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Special Issue Paper

Facilitating health care workers' self-determination: The impact of a self-leadership intervention on work engagement, health, and performance

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The present study aims to test the impact of a self-leadership intervention on the work engagement, performance, and health of health care workers. By integrating self-determination theory and self-leadership theory, we propose that when employees are trained how they can autonomously influence own cognitions and behaviour, this will impact their work engagement, perceived performance, and general health. To test the hypotheses, a longitudinal field experiment with three measurement waves was conducted (pre-intervention, immediately after the intervention, and 2 months after the intervention). Health care professionals (n = 195) from five different organizations participated on voluntary basis and were randomly assigned to the intervention or control group. Results show that a self-leadership training positively impacts work engagement and performance of health care workers. Furthermore, the improved work engagement also mediates the effects of the training on health and performance 2 months later. No direct effect was found on general health. Theoretical and practical implications are discussed.

Practitioners points

- The self-leadership intervention facilitates healthcare workers to develop self-determination and autonomous motivation, which will positively impact their work engagement, health, and performance
- Participation in the self-leadership intervention needs to be based on volition as this will contribute to the intrinsic motivation for actual self-leadership development through training.

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The recent COVID-19 crisis has once again demonstrated the critical societal importance of health care and health care workers. It has put an additional strain on health care workers who already perceived their jobs as highly demanding and stressful (Broetje, Jenny, & Bauer, 2020; McVicar, 2016). Research has shown that, in recent years, health care workers report low mental and physical health, low job satisfaction, and low motivation to continue working within the health care sector (Garrosa, Moreno-Jiménez, Liang, & González, 2008; Gurses, Carayon, & Wall, 2009; Hayes et al., 2012; Shantz, Alfes, & Arevshatian, 2016).

To address these issues, a large number of studies have focused on developing and testing organizational and individual interventions to reduce stress and burnout as a way of ensuring job satisfaction and productivity of health care workers (Lee, Kuo, Chieen, & Wang, 2016; McVicar, 2016). The premise of these studies is that workplace interventions that aim to increase social support, job autonomy and opportunities for professional skills development will help health care workers to better deal with work related stress (McVicar, 2003). Moreover, the literature suggests that, at an individual level, health care workers might benefit from developing coping strategies in order to deal with work related stress, in turn leading to better health and reduced job turnover (Garrosa et al., 2008; Ruotsalainen, Verbeek, Mariné, & Serra, 2015; McVicar, 2003).

While the focus on stress management has shown some potential for the reduction of burnout and job turnover, the results are inconclusive (McVicar, 2016; Ruotsalainen et al., 2015). It is remarkable that studies that focus on increasing positive motivation and positive behaviours of health care workers are rare. Building on the positive psychology movement (Gable & Haidt, 2005; Linley, Joseph, Harrington, & Wood, 2006; Seligman & Csikszentmihalyi, 2000), we propose that interventions should not only focus on reducing stress, but also on increasing self-leadership of health care workers, as this positively contributes to work engagement, health and performance (Kayral & Dülger, 2019; Van Dorssen-Boog, De Jong, Veld, & Van Vuuren, 2020).

Self-leadership theory states that people are not merely a result of their social context and personality traits, rather they are active agents of their own motivation, well-being and performance (Manz, 1986, 2015; Manz, Houghton, Neck, Fugate, & Pearce, 2016; Neck & Houghton, 2006). Those who take the lead are assumed to use cognitive and behavioural self-influencing strategies (e.g., positive self-talk, goal-setting, self-observation) and act on a basis of self-determination. They are more intrinsically motivated in their job, while being less dependent on external directions or control systems for optimal functioning (Manz, 2015; Stewart, Courtright, & Manz, 2019). Several intervention studies have found evidence of positive effects related to self-efficacy, health, positive affect, and performance as a result of self-leadership training programmes in profit and not for profit industries (e.g., Lucke & Furtner, 2015; Neck & Manz, 1996; Unsworth & Mason, 2012). These studies mainly draw on the principles of Conservation of Resources-theory (HobFoll, 1989) and self-efficacy (Neck & Manz, 1996). In this paper, we propose that work engagement is the key mechanism through which self-leadership interventions impact health and performance of health care workers. Work engagement refers to a positive, fulfilling, and work-related state of mind that is characterized by vigour, dedication, and absorption (Salanova & Schaufeli, 2008; Schaufeli, Bakker, & Salanova, 2006). It is considered to indicate general autonomous work motivation (Van Beek, Hu, Schaufeli, Taris, & Schreurs, 2012). Autonomous work motivation refers to the full endorsement of one's own activities, as these are in concordance with personal goals, needs, interests, and values (Deci & Ryan, 2000; Gagné & Deci, 2005; Sheldon & Elliot, 1999). According to self-determination theory (SDT; Deci & Ryan, 2000), autonomous

motivation is the most sustainable type of motivation, predicting high quality performance and positive outcomes related to well-being, vitality, and health (Deci, Olafsen, & Ryan, 2017; Ryan & Deci, 2008). In the present study, we are interested in the work engagement of health care workers to provide insight into the general development of autonomous motivation. Work engagement represents a more persistent and pervasive affective-cognitive state of autonomous motivation, as engaged workers work because they genuinely *want* to work, meaning that they tend to act on basis of autonomous motivation (Salanova & Schaufeli, 2008; Van Beek et al., 2012).

In this study, we aim to assess the impact of a self-leadership intervention on work engagement, health, and job performance of health care workers. We hypothesize that, based on SDT (Deci et al., 2017), the intervention will both directly and through the mediating role of work engagement, influence health and performance. This research contributes to theory and practice in several ways. First, the self-leadership intervention study is specifically focused on health care professionals. Self-leadership training has been studied in other industries and services (Lucke & Furtner, 2015; Neck & Manz, 1996; Unsworth & Mason, 2012), but not among health care professionals. It is assumed that jobs aimed to service the needs and goals of others, such as those of health care workers, are challenging for self-leadership, because the professional focus on servicing others can distract them from their own personal needs and goals (Alves et al., 2006). Our sample includes health care workers from five different Dutch health care organizations in different specialists fields: two nursing homes, two disability care homes, and one hospital. To test both short- and long-term effects of the self-leadership intervention, while controlling for the organizational influences, we took three measurements. Second, we position the self-leadership training programme as a positive psychology intervention (Van Woerkom, Bakker, & Leiter, 2019), which provides a novel perspective for improving motivation, health, and performance of health care workers (Jooste & Cairns, 2014; Kayral & Dülger, 2019; Van Dorssen-Boog et al., 2020). While interventions for health care workers are often focused on developing coping strategies for dealing with the high job demands (Lee et al., 2016; McVicar, 2003; Ruotsalainen et al., 2015), this intervention is explicitly focused on developing work engagement through a self-leadership training programme. Finally, in contrast to prior intervention studies of self-leadership, the present self-leadership intervention is specifically designed to improve self-determination, meaning that goals and activities are based on autonomous motivation. As discussed, autonomous motivation is a key factor for work engagement (Van Beek et al., 2012), which subsequently predicts health and performance (Deci et al., 2017). Until now, self-leadership intervention studies have mostly assumed that self-leadership training influences health and performance through two mechanisms: motivation to conserve and accumulate resources, and increased self-efficacy (e.g., Lucke & Furtner, 2015; Unsworth & Mason, 2012). In the present study, we add to the literature by proposing a third mechanism; the improved health and performance are a result of the work engagement. Work engagement represents the autonomous motivation, which follows from the training self-leadership.

Theoretical background and hypotheses

Self-leadership

Self-leadership refers to 'a comprehensive self-influence perspective that concerns leading oneself towards performance of naturally motivating tasks as well as managing oneself to do work that must be done, but is not naturally motivating' (Manz, 1986, p. 589).

Informed by insights from classical self-regulation and motivational theories such as self-regulation and control theory (Carver & Scheier, 1998), social cognitive theory (Bandura, 1991) and cognitive evaluation theory (Deci, 1975), self-leadership proposes that specific a range of cognitive and behavioural self-influencing strategies help people to take charge of their own motivation and performance (Manz, 1986, 2015; Neck & Houghton, 2006). Self-leadership theory makes a distinction between self-management and self-leadership (Manz, 1986; Stewart, Courtright, & Manz, 2011). In self-management, goals and standards (what is to be done) and strategy (why it is to be done) are externally determined. The individual influences how to motivate and direct oneself in order to achieve these externally determined goals. In contrast, self-leadership involves consciously reflecting on the what and why of behaviour as well as the question of how to act (Stewart et al., 2011). As a result, self-leadership allows individuals to align activities with their personal goals, values and interests (Manz, 1986, 2015; Stewart et al., 2019).

Self-leadership strategies are divided into three categories: behaviour-focused strategies, constructive thought pattern strategies, and natural rewards strategies. *Behavioural focused self-leadership strategies* include self-observation, goal setting, self-cueing and self-rewards. Through self-observation one gains information about one's own functioning (Neck & Houghton, 2006), this being an important requirement for actual behaviour change (Mahoney & Arnkoff, 1978). Goalsetting addresses the setting of clear and challenging goals for oneself (Latham & Locke, 1991) and is assumed to encourage action. Self-cueing refers to constructing concrete reminders (e.g., to-do lists, images, or motivational posters) that can help to keep attention focused on important issues and goals (Houghton & Neck, 2002). Self-rewards (tangible rewards or a mental pat on the back) aim to function as powerful motivators during the process of goal achievement, especially when one is not intrinsically motivated to achieve the goal or specific activity (Neck & Houghton, 2006).

Constructive thought pattern strategies aim to take an optimistic and solution-focused approach and avoid ruminating on negative and unchangeable things (Manz, 1986; Neck & Houghton, 2006). Constructive thoughts include the evaluation of thoughts and assumptions, positive self-talk, and visualization of successful performance.

Natural rewards strategies refer to both behavioural (e.g., making a job task more enjoyable) and cognitive strategies (e.g., mentally focusing on the enjoyable aspects of a task, rather than focusing on the negative), with the specific aim to increase the implicit joy, thus intrinsic motivation, for a job task (Manz, 2015). If doing a job task is enjoyable in itself, then the task is naturally rewarding (Ryan & Deci, 2017).

The self-leadership process and its effect on work engagement, health and performance

Several studies were able to confirm that self-leadership is positively associated with employee outcomes, including job satisfaction, career success, performance, and stress/health (for an overview, see Stewart et al., 2011). The theoretical mechanism underlying these effects is generally derived from the principles of Conservation-of-Resources theory (CoR, see Hobfoll, 1989; Unsworth & Mason, 2012) and self-efficacy (Neck & Houghton, 2006; Prussia, Anderson, & Manz, 1998). CoR theory assumes that stress is a reaction to a loss (or threatened loss) of resources. Resources can be objects, personal characteristics, conditions, or energies, that are valued by the individual or that serve as a means for attainment of other resources (Hobfoll, 1989). Drawing on CoR, self-leadership is thought to generate resources which will lead to stress reduction and positive affect (Breevaart, Bakker, & Demerouti, 2014; Unsworth & Mason, 2012). Furthermore, self-efficacy theory

helps explain how self-leadership fosters a sense of competence. Through self-leadership people experience more self-efficacy in their performance, leading to improved performance (Neck & Houghton, 2006; Prussia et al., 1998). Moreover, improved self-efficacy as a result of self-leadership helps to reduce the experience of stress (Unsworth & Mason, 2012).

Indeed, several studies have found positive correlations between self-leadership and work engagement (e.g., Amundsen & Martinsen, 2015; Breevaart et al., 2014; Zeijen, Peeters, & Hakanen, 2018), either through increased job resources (Breevaart et al., 2014) or through psychological resources such as psychological empowerment (Amundsen & Martinsen, 2015). Furthermore, it is assumed that self-leadership contributes to health, both through the ability to cope with stress by increasing job resources and to self-regulate emotions with psychological resources (Houghton, Wu, Godwin, Neck, & Manz, 2012; Lovelace, Manz, & Alves, 2007). Manz (2015) suggests that self-leadership can also be helpful in the self-motivation and self-direction for physical fitness, which is assumed to contribute to health. Also, several studies on self-leadership training confirmed that self-leadership is helpful in the reduction of strain, and is positively associated with physical and mental health (Lucke & Furtner, 2015; Sampl, Maran, & Furtner, 2017; Unsworth & Mason, 2012).

Furthermore, self-leadership is found to increase the ability to self-influence performance (e.g., Furtner, Rauthmann, & Sachse, 2015; Lucke & Furtner, 2015; Marques-Quinteiro & Curral, 2012; Sampl et al., 2017). The main theoretical grounding for this is that self-leadership positively impacts self-efficacy which influences the actual performance (Konradt, Andressen, & Ellwart, 2009; Prussia et al., 1998).

Based on these theoretical arguments as well as extensive research on how self-leadership and self-leadership interventions impact our three dependent variables, we hypothesize the following:

Hypothesis 1. Compared to the control group, participants in a self-leadership training will experience increased (1) work engagement, (2) general performance and (3) general health 1 and 8 weeks after the training.

The mediating role of work engagement

In addition to the two theoretical mechanisms described above, this paper draws on SDT (Deci et al., 2017) to describe a third mechanism explaining the impact of self-leadership interventions through autonomous motivation.

Self-leadership theory assumes that true self-leadership is based on self-determination and intrinsic motivation (Manz, 1986; Stewart et al., 2011). Self-leading individuals reflect on the what and why of their behaviour as a way to assess whether they can truly endorse their own activities (Stewart et al., 2011). They use self-influencing strategies for the achievement of personal goals and proactively bring their activities in alignment with own values and interests, as such they are intrinsically motivated in their activities (Manz, 1986, 2015; Stewart et al., 2019). This implies that, at its core, self-leaders strive to act on the basis of autonomous motivation.

Autonomous motivation refers to the full endorsement of one's own activities at the highest level of reflection and is a powerful driver for actual behaviour (Dworkin, 1988; Gagné & Deci, 2005). If goals and activities are based on autonomous motivation, they are experienced as enjoyable and/or meaningful resulting in high levels of energy and motivation for the actual behaviour (Manz, 1986; Ryan & Deci, 2000). There is evidence that autonomous motivation is an important predictor for the quality of actual

performance (Deci et al., 2017; Judge, Bono, Erez, & Locke, 2005; Sheldon, 2014). Moreover, research suggests that autonomous motivation can be vitalizing such that it also positively affects mental and physical health (Ryan & Deci, 2008; Weinstein & Ryan, 2011). In contrast, controlled motivation is focused on external rewards or the avoidance of punishment, thus based on an urge, which can deplete the energy which is available to the self (Broeck et al., 2011; Van den Ryan & Deci, 2008). As a result, controlled motivation can easily lead to increased stress levels and impairment of health (Gagné & Deci, 2005). Long term controlled motivation can have detrimental effects on performance and health (Deci et al., 2017). It is based on what one *must* do, whereas autonomous motivation is based on what one *wants* to do. Therefore, autonomous motivation is the most sustainable type of motivation (Deci et al., 2017; Gillet, Lafrenière, Vallerand, Huart, & Fouquereau, 2014; Ryan & Deci, 2008).

When autonomously motivated at work, this translates to high levels of work engagement (Salanova & Schaufeli, 2008; Van Beek et al., 2012). Engaged workers work because they genuinely *want* to work; they experience the activities of the job as enjoyable, interesting and valuable (Bakker, Demerouti, & Sanz-Vergel, 2014; Salanova & Schaufeli, 2008). As we are interested in the general development of autonomous motivation for a job, the present study will focus on work engagement of health care workers. Work engagement represents a more persistent and pervasive affective-cognitive state, as compared to autonomous motivation which refers to a momentary state of behaviour intention (Salanova & Schaufeli, 2008). Engaged workers tend to perform better as they are highly interested in their job and experience positive emotions while at work (Bakker et al., 2014). They solve their daily issues proactively and think of new ideas for improving the quality of their work. They are motivated to 'go the extra mile' if necessary and show extra-role performance (Bakker et al., 2014). Christian, Garza, and Slaughter (201) explain this positive association on the basis of the extent to which individuals invest their 'full selves' in the execution of their work.

Moreover, work engagement is assumed to vitalize people, such that it impacts health. As engaged people are genuinely autonomously motivated by their activities, they experience lots of energy from daily activities, which leads to the experience of greater well-being and physical health in the long run (Reis, Hoppe, & Schröder, 2015; Ryan & Deci, 2008; Weinstein & Ryan, 2011).

In line with this, we expect work engagement to positively impact general performance and general health (Bakker et al., 2014; Deci et al., 2017; Ryan & Deci, 2008). More specifically, drawing on the integration of self-leadership and SDT, we hypothesize that work engagement will mediate the effects of the self-leadership training program on the performance and health of health care workers. Therefore, we state that:

Hypothesis 2. Work engagement at T2 mediates the effect of the self-leadership intervention on (1) performance and (2) health 2 months after the intervention (T3).

Methods

Research procedure & participants

To test our hypotheses, a longitudinal field experiment with three measurement waves was conducted. The variables were measured 2 weeks before the intervention started in

January and February (T1), approximately 1 week after the intervention in March and April (T2) and finally, 8 to 10 weeks following the intervention in May, June, or July (T3). All measurements were taken before the waiting list control group started its self-leadership training in the autumn. We could not increase this measurement interval due to the training dates of the experimental group (January–April) and control group (autumn).

Six different health care organizations in the Netherlands with varied backgrounds and specializations were invited to join the project by an employers' association. In order to control for the influence of organization-related factors including regional labour market shortages or reorganizations, we sampled multiple organizations. Five of these organizations were willing to participate, including two nursing homes for elderly people, two disability care homes, and one general hospital.

The health care workers in these organizations were approached to participate through multiple channels such as flyers, email, and through managers. Approval from a manager was not required to participate. However, only professionals working in the primary care process were allowed to participate (e.g., nurses and social workers) to ensure a homogeneous sample. Workshops were during working time, while the online training was undertaken during free time. It was clearly communicated that the training was part of scientific research.

Each participating organization was asked to contribute at least 40 participants in order to create four groups per organization; two experimental groups and two waiting list control groups. Two organizations were unable to meet this requirement due to budgetary restrictions and workload. They each contributed 20 participants, and thus, one experiment and one control group. Two organizations for disability care were able to contribute more 50 employees each. Table 1 provides an overview of the participants per organization and measurement wave. Participants were randomly assigned to the experiment or waiting list control group and were not informed which group they were allocated to. A maximum of two members from the same team participated to minimize contamination between the control and experimental group. The HR managers checked whether the groups were diverse in terms of age and working team. The experiment group would train in the first 4 months of the year, whereas the waiting list control group was told that they would train in the autumn of the same year (i.e., starting after data collection).

At Time 1, the sample consisted of 195 respondents (i.e., N intervention = 94, N control = 101). From Time 1 to Time 2, 25 respondents dropped out, and at Time 3 another 27 respondents dropped. In total, the original sample reduced by 27% (30% of the experiment group and 24% of the control group). Additional analyses (*t*-tests) showed that

Table 1. Sample distribution intervention/control group per organization at T1, T2, and T3

	T1 Total	T1 Intervention	T1 Control	T2 Intervention	T2 Control	T3 Intervention	T3 Control
Hospital care	20	10	10	6	9	3	9
Disability care 1	68	31	37	28	34	24	28
Disability care 2	46	22	24	20	19	16	15
Elderly care 1	43	22	21	20	21	19	18
Elderly care 2	18	9	9	6	7	4	7
N total	195	94	101	80	90	66	77

not completing all measurements within the control group was random, while in the experiment group it was negatively associated with age (at Time 3) and educational level (at Time 2). Work engagement at Time 1 was also negatively related to non-completion at Time 2 within the experiment group. Furthermore, two organizations had relatively higher dropout rates among the experiment groups. The trainers observed that participants in these groups found it more difficult to prioritize themselves and the training, as they reported work related stress. Low education, youth, and high levels of psychological distress have been reported to predict attrition in longitudinal studies (Gustavson, Von Soest, Karevold, & Røysamb, 2012). Based on the observations regarding dropout, we decided to control for age and educational level in all the analyses. Due to the dropout, the sample predominantly consisted of respondents from three organizations (2× disability care homes and 1× nursing home; Table 1). This sample of 170 respondents was mainly female (96%) with an average age of 43.7 (*SD* = 11.3). Furthermore, 7% completed primary/secondary school, 67% completed vocational training and 26% completed a college degree.

Self-leadership intervention

The training programme had a blended learning approach consisting of two group workshops (week 1 and week 8) and eight weekly e-learning modules available on an online learning platform. The content of the self-leadership training programme was based on exercises from the practical guide for mastering self-leadership by Neck and Manz (2013), positive thinking (Seligman, 2012), strength-based coaching (Linley & Harrington, 2006), and proactive problem solving (Covey, 1989). In addition, the facilitation of autonomy was the specific starting point for the training programme design, in order to stimulate the self-determination process (Deci & Ryan, 2000; Ryan & Deci, 2017). Autonomous motivation to develop self-leadership through this training, was prompted by making participation fully voluntary. Equally, the online training exercises were not mandatory, but based on free choice. This means that participants were free to decide for themselves whether or not to make use of the exercises for developing self-leadership and achieving their self-set goal. Furthermore, in the content of every exercise it was checked whether the autonomous motivation was facilitated. Prior to the training, a pilot study was conducted with two small training groups (resp. six hospital nurses and three homecare nurses), in order to make the workshops and the e-learnings applicable and relatable to the target audience. Three expert trainers with a background within occupational psychology and occupational health psychology were responsible for facilitating the training.[1]

The training started with an introduction workshop. During this workshop, participants were supported to observe their own effectiveness in self-leadership skills as well as observe their own vitality. By reflecting on whether activities and situations are energizing or depleting, people are assumed to become more aware of their vitality as well as the differences between controlled and autonomous motivation for activities in their lives. Subsequently, people were encouraged to mentally focus on the things they *can* influence, and also *want* to influence. Thereafter, participants were asked to determine their own goals for developing their vitality, thus based on autonomous motivation.

[1] *In order to check the overall satisfaction with the training, a short survey with two open-ended questions was conducted among the intervention group after finishing the training as a way to get insight in the perceptions and experiences of the training itself. The results are available upon request.*

Following the introduction workshop, participants could exercise self-leadership throughout the eight e-learning modules. Based on the pilot, it was expected that the weekly module would take approximately 1 hr.

Module 1 focused on the use of challenging goal setting with the aim to increase energy in a short time, namely 1 week. The rationale was that setting challenging though energizing and achievable short-term goals would increase both self-efficacy (belief that one is able to achieve the goal) and autonomous motivation (willingness to actually achieve the goals). As the goal is a challenging one, it is assumed people still may experience difficulties in achieving the goal. Therefore, participants were encouraged to use reminders and self-rewards to support goal-achievement (Neck & Manz, 2013).

In module 2, participants reflected on the natural rewards within their job and on the opportunity to actually change aspects within the job such that it becomes more intrinsic motivating (Neck & Manz, 2013). By doing so, participants are supported in reflecting on their opportunities for self-influencing own work engagement.

In module 3, 4, 5, and 6, the specific focus was on training constructive thought patterns, based on strengths and opportunities for self-influence, rather than weaknesses and threats. In module 3, participants reflected on their strengths which they perceive as energizing and were encouraged to specifically use the energizing strengths (Linley & Harrington, 2006). Module 4 encouraged participants to mentally focus on the positive or naturally rewarding aspects during a day, rather than the negative ones, and reflect on how they influenced these (Seligman, 2012). Module 5 facilitated participants to evaluate negative thoughts in specific situations within their daily life and subsequently transform these into positive thoughts (Neck & Manz, 2013). Module 6 concerned the implementation of self-leadership strategies in concrete difficult or challenging situations in daily life. Participants were encouraged to reflect on their own thoughts and behaviours within this situation as well as on the opportunities and their willingness to actually change the situation (Covey, 1989; Neck & Manz, 2013). Based on this reflection, the participant was able to draw his/her own conclusion for actual change behaviour.

In module 7, participants were invited to reflect on their aspirations for career development based on the insights from the previous modules: the insights in desired natural rewards within the job (module 2) and in personal strengths which are inherent energizing (module 3). Module 8 was a summary of the course.

At the end of these 8 weeks, the training closed with a second group workshop. During this workshop, participants evaluated their own results with regard to their personal goal for the development of their vitality. Moreover, participants were challenged to mentally focus on their strengths and positive achievements rather than negative aspects of their personal functioning. Finally, the workshop gave participants the opportunity to discuss questions concerning the implementation of self-leadership within their daily lives.

Measures

Work engagement

For measuring work engagement, we took the six items from the Utrecht Work Engagement scale specifically referring to vitality and dedication (Schaufeli et al., 2006), since this indicates autonomous motivation at work. A sample item referring to vitality at work is 'At my work, I feel bursting with energy'. A sample item for dedication was 'I am enthusiastic about my job'. Participants responded on a 7-point response scale ranging

from never (1) to always (7). Cronbach's alpha's were stable over time (T1 = .91; T2 = .94; T3 = .93).

General performance was measured with the single item indicator for general performance (Kessler et al., 2003) in which respondents are asked to rate their overall work performance during the last 4 weeks on a scale ranging from 0 to 10.

General health was measured with a single item 'How would you rate your general health at this moment' (Hooftman et al., 2017). Respondents answer on a 6-point Likert scale ranging from very bad to very well.

Self-leadership

For measuring self-leadership strategies, eight subscales from the Revised Self-leadership questionnaire (Houghton & Neck, 2002) were selected: self-observation (four items, e.g., 'I usually am aware of how well I'm doing as I perform an activity'), self-goal setting (five items, e.g., 'I establish specific goals for my own performance'), self-cueing (two items, e.g., 'I use written notes to remind myself of what I need to accomplish'), self-reward (three items, e.g., 'When I do an assignment especially well, I like to treat myself to some thing or activity I especially enjoy'), self-punishment (four items, e.g., 'I tend to get down on myself in my mind when I have performed poorly'), evaluation thoughts and assumptions (four items, e.g., 'I think about my own beliefs and assumptions whenever I encounter a difficult situation'), self-talk (3 items, e.g., 'Sometimes I find I'm talking to myself (out loud or in my head) to help me deal with difficult problems I face'), and natural rewards (five items, e.g., 'I seek out activities in my work that I enjoy doing' and 'I focus my thinking on the pleasant rather than the unpleasant aspects of my job activities'). Furthermore, we used the scale for self-leadership behaviour (Yun, Cox, & Sims, 2006; six items, e.g., 'I solve problems when they pop up without always getting my supervisor's stamp of approval'). Cronbach's alpha's were stable over time (T1 = .81; T2 = .87; T3 = .88).

Control variables

We controlled for organization (by creating four dummy-variables), age and educational level, since these variables were related to the dropout within the experiment group throughout the intervention. We also controlled for job autonomy at T1, since job autonomy is seen as an important resource for work engagement, health, and performance of health care workers (Keyko, Cummings, Yonge, & Wong, 2016), while it is also an antecedent for self-leadership (Stewart et al., 2011). Job autonomy was measured with the 9-item job autonomy scale by Morgeson and Humphrey (2006). Employees responded on a 5-point response scale ranging from strongly disagree (1) to strongly agree (5), and the scale showed sufficient reliability (α = .91).

Analyses

Multi-level modelling was used to test the hypotheses. We used a two-level model as the measurement occasions were nested within person. Level-one variables were group-mean centred, and all random effects were fixed. We followed the procedure used by Le Blanc, Hox, Schaufeli, Taris, and Peeters (2007) to test Hypothesis 1. LeBlanc and colleagues propose to conduct a level-1 moderation analysis which includes two dummy variables representing measurement time (i.e., pre-intervention was coded as 0 and

post-intervention at T2 and post-intervention at T3 as 1), group membership (i.e., experimental or control group), two interaction terms representing the products of these three dummy variables, and effects of these variables on the three dependent variables work engagement, job performance, and health. A significant interaction term indicates that the level of change in the experimental group is significantly different from that of the control group.

To test Hypothesis 2, which proposes that work engagement at T2 mediates the effect of the intervention on job performance and health at T3, we followed the procedure for testing multilevel mediation recommended by Preacher, Zyphur, and Zhang (2010). This involved testing the significance of the within- and between-level indirect effect using bootstrapping to obtain bias-corrected 95% confidence intervals for the indirect effects (Bauer, Preacher, & Gil, 2006). In the model, Path a is the path from the interaction terms to the mediator work engagement, and Path b is the path from work engagement to the dependent variables job performance and health. Also included in the model were paths from the interaction term to the dependent variables. Because we are interested in the mediating role of work engagement at T2 on the dependent variables at T3, we used the between-level indirect effect to test hypothesis 2.

To test for non-random sampling effects due to participant attrition, we followed Goodman and Blum's procedure (Goodman & Blum, 1996). They propose to conduct a logistic regression in which the dependent variable was a dichotomous variable representing those present at Time 1, 2, and 3 and those who responded at Time 1 and dropped out at Time 2 and/or Time 3 (i.e., dropouts). All the main study variables at Time 1 and Time 2 were entered as independent variables. A significant effect of one of the independent variables indicates that participant attrition might bias the results. The results show that none of the study variables at Time 1 and Time 2 significantly predicted the attrition dummy variable.

Results

Manipulation checks

Table 2 presents the means and standard deviations for both the experiment and control group and includes group differences at the three measurement points. We first tested whether the self-leadership intervention indeed significantly improved self-leadership within the intervention in contrast to the control group. In line with other studies on self-leadership training (Lucke & Furtner, 2015; Unsworth & Mason, 2012), we tested whether the use of self-leadership strategies significantly increased among the intervention group as compared to the control group (see Table 2). A series of *T*-tests revealed that there were no differences between experiment and waiting list control groups in the pre-test condition at Time 1 (3.03 vs. 3.01, $t = -.35(168)$, p = ns). On Time 2 (3.25 vs. 3.11, $t = 2.28(168)$, $p < .01$) and Time 3 (3.31 vs. 3.14, $t = 2.43(141)$, $p < .01$), the results show that self-leadership is higher in the experimental group compared with the control group, which shows the effect of the manipulation.

Hypothesis tests

Table 3 presents the means, standard deviations, correlations, and reliabilities between all study variables over time. Table 4 shows the results of the multilevel analyses used to test the hypotheses. We also conducted additional ANOVA's to compare the means of the five

Table 2. Means and standard deviations of experimental and control group, including *T*-values at the three measurement occasions

	Experimental		Control					
Variable	Mean	*SD*	Mean	*SD*	*t*	df	*p*	Diff
Self-Leadership T 1	3.03	0.35	3.01	0.36	0.35	168	.73	0.02
Self-Leadership T 2	3.25	0.40	3.11	0.40	2.28	168	.02	0.14
Self-Leadership T 3	3.31	0.43	3.14	0.40	2.43	141	.02	0.17
Work engagement T1	5.11	1.00	4.99	1.03	0.79	168	.43	0.12
Work engagement T2	5.36	1.06	4.99	1.10	2.23	168	.03	0.37
Work engagement T3	5.45	0.90	5.11	1.13	2.01	141	.05	0.35
Job performance T1	7.33	1.12	7.37	1.12	-0.24	168	.81	-0.04
Job performance T2	7.86	1.00	7.47	0.94	2.66	168	.01	0.40
Job performance T3	7.97	0.89	7.56	0.92	2.69	141	.01	0.41
Health T1	3.95	1.02	3.68	1.09	1.68	168	.10	0.27
Health T2	4.08	0.73	3.82	1.00	1.87	168	.06	0.25
Health T3	4.21	0.87	3.95	1.05	1.62	141	.11	0.26

organizations. No differences between the five organizations with respect to the core variables of the study were found. We also conducted the multilevel analyses with all control variables (age, educational level, job autonomy, and the four organization-dummies) again; the results were not different from the results reported in Table 4. Considering the size of the sample, we therefore decided to report the most parsimonious model.

Hypothesis 1 proposes that compared with the control group, participants in a self-leadership training will experience an increased (1) work engagement, (2) general health, and (3) general performance 1 and 8 weeks after the training. For work engagement, the results show a significant intervention effect at Time 2 (γ = .24(.10), $p < .05$), and a small intervention effect at Time 3 (γ = .20(.11), $p < .10$). Closer inspection of the means at the three measurement points shows that work engagement increased from Time 1 to Time 2 in the experimental group (5.11 to 5.36), but not in the control group (4.99 to 4.99). From Time 1 to Time 3, work engagement slightly improved in both the experimental group (5.11 to 5.45) and control group (4.99 to 5.11). This partly supports Hypothesis 1a.

For job performance, the results show a significant intervention effect at Time 2 (γ = .43(.18), $p < .05$), and at Time 3 (γ = .43(.19), $p < .05$). Closer inspection of the means at the three measurement points shows that job performance increased from Time 1 to Time 2 in the experimental group (7.33 to 7.86) to a larger extent compared with the control group (7.37 to 7.47). From Time 1 to Time 3, job performance also improved more strongly in the experimental group (7.33 to 7.97) compared with the control group (7.37 to 7.56). This result supports Hypothesis 1b.

Finally, for general health, the results show that the intervention effects at Time 2 (γ = −.02(.12), p = ns) and at Time 3 (γ = .05(.14), p = ns) are not significant. Closer inspection of the means at the three measurement points show that general health increased from Time 1 to Time 2 in the experimental group (3.95 to 4.08) but also in the control group (3.68 to 3.82). From Time 1 to Time 3, general health also improved in the experimental group (3.95 to 4.21) as well as in the control group (3.68 to 3.95). This result rejects Hypothesis 1c.

Table 3. Means, standard deviations, and correlations of the study variables

Variable	Mean	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Intervention[1]	–	–	–											
Educational level	7.00	1.17	.10	–										
Age	43.71	11.29	.04	−.19*	–									
Job autonomy	2.84	.61	.06	.01	−.01									
Health T1	3.81	1.06	.13	−.02	−.01	.09	–							
Health T2	3.94	.89	.14	.03	.01	.05	.72**	–						
Health T3	4.07	.98	.14	.01	−.03	.19*	.67**	.71**	–					
Performance T1	7.35	1.12	−.02	−.03	.13	.27**	.25**	.20**	.18*	–				
Performance T2	7.65	.99	.20**	−.02	.22**	.05	.27**	.32**	.34**	.51**	–			
Performance T3	7.75	.93	.22**	.06	.16	−.01	.18*	.29**	.38**	.51**	.51**	–		
Work engagement T1	5.05	1.01	.06	−.06	.16*	.29**	.43**	.41**	.48**	.55**	.51**	.37**	–	
Work engagement T2	5.17	1.10	.17*	−.03	.15	.19*	.40**	.45**	.56**	.57**	.55**	.41**	.80**	–
Work engagement T3	5.27	1.04	.17*	.03	.09	.24**	.36**	.41**	.54**	.20**	.57**	.53**	.77**	.81**

[1]0 = waiting list control group, 1 = intervention group.; *Correlation is significant at the .05 level (two-tailed).; **Correlation is significant at the .01 level (two-tailed).

Table 4. Results of multilevel analyses

	Work engagement	Job performance	Health	Job performance T3	Health T3
Intercept	5.11(.12)***	7.32(.13)***	3.95(.11)***	5.03(.24)***	2.27(.24)***
Work engagement T2				.44(.04)***	.32(.04)***
Time and intervention					
Experimental group[1]	.12(.16)	−.04(.17)	.27(.15)†	−.09(.16)	.23(.14)
Time 2	.25(.07)**	.54(.13)***	.12(.08)	.42(.13)**	.04(.09)
Time 3	.32(.08)***	.61(.14)***	.30(.10)**	.47(.14)**	.19(.09)†
Experimental group × Time 2	.24(.10)*	.43(.18)*	−.02(.12)	.32(.18)†	−.10(.12)
Experimental group × Time 3	.20(.11)†	.43(.19)*	.05(.14)	.33(.18)†	−.01(.13)

[1]0 = waiting list control group, 1 = intervention group.; †Parameter is significant at the .10 level (two-tailed).; *Parameter is significant at the .05 level (two-tailed).; **Parameter is significant at the .01 level (two-tailed).; ***Parameter is significant at the .001 level (two-tailed).

Hypothesis 2 concerned the indirect effect of the intervention on (1) performance and (2) general health 2 months after the intervention, mediated by work engagement directly after the intervention. Table 4 shows that work engagement at T2 is significantly associated with both job performance T3 (γ = .44(.04), $p < .001$) and general health T3 (γ = .32(.04), $p < .001$). Moreover, the indirect path from the intervention to job performance at Time 3 through changes in work engagement at Time 2 was significant (γ = .41(.22), $p < .05$, 95%$CI_{ll,ul}$ = .86; .01). We find a similar result for general health, work engagement at Time 2 mediates the intervention effect on general health at Time 3 (γ = .43(.20), $p < .05$, 95%$CI_{ll,ul}$ = .83; .03). These findings provide full support for hypothesis 2.

Discussion

In this study, we aimed to test the impact of a self-leadership intervention on work engagement, health, and job performance of health care workers, and the mediating role of work engagement on this effect for health and job performance. By integrating SDT and self-leadership theory, the present study showed that a voluntary-based self-leadership training programme positively impacts work engagement and performance of health care workers. Moreover, improved work engagement also mediates the effects of the training programme on health and performance 2 months later.

Theoretical implications

These findings have several implications for theory. Working within a health care setting is considered highly demanding, both physically and emotionally (Broetje et al., 2020; Garrosa et al., 2008). The current corona virus pandemic (COVID-19) is challenging health care workers' ability to cope with stress and to proactively look after their own health even more than before (Pearman, Hughes, Smith, & Neupert, 2020; Vagni, Maiorano, Giostra, & Pajardi, 2020). This is in sharp contrast to the critical need for healthy and productive health care workers. In the past, acknowledgement of the highly demanding

work context of health care workers has led to a large number of intervention studies with the aim to reduce stress (e.g., Ruotsalainen et al., 2015). However, this main focus on the negative work context might have resulted in a blind spot for the potential benefits of enhancing positive motivational processes.

According to SDT, stress is associated with controlled motivation (Deci et al., 2017; Van den Broeck et al., 2011). If interventions for health care workers continue to focus on dealing with demands, the focus remains too much on problems instead of strengthening positive mechanisms in motivation and performance. SDT asserts that it is autonomous motivation that predicts vitality, health, personal growth, as well as high quality and sustainable performance (Deci et al., 2017). If people are able to function autonomously, they tend to be more engaged in their job, they are more likely to thrive, as well as be more resilient to work related stressors. The present study shows that developing self-leadership indeed contributes to work engagement and performance, and moreover, that work engagement predicts health and performance 2 months later. This underpins the importance of changing the focus from dealing with negative external factors to taking the lead and acting on basis of self-determination for the individual development of health care workers.

Our findings are also in line with recommendations by several health care scholars about the development of psychological empowerment (Wagner et al., 2010) and hardiness (Garrosa et al., 2008; Guglielmi, Gallì, Simbula, & Mazzetti, 2019) of health care workers. Psychological empowerment is characterized by self-determination, competence to control things, and the perception of having impactful and meaningful work (Thomas & Velthouse, 1990). People with a hardy personality tend to proactively control work and life, search for solutions to the challenges and difficulties which they meet, while being committed to both their work and to themselves (Garrosa et al., 2008). Research shows that health care workers with a hardy personality have a positive and reciprocal relationship with work engagement and have fewer symptoms of burnout (Garrosa et al., 2008; Guglielmi et al., 2019). A self-leadership training programme can be an effective way of giving health care workers the opportunity to develop more psychological empowerment, hardiness, and better health. Through developing their self-leadership, health care workers might experience that they are more in control of their work, as well as enjoying their job for the implicit or natural rewards which reside within their job.

The present study also contributes to self-leadership theory by addressing autonomous motivation as a mechanism to explain the positive and sustainable effects of self-leadership interventions. Other studies have shown that self-leadership interventions contribute to self-efficacy and the conservation of resources, which subsequently explain the positive outcomes related to well-being and performance (e.g., Lucke & Furtner, 2015; Unsworth & Mason, 2012). However, Ryan and Deci (2006) argued that self-efficacy is not a guarantee for autonomous motivation. If a performance goal is externally regulated and still achieved, the self-efficacy concerning that goal-achievement might increase, and also short-term performance, while autonomous motivation is still lacking (Ryan & Deci, 2006). Therefore, both self-efficacy and autonomous motivation are important considerations in the self-leadership process and should be tested together in future research to examine its combined effects.

While we assume that practising self-leadership on the basis of autonomous motivation have contributed to the research outcomes, we need to consider the potential effects on need satisfaction through training as well (Deci et al., 2017). SDT theorizes that the satisfaction of the basic psychological need for autonomy, for competence and for social

relatedness facilitate the intrinsic motivating process. Therefore, SDT-based interventions often specifically focus on facilitating the need satisfaction as it is assumed that need satisfaction will in itself function as nutrient for the intrinsic motivational process (Ryan & Deci, 2017). Although we did not measure need satisfaction, we expect that our intervention may have satisfied all three needs. First, our intervention satisfied the need for autonomy, because participation in the intervention was fully voluntary during the whole process. The development goals were encouraged to be autonomy-based. Second, training of self-leadership might have satisfied the need for competence, since self-leadership scholars have repeatedly found evidence for the increase in self-efficacy after training self-leadership (e.g., Lucke & Furtner, 2015; Unsworth & Mason, 2012). And third, the training of self-leadership was designed within a group setting (maximum 10 participants). People were encouraged to cooperate with each other during the workshops as well as during the online training. Equally, the trainer facilitated the learning process by positively rewarding participants for their reflections and behaviour. These encouragements by colleagues and the trainer may have satisfied the need for social relatedness, which in itself might have contributed to the work engagement. Future research should include measures of need satisfaction in order to establish its contribution to work engagement, performance, and health as a result of a self-leadership training programme.

Practical implications

When health care organizations offer their employees a self-leadership training programme, they can expect better work engagement, health and performance from their employees due to their improved ability to take the lead. However, facilitating self-leadership development requires some consideration. The voluntary basis of the training programme challenges HRM and managers to attract employees to actually participate in the training programme. The employer can of course facilitate the development of self-leadership but cannot dictate it, as this would lead to controlled motivation instead of autonomous motivation for participation (Dorssen-Boog, Van Vuuren, & Yigit, 2019; Van Vuuren, Lub, & Marcelissen, 2016). In order to encourage employees to participate, health care organizations need to build a communication strategy around self-leadership and the development opportunities. Using multiple communication lines such as direct emails and verbal information by managers and HR professionals is recommended. Furthermore, it is important that employees experience a culture in which they are allowed to take the lead in their own performance and well-being (Van Vuuren et al., 2016). Developing empowering leadership can be helpful for building such a culture, as it is this type of leadership that positively influences self-leadership of employees (Yun et al., 2006).

Limitations and implications for further research

Although the experimental design is an important strength of our study, there are also several limitations. The present study was set within the health care sector, which is a strength for understanding this specific female sector, but a limitation for generalizing to the general labour market. Replication of this study within other sectors is therefore needed.

Second, all our data are based on self-report questionnaires, which are prone to common method bias. Yet, we specifically chose this design, because we were interested in how engaged our participants were. Work engagement is a private experience which is

difficult to assess by another person (e.g., supervisor or colleague). To support our choice, Spector (2006) has shown that common method bias is hardly ever strong enough to bias results. We followed the recommendations by Podsakoff, MacKenzie, Lee, and Podsakoff (2003) to minimize the risk of common method bias. First, we guaranteed anonymity of respondents, thereby reducing the possibility of social desirable answers. Second, we created a psychological separation between the measures in the questionnaire. However, we encourage research using more objective measures for health and performance.

Self-report questionnaires are often lengthy, which may result in a substantial burden to participants and stimulate dropout. To avoid this, we used two single-item measures for general health and general performance. Although single-item measures could be a challenge for reliability and validity, research shows that our self-reported single-item measures for general health and general performance have been used with satisfactory levels of validity and reliability (Bowling, 2005).

While the present study assessed the sustainability of the training effects 2 months after finishing the training and theorized that this will predict the impact of the training on work engagement, performance, and health, we were not able to test the effects over longer time periods. We suggest for future studies to design the research in such way that effects can be measured over longer time periods. Moreover, further research could include a third group that follows a placebo intervention in order to test for potential placebo effects (Foroughi, Monfort, Paczynski, McKnight, & Greenwood, 2016).

The self-leadership literature suggests that self-leadership might not suit every individual nor is it a panacea for all the problems related to the work environment or labour market (Manz, 2015). Within our dropout analysis, it was found that people who have less education, were younger or reported lower work engagement, and had higher attrition rates in the experiment group. It remains unclear whether these participants did or did not benefit from the training of self-leadership. We suggest a more elaborate investigation of the preconditions (both personal, private, and contextual aspects) which positively or negatively influence training effects. For example, the improvement of self-leadership might affect both working and private life, leading to positive gain spirals of resources in both at work and at home.

Finally, the present study did not control for individual characteristics such as personality or core self-evaluation, since autonomous motivation to participate in the training programme was an important precondition for the study. The study also did not control for the effect of hierarchical leaders. However, individual characteristics (Williams, 1997) and hierarchical leaders (Marshall, Kiffin-Petersen, & Soutar, 2012) may have had an impact on the effectiveness of self-leadership development. For instance, Assen and Bekker (2009) have suggested that women, who formed the biggest part of our sample, often find it difficult to stay aware of their autonomous goals and needs, as they tend to be highly sensitive to other's needs (Assen & Bekker, 2009). Inclusion of personality and leadership characteristics can provide insight into the influence of these factors on the effectiveness of a self-leadership training programme.

Conclusion

The present study has shown the relevance of facilitating health care workers with a voluntary based self-leadership training programme. Considering the critical role of the health care sector in society, gaining more knowledge on developing healthy and productive health care workers is of vital importance. By developing self-leadership, with

specific attention for self-determination, our study finds that health care workers are more engaged with their job, which in turn leads to more health and performance.

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Conflicts of interest

All authors declare no conflict of interest.

Author contribution

Pauline van Dorssen Boog (Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Visualization; Writing – original draft; Writing – review & editing) Jeroen P. de Jong (Conceptualization; Formal analysis; Methodology; Supervision; Validation; Writing – original draft; Writing – review & editing) Tinka van Vuuren (Conceptualization; Funding acquisition; Methodology; Supervision; Validation; Writing – original draft; Writing – review & editing) Monique Veld (Conceptualization; Methodology; Writing – original draft).

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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