Health-oriented Leadership in a Digital World: A Literature Review and a Research Agenda

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***Abstract* – In the course of the Covid 19 pandemic, many employees had to work from home. In addition to opportunities and risks for all employees, working from home also brings special challenges for leaders. In recent years, workplace health promotion has gained enormous importance due to the increase in work demands and a rise in mental illnesses. Leadership also plays an essential role in maintaining health in the workplace. The concept of Health-oriented Leadership (HoL) was developed as a health-specific leadership concept describing how leaders can promote employees' health (Franke et al., 2014). Up to now, previous literature has mainly focused on HoL in traditional work contexts, but less is known for the digital context. The purpose of the present article is to provide a literature review of Health-oriented Leadership in both traditional and digital work context. Moreover, key research gaps for Health-oriented Leadership in the digital context will be identified.**

Keyword – Health-oriented Leadership, occupational health, working from home, health promotion

I. INTRODUCTION

As a result of the Covid-19 pandemic, many employees had to transfer their work from the traditional office to their home. Although working from home has already gradually increased in previous years, driven in particular by technological developments, it was still the exception for most employees [1]. Since the outburst of the Covid-19 pandemic working from home has become the regular normal [2].

For employees, working from home brings opportunities, but also risks. On the one hand, there may be advantages of greater flexibility in terms of time and workplace, more autonomy, time savings due to the omission of commuting to work, and a better work-life balance. On the other hand, there may be risks like constant availability, loss of temporal and spatial structure, loss of informal social contacts, and communication barriers. This is accompanied by potential long-term effects on mental and physical health.

Research on effects of working from home on health is inconsistent so far. Tavares [3] emphasizes that good arguments can be found for both directions of impact. The reduction of the stress level could be due to the increased flexibility, which makes it easier to reduce work-family-conflicts. The flip side of this, however, is what contributes to an increase in the stress level, namely the blurring of the boundaries of working time, an expansion of working hours and the inability to switch off and recover properly. Studies showed that emotional exhaustion increases when working from home [4, 5] and recovery from work may be impaired [6, 7], especially due to the lack of separation between work and personal life. Studies also showed that self-harming behavior and depression increase [8, 9]. Studies also report an increase in musculoskeletal disorders [10–12], possibly due to a poor feasibility of implementing occupational health and safety measures and workplace ergonomics when working from home [13, 14]. This research highlights the importance of maintaining and promoting employees' health when working from home.

As previous research has shown, leaders play an important role in fostering employees' health [15]. Accordingly, scholars have started to develop more health-specific leadership concepts to complement more traditional leadership concepts such as transformational leadership [16], LMX, or consideration. The Health-oriented Leadership (HoL) concept [17] differentiates between health-oriented self-leadership of the leader and employees (SelfCare) and health-oriented employee-directed leadership (StaffCare). SelfCare describes how leaders and employees prioritize their own health, are aware of their health-specific warning signals, and take actions to promote their health. StaffCare encompasses how leaders prioritize their employees' health, are aware of their health-specific warning signals (i.e., signs of overload), and take actions to promote their health.

Leaders have to face leadership-specific hindrances and challenges while leading from home. Contreras and colleagues stated that previous leadership behavior cannot easily be transferred from the traditional workplace to the digital world [18]. For example, trust and communication are important issues [19, 20]. Therefore, it is an open question what happens with Health-oriented Leadership when leading from a distance.

To answer this question, the present study aims to provide an overview of the current research on HoL and, in particular, to shed light on HoL in the digital work context and to identify research gaps. To identify research gaps for HoL in the digital context, we also present previous research of HoL from the traditional work and derive what we do not know yet. In recent years, there has already been a review on healthy leadership by Rudolph and colleagues [21], but their focus was broader and included several concepts of healthy leadership. In the present review, we focus exclusively on HoL. As many recent studies have been published in this area since the last review, it is worthwhile to systematically analyze the current findings on HoL.

The present literature review was conducted as part of the "Digital Leadership and Health" project.

II. HEALTH-ORIENTED LEADERSHIP

A. *Theoretical Concept*

The HoL concept [17, 22] considers health-oriented leadership from three perspectives, namely the health-oriented employee-directed leadership (StaffCare), and the health-oriented self-leadership of leaders and employees themselves (SelfCare). Each SelfCare and StaffCare encompass three sub facets or dimensions: (a) "Value of health" describes how the own (for SelfCare) and employees' health (for StaffCare) is prioritized; (b) "health awareness" refers to the extent to which own (for SelfCare) and employees' health-specific warning signals and signs of overload are perceived and recognized (for StaffCare); (c) "health behavior" encompasses specific behaviors actively promoting one's own (for SelfCare) and employees' health (for StaffCare) and minimizing health risks (i.e., *improvements in the work environment*, e.g., work organization, ergonomic work environment; and *behavioral prevention activities*, e.g., time management, healthy sitting, taking breaks, balance between private life and work).

B. *Framework and Model Assumptions*

The HoL model assumes that leader SelfCare is positively related to leader health (path a; FIGURE 1). The same applies to employees. Employees high in SelfCare are also supposed to be healthier (path g; FIGURE 1).

Leaders high in SelfCare are also assumed to directly have a positive influence on employee health (path d), but also by encouraging and motivating their employees to take care for their own health (in terms of their own SelfCare) by a role model effect (f; f x g; FIGURE 1). This direct effect of leader SelfCare and employee SelfCare and indirect pathway of leader SelfCare on employee health via employee SelfCare is based on assumptions of the Social Learning Theory [23].

Leader's own SelfCare does not only promote employee health by encouraging employees' SelfCare via role model effect but also by facilitating leader's StaffCare (path b x c; consistent behavior). Leaders high in SelfCare are assumed to be more able to take care for their employees' health in terms of StaffCare (path b; FIGURE 1). In turn, leader's StaffCare directly positively influences employee health (path c) by giving high priority to their followers' health ("value of health"), by paying attention to their warning signals and signs of overload at an early stage ("health awareness"), and by demonstrating specific health-promoting actions ("behavior"; e.g., providing healthy working conditions and appropriate resources [e.g., positive climate, work design], addressing health issues, motivating followers to adopt health-promoting behavior [e.g., avoid presentism, avoid excessive overtime, etc.]). StaffCare does not only directly influence employee health but also indirectly by encouraging employees to take care for their own health via employee SelfCare (path e and e x g; FIGURE 1). Furthermore, leaders taking care for their employees' health are also assumed to feel better and healthier themselves (path i; FIGURE 1).

Another central assumption of the HoL is the crossover effect between leader health and employee health (path h; FIGURE 1). Leaders who are strained are more likely to transfer their own pressure to their employees leading to a lower employee health. FIGURE 1 shows the core assumptions of the HoL model and modifications drawn from the state of the current research.

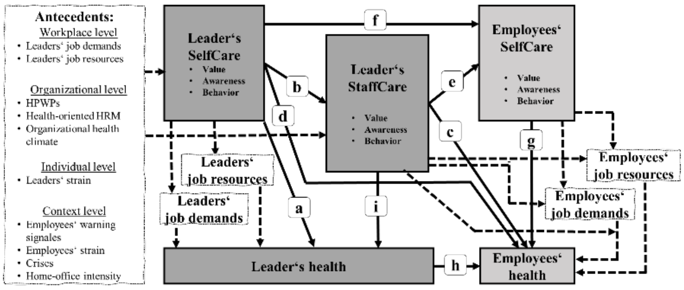

FIGURE 1: HEALTH-ORIENTED LEADERSHIP CONCEPT AND ADAPTED FRAMEWORK MODEL.

III. LEADING FROM THE DISTANCE

For example, **trust** in employees is a key challenge for leaders when leading from the distance [19]. Leaders may be concerned that some employees are busy with private matters at home and less engage in their work tasks. Since they are not aware of how much their employees really work, they may assume that their employees are less committed and less productive when working from home [19]. Insufficient trust often leads to leaders starting to control their employees with frequent calls and attendance checks when working from home. This, in turn, leads to dissatisfaction and demotivation among employees. They do not only feel restricted in their autonomy and scope of action, but also the worry that one's leader does not trust one is experienced as frustrating [19, 24]. Concerns about not being able to adequately control productivity and commitment is a major issue for leaders [19].

While working from home, communication changes from mostly face-to-face to digital communication via mail, videocalls, or phone. When digitally communicating, leaders may face more communication obstacles, as fewer physical and visual cues are available, these cues may be more easily overlooked, less information is transmitted, and responses (feedback) are delayed [25, 26]. The lack of nonverbal cues in digital communication leads to a reduced transmission of all necessary information [27]. The limited flow of information and fewer non-verbal cues during digital communication may make it more **difficult** for leaders **to perceive and interpret employees' moods and feelings**, to **recognize signs of overload**, and to take adequate countermeasures [28]. Thus, it may be not only challenging to motivate employees sufficiently to perform well when working from home, but also to pay attention to employees' health from a distance.

In addition, limited communication channels can lead to increased **misunderstandings** [20, 29]. As a leader, it is not always easy to identify conflicts early on and take effective action when working from home. While leaders in the office quickly get a sense of a bad mood and potential conflicts, this may remain undetected when leading from the distance [29, 30]. Therefore, leaders may detect conflicts too late, and the conflicts may have already escalated. It is also more difficult to understand all conflict parties as well as the problem in its entirety and to deal with it in a way that everyone is satisfied with a solution.

Studies have shown that communication and regular contact and encounters between leaders and employees decrease while work from home [31]. Moreover, informal and relationship-promoting communication is more difficult when working from home [32]. This can further lead to a lower relationship quality and reduced personal connectedness [33]. Overall, effective communication via digital media is more difficult [34].

Since it is to be expected that employees also continue working from home after the Covid-19 pandemic and given the need to promote occupational health when working from home, it is particularly important to understand how Health-oriented Leadership can be transferred to the digital context and if it is also effective here. The presented leadership-specific challenges and hindrances might make it difficult for leaders to adjust their employees' work assignments, balance their employees' demands and resources, and thus lead in a way that promotes health and performance [28, 35].

IV. METHODS

For this literature review, relevant databases were searched for relevant publications. On the one hand, published peer-reviewed scientific studies were included, including quantitative studies and experiments, qualitative studies, reviews, and meta-analyses. On the other hand, reports and recommendations for action, many of which were published in response to the pandemic, were also reviewed. In addition, references to relevant literature in the publications were followed up and we were also made aware of further relevant publications by experts in the course of the literature search.

In this literature review, we follow the understanding of working from home according to Lal and Dwivedi [36] (p. 257): "Homeworking" which involves individuals undertaking traditionally office-based paid employment from home by means of information and communications technologies (ICTs) on a full- or part-time basis." We are referring here to the performance of work that was previously performed primarily on the employer's premises, from home or another location, using IT, as a member of a fixed team and with colleagues who perform their work either from the shared company location or from home. In English, the terms telework, telecommuting, or working from home are often used for this [37].

V. RESULTS: CURRENT STATE OF RESEARCH

A. Distinctiveness and Incremental Validity

Franke and colleagues [17] were able to show a positive effect of StaffCare on employee health that went beyond the influence of transformational leadership. The incremental validity of HoL beyond the effects of transformational leadership was also confirmed in other studies [38–40].

B. Direct Effects and Effectiveness

1) SelfCare

Regarding *health-related outcomes*, previous studies showed that SelfCare is positively related to general health [17, 22, 41, 42], well-being [43], and negatively associated with irritation/ strain [17, 22, 41, 42], health complaints [17, 22, 41–43], burnout/exhaustion [38, 43–47], depression [43], presentism [22], and work-family conflict [17, 22]. Regarding *work-related attitudes,* studies showed that SelfCare is positively related to work engagement [45, 46] (path a and g; FIGURE 1).

These studies refer to the traditional work context, but so far little is known about SelfCare in the digital work context. There have been only scattered studies examining health-oriented self-leadership in terms of SelfCare in the home-office context. Initial findings from an interview study by Efimov et al. [48] show that virtual leaders place a high value on their own health and show a high level of attentiveness to their own warning signals. In particular, physical activity and setting boundaries (boundary management) were mentioned as health-oriented self-leadership behaviors. A diary study by Müller and Niessen [49] focused on general self-leadership, not specifically on health-oriented self-leadership, but important conclusions can be drawn here as well. The authors were able to show that employees on home-office days reported higher self-goal setting, higher self-reward, and higher visualization of successful performance than on office days. The effects of work location on these self-leading behaviors were thereby mediated by experienced autonomy. In addition, there was a direct effect of work location on ego depletion and job satisfaction. Employees who work only partially from home were less exhausted and more satisfied with their work on home-office days than on office days. The authors concluded that working from home allows for more flexibility, e.g., in terms of workplace design, task scheduling, prioritization and selection of tasks, but that this requires the appropriate self-leading skills.

However, it is unclear how well health-oriented self-leadership in terms of SelfCare succeeds when working from home and how effective it is compared to the traditional work context. So far, only one qualitative study to date has focused on health-oriented self-leadership in the digital work context. Since working from home has both opportunities and risks for health, future empirical research on health-oriented self-leadership in the digital context is required for a better understanding.

Regarding *the effects of leaders' SelfCare on employees' health* (path d; FIGURE 1), Pundt and Felfe showed a negative relationship between leaders' health-endangering SelfCare behavior and employees' health, and a positive relationship with employees' health complaints and presentism [22]. Klug and colleagues also showed a positive relationship between leaders' SelfCare and employee health, and a negative relationship to employee strain and health complaints [41]. In line with these findings, Grimm and colleagues considered both leader and employee level and found a positive relationship between leader SelfCare and employees' engagement and a negative relation to employees' exhaustion [45]. However, another study considering both leader and employee level did not find an effect of leaders' SelfCare "awareness" on employees' exhaustion and cynicism, but for the sub facet "behavior". They found a cross level effect on employees' exhaustion in one of their two examined organizations [50]. A another multilevel study by Klug and colleagues did also not show an effect of leader SelfCare on employee health, strain, and health complaints [42]. However, they found that leader SelfCare indirectly affects employee health via StaffCare.

Regarding the effects of leader SelfCare on employee health, the findings are somewhat inconsistent. Therefore, further studies are needed to systematically investigate the underlying effects here in more detail. In particular, in a digital context, leader SelfCare may be barely visible to employees. It is conceivable that the effects are weakened due to the lack of direct contact and opportunities to perceive the leader's SelfCare.

2) *StaffCare*

Regarding effects of *employees' health-related outcomes*, several studies show that *StaffCare* is positively related to employee general health [17, 22, 41, 42, 51–53], mental health [54], well-being [43] and negatively related to employees' physical and psychosomatic health complaints [17, 22, 41–43, 51, 53, 55, 56], strain [17, 22, 41, 42, 51, 53], burnout/exhaustion [22, 38, 43–47, 57–59], depression [43, 60], anxiety [60], presentism [22], and work-family conflict [17, 22]. Regarding *work-related attitudes*, studies also show that StaffCare is positively related to employees' work engagement [38, 45, 46, 51, 59], job satisfaction [22, 53], task proficiency [58], and commitment [51, 52, 55] (path c; FIGURE 1).

Moreover, studies show that StaffCare fosters employees' disclosure intentions to leaders [39] and is positively related to employees' intention to participate in occupational health promotion activities, and actual participation [61].

Regarding multilevel effects of leader StaffCare on employee health, Grimm and colleagues showed that StaffCare was marginally positively related to individual employee engagement and exhaustion [45]. Vonderlin and colleagues examined how leader and employee ratings of Health-oriented Leadership in terms of StaffCare correspond to each other and which sources are predictive for employee mental health [60]. They showed that leaders' self-ratings of StaffCare were related to their employees' ratings (at the team level) on the "behavior" dimension, but not on the "awareness" and "value of health" sub facets. Also, leaders rated themselves significantly higher on StaffCare compared to their employees. Employee ratings of StaffCare significantly predicted their own level of mental distress (direct within-level effect), whereas leaders' ratings of StaffCare did not predict employees' mental distress at the team level (direct cross-level effect). Leaders' self-ratings of StaffCare did not influence the relationship between employee ratings of StaffCare and their mental distress on an individual level (cross-level interaction).

Regarding *effects of leaders StaffCare on their own health* (path i; FIGURE 1), Pundt and Felfe showed positive relationships between StaffCare "awareness" and leaders' general health and negative relationships with leaders' strain, and work-family conflicts [22]. The "behavior" facet showed positive associations with leaders' health state and a negative relation to work-family conflicts [22]. Additionally, Grimm and colleagues found that leaders' StaffCare positively relates to their own work engagement and negatively to their own exhaustion [45].

There are also studies examining *conditions for the effectiveness of StaffCare*. For example, a study by Klebe and colleagues [58] showed that StaffCare is particularly important for employees' health in times of crisis: StaffCare has a particularly positive influence on employees' health when their health is threatened by a crisis situation. Particularly when employees are dependent on the support of their leader, health-oriented leaders can have a positive influence on employee health and make an important difference to their mental health. Another study by Klebe and colleagues showed that StaffCare was more effective for follower health the stronger the crisis was. The results were largely supported in a subsample when exhaustion was measured 1 week later [47]. Findings underline that StaffCare was jeopardized but gained in importance during the pandemic. By displaying StaffCare, leaders can buffer negative crisis effects on followers.

Overall, StaffCare thus has a positive influence on the health and other work-related attitudes of employees in a traditional work setting. However, little is known about the effects of StaffCare in a digital work context. We are only aware of two studies. In an interview study with 13 leaders of virtual teams Efimov and colleagues [48] showed that leaders also attach great importance to Health-oriented Leadership in virtual collaboration. They considered communication, trust-building, support in drawing boundaries between work and private life (work-life boundary management), and face-to-face meetings to be the most important leadership behaviors. Support from the organization is also seen as particularly relevant by the leaders.

Following up on these findings, Klebe et al. [62] examined the effectiveness of StaffCare in the home-office. Using a sample that worked exclusively from home, the authors were able to show that StaffCare is also positively associated with employees' health and commitment in the digital context. However, this study also showed that the effectiveness of StaffCare in the digital context can be subject to limitations: If employees working from home have to deal with a high level of technical disruptions (e.g., computer crashes, poor audio and video quality), the positive influence of StaffCare on employees is reduced. Organizations should ensure a reliable IT infrastructure so as not to jeopardize leadership effectiveness and thus employee health.

Overall, the evidence base on HoL in terms of StaffCare in the digital context is still limited. Apart from an interview study and one empirical study, there is still a lack of research that provides information on the potential of both SelfCare and StaffCare in a digital context. Since StaffCare has an important influence on employees' well-being, future studies should investigate further opportunities and risks for both SelfCare and StaffCare in the digital context.

C. *Indirect Mechanisms*

1) *Indirect Effects of StaffCare via Employee SelfCare*

Studies also showed evidence for the postulated *indirect effect of StaffCare on employees' health via employee SelfCare* (path e x g; FIGURE 1) [17, 38, 43, 44, 47, 63]. This means that leaders' StaffCare leads to improved employees' SelfCare, which in turn contributes to better health and a better work-life balance among employees. For example, Kaluza and colleagues showed that employees' SelfCare mediated the association between StaffCare behavior and exhaustion [38]. Another study confirmed this indirect effect and showed that StaffCare at T1 positively relates to employee SelfCare at Time 2, which is negatively associated with employee exhaustion at Time 3 [63].

The study by Klebe and colleagues [47] on StaffCare in crisis situations was also able to confirm this indirect effect: 1) a crisis situation leads to a lower level of StaffCare. 2) Since leaders show less consideration for their employees' health, employees themselves have less capacity to protect their own health in terms of SelfCare. 3) If employees show less SelfCare, this is also reflected in poorer mental health.

Regarding the digital work contexts, it is yet unclear if the indirect effect of StaffCare via employee SelfCare still remains, as leaders might not be successful in transferring their StaffCare via digital communication. More research is needed which role the digital work context plays for this indirect effect.

2) Indirect Effects of StaffCare and SelfCare via Work Conditions

Regarding *other indirect effects of StaffCare*, a study by Grimm et al. [45] was able to show that the effects of StaffCare on employee engagement are mediated through team resources such as role clarity, support from the leader and colleagues, or professional development opportunities. They further showed that the relationship between leader StaffCare and employee exhaustion was mediated by employee job demands. Horstmann and Remdisch [55] also showed that StaffCare promotes employess' resources and minimizes job demands and thus has an indirect effect on employees' health and commitment. Kaluza and Juncker showed that StaffCare at T1 indirectly affects employee exhaustion at T3 via perceived team health climate at T2 [63].

Regarding the *indirect effect of SelfCare via resources and job demands*, Grimm and colleagues showed a significant indirect effect for leader SelfCare on leader engagement through leader job resources, and for leader SelfCare on leader exhaustion through leader job demands [45].

There are also studies that did not exactly examined the mediation effects but showed a positive link between employees' SelfCare [22], leaders' SelfCare [64], and StaffCare [22] on the one hand to employees' job demands and resources on the other hand.

So far, nothing is known about the indirect effects of HoL in the digital context and whether leaders high in StaffCare are able to influence their employees' job demands and resources and indirectly positively influences their health when working from home. Regarding the digital work context, it would further be interesting to examine whether and how SelfCare indirectly influences employees' and leaders' health via influencing job resources and job demands at the home-office. Moreover, a potential interaction between SelfCare as a resource and other resources in terms of a positive resource gain spiral according to the COR theory [65] would be worth examining in the digital context to provide further evidence for the role of SelfCare as an important resource in the digital work context. Based on the JD-R model, it is also conceivable that SelfCare helps to buffer against the negative influences of job demands and job stressors.

3) Indirect Effects of Leader SelfCare via StaffCare and Employee SelfCare

Drawing on the COR theory and the HoL concept, a multilevel study by Klug and colleagues [42] tested two mechanisms through which employees may benefit from self-caring leaders: (a) *through StaffCare*, that is, concern for their employees' health (improved leadership hypothesis; path b x c (FIGURE 1); and (b) through a direct relationship between leaders' and employees' SelfCare (role-modeling hypothesis). Their findings revealed that leader SelfCare was positively related to leader-rated StaffCare at Level 2, which was positively related to employee-rated StaffCare at Level 1. In turn, employee-rated StaffCare was positively related to employee health. They provide evidence for the indirect effect of leader SelfCare on employee health via leader StaffCare and employee-rated StaffCare for strain and overall health. The findings support the improved leadership hypothesis and underline the importance of leader SelfCare as a determinant of StaffCare. This indirect effect is also confirmed by Arnold and Rigotti [46].

Regarding the *role model effect of leader SelfCare on employee SelfCare* (path f; FIGURE 1), there are only a few studies yet. Klug and colleagues found a positive relationship between leaders' SelfCare and employees' SelfCare [41]. The aforementioned multilevel study by Klug and colleagues [42] did not find an effect of leader SelfCare on employee SelfCare. They also did not find indirect effects of leader SelfCare on employee health via employee SelfCare (path f x g; FIGURE 1).

More research is needed to examine the role model effect. Especially in the digital work context, it is not clear if employees are able to perceive role model behavior of their leaders at all when working at home. The limited visibility of leaders' SelfCare for employees might diminish a potential role model effect when working from home.

4) Buffering effect of StaffCare

Based on assumptions of the JD-R model, studies have examined the buffering effect of StaffCare on the relationship between employees' job demands and their health (e.g., strain, burnout) and job satisfaction [53, 57]. Santa Maria and colleagues showed that StaffCare "awareness" and "value" buffered the effects of work effort on police officers' burnout levels [57]. Krick and colleagues showed that employees with a leader high in StaffCare are less likely to experience strong negative effects on their health and job satisfaction when facing high job demands and work stressors [53]. These studies have shown that StaffCare can be seen as an essential work resource that counteracts negative effects of high work stress.

It is conceivable that StaffCare could also be an effective resource in the digital context with regard to home-office and ICT-specific stressors. On the other hand, it is conceivable that StaffCare would have no effect here, since StaffCare could lose effectiveness due to the limited transmission of information during digital communication.

Bregenzer and Jimenez [66] investigated this question in a survey study. The authors were able to show that a lack of technical support in the digital work environment leads to an increase in stress among employees. However, health-promoting leadership can mitigate these effects: If leaders show health-promoting leadership when technical support is inadequate, the stress level among employees is lower than when little or no StaffCare is shown. However, negative effects of other risk factors in the digital work context (e.g., constant availability) could not be mitigated by health-promoting leadership in this study.

So far, there is only one empirical study on the buffering effect of StaffCare in the digital context. The question of whether StaffCare can also mitigate negative effects of job demands and ICT stressors in the digital context therefore remains largely unanswered. Future studies should therefore investigate the potential buffering effect of StaffCare with regard to other risk factors in the digital work context.

D. Crossover Effects

Based on the assumption that strain could transfer between leaders and followers through social exchange [67], specifically when leaders and employees work closely together, the HoL model further assumes that the leaders' own health state also has an influence on employees' health state (path h; FIGURE 1). In the literature this effect is called crossover effect. Köppe and colleagues [56] did not find a direct crossover effect of leaders' exhaustion on employees' somatic complaints in the traditional work context, but they found an indirect effect mediated by leaders' StaffCare, such that leader health was related to StaffCare which in turn was related to follower health. Wirtz and colleagues examined the crossover effect from employees to the leader and found that employees' work engagement leads to leaders' work engagement, but employees' emotional exhaustion was not directly related to leaders' emotional exhaustion over time [68]. Future research is therefore needed to further investigate and provide more insight into crossover effects in both directions. It is not yet known whether a crossover effect can occur when leaders and employees communicate exclusively digitally. Therefore, further research is needed to examine the crossover effect in the digital work context.

E. Antecedents of HoL

As a better understanding of favorable and hindering factors of HoL may help organizations to improve their occupational health promotion and psychosocial risk management, it seems important to understand which antecedents facilitate or hinder HoL [46, 58].

Workplace level: Based on the established Job Demands-Resources Model [69] differentiating between *demands and resources* to explain work experience and behavior and the Conservation of Resources Theory [70], several studies examined antecedents of HoL.

A study by Arnold and Rigotti [46] showed that job resources are positively and job demands are negatively related to leader SelfCare. Leader SelfCare in turn leads to more StaffCare, which in turn leads to more work engagement among employees. They also found positive relationships between job resources and StaffCare and negative relationships between job demands and StaffCare. These results indicate that leaders experiencing more job resources and less job demands overall, show more SelfCare and StaffCare. These findings were confirmed by another study by Krick and colleagues [71]. Work-related resources such as *social support and autonomy* are conducive conditions and enable SelfCare and StaffCare, whereas work demands such as *multitasking and permanent availability* are hindering factors. These studies showed that leaders' resources and demands represent important antecedents for SelfCare and StaffCare. Pischel and colleagues used an experimental study and a survey study to examine antecedents (a) clarity of displayed warning signals in followers, b) leaders' stressors, c) *leaders' autonomy*) of StaffCare "awareness" in followers and leaders [72]. They show that leaders had a lower StaffCare "awareness" during times of low autonomy.

Organizational level: A study also considered organizational factors such as *High-Performance Work Practices (HPWPs)* and *health-oriented human resource management strategies* as antecedents facilitating SelfCare and StaffCare. They found a positive relationship between HPWPs and HoL. They also showed that HRM practices related to employee health show a positive relationship with HoL indicating that a general climate or culture of concern for employees' and leaders' health can provide a resource for leaders that helps them to engage in HoL [71]. A study by Kaluza and colleagues investigated *organizational health climate* as an antecedent of StaffCare "awareness" and StaffCare "behavior" [59]. They showed that leaders' perceptions of organizational health climate were positively related to their health mindsets (i.e., their health awareness) and in turn was positively associated with their health-promoting leadership behavior, which ultimately went along with better employee well-being.

Individual level: Studies also examined *leaders' own strain* as an antecedent of HoL and showed that leaders' own stress level makes it more difficult for leaders to lead themselves and their employees in a healthy way [73, 74]. Leaders who are exhausted show less SelfCare behavior, as a study by Köppe and Schütz [74] showed. Another study by Köppe and colleagues [56] also showed that leaders' exhaustion is negatively associated with leaders' StaffCare. An experimental study by Klebe and colleagues [73] showed that it is more difficult for leaders to lead in a health-promoting manner when under stress. The aforementioned study by Pischel and colleagues focused on antecedents of StaffCare "awareness" and also showed that leaders had a lower awareness during times of high stress [72].

Context level: The aforementioned experimental study by Klebe and colleagues [73] also showed that it is more difficult for leaders to lead in a health-promoting manner in critical situations. When leaders have to counteract a *crisis situation*, StaffCare decreases due to a lack of resources and capacities on the part of the leaders. It is particularly challenging for leaders to show StaffCare when they experience strain in a critical situation. In addition, they investigated the influence of *employees' stress level* as a contextual influence factor on StaffCare. Here, a positive effect on StaffCare was revealed: Leaders in turn make more of an effort to lead in a way that promotes health when they perceive that their employees are under great psychological strain. Although leaders show less StaffCare in critical situations and when they experience high psychological strain, they show more StaffCare when they notice that their employees are stressed.

The experimental study by Pischel and colleagues examined *clarity of displayed warning signals* in followers as an antecedents of StaffCare "awareness" [72]. Their results showed that leaders are less able perceive warning signals and signs of overload in their employees when followers displayed less clear warning signals.

The fact that StaffCare decreases in critical situations was also confirmed in another study by Klebe and colleagues in the context of the Corona pandemic [47]. They showed that crisis severity is indirectly related to exhaustion via StaffCare and SelfCare: 1) crisis severity is related to leader StaffCare, 2) which is related to follower SelfCare and 3) in turn with exhaustion.

The aforementioned study by Krick and colleagues also examined leaders' **home-office intensity** as a predictor of leaders' SelfCare and StaffCare [71]. They showed that working from home seems to favor SelfCare and StaffCare and thus represents a supportive condition of HoL. Possibly, higher flexibility and better work-life-balance offer more opportunities for SelfCare and StaffCare when working from home. Moreover, it is possible that leaders feel more responsible for their employees' health due to a lack of direct contact. However, it may be more difficult to act from the distance. Future research should identify the relevant reasons and mechanisms.

Future studies should also examine home-office specific resources and job demands of leaders as antecedents of leaders' SelfCare and StaffCare. Certainly, previous relationships between job demands, resources from the traditional work context and HoL can also be transferred to the digital context, but it is unclear whether, for example, home-office specific or ICT-specific stressors also influence StaffCare and SelfCare. It is conceivable that work-related stressors of leaders in the home-office can have a negative impact on employee health via a decrease in StaffCare and employee SelfCare. On the other hand, it is also conceivable that work-related and home-office specific resources of leaders can positively influence employee health through an increase in StaffCare and SelfCare. Which home-office specific resources and job demands directly influence leaders' StaffCare and SelfCare and indirectly employees' health should be investigated in future research. This is an important starting point for future research.

F. *Profiles of HoL*

Most studies show a positive correlation between leader SelfCare and StaffCare [22, 42, 45, 46] (path b; FIGURE 1) as well as between StaffCare and employee SelfCare [17, 22, 38, 41–44] (path e; FIGURE 1).

Although relationships are often moderate to high, they are not perfect, and SelfCare and StaffCare do not always go hand in hand but can also be pronounced differently. A study by Klug and colleagues [41] therefore investigated the extent to which different constellations of HoL can be observed and how they are related to employee health. In their study, a total of four different profiles of HoL could be empirically identified and confirmed: A consistent positive profile (high care), a consistent negative profile (low care), as well as two inconsistent profiles with regard to employee SelfCare, leader SelfCare, and StaffCare (leader sacrifice and follower sacrifice). Employees in the high care profile, characterized by consistently high SelfCare and StaffCare, reported the highest health scores compared to the low care and the two inconsistent profiles. The follower sacrifice profile, characterized by higher SelfCare of the leader compared to StaffCare of the employee, showed higher psychological stress among employees than the leader sacrifice profile (characterized by higher StaffCare of the employee, but comparatively low SelfCare of the leader). As expected, psychological stress was highest among employees in the so-called low care profile, which was characterized by consistently low levels of StaffCare and SelfCare. The results show that not only consistently negative leadership behavior can worsen employee health, but that even inconsistent behavior with regard to StaffCare and SelfCare can impair the mental health of employees.

So far, it is not known whether these profiles of HoL can be found exclusively in the traditional work context with a lot of face-to-face contact, or whether these profiles are also evident in the digital work context. It would also be interesting to know whether the different profiles of HoL have the same impact on employees when they work from home, or whether their effect decreases or perhaps even increases in the digital context. It is conceivable that some leaders might succeed in showing StaffCare and at the same time motivate their employees to take care for their own health (in terms of SelfCare) because they communicate sufficiently and use digital media effectively. It might also be possible that leaders find ways to be a good role model by openly talking about their health behavior and how they stay healthy when working from home. However, due to the specific working conditions when working from home (e.g., digital communication through ICT), the visibility of leaders' StaffCare and SelfCare could be limited when leading from a distance. Leaders may have difficulties conveying StaffCare and being a role model through digital media. It would be possible that not only the limited visibility of leaders' health-oriented (self-)leadership behavior, but also the own experienced risks at the home-office, lead to a rather opposing relationship between StaffCare, leaders' SelfCare, and the SelfCare of the employees. However, independent employees whose health has a high priority for them, could still succeed in taking good care of themselves. It would also be conceivable that employees focus on their own health even more because no one else does. This would rather lead to an inconsistent profile.

An investigation of this issue is currently pending. Furthermore, nothing is yet known about antecedents of these different profiles and differences regarding performance, engagement or commitment.

G. *Interventions of HoL*

To promote Health-oriented Leadership, researchers and practitioners have developed leadership intervention, for example the HoL process (an intervention on the team level), the GoFüGo training (an intervention to promote Health-oriented Leadership competences), and the Mindfulness- and Skill-Based Health-Promoting Leadership Intervention [75–77]. The GoFüKo training is a one-day workshop for leaders and can serve as a preparation for a following HoL process with the leader and the team. The training aims to achieve three goals: 1) to provide knowledge and facts about Health-oriented Leadership, occupational health management and the significance for health, 2) to help leaders to reflect on their own strengths and potential regarding their SelfCare and StaffCare, and 3) to improve SelfCare and StaffCare by exercises, action plans, and exchange among participating leaders. The workshop consists of four parts: (1) Warm up (introduction, getting to know each other, facts on HoL, OHM, etc.), (2) SelfCare, (3) StaffCare, and (4) Cool down (including transfer of what has been learned into everyday working life). Both the SelfCare and StaffCare part contain self-reflection and exercises addressing the sub dimensions “value”, “awareness”, and “behavior” [75].

The HoL process aims to identify all relevant characteristics of Health-oriented Leadership as a status quo assessment for a leader and the team. In a feedback process, leader and team become aware of strengths and weaknesses regarding SelfCare and StaffCare and develop measures for a better health promotion in their workplace. This process consists of nine systematic steps: (1) coordination with management, (2) information event on HoL for the leaders, (3) preliminary talk with the leader, (4) kickoff event with the team and the leader, (5) participation in online survey (HoL instrument; team and leader), (6) evaluation and preparation of the HoL report (leader), (7) coaching with the leader, (8) evaluation workshop for the team with the leader, (9) follow-up workshop after approximately 3 months (team and leader). The process is professionally guided and moderated by a coach [40, 75, 77, 78].

The Mindfulness- and Skill-Based Health-Promoting Leadership Intervention consists of three full-day courses (8 hr each) and two 3-hour booster sessions with a total training time of 30 hours over a period of 6 months containing three modules: (a) SelfCare, (b) StaffCare, and (c) addressing employees under stress. The intervention includes information transfers, demonstrating their scientific backgrounds and emphasizing the importance of each topic, mindfulness practices, practical everyday skills to foster behavioral change [76].

There are several studies that have examined the effectiveness of interventions to promote HoL. Stuber and colleagues [79] examined the effectiveness of HoL interventions in a systematic review. They demonstrated that 4 of the 7 included studies showed a significant improvement in employee mental health as a result of the leadership interventions. None of the eligible studies showed a negative effect on employee mental health. Two studies showed no effect. They concluded that leadership interventions with reflective and interactive parts in group settings over several seminar days appear to be the most promising strategy for promoting mental health among healthcare workers. Another systematic review by Dannheim and colleagues [80] also showed significant effects of leadership training on employees' exhaustion, self-reported sickness absence, work-related sickness absence and job satisfaction when comparing health-oriented leadership interventions to no intervention. For studies comparing health-oriented leadership training to other training they found no significant effects. Vonderlin and colleagues [76] developed the mindfulness- and skill-based HoL intervention and investigated its effectiveness in a quasi-experimental multisite field study including supervisor and employee ratings from 12 German companies. They compared their intervention group to a passive control cohort based on propensity score matching. Their results showed that the supervisors who had participated in the HoL intervention experienced a significantly larger decrease in mental distress and an increase in SelfCare as well as StaffCare than did their matched controls. They also showed that the effect on supervisors' mental distress was mediated by an increase of their SelfCare and moderated by the frequency of their mindfulness practice. However, they did not find significant effects between groups regarding employee level outcomes. Evaluations of the HoL process revealed that leaders and team members were quite satisfied with the improvement in SelfCare and StaffCare, and that most agreements were implemented after three months [78].

As the empirical evidence of the effectiveness of HoL interventions for supervisors and their employees is still scarce, more effort to develop and evaluate such interventions is needed. Furthermore, these interventions were designed to promote health-oriented leadership in traditional work settings. Since health-oriented leadership (in terms of StaffCare) and health-oriented self-leadership (in terms of SelfCare) represent important competencies when working from home, interventions to promote these competencies should be developed. In this context, it is particularly important to consider possible challenges in the digital work context for SelfCare and StaffCare. Further studies should examine their effectiveness to promote employees' and leaders' health when working from home.

H. Methodology of previous research

Most of the previous studies have a cross-sectional design [43, 44, 52, 55, 74]. However, there are also studies that collected their data at least at two different time points to reduce biases such as the common method bias [17, 22, 38, 47, 51, 54, 56, 62, 63, 71]. There are also several studies that collected matched data considering both perspectives of leaders and employees [41, 42, 45, 50, 56, 59, 60]. These studies were thus able to conduct multilevel analyses [42, 45, 60] considering the leaders' level and team level. Furthermore, besides the common variable-centered approach, one study focused on a person-centered approach and examined profiles of HoL [41]. More current studies also examined antecedents and effectiveness of HoL using experimental designs to shed more light on causality [38, 58, 62, 72, 73]. Overall, the research to date shows a wide range of diverse methodological approaches to investigate effects of HoL.

VI. CONCLUSION

Overall, the current evidence confirms that the concept of Health-oriented Leadership is a valid construct that can have a positive influence on employee health beyond other leadership styles [17, 38]. Health-oriented Leadership can have a positive impact not only on employee health, but also on other work-related attitudes such as job satisfaction, commitment, or performance [22, 53, 58]. While previous studies were mostly conducted pre-pandemically in a traditional work context with regular face-to-face contact, there have been only a few studies to date on Health-oriented Leadership in the digital context. Initial empirical findings indicate that the effectiveness of Health-oriented Leadership in the digital context may be limited by technical problems. From these initial findings and based on previous research on leadership in times of crisis [58, 73], a **first research perspective** for future research can be derived. As shown in FIGURE 2, future research should take a closer look at the extent to which the effectiveness of StaffCare and SelfCare might be reduced (i.e., moderated) by home-office specific demands such as technical problems or permanent availability or home-office intensity itself, or even increased by resources such as higher flexibility.

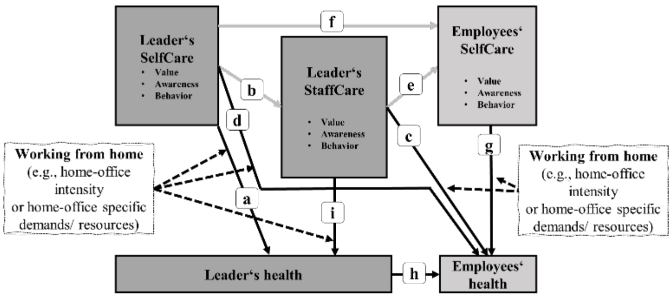

FIGURE 2: RESEARCH PERSPECTIVE I FOR HOL IN A DIGITAL WORK SETTING: EFFECTIVENESS OF HOL AND THE MODERATING ROLE OF HOME-OFFICE SPECIFIC WORK CHARACTERISTICS.

There are already initial findings that HoL is also of importance in the digital work context, since StaffCare can positively influence the health and commitment of employees even when working from home and mitigate the negative effects of inadequate technical support. This highlights a **second research perspective** of HoL in the digital context. Future research could further shed light on mechanisms of HoL in the digital work context. One potential mechanism might be the buffering effect of StaffCare. It is an open question, if leaders high in StaffCare are able to buffer against the negative effects of employees' home-office specific or ICT demands (e.g., technical problems, constant availability) on their health. A second mechanism could be indirect effects of SelfCare and StaffCare mediated through home-office specific demands and resources. Both potential mechanisms (both moderating and mediating effects) are displayed in FIGURE 3.

The perspectives presented could provide a valuable starting point for future studies.

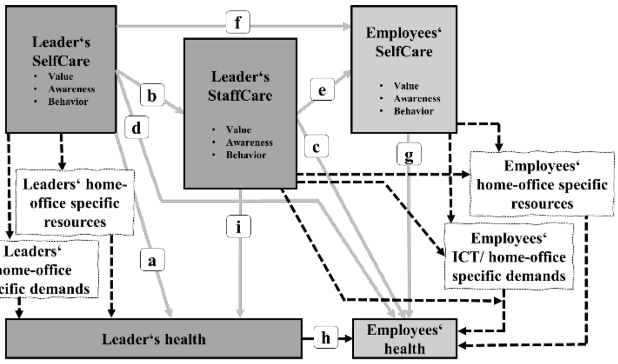

FIGURE 3: RESEARCH PERSPECTIVE II FOR HOL IN A DIGITAL WORK SETTING: INDIRECT AND MODERATING EFFECTS OF HOL.

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