplex model has seen limited operationalization. Second, health-oriented leadership (Franke & Felfe, 2011), focuses on leaders' health-promoting behaviours, communication, and workplace design, alongside leaders' values and awareness of followers' health. It encompasses "SelfCare" (leaders' management of their own health), "StaffCare" (leaders' health-conscious behaviours as perceived by followers), and how these influence followers' "SelfCare." The framework, represented by a "house of health-promoting leadership" (Franke, 2012; Franke et al., 2015), suggests that leaders' self-care sets the foundation for fostering follower health and well-being. Leaders who actively demonstrate "StaffCare" – by promoting work-life balance, encouraging healthy habits, and recognizing signs of stress – foster a culture where well-being is prioritized. This

supportive leadership style not only reduces workplace stress (Franke et al., 2014; Hauff et al., 2022; Klug et al., 2019, 2022; Pundt & Felfe, 2017) but also enhances work engagement (Arnold & Rigotti, 2023; Grimm et al., 2021; Hauff et al., 2022; Kaluza et al., 2020, 2021). When employees feel valued and cared for, they are less likely to experience burnout (Grimm et al., 2021; Horstmann, 2018; Kaluza & Junker, 2022; Pischel et al., 2023; Santa Maria et al., 2021). They also demonstrate greater mental resilience (Arnold & Rigotti, 2021), higher task proficiency (Klebe et al., 2021), and improved workability (Friedrich et al., 2024). Besides these more dominant approaches to the literature, there are various other approaches, such as Gurt et al.'s (2011) health-specific leadership, Jiménez et al.'s (2017) health-promoting leadership, or Della et al.'s (2008) leadership support for health promotion (please see Rudolph et al. (2020) for a systematic review).

For our study, we build particularly on the "StaffCare" dimension of HoL, which shows theoretical overlap with the HFIB concept used in this study.

### **The role of HFIB for employees' sickness absenteeism**

To investigate the role of HFIB on sickness absenteeism, we draw from Boehm and Baumgaertner (2014, 2016) model of health-focused leadership (HFL), which incorporates intervention behaviours, adapting evidence-based medical practices to organizational settings. The scale complements existing measures like StaffCare (Franke & Felfe, 2011) by focusing on concrete leadership behaviours directed at employees who show early signs of ill health or are already ill (e.g., "When an employee is in poor health, my direct supervisor works to develop a solution with the employee"). Intervention becomes essential once employees face health challenges, whether physical or mental. Early intervention, as demonstrated in evidence-based medicine, is a key pillar of health and well-being, as it prevents the progression of health issues and reduces long-term burdens (Campbell et al., 2013). In the leadership context, intervention behaviour involves recognizing and addressing health-related changes with empathy, care, and proactive actions that support employees in continuing their work despite health impairments.

Leaders are not physicians or therapists, but they set the tone for communication and action by prioritizing health and recovery over short-term work goals. They also help normalize illness and collaborate with employees to find tailored solutions, such as workplace accommodations, task restructuring, or flexible schedules, aligning job demands with available resources (Schur

et al., 2014). For employees with physical health conditions, such as cancer or diabetes, leaders may facilitate time off for treatments, while for mental health challenges, they can reduce emotional demands or reallocate tasks to prevent overwhelming affected employees. These timely and proactive interventions foster recovery while maintaining productivity, ultimately reducing the likelihood of employees missing significant work time or leaving the workforce entirely due to a severe loss of resources.

Specifically, we propose that HFIB impacts sickness absenteeism through three conceptual channels.

- (1) **Breaking loss cycles early:** First, HFIB helps break loss cycles, a crucial concept in COR theory. If employees struggle with health impairments, this might lead to a vicious cycle of resource loss (e.g., reduced energy leads to poorer performance, creating more stress and further depleting resources). HFIB intervenes in this cycle by actively providing additional resources like workload adjustments, accommodations, and encouraging rest and recovery, which helps halt or reverse these downward spirals, allowing employees to regain a sense of control over their resources (Hobfoll, 2001) and prevent the escalation of health issues into chronic conditions that may necessitate long-term sickness absence.
- (2) **Facilitating (new) resource gain:** Beyond mitigating resource loss, COR theory emphasizes the importance of resource gain cycles, particularly for individuals recovering from past depletion (Hobfoll, 2001, pp. 2011, 2018). HFIB fosters such gains by creating a supportive work environment where employees can rebuild and accumulate resources, such as workplace accommodations, emotional support, and adaptive job designs (Bakker et al., 2005; Frese, 1999; Wright & Hobfoll, 2004). These new resource investments enhance employees' ability to manage job demands and sustain long-term work ability. Employees with existing health impairments, who often face substantial resource depletion, stand to benefit the most, as HFIB provides critical support that strengthens their ability to work and avoid sickness absenteeism.
- (3) **Reducing the need for resource protection strategies:** COR theory suggests that individuals facing resource loss prioritize protecting their remaining resources, often by withdrawing from work through absenteeism or reduced engagement, which may eventually lead to job loss (Halbesleben, 2010; Hobfoll, 2001, 2018).

Employees with health impairments may adopt such self-protective strategies to prevent further depletion. HFIB mitigates this need by fostering a supportive work environment where resources are actively protected and enhanced. By signalling that leaders are invested in employees' well-being and proactively addressing health challenges, HFIB reduces the perceived necessity of withdrawal, thereby decreasing sickness absenteeism and promoting sustained engagement and long-term employees' loyalty.

Through these channels, leaders who demonstrate HFIB support employees by safeguarding their remaining resources, facilitating new gains, and reducing the need for them to withdraw from work to conserve resources, thus reducing sickness absenteeism, contributing to a healthier, more engaged workforce.

*Hypothesis 2. HFIB is negatively related to employees' sickness absenteeism, over and above the potential effect of LMX*

### ***The moderating role of health impairment severity for the relationship between HFIB and employees' sickness absenteeism***

While HFIB is expected to reduce sickness absenteeism across employees, its effectiveness should be especially beneficial for those with more severe pre-existing health impairments. Employees with physical or mental health conditions are at greater risk of long-term sick leave due to the often-chronic nature of their conditions (Ármanndóttir et al., 2013; Bergh et al., 2007; Laaksonen et al., 2013). From a COR perspective (Hobfoll, 2011), depleted resource pools make individuals more vulnerable to further loss (Klebe et al., 2021, 2022). Affected employees often lack the necessary reserves (e.g., energy, resilience) to cope with work demands, increasing their susceptibility to more long-term negative outcomes such as prolonged sickness absenteeism (Dekkers-Sánchez et al., 2008). As resource losses accumulate, employees with more severe impairments are particularly at risk of entering self-reinforcing downward spirals of depletion (Hobfoll et al., 2018; Ten Brummelhuis & Bakker, 2012). In this context, HFIB should be especially beneficial for those with more severe impairments because these employees stand to gain the most from additional resources. Specifically, employees with substantial health limitations face ongoing resource depletion, such as chronic fatigue reducing performance and increasing stress, and are therefore more sensitive to the resource-stabilizing and resource-building effects of HFIB. Through

workload adjustments, job modifications, and emotional support, HFIB can help interrupt cycles of strain and foster recovery and sustained work engagement.

Moreover, from a resource gain perspective, the same HFIB actions, such as flexible scheduling, adapted tasks, or workplace accommodations, may have a disproportionately positive impact on employees with severe impairments, as even small resource infusions can significantly enhance their ability to remain engaged and present (Bakker et al., 2007; Chan et al., 2015; Halbesleben, Neveu, et al., 2014). By signalling sustained support and aligning demands with available resources, HFIB can prevent further depletion and reduce the need for resource-conserving behaviours such as sickness absenteeism (Hobfoll, 2011; Westman, 2001).

Taken together, while HFIB generally reduces sickness absenteeism, its beneficial effects should be strongest for employees with severe pre-existing impairments, as these employees experience higher resource strain and greater potential gains from supportive leadership. Therefore, we propose that the severity of health impairments moderates the relationship between HFIB and sickness absenteeism, such that the negative relationship between HFIB and absenteeism is more pronounced for employees with more severe health impairments.

*Hypothesis 3: The severity of employees' health impairments moderates the relationship between HFIB and sickness absenteeism, such that the negative relationship is stronger for employees with more severe health impairments.*

### **A dynamic and longitudinal perspective on the HFIB-sickness absenteeism relationship**

Beyond static approaches, absenteeism is increasingly viewed as a dynamic process that unfolds over time (Dello Russo et al., 2013; Miraglia & Johns, 2021; Rivkin et al., 2022). Absence and presence are episodic behaviours whose cumulative effects shape both individual well-being and organizational functioning (Johns, 2010). Longitudinal studies indicate that presenteeism can precede and predict later sickness absence, illustrating the temporal interdependence of these behaviours (Bergström et al., 2009). Nevertheless, systematic insight into long-term absenteeism trajectories and the social and contextual factors that influence them remains limited (Miraglia & Johns, 2021; Whysall et al., 2023).

From a theoretical standpoint, COR theory (Hobfoll, 1989, 2001) offers a powerful lens for understanding how absenteeism develops and changes over time. As resource gain and loss processes are inherently dynamic,

individuals' behavioural responses, such as absence or continued presence, may shift as their resource reservoirs fluctuate across time. In this sense, sickness absenteeism can be viewed as a temporal manifestation of resource regulation, where short-term withdrawal may help to preserve resources, while prolonged absence might signal more substantial or cumulative resource depletion.

Within this framework, leadership behaviour should play a crucial role in either stabilizing or altering resource trajectories. HFIB, for instance, can function as an external contextual resource that helps replenish depleted personal resources and prevent further losses. However, its effectiveness likely depends on employees' initial health conditions: those with pre-existing impairments may benefit differently from resource-enriching leadership behaviours than those in better health. Given that both resources and health behaviours evolve dynamically, a longitudinal lens seems promising to capture how leadership-driven resource processes unfold.

Methodological advances, including multi-wave and multi-source designs, therefore provide critical leverage for understanding the temporal interplay between leadership, health status, and absenteeism (George & Jones, 2000; Ployhart & Vandenberg, 2010; Spector, 2019). Yet, it remains unclear whether early exposure to HFIB yields enduring resource gains that translate into reduced absenteeism over time – or whether such effects diminish as organizational and personal contexts change. Accordingly, we pose the following research question:

*How do initial levels of HFIB correspond to different patterns of absenteeism development over time, and do these patterns differ between employees with and without pre-existing health impairments?*

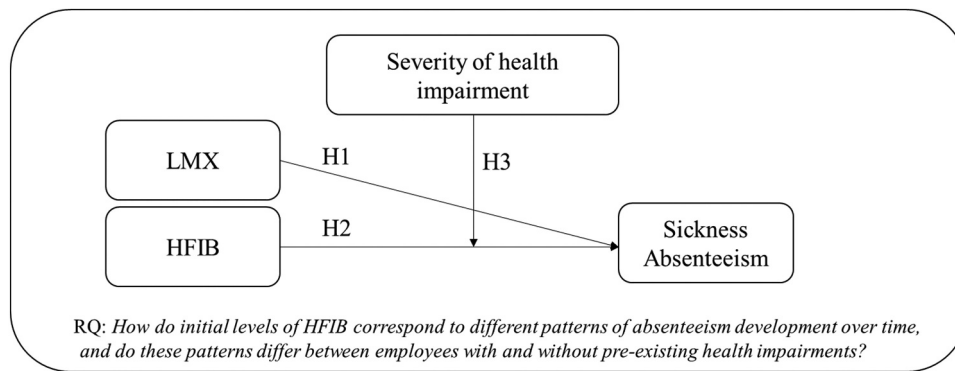
Figure 1 summarizes our conceptual research model.

## **Method**

### **Sample and procedure**

Data for this study were collected from a German industrial company's production facility. To minimize the risk of common source bias a priori and to control for potential confounders (Podsakoff et al., 2003), we collected data from four different sources: employee self-reports, HR personnel data, time-lagged information on sickness absenteeism from medical records, as well as epidemiological data on respiratory diseases.

First, an online survey of 2858 employees was deployed that yielded a 41% response rate, with respondents assured of anonymity. Second, demographic information was obtained from HR personnel records. Third, we collected data on employees' sickness absenteeism for



**Figure 1.** Study model.

the 18 months that followed our study (from HR personnel records as well). Fourth, data on respiratory infection incidence were obtained from the Robert Koch Institute (<https://influenza.rki.de/Wochenberichte.aspx>) to account for potential seasonal confounding health effects.

A unique identifier was used to match these data sources. 91% of the respondents were male, and 9% were female. Although unbalanced, these proportions actually represent the manufacturing company's gender distribution. Ages ranged from 18 to 64 years, with a mean of 39.82 ( $SD = 10.65$ ), and tenure ranged from 1 to 44 years, averaging 17.44 years ( $SD = 9.42$ ).

## Measures

### LMX

LMX and HFIB were measured once at the beginning of the study via an employee opinion survey. We used the well-established LMX-7 scale (Scandura & Graen, 1984). An exemplary item is: "My direct supervisor understands my problems and my needs". The calculated Cronbach's alpha for the overall scale was .95 ( $M = 3.93$ ,  $SD = 0.94$ ).

### HFIB

We employed the five-item HFIB scale developed by Boehm and Baumgaertner (2014, 2016), which is also listed as one of the healthy leadership constructs in a recent review done by Rudolph et al. (2020). An exemplary item is "When an employee is in poor health, my foreman tries to work together with him/her to find a joint solution." HFIB was measured on a 5-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree." Yet, to further assess the validity in our study context, we performed a CFA. The results were satisfactory ( $\chi^2 = 40.593$ ,  $df = 5$ ; CFI = 0.996, SRMR = 0.009). The overall scale demonstrated high reliability, with a Cronbach's alpha of .86 ( $M = 3.84$ ,  $SD = 0.85$ ).

### Sickness absenteeism

Sickness absenteeism was measured by the number of days employees were absent from work due to illness, based on the company's HR records. The data were provided in monthly packages for 18 months after the start of our study. We matched the data with a unique identifier. To account for seasonal fluctuations and to obtain more robust results (Johns, 1994; Steel, 2003), we aggregated data in three-month pockets across six waves, resulting in an 18-month dataset on individual sickness absenteeism. HR records provide greater objectivity and validity compared to self-reported sick leave (Van Poppel, 2002). To assess the robustness of our analytical strategy, we also tested one-month and six-month data aggregations, which yielded no differences in the main effects of our analyses. Please refer to footnote 2 and the corresponding supplementary material on these robustness checks.

### Severity of health impairments

Health impairments in our study context are officially diagnosed impairments that are assessed and confirmed by a company physician, including conditions such as musculoskeletal disorders, rheumatic disorders, gastrointestinal issues, or cardiovascular diseases. The company physicians of the partner organization categorized these health impairments into four levels of severity, ranging from mild to critical, using the following categories: 0 (no impairment), 1 (irrelevant impairment), 2 (relevant impairment), or 3 (critical impairment). No impairment indicates that no pre-existing health condition was diagnosed. Irrelevant impairments refer to diagnosed health conditions that are not important for job functioning (e.g., colour blindness in a role where colour perception is not critical). Relevant impairments represent conditions that could cause challenges in job functioning, such as chronic diseases like diabetes. Finally, critical impairments are more severe conditions with a direct and potentially

strong impact on current job functioning, such as advanced rheumatoid arthritis, Parkinson's disease, or cancer. We coded this information (0–3) as a categorical variable in the dataset. More specific diagnoses were not provided to protect sensitive health data.

### Control measures

**Age & Gender.** Research has shown that sickness absenteeism is modestly yet significantly related to age (Ng & Feldman, 2008) and gender (Bekker et al., 2009). Both, gender and age of participants were retrieved at the beginning of the study from the HR system and matched with our survey data.

**Firm tenure.** We controlled for tenure for the same reason as for age. Tenure, measured at the beginning of the study in absolute years, was obtained from the HR system ( $M = 18.01$ ,  $SD = 9.64$ ) as well.

**Musculoskeletal strain per workspace.** We controlled for musculoskeletal strain per workspace, as it can impact health and contribute to increased sickness absenteeism. Company physicians and ergonomic experts assessed strain at the beginning of the study, using a scale from 1 (very low strain) to 50 (extremely high strain) ( $M = 12.75$ ,  $SD = 9.65$ ).

**Respiratory infection incidence.** We retrieved data from the Robert Koch Institute's<sup>1</sup> weekly reports on acute respiratory infection incidence in Bavaria (where our partner organization has its production site) over the 18-month study period. We controlled for the number of cases of Acute Respiratory Infections (ARI), as this variable can impact health and contribute to increased sickness absenteeism. The number of cases was reported weekly, so we aggregated them for each month and then matched with each wave of the data collection in our study ( $M = 378.95$ ,  $SD = 118.68$ ). This variable was added to the dataset to account for seasonal fluctuations in absenteeism.

## Data and analyses

### Negative binomial mixed-effects model (NBMM)

To account for the multilevel structure of the sickness absenteeism data -nested within individuals over time- we employed multilevel mixed-effects models as our main empirical approach to test hypotheses 1–3. This approach captures both individual and time-varying characteristics of the data and is commonly used to study sickness absenteeism (Duchemin & Hocine, 2020; McNeish & Kelley, 2019). Additionally, we used robust standard errors to address potential heteroskedasticity and within-group correlation. It is important to note that sickness absenteeism as a count-based dependent variable required Poisson- or negative binomial modelling. The presence of overdispersion ( $M = 17.14$ ,  $SD = 26.35$ ) with the standard deviation exceeding 130% of the mean can otherwise lead to inaccurate estimates (Hoetker & Agarwal, 2007). Moreover, an excessive number of zeros in the data suggested that a significant number of employees showed no sickness absenteeism (see Table 2). The dispersion parameter's natural log was not significant ( $\ln(\alpha) = -.05$ ,  $p = .30$ ), but the Vuong test indicated that the negative binomial model was most appropriate (Long & Freese, 2006). Even though the Poisson mixed-effects models (PMM) can be an appropriate choice for such repeated count data, this model is not realistic because of the restriction that the mean and variance are equal. Therefore, the NBMM is the model of choice for our study since it effectively manages the over-dispersion of the longitudinal data, considering both fixed effects and random effects (McNeish & Kelley, 2019). The likelihood-ratio test also favours the NBMM over the equivalent Poisson model ( $\chi^2(1) = 37410$ ,  $p < .01$ ).

## Results

### Correlational analyses

Descriptive statistics are provided in Table 1 for the main variables of interest. For our focal dependent variable, sickness absenteeism, the average number of days absent in various waves is reported in Table 2. Sickness

**Table 1.** Descriptive statistics and correlations among the variables used.

|                                 | Mean  | SD    | 1      | 2      | 3      | 4      | 5     | 6     | 7      |
|---------------------------------|-------|-------|--------|--------|--------|--------|-------|-------|--------|
| 1 Gender                        | 0.10  | 0.29  |        |        |        |        |       |       |        |
| 2 Age                           | 40.32 | 10.39 | -.14** |        |        |        |       |       |        |
| 3 Firm tenure                   | 17.14 | 9.14  | -.02   | .80**  |        |        |       |       |        |
| 4 Musculoskeletal strain        | 13.29 | 9.60  | .00    | -.11** | -.13** |        |       |       |        |
| 5 Severity of health impairment | 0.41  | 0.85  | .06**  | .25**  | .24**  | -.15** |       |       |        |
| 6 LMX                           | 3.95  | 0.94  | .02    | .05*   | .05*   | -.07** | .00   | .95   |        |
| 7 HFIB                          | 3.78  | 0.88  | .04    | .00    | .02    | -.15** | -.03  | .51** | .86    |
| 8 Sickness Absenteeism          | 3.25  | 9.54  | .04**  | .1**   | .08**  | -.02** | .16** | -.01  | -.05** |

Note.  $N = 2175$ . \* $p < .05$ (two-tailed), \*\* $p < .01$ (two-tailed). Alpha reliabilities are in italic on the diagonal. Gender dummy coded as 1 = female and 0 = male. HFIB = Health-Focused Intervention Behavior.

**Table 2.** Sickness absenteeism in the six waves depending on the severity of health impairment.

| Health Status | Wave 1                         | Wave 2                         | Wave 3                          | Wave 4                          | Wave 5                          | Wave 6                          |
|---------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| None          | 1.97 (6.15)<br><i>N</i> = 1675 | 2.61 (8.34)<br><i>N</i> = 1675 | 3.55 (9.47)<br><i>N</i> = 1675  | 3.00 (8.73)<br><i>N</i> = 1675  | 2.75 (9.22)<br><i>N</i> = 1675  | 3.21 (9.62)<br><i>N</i> = 1662  |
| Irrelevant    | 3.45 (9.72)<br><i>N</i> = 159  | 3.23 (8.09)<br><i>N</i> = 159  | 5.22 (11.77)<br><i>N</i> = 159  | 5.77 (13.02)<br><i>N</i> = 159  | 4.06 (10.80)<br><i>N</i> = 159  | 4.61 (12.56)<br><i>N</i> = 158  |
| Relevant      | 5.54 (11.29)<br><i>N</i> = 202 | 5.78 (12.26)<br><i>N</i> = 202 | 7.53 (15.46)<br><i>N</i> = 202  | 8.11 (16.57)<br><i>N</i> = 202  | 4.84 (10.46)<br><i>N</i> = 202  | 7.12 (14.48)<br><i>N</i> = 201  |
| Critical      | 7.97 (12.97)<br><i>N</i> = 103 | 9.30 (16.68)<br><i>N</i> = 103 | 8.07 (15.11)<br><i>N</i> = 103  | 11.47 (18.59)<br><i>N</i> = 103 | 10.95 (18.46)<br><i>N</i> = 103 | 10.19 (18.97)<br><i>N</i> = 103 |
| <b>Total</b>  | 2.71 (7.69)<br><i>N</i> = 2139 | 3.28 (9.46)<br><i>N</i> = 2139 | 4.27 (10.77)<br><i>N</i> = 2139 | 4.10 (10.94)<br><i>N</i> = 2139 | 3.44 (10.25)<br><i>N</i> = 2139 | 4.02 (11.15)<br><i>N</i> = 2124 |

Note. Standard deviation of sickness absenteeism is reported in parentheses. The last row reports the total number of sick days in each wave.

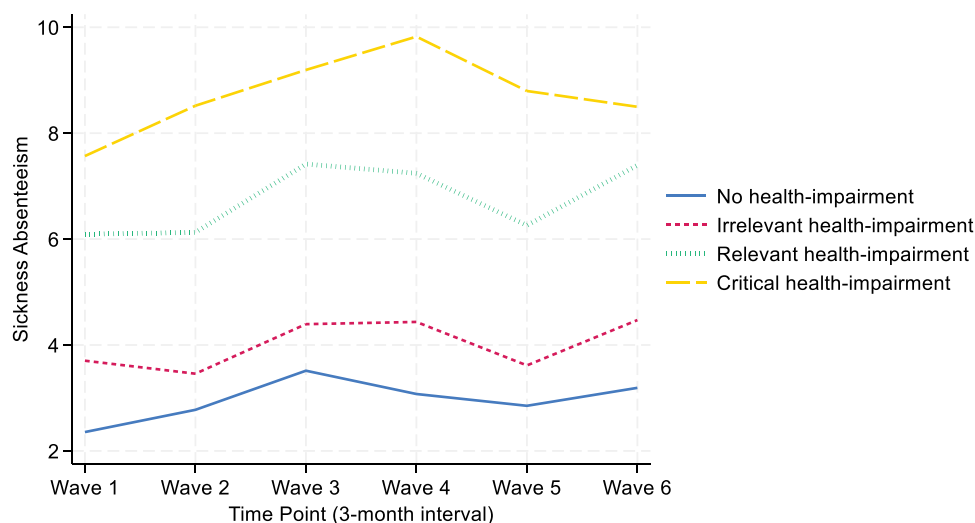
absenteeism is highly skewed, as more than 50% of the employees did not show any sickness absenteeism in all six waves.

### Tests of hypotheses 1–3 with a NBMM

As outlined above, to test hypotheses 1–3, we employed a NBMM using the long-format dataset, which comprises six measurement waves of sickness absenteeism, each collected at three-month intervals (total observation period: 18 months). The dependent variable was the count of sickness absenteeism days per employee per wave. Our NBMM specified random intercepts for individuals to account for repeated observations of absenteeism over six waves (nested within persons). Slopes were modelled as fixed, as all individual-level predictors (e.g., leadership, health impairment, tenure) were measured only once at baseline, and thus there were no variations over time. This approach provides a robust estimation of individual-level differences and temporal patterns in sickness absenteeism while accommodating the overdispersion of count data, also controlling for the effect of covariates such as ARI, age, gender, tenure, and musculoskeletal strain. All analyses were conducted using STATA version 19. As Figure 2 shows, the number of

sick days increased throughout the course of the study for all levels of impairment severity. Moreover, the development of the number of sick days peaked at around T3 and T4 for all four health impairments, which is probably due to the flu season. To consider this development within the model, the trajectories of the time trends were defined so that they could capture the linear as well as the quadratic increase in sickness absenteeism.

NBMM results are displayed in Table 3. We reported the Incidence Rate Ratio (IRR) as the exponentiated form of coefficients (i.e., any coefficient below 1 shows a decrease, and any coefficient above 1 shows an increase). Also, each coefficient reports the estimated change in sickness absenteeism by a one-unit increase in each independent variable (IRR), holding all other variables constant. The first column reports the results for the overall LMX effect. A one-unit increase in LMX yields an approximately 9% decrease in the average number of sickness absence days per wave ( $IRR = 0.91$ ,  $p = 0.01$ ;  $AIC = 41629.31$ ,  $BIC = 41726.2$ ), controlling for ARI, age, gender, tenure, and musculoskeletal strain. This relationship reflects differences in absenteeism levels after accounting for repeated measures within individuals. Thus, our results support H1



**Figure 2.** The interaction effect of the severity of health impairment with HFIB on sickness absenteeism.

**Table 3.** Negative binomial mixed-effects regression for sickness absenteeism.

| Variables                            | Model 1   |      | Model 2   |      | Model 3   |       | Model 4   |      |
|--------------------------------------|-----------|------|-----------|------|-----------|-------|-----------|------|
|                                      | IRR       | Z    | IRR       | Z    | IRR       | Z     | IRR       | Z    |
| LMX                                  | .91**     | 2.46 | 1.00      | .07  | 1.01      | .28   | 1.01      | .23  |
| HFIB                                 |           |      | 0.81**    | 4.37 | 0.83**    | 4.02  | 0.83**    | 3.54 |
| <b>Severity of health impairment</b> |           |      |           |      |           |       |           |      |
| Irrelevant health impairment         |           |      |           |      | 1.80**    | 4.61  | 2.79*     | 1.97 |
| Relevant health impairment           |           |      |           |      | 2.42**    | 7.21  | 2.41      | 1.81 |
| Critical health impairment           |           |      |           |      | 4.32**    | 10.23 | 2.88*     | 1.97 |
| HFIB × Irrelevant health impairment  |           |      |           |      |           |       | .89       | 0.81 |
| HFIB × Relevant health impairment    |           |      |           |      |           |       | 1.00      | 0.01 |
| HFIB × Critical health impairment    |           |      |           |      |           |       | 1.11      | 0.76 |
| <b>Controls</b>                      |           |      |           |      |           |       |           |      |
| Age                                  | 1.25**    | 3.81 | 1.25**    | 3.68 | 1.16**    | 2.56  | 1.16*     | 2.56 |
| Gender                               | 1.75**    | 4.34 | 1.79**    | 4.51 | 1.57**    | 3.65  | 1.57**    | 3.64 |
| Flu rate                             | 1.00**    | 3.35 | 1.00**    | 3.29 | 1.00**    | 3.49  | 1.00**    | 3.48 |
| Firm tenure                          | 1.01      | 1.37 | 1.01      | 1.35 | 1.01      | 0.77  | 1.01      | 0.76 |
| Musculoskeletal strain               | 1.00      | 0.29 | 1.00      | 0.28 | 1.01      | 1.45  | 1.01      | 1.45 |
| Waves                                | 1.38**    | 4.46 | 1.38**    | 4.45 | 1.39**    | 4.55  | 1.39**    | 4.55 |
| Wave <sup>2</sup>                    | 0.96**    | 3.95 | 0.96**    | 3.93 | 0.99**    | 4.03  | 0.96**    | 4.02 |
| Constant                             | 0.45      | 2.93 | 0.71      | 1.18 | 0.64      | 1.59  | 0.63      | 1.56 |
| /lnalpha                             | 2.04      |      | 2.04      |      | 2.04      |       | 2.04      |      |
| Random-effects parameters            |           |      |           |      |           |       |           |      |
| Individual (var_cons)                | 1.15**    |      | 1.16      |      | .94       |       | .94       |      |
| Observations                         | 12,744    |      | 12,744    |      | 12,744    |       | 12,744    |      |
| Number of groups                     | 2124      |      | 2124      |      | 2124      |       | 2124      |      |
| AIC                                  | 41,636.56 |      | 41,620.52 |      | 41,505.22 |       | 41,510.29 |      |
| BIC                                  | 41,718.54 |      | 41,709.95 |      | 41,617.01 |       | 41,644.44 |      |

Note. Dependent variable = number of sickness absence days per employee per wave (six waves over 18 months). Robust standard errors in parentheses. IRR = Incidence Rate Ratio; HFIB = Health-Focused Intervention Behavior; gender dummy coded as 1 = female and 0 = male; Akaike information criterion (AIC), smaller values indicate better relative model fits (Singer & Willett, 2003). \* $p < .05$ , \*\* $p < .01$ .

that LMX is negatively related to employees' sickness absenteeism. Among our control variables, gender, age, and ARI are significantly related to absenteeism. Sickness absenteeism was higher for women, and it increased significantly with age.

However, after introducing HFIB in step 2, the relationship between LMX and sickness absenteeism became insignificant. H2 proposed that HFIB is negatively related to employees' sickness absenteeism, controlling for LMX. Column 3 shows that HFIB is significantly negatively related to sickness absenteeism, supporting H2. A one-unit increase in HFIB was associated with a 19% decrease in the number of days absent (IRR = 0.81,  $p < 0.01$ ; AIC = 41620.52, BIC = 41709.95).<sup>2</sup>

To understand the explained variance by each predictor, we conducted likelihood ratio tests showing that adding LMX significantly improved model fit relative to the null model ( $\chi^2 = 5.80$ ,  $p = .02$ ), suggesting that LMX explains a significant portion of the variance in sickness absenteeism. Adding HFIB to the null model also improved the model fit ( $\chi^2 = 24.06$ ,  $p < 0.001$ ), but the increase in chi-squared was larger than that observed for LMX ( $\chi^2 = 40.85$ ,  $p < 0.001$ ). The likelihood ratio test comparing the model with both predictors to the model with only LMX was significant ( $\chi^2 = 18.27$ ,  $p < 0.01$ ), suggesting that HFIB accounts for unique variance beyond that explained by LMX.

H3 suggested that the severity of health impairments moderates the relationship between HFIB and sickness absenteeism. Specifically, the relationship should be more pronounced for employees with more severe health impairments. Firstly, we found that health status is significantly linked to sickness absenteeism. Critical (IRR = 4.32,  $p < 0.001$ ), relevant (IRR = 2.42,  $p < 0.001$ ), and irrelevant impairments (IRR = 1.80,  $p < 0.001$ ) significantly increased the incident rate of absence days when the baseline was set to "no health impairments". The model showed a better fit compared to the previous model (AIC = 41505.22, BIC = 41617.01,  $\chi^2 = 121.83$ ,  $p < 0.001$ ). Second, to further test the moderating effect of health impairments, we investigated the interaction effect in the relationship between HFIB and sickness absenteeism. The results of the NBMM did not confirm an overall interaction effect, indicating no robust moderation effect. Nevertheless, we conducted exploratory comparisons of simple slopes to illustrate how the leadership – absenteeism association might differ across levels of health impairment. Consistent with Robinson, Tomek, and Schumacker (2013), these follow-up analyses are interpreted descriptively to aid interpretation rather than as confirmatory moderation tests. More specifically, we further conducted an exploratory analysis and

compared the marginal changes for different levels of the moderator, representing the four groups of employees (*with no* health impairments, *with irrelevant* health impairments, *with relevant* health impairments, and *with critical* health impairments). Examining the different employee groups based on health impairments, the results indicate that the predicted slope values at the mean level of HFIB ( $M = 3.78$ ) vary across health groups compared to the “no health impairments” baseline: Our data showed that employees *with no* health impairments had an average of 3.47 sick days with low intervention ( $-1$  SD), compared to 2.50 sick days with high intervention behaviours ( $+1$  SD). A test of predicted margins showed a significant link between HFIB and a decrease of sickness absenteeism in the “no health impairments” group ( $\chi^2(1) = 11.48, p < .01$ ). This was also the case for the *irrelevant* health impairments group with an average of 6.81 sick days with low HFIB ( $-1$  SD), compared to 4.01 sick days with high HFIB ( $+1$  SD), ( $\chi^2(1) = 5.09, p = .02$ ). However, for “relevant” and “critical health impairments”, HFIB was non-significant in this interval. In the “relevant health impairments” group, low HFIB ( $-1$  SD), resulted in an average of 8.41 sick days, compared to 6.08 sick days under high HFIB ( $+1$  SD) ( $\chi^2(1) = 2.22, p = .14$ ). The “critical health impairments” group had on average, 13.73 sick days under low HFIB ( $-1$  SD) and 11.94 sick days under high HFIB ( $+1$  SD) ( $\chi^2(1) = 0.35, p = .55$ ).

When inspecting the interplay of health impairments and HFIB graphically, Figure 3 illustrates that an increase in HFIB is related to an average decrease in sickness

absenteeism for all employees and specifically for groups of employees with no or irrelevant health impairments. Taken together, these findings partially support H3 that the effect of HFIB depends on different levels of severity of health impairments; however, contrary to our expectations, individuals with milder health impairments benefited from HFIB, while for those with more severe health impairments, HFIB was not effective.

### Addressing the research question with a latent growth curve model (LGCM)

While the NBMM and the consequent moderation analyses provided valuable insights into the average effects of our predictors, they did not account for the dynamic nature of absenteeism over time. To capture these longitudinal developments and investigate our research question, we complemented our analyses with a latent growth curve modeling (LGCM) approach within a structural equation modelling framework. LGCM enables the estimation of individual change trajectories while accounting for measurement error and testing measurement invariance (Curran et al., 2010; McArdle, 2009). Given that our independent variables (health status, LMX, and HFIB) were time-invariant and assessed at baseline, the model allowed us to examine how these variables predicted individual differences in both the intercept (initial level) and slope (rate of change) of absenteeism across time. Trajectories were specified as linear and quadratic. Specifically, we estimated a negative binomial latent growth curve model with an intercept and quadratic slope (log link) across six quarters. This

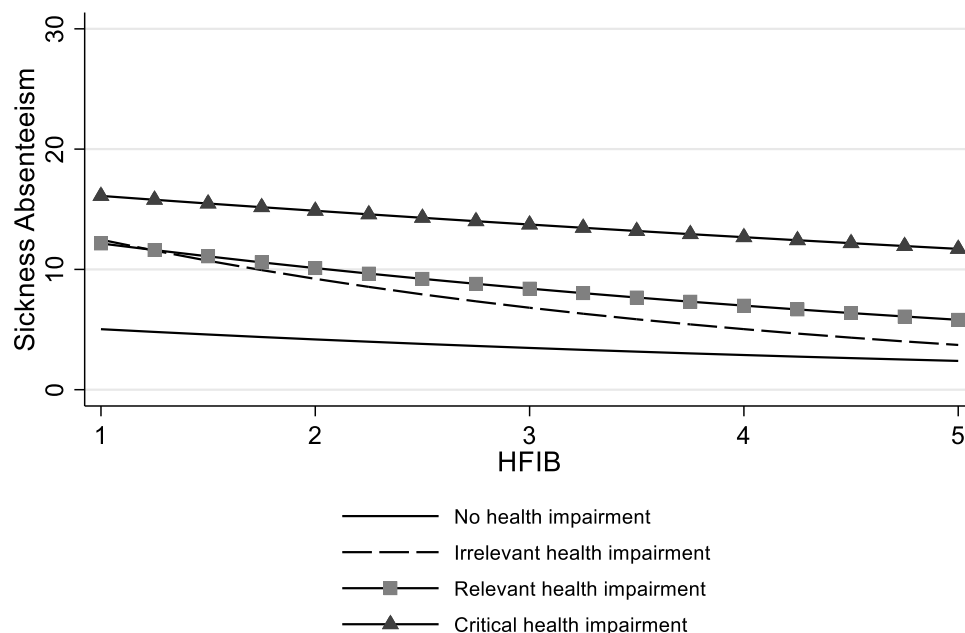


Figure 3. The effect of the severity of health impairment on sickness absenteeism.

allowed us to test whether LMX, HFIB, and initial health impairments predicted both baseline levels and systematic changes in absenteeism.

The unconditional growth model first provides a baseline understanding of how sickness absenteeism changed across the study period. The baseline model revealed a significant negative intercept ( $\beta = -0.73$ ,  $SE = 0.02$ ,  $p < .01$ ; AIC = 106752.3; BIC = 106781.8). Regarding the growth factors, the mean slope was positive ( $\beta = 0.07$ ,  $SE = 0.06$ ,  $p < .01$ ), indicating an overall increase in absenteeism across the 18 months of study. Importantly, this increase was curvilinear, as shown by a significant negative quadratic slope ( $\beta = -0.47$ ,  $SE = 0.01$ ,  $p < .001$ ), suggesting that absenteeism rose during the early waves, peaked, and subsequently declined. Also, baseline absenteeism (intercept) variance was significant ( $\text{Var}(\eta_0) = 7.18$ ), as was change over time ( $\text{Var}(\eta_1) = 0.35$ ). However, the analyses showed a significant slope variance,  $\sigma^2 \text{ slope} = 0.36$ ,  $p = .045$ , indicating that employees differed in their increase in the number of sick days. Furthermore, the significant intercept variance revealed that employees showed a difference in their number of absence days at the beginning of the data collection ( $\sigma^2 \text{ intercept} = 8.31$ ,  $p = .00$ ). Additionally, the slope and the intercept of sickness absenteeism correlated significantly ( $\beta = -1.08$ ,  $p < 0.01$ ). That is, employees who already had high sickness absenteeism at the beginning showed a smaller change in the number of sickness absenteeism than did employees with an initially lower number of sickness absenteeism.<sup>3</sup>

After establishing the baseline growth trajectory, we introduced our focal predictors to examine whether they accounted for differences in initial absenteeism levels (intercepts) and in changes over time (slopes) (see Table 4). We assumed that employees with a higher LMX show a lower baseline level regarding the number of sick days and a lower increase in the number of sick days than employees with low LMX. Therefore, LMX was expected to be significantly associated with the slope and the intercepts of sick days. However, having HFIB rendered the LMX effect on the intercept non-significant (intercept:  $\beta = .011$ ,  $p = .078$ ). HFIB though predicted the intercept ( $\beta = -.17$ ,  $SE = 0.08$ ), but not the slope ( $\beta = -.001$ ,  $SE = 0.02$ ). Finally, we tested whether the severity of health impairments at the baseline moderated the effect of HFIB on absenteeism trajectories, in line with our theoretical reasoning that interventions may be differentially effective depending on employees' health status. Thus, we introduced the severity of health impairments and their interaction term with HFIB at T0 and looked at whether impairment severity was related to the growth of the number of sickness days. The model results showed a strong effect of the severity of health impairments with the intercept of the number of

sick days in all levels of severity of health impairments, but not with the slope. Introducing the interactions, the defined model did not fit the data better. The interaction effects also did not reach significance within our sample. Thus, consistent with the previous analyses, the assumption that health status moderates the effect of HFIB on the growth of the number of sick days was not supported.

## Discussion

This research was driven by three main objectives: (1) to better integrate research on healthy leadership and absenteeism by focusing on objectively measured employees' sickness absenteeism as a central outcome; (2) to extend healthy leadership theory by suggesting differentiated effects on employees with varying levels of pre-existent health impairments; and (3) to explore the longitudinal development of sickness absenteeism trajectories by assessing individual differences in initial absenteeism (intercept) and change over time (slope) in relation to HFIB.

Regarding our first research endeavour, our findings indicate that HFIB relates to absenteeism beyond the effects of physical strain and acute respiratory infection incidences, highlighting their practical relevance for workforce sustainability. Specifically, HFIB predicted lower baseline sickness absenteeism, suggesting that leaders who engage in active, health-oriented interventions help employees manage existing health challenges and sustain work participation. Unlike leader – member exchange (LMX), which lost significance when HFIB was introduced, HFIB remained a robust predictor, underscoring its value as a more targeted leadership resource in the context of health impairments. It is important to note that these results were obtained using objective, time-lagged data, which is still relatively uncommon in the healthy leadership literature. In fact, to our knowledge, only two studies prior to this employed a longitudinal design and/or used objective measures (Stansfeld et al., 2015; Vonderlin et al., 2023) to study the healthy leadership-absenteeism link.

Regarding our second research goal and contrary to our expectations, our analyses did not confirm the overall moderating effect of health impairment severity on the relationship between HFIB and sickness absenteeism. While Figure 3 illustrates a desirable negative relationship of HFIB and sickness absenteeism for all groups of employees, a more fine-grained moderation analysis showed that HFIB was only effective for those with “no health impairments” and those with “irrelevant health impairments”. One potential explanation for that finding is that in cases of very severe physical impairments (such as multiple sclerosis, rheumatoid arthritis, etc.), the

**Table 4.** Growth curve model predicting sickness absenteeism over the course of 18 months.

| Variables                                               | Model 1         | Model 2          | Model 3          |
|---------------------------------------------------------|-----------------|------------------|------------------|
| <b>Fixed effects: means of growth factors</b>           |                 |                  |                  |
| Intercept                                               | 0.317** (0.13)  | 0.088 (0.133)    | 0.087 (0.133)    |
| Linear time trend                                       | 0.283** (0.08)  | 0.293*** (0.08)  | 0.294*** (0.08)  |
| Quadratic time trend                                    | −0.032** (0.01) | −0.033** (0.011) | −0.033** (0.011) |
| <b>Fixed effects (Intercept)</b>                        |                 |                  |                  |
| LMX                                                     |                 | 0.011 (0.078)    | 0.014 (0.078)    |
| HFIB                                                    |                 | −0.166* (0.076)  | −0.142 (0.084)   |
| Irrelevant health impairment                            |                 | 0.559* (0.268)   | 0.547* (0.268)   |
| Relevant health impairment                              |                 | 1.053*** (0.229) | 1.048*** (0.23)  |
| Critical health impairment                              |                 | 1.613*** (0.306) | 1.627*** (0.307) |
| <b>Fixed effects (Slope)</b>                            |                 |                  |                  |
| LMX × Linear time trend                                 |                 | 0.006 (0.019)    | 0.005 (0.019)    |
| HFIB × Linear time trend                                |                 | −0.001 (0.019)   | −0.007 (0.021)   |
| Irrelevant health impairment × Linear time trend        |                 | 0.009 (0.066)    | 0.009 (0.066)    |
| Relevant health impairment × Linear time trend          |                 | −0.02 (0.055)    | −0.018 (0.055)   |
| Critical health impairment × Linear time trend          |                 | −0.006 (0.074)   | −0.012 (0.075)   |
| <b>Interaction (Intercept)</b>                          |                 |                  |                  |
| HFIB × Irrelevant health impairment                     |                 |                  | −0.151 (0.254)   |
| HFIB × relevant health impairment                       |                 |                  | −0.058 (0.221)   |
| HFIB × critical health impairment                       |                 |                  | −0.131 (0.298)   |
| <b>Interaction (Slope)</b>                              |                 |                  |                  |
| HFIB × Irrelevant health impairment × Linear time trend |                 |                  | 0.012 (0.065)    |
| HFIB × relevant health impairment × Linear time trend   |                 |                  | 0.017 (0.051)    |
| HFIB × critical health impairment × Linear time trend   |                 |                  | 0.062 (0.073)    |
| Random Effect (Intercept)                               | 1.05            | 0.942            | 0.943            |
| AIC/                                                    | 44,523.7        | 44,354.5         | 44,364.8         |
| BIC                                                     | 44,561.3        | 44,467.3         | 44,522.6         |

Note. Dependent variable = number of sickness absence days per employee per wave (six waves over 18 months). Robust standard errors in parentheses. HFIB = Health-Focused Intervention Behavior; gender dummy coded as 1 = female and 0 = male; Akaike information criterion (AIC), smaller values indicate better relative model fits (Singer & Willett, 2003). \* $p < .05$ , \*\* $p < .01$ .

effectiveness of leader-provided interventions may be limited. Such pronounced health challenges (which represent a smaller subgroup in our sample, i.e., 106 employees compared to 1694 without health impairments) may require additional support, such as workplace accommodations, including new tasks that are physically less demanding.

Finally, regarding the longitudinal aspects of our study, summarized in our third research goal and addressed via our research question, several noteworthy findings emerged. On the one hand, the results of the latent growth curve analysis suggest that absenteeism is not static but develops dynamically over time. Employees differed both in their initial level of sickness absenteeism and in the rate at which absenteeism increased across the study period, suggesting that absenteeism trajectories are rather heterogeneous than uniform. The positive mean slope indicates that, on average, absenteeism increased over the 18 months, with peaks around the flu season, which is consistent with seasonal health fluctuations reported in prior research. In this way, our findings reinforce prior arguments that absenteeism must be understood within a temporal context, as emphasized by Johns (2010), who noted that absence behaviour fluctuates with health cycles, work demands, and temporal events (e.g., seasonal illnesses). Importantly, the negative

correlation between intercept and slope implies that employees with higher baseline absenteeism showed a smaller change in sickness absenteeism, compared to those with initially low absenteeism. This can point to the possibility of ceiling effects in sickness absenteeism and highlights that interventions may need to be tailored depending on employees' baseline levels of absenteeism. Moreover, our analysis revealed that employees' sickness absenteeism followed a nonlinear trajectory over the 18-month period, as indicated by the significant quadratic slope factor. Specifically, absenteeism increased during the early measurement points but decreased later in the period, producing a curvilinear pattern.

On the other hand, the latent growth curve model revealed that HFIB was significantly associated with lower absenteeism at the baseline. This suggests that leaders who actively promote and support health-related behaviours may help employees prevent or manage sickness-related absenteeism. However, neither LMX nor HFIB accounted for changes in absenteeism over time, indicating that external factors, such as seasonal illnesses or organizational conditions beyond leadership, are more likely to play a prominent role. That may be because leadership effects also depend on time: resource-based models suggest that leadership behaviours provide short-lived

boosts to employees' resources unless enacted consistently (Bakker & Xanthopoulou, 2009; Breevaart et al., 2014). This can explain why HFIB predicted baseline absenteeism but not change over time. Similarly, in the longitudinal analyses, health impairments did not moderate the link between HFIB and absenteeism trajectories. It seems important to note, though, that HFIB was measured only once at the beginning of our study, which may have limited our ability to detect effects over time.

### ***Theoretical implications***

This study advances theory on healthy leadership and absenteeism in several interrelated ways. Although HFIB shares conceptual terrain with existing constructs such as the StaffCare component of HoL (Franke & Felfe, 2011; Franke et al., 2015), our results suggest that HFIB warrants distinct theoretical treatment. HFIB emphasizes purposive, targeted interventions directed at employees' concrete health constraints (Boehm & Baumgaertner, 2014, 2016; Boehm & Dwertmann, 2015), initiating health-related conversations, adapting tasks, or facilitating access to medical and organizational support, whereas broader constructs such as LMX or general staff care capture relational quality or wide-ranging supportive and preventive orientations. The empirical incremental validity of HFIB over LMX indicates that leadership theory should incorporate a two-dimensional account, distinguishing relationship-based resources from targeted, need-based health interventions. This distinction clarifies the different proximal mechanisms through which leaders influence employees' health and attendance.

Drawing on Conservation of Resources theory (Halbesleben, Neveu, et al., 2014; Hobfoll, 2001), HFIB can be understood as operating through three complementary resource pathways: mitigating further resource loss by interrupting loss spirals, facilitating resource gains, and reducing the need for self-protective resource allocation. Leaders who recognize early signs of employee strain and implement timely accommodations such as workload redistribution or flexible scheduling can prevent minor health challenges from escalating into chronic conditions requiring extended sick leave (Jiménez et al., 2017; Kaluza et al., 2022; Krick et al., 2022). Although these channels were not directly tested in this study, they provide an explanatory framework that links leader actions to reduced sickness absenteeism and suggests potential mediators for future empirical work.

The quadratic trajectory observed in our data is consistent with these interpretations. The decrease in sickness absence towards later time points may reflect processes of adaptation, resource replenishment, or stabilization in the work context. From a COR perspective, this pattern could indicate that early increases in strain or health-related resource depletion are followed by periods in which employees are able to regain or conserve resources. This suggests that early rises in sickness absence should not be viewed as inevitably leading to continued escalation; instead, it may be useful to identify and strengthen the mechanisms that contribute to this levelling-off, such as recovery opportunities, job design, and sustainable workload management (Andersen et al., 2021; Bryan et al., 2021; Funk, 2025).

The descriptive patterns in our results suggested that HFIB was effective for employees with no or minor impairments but not for those with severe or chronic conditions, potentially pointing to a threshold model in which HFIB can prevent escalation and support participation up to a certain severity level. However, these differences did not emerge as statistically significant moderation effects in either of our analytical approaches. Although impairment severity was strongly associated with the initial level of absenteeism, it neither predicted the rate of change over time nor significantly interacted with HFIB across the 18 months, a pattern consistent with occupational health research showing that relatively stable individual differences tend to explain initial states more strongly than dynamic trajectories (Ilies et al., 2015). This suggests that impairment severity functions primarily as a static predictor of baseline absenteeism rather than as a boundary condition shaping the temporal effects of HFIB. Nonetheless, integrating HFIB with research on workplace accommodation and chronic illness trajectories may help clarify how impairment severity and leader-induced support jointly shape immediate responses, even when longer-term moderation effects are not observable.

Finally, because HFIB was measured at a single time point in this study, the absence of effects on absenteeism trajectories invites theoretical refinement concerning timing and dosage. Leaders' health-focused behaviours are plausibly time-varying and cumulative; timely, repeated HFIB may have stronger effects on trajectories than one-time interventions. Future theory should therefore conceptualize HFIB dynamically, attending to its intensity, timing, and duration, and propose mechanisms for cumulative versus diminishing returns. Integrating HFIB into trajectory models of absenteeism will permit explicit hypotheses about

when and how leadership interventions alter long-term health and attendance outcomes.

### **Practical implications**

Our study has several practical implications. First, a day absent due to sickness costs the organization in our study around 500 USD. Our results indicate that HFIB significantly relates to lowered sickness absenteeism. Thus, implementing HFIB training for managers could be a cost-effective way to reduce sickness absenteeism and improve well-being while also saving costs for the company. Organizations should consider training supervisors in HFIB to protect and support employees' mental and physical health, which is key in times of ageing workforces (Kulik et al., 2014) and an increasing prevalence of stress, psychological illnesses, and disabilities (Beatty et al., 2019; WHO Europe, 2021).

Second, organizations could complement HFIB trainings with other health promotion activities (e.g., Goetzel et al., 1998; Heaney & Goetzel, 1997) to foster a general health climate (Wilson et al., 2004) and promote the health of supervisors as role models inside the organizations. Such activities might include health-education programs, recurrent medical check-ups, screenings, or prevention-oriented workplace accommodations that support supervisors' health-focused behaviours from an ergonomic and medical perspective.

Third, leader awareness of health issues and the ability to recognize health-related warning signs at an early stage are critical prerequisites for healthy leadership behaviour (Franke & Felfe, 2011; Franke et al., 2015). This aligns well with the prevention aspect of health-focused leadership, which emphasizes proactive measures to support employees' well-being. However, in the current study, our primary focus was on the intervention aspect of health-focused leadership behaviour. While leader awareness is undeniably important, the study's context required us to concentrate on intervention-focused behaviours to address employees' immediate health-related challenges. For practitioners, however, it might be most promising to combine prevention and intervention-oriented behaviours in order to create healthy workplaces. Training concepts such as the HoL coaching intervention (Pischel et al., 2023) and the work of Krick and Felfe (2024) and Vonderlin et al. (2020, 2023) might be particularly valuable in this respect.

Finally, this study has important societal implications. Health issues are a major cause of long-term sickness and disability among the working-age population (Jarvis et al., 2022). Research shows that both physical and psychological symptoms can worsen when individuals lose their jobs (Huijts et al., 2015; McKee-Ryan et al.,

2005; Schaller & Stevens, 2015). Organizations, on the other hand, can profit from both reduced sick-days and the continued employment of qualified personnel, which is vital in times of increasing war for talent. Also, for society, such interventions help alleviate the financial strain on social security systems, particularly in health and disability insurance sectors, which often face significant financial challenges in developed countries.

### **Limitations and future research**

Despite the objective measurement of several controls (musculoskeletal strain per workspace, respiratory infection incidence), our moderator (severity of health impairment) and outcome variable (sickness absenteeism), as well as the time lag in outcome data collection, some limitations must be considered. First, the non-experimental nature of this study prevents definitive conclusions about causality. Although we gathered objective outcome data over eighteen months post-survey, future research should employ fully longitudinal (e.g., with different time lags; Brzykcy et al., 2024) or (quasi-)experimental designs (Shadish, 2002; Shadish et al., 2002).

Second, although the study used a sample of employees of a large German industrial company, future research might still want to further boost the external validity by testing comparable models in different organizations and cultural hemispheres. As prior research has indicated, leadership preferences and effects vary with culture (e.g., Dorfman et al., 2012; Rockstuhl et al., 2012).

Third, while it was our main goal to compare HFIB against relational approaches such as LMX, it would have been ideal to also compare it against other healthy leadership approaches, such as health-promoting (Eriksson, 2011) and health-oriented leadership (Franke et al., 2011). This, however, was not feasible in this study due to the characteristics of our sample. Nevertheless, future research should build upon our findings to test HFIB in comparison with other healthy leadership constructs in diverse samples.

Fourth, although this study underscores the importance of adopting a health-focused approach to foster a healthier and more sustainable workforce, we still might have a limited understanding of the underlying mechanisms and longitudinal dynamics. For instance, while sickness absenteeism is traditionally viewed as a consequence of resource loss, it could also serve as a resource under certain conditions. COR theory emphasizes resource gain cycles, wherein individuals seek to acquire resources to offset loss or build resilience. From this perspective, sickness absenteeism could function as a time

resource, allowing individuals to recover physical and emotional health. Unfortunately, though, we cannot further explore the potentially dynamic nature of such resource cycles, as our research design is not fully longitudinal (particularly, leadership behaviour was only measured at one time point and not repeatedly). Therefore, we highlight the need for fully longitudinal research with repeated measures of all variables to examine these resource dynamics more comprehensively. Future research should continue to explore the specific mechanisms, potential loops, and cycles through which such interventions take effect in order to optimize them towards the support of employees' health and well-being.

Finally, although healthy leadership is often associated with reduced absenteeism, lower absence rates should not automatically be interpreted as beneficial outcomes. Evidence suggests that reduced absenteeism can sometimes occur at the expense of increased presenteeism, where employees continue to work despite health impairments. For example, Nielsen and Daniels (2016) found that supervisory responsibility was associated with a 13% decrease in absenteeism (−1.7 days), but simultaneously with a 6.2% point increase in presenteeism. Moreover, leader presenteeism itself tended to model greater employee presenteeism, which in some instances translated into more sick leave (Dietz et al., 2020). These patterns highlight that leadership practices may shift the balance between absenteeism and presenteeism rather than reduce overall health-related productivity loss. Future research should therefore avoid treating absenteeism reduction as an unequivocal indicator of effective or “healthy” leadership. Instead, integrative approaches (e.g., Whysall et al., 2023) are needed that simultaneously examine absenteeism and presenteeism to better capture the full spectrum of health-related work behaviour and the potential hidden costs of leadership interventions.

## Conclusion

This study demonstrates that HFIB constitutes a distinct and impactful leadership resource that predicts lower employees' sickness absenteeism beyond relational quality and other confounding factors. By highlighting resource-based mechanisms, boundary conditions related to impairment severity, and the dynamic nature of absenteeism, our findings extend healthy leadership theory and offer a more nuanced understanding of how targeted leader actions can sustain employees' health and attendance.

## Notes

1. The Robert Koch Institute (RKI) is the German Federal Government's central institution in the field of biomedicine. Its core tasks include detecting, preventing and combating infectious diseases and improving the health of the population in Germany.”(RKI, 2025).
2. It is important to note that running our analyses with the data with 1-month or 6-month intervals did not change the main effects compared to the 3-month intervals. More specifically, in the 1-month interval, the effect of LMX ( $IRR = 0.88, p = 0.001$ ) and HFIB ( $IRR = 0.78, p = 0.001$ ) on sickness absenteeism remained significant. However, the variance related to random intercepts was higher ( $var(cons) = 2.23$ ). Also, with data structured in 6-month intervals, results revealed a similar effect of LMX ( $IRR = 0.90, p = 0.001$ ) and HFIB ( $IRR = 0.81, p = 0.001$ ). The variance related to random intercepts in the three-month data improved ( $var(cons) = 1.11$ ). That is why we chose to keep the 3-month increments on absenteeism.
3. In the latent growth curve models, the slope of time was specified as fixed to focus on average change and its predictors while ensuring model parsimony. Given evidence of interindividual variability in change over time, as a robustness check, we conducted supplementary analyses allowing the time slope to vary randomly; the substantive conclusions remained unchanged (see Supplementary Material).

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Generative AI assistance disclosure

In line with journal guidelines, we disclose that ChatGPT 5.1 (OpenAI) was used solely for linguistic refinement (e.g., summarization, clarity, grammar). No AI tools were used to generate scientific ideas, hypotheses, analyses, or conclusions. All content was critically reviewed and approved by the authors.

## Data availability statement

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research on the health information of individuals, supporting data is not publicly available.

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