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Enhancing employee engagement through integrating leadership and employee job resources: evidence from a public healthcare setting

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ABSTRACT

This study examines the mediating role of job resources on the relationship between leadership and the work engagement of healthcare professionals. A stratified random sample from across the public healthcare sector of Cyprus was used. Data from a total of 605 respondents were analyzed: nurses ($n=348$), physicians ($n=114$), and other health professionals ($n=143$). Using exploratory factor analysis, the antecedents of engagement were extracted, and a structural equation model was developed to investigate the hypothesized relationships. The results suggest that leadership factors such as leadership role encouragement and employee orientation leadership could elicit greater engagement among healthcare professionals by facilitating improved job resources (line-management supervision, development and training opportunities, and shared organizational vision). Notably, our results highlight the important role of a shared organizational vision in enhancing employee engagement. Our study provides important insights that can help managers and decision-makers further engage public healthcare employees.


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Introduction

In recent years, there has been a growing interest in the drivers of public employee engagement (Jin and McDonald 2017; Noesgaard and Hansen 2018; Gross, Thaler, and Winter 2019). According to the evidence accumulated, employee engagement can drive higher organizational performance. However, the underlying mechanisms and the relationship between such drivers and performance may differ in public sector organizations. Researchers and practitioners alike have stressed both the importance and the uniqueness of the environment in which public sector managers operate, which in turn may lead to differences in how employees are motivated (Ritz and Brewer 2013, Grand 2010). For instance, unlike in the private sector, leaders in public sector organizations are elected or politically appointed (Boyne 2002). Other factors that could introduce challenges in motivating government employees include strong employee protectionism and restricted capacity for the use of financial incentives (Boyne 2002).

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Consequently, motivating employees in the public sector could be challenging. Thus, promoting employee engagement in such settings needs to be addressed separately and in greater depth (Jin and McDonald 2017).

A public setting in which employee engagement could be of particular importance is health-care. The importance of this sector and its distinctiveness from the private sector has long been recognized (Walshe and Smith 2011, Hansen and Kjeldsen 2018). Annual healthcare expenditure in the US alone stands at \$3.5 trillion (Pearl and Madvig 2020), and the pressures on healthcare organizations to improve their quality of care are mounting. Healthcare services are typical examples of high-contact services (Chase 1981; Soteriou and Chase 1998), where the interaction between personnel and patient has significant potential for co-creation of value (Damali, Miller, Fredendall, Moore, and Dye 2016). Moreover, in healthcare settings, employee engagement has been associated with higher service quality ratings (Wake and Green 2019), self-reported quality of care (Lowe 2012), and patient experience (Lee 2017). Antecedents of employee engagement could therefore enhance engagement and indirectly facilitate higher organizational and employee performance (Harter, Schmidt, and Keyes 2003; Macinati, Nieddu, and Rizzo 2020). Previous studies have examined the effect of antecedents of engagement, employing a variety of theoretical approaches. These include examination, separately or in combination, of the effect on employee engagement of factors related to individual psychological states, their experience of job design-related factors, perceived leadership and management factors, individual perceptions of organizational-level factors, and organizational interventions or activities (Bailey et al. 2015). Consequently, it is of central importance for public health services management to further understand and identify the most relevant context-specific drivers of employee engagement, to target those areas of administration that will enhance employee engagement more proficiently.

Many countries recently have gone through major structural reforms regarding their healthcare systems. The setting of interest in this paper is the Republic of Cyprus' public health hospitals and health centers, which are undergoing a period of major transition toward a new, universal coverage system (General Healthcare System – GHS; Pallari, Samoutis, and Rudd 2020). The new national health system faces a series of challenges, as it is expected to provide universal coverage to Cyprus' population through the merging and coordination of public and private health resources. This study, undertaken during this transition period, sheds light on and further contributes toward understanding, the drivers of engagement among healthcare professionals, providing evidence-based suggestions and recommendations that can be useful to improve the work motivation of healthcare workers.

This paper makes several contributions. First, with its stress on the mediating role of job resources in the relationship between leadership practices and employee engagement (Schaufeli 2015), it contributes to public management research. Second, it makes an empirical contribution by exploring antecedents of employee engagement in a public healthcare setting. Unlike previous studies (Gillet, Fouquereau, Bonnaud-Antignac, Mokoukolo, and Colombat 2013; Hayati, Charkhabi, and Naami 2014), by identifying and treating shared organizational vision as a distinct job resource within our public healthcare setting, our study highlights the important role of shared organizational vision in employee engagement. Finally, with the setting of our study being a public healthcare system currently undergoing a major reform, our study provides important insights that can help managers further engage public healthcare employees in other, similar settings (Pallari et al. 2020). Enhancing employee engagement in such settings is of paramount importance and can prove beneficial toward a successful transition, as engagement has been shown to facilitate change implementation strategies, while reducing resistance to change behaviors (Sonenshein and Dholakia 2012).

The next section presents our theoretical framework and outlines our research hypotheses. This is followed by a description of our empirical study and the methods employed. Results, discussion, future research directions, and concluding remarks follow.

Theory and hypotheses

Employee engagement and antecedents in healthcare

The meaning of engagement and how it is defined in the practitioner literature, often overlaps with other constructs. However, in the academic literature it has been distinguished from other, related constructs, such as organizational commitment, organizational citizenship behavior, and job involvement (Saks 2006). Most frequently, engagement has been conceptualized as a “positive fulfilling, work-related state of mind” (Schaufeli, Salanova, González-Romá, and Bakker 2002). This perspective refers to engagement as a positive psychological experience that reflects a sense of vigor, dedication, and absorption, when carrying out work tasks. In this conception, employee engagement has been identified as a positive predictor of retention, employee health, performance, and job satisfaction (Harter et al. 2003, Halbesleben 2010). This underlines the significance of antecedents’ contributory to the development of work environments that are fulfilling and that enhance employee engagement.

Numerous theoretical frameworks have been used to assess engagement in the healthcare context. A systematic literature review performed by Bailey et al. (2015) highlights that a dominant framework in the literature is the Job Demands-Resources (JD-R) model, which classifies resources in terms of being either job-related or personal resources, and job demands (Bailey et al. 2015). Job resources can boost employees’ morale and foster engagement, which, in turn, yields positive outcomes such as higher levels of well-being and performance (Hu, Schaufeli, and Taris 2011). Personal resources such as self-efficacy, self-esteem, or optimism can also be relevant to high levels of engagement. Alternatively, job demands require employees to spend additional effort which, in the long term, could cause exhaustion and lead to negative outcomes (Demerouti, Bakker, Nachreiner, and Schaufeli 2001).

Another set of widely studied antecedents consists of perceptions of organizational and team factors, and psychological states (Bal, Kooij, and De Jong 2013). Individual psychological states encompass notions such as experienced psychological safety or availability, and can often be influenced by organizational factors such as perceived organizational support, organizational mission, climate or culture, and positive perceptions of colleagues and teams (Bailey et al. 2015). Finally, a set of studies has evaluated employee engagement through theoretical frameworks of leadership and management styles (Albrecht and Andreetta 2011; Gillet et al. 2013; Hayati et al. 2014), while a smaller number of studies have assessed organizational interventions, often aimed at raising engagement levels through training or development programs (Rickard et al. 2012; Tullar et al. 2016). Overall, studies suggest that there is a positive association between higher levels of antecedents such as job resources, positive psychological states, and positive perceptions of leaders and organizations, and higher levels of engagement. Alternatively, increased job demands and a negative organizational environment, in the form of bullying and harassment, coworker incivility, interpersonal conflict, pace of work and interdependence, were often found to be negatively linked to engagement (Bailey et al. 2015).

The research model

In the past, for the most part, JD-R scholars have considered leadership as a mere job resource in their JD-R frameworks (Breevaart, Bakker, Hetland, and Hetland 2014). However, recent research places leadership in another role, that of facilitating and/or balancing job resources and demands, which in turn generates greater levels of engagement (Schaufeli 2015; Hawkes, Biggs, and Hegerty 2017). This updated approach could provide a more thorough and comprehensive explanation of the relationship between leadership and engagement, which hasn’t yet been adequately and explicitly tested in the public sector, let alone in the healthcare setting. Moreover, this study is compatible with the recent call for academic research into the public sector that further clarifies the relationship between engagement and leadership, while contextualizing general

engagement models in relation to cultural and institutional factors (Fletcher, Bailey, Alfes, and Madden 2020).

According to Schaufeli (2015), leadership goes beyond a mere resource, since leaders are supposed to balance job demands and the resources available to their employees in such a way that they remain motivated, healthy, and productive. In carrying out this task, senior leaders should skillfully consider the impact of job demands and job resources upon their subordinates. For instance, transformational leadership has been found to facilitate employees' motivation and commitment by altering the work environment and core job characteristics (Piccolo and Colquitt 2006), which leads thereafter to greater work engagement (Breevaart, Bakker, Hetland, and Hetland 2014). On the other hand, inadequate leadership is associated with role conflict, role ambiguity, and conflicts with coworkers (Skogstad, Einarsen, Torsheim, Aasland, and Hetland 2007) and may therefore foster employee burnout and turnover.

With the aim of assessing the effect of JD-R on employee engagement, in conjunction with perceived leadership, two hypotheses are developed: One where leadership directly impacts employee engagement, and one where job resources mediate the impact of leadership factors on engagement. Previous research suggests that leadership has only an indirect effect on burnout and engagement – *via* job demands and job resources – and not a direct effect (Schaufeli 2015). However, we aimed to expand this knowledge by examining associations in a new setting, namely the public healthcare sector, while enriching the integration of leadership into the JD-R model (Schaufeli 2015), by also considering further job resources and leadership factors that are frequently not considered together. For this reason, we considered senior leadership concepts such as delegation of authority and employee orientation leadership, as well as shared organizational vision as an organizational job resource, that have not been considered before in the integration of leadership with the JD-R model.

Furthermore, although this may not be considered a job demand, undergoing a major administrative reform in creating a new universal coverage healthcare system, could nonetheless act as an implicit job demand in this setting. This adds to the policy salience of the present study, since leadership and its effect on engagement could act as a facilitator of structural reform *via* enhancing job-resources while reducing resistance to change behaviors (Sonenshein and Dholakia 2012). Efforts to encourage employee engagement generally have a positive impact on performance, since engaged employees tend to be more productive (Bakker, Demerouti, and Verbeke 2004, Schaufeli 2015). Nevertheless, scholars highlight that this relationship varies according to: the components that make up the engagement index, the professional group, and the organizational level at which these efforts are executed (Hameduddin and Fernandez 2019; Duda, Kominis, and Brunetto 2021). On the other hand, increased job demands from reform-based amendments such as the adoption of clinical practice guidelines and the introduction of an upgraded auditing clinical services system (Pallari et al. 2020), could act negatively on employee engagement and thus hinder the implementation of reform. Whether the first or the latter condition would apply, was beyond the scope of this study. [Figure 1](#) presents our overarching theoretical framework.

Job resources

Organizational shared vision. Shared vision has been treated in the past as an organizational-level resource capability, where the organization communicates its goals to members and shares responsibility for the attainment of organizational objectives (Aragón-Correa, Hurtado-Torres, Sharma, and García-Morales 2008; Lindley and Wheeler 2000, Alt, Díez-de-Castro, and Lloréns-Montes 2015). Alternatively, shared vision has also been included in leadership frameworks, such as transformational and engaging leadership constructs capturing senior management's efforts to communicate a shared vision and goals (Gillet et al. 2013, Hayati et al. 2014). Nevertheless, the present study considered more relevant that literature, where shared vision is treated as a distinct organizational resource capability (Pearce and Ensley 2004; Aragón-Correa et al. 2008) and has set

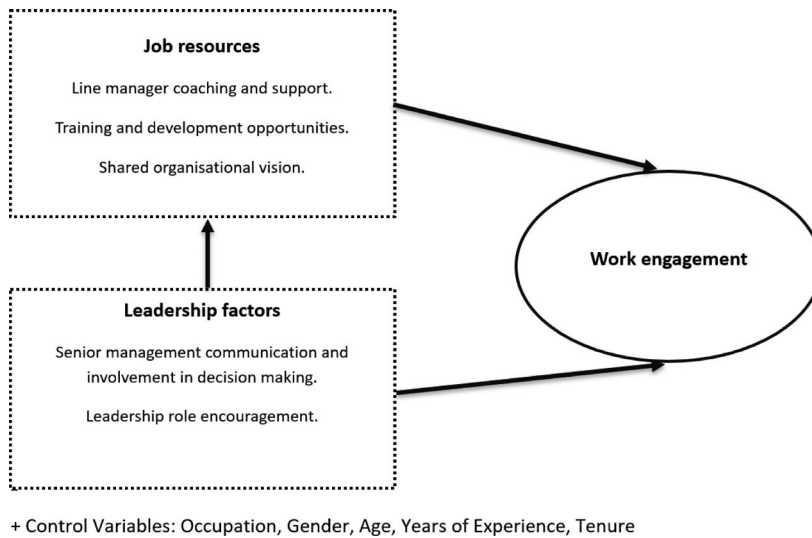


Figure 1. Study's theoretical framework with integration of leadership into the JD-R model.

aside the literature that treats it only within leadership frameworks. This is partly due to the institutional logic and bureaucratic environment of public organizations, which emphasize the separation of organizational culture from senior management (Parker and Bradley 2000), and stress the need to adopt models/constructs that better fit the public sector setting (Flecher, 2020). A further justification of this choice can be found in the competing empirical results, which encouraged the consideration of shared organizational vision as an organizational job resource rather than part of senior management construct.

A shared vision capability provides the basis for action within the organization, facilitating convergence toward long-term goals (Pearce and Ensley 2004). In the absence of shared vision, employees can become disengaged, resulting in “disillusionment and distrust instead of inspiration and motivation” (Oswald, Mossholder, and Harris 1994:479). The development of a shared vision could assist in providing meaning to employees’ everyday work activities (Real, Roldán, and Leal 2014). In this way, employees could become more engaged and committed to newly implemented strategies, which suggests that the effective deployment of strategies is highly dependent on the existence of a shared vision between managers and employees (Saks 2006, Pearce and Ensley 2004).

Previous empirical research suggests that shared organizational culture (Sarangi and Srivastava 2012) and strategic alignment with organizational priorities predict employee engagement in numerous work settings (Biggs, Brough, and Barbour 2014). Following the above discussion, we expect that a shared vision resource capability could be an important facilitator of employee engagement in the public healthcare sector, resulting to the following hypothesis:

H1: Health professionals’ perceptions of a shared organisational vision are independently positively associated with employee engagement in the public healthcare sector.

Line management resources. Within the framework of JD-R theory, line management resources have previously been associated with higher employee engagement (Demerouti et al. 2001; Bakker et al. 2004), with supervisory support being defined as “the degree to which employees perceive that supervisors offer employees support, encouragement and concern” (Babin and Boles 1996). A result of higher perceptions of supervisory support is that employees feel more secure, and believe that the firm takes care of their welfare (DeConinck 2010). Additionally, providing line management resources establishes reciprocity rules, where the efforts of employees are rewarded by the

organization, therefore, strengthening their psychological contract with the organization and motivating them to make the extra effort in their task performance (Demerouti et al. 2001). At the same time, supervisors who listen, give feedback and support under adverse circumstances, can give a significant motivational boost to employees (DeConinck 2010), since they can alleviate some of the stress associated with high job demands (Babin and Boles 1996). Consequently, providing employees with adequate resources such as supervisory support, results in their feeling less overwhelmed by job demands and maintaining higher levels of engagement (Demerouti et al. 2001; Bakker et al. 2004). Conversely, when supervisory support is absent, employees could question their value to and recognition by the organization, which can lead to detachment, frustration and disengagement (Menguc, Auh, Fisher, and Haddad 2013).

The line management resources encompassed in this study are line managers' support, feedback, supervision, encouragement of employee autonomy, and participation in decision-making processes. According to the literature, these job resources could drive employee engagement by a) assisting in achieving work goals, b) reducing job demands that are associated with psychological and physiological costs and c) stimulating growth and development (Demerouti et al. 2001). Where these job resources encompass or are accompanied by well-designed performance measurement tools (such as selection practices, rewards, training and appraisals), they can yield greater levels of employee engagement and, essentially, higher organizational performance (Smith and Bititci 2017). We would therefore expect that positive perceptions of line management resources are positively associated with engagement.

H2: Health professionals' perceptions of line management resources are positively associated with employee engagement.

Training and development opportunities. Development and training opportunities offered to employees are an acknowledged and empirically assessed set of engagement-facilitating activities. In the past, it has been argued that investment in employee development practices fosters a sense of obligation in employees toward the organization, and therefore increases employees' motivation, contributing to organizational performance (Kuvaas 2007). Training and developmental opportunities and their positive effect on employee engagement have been assessed within various theoretical frameworks, such as the Social Exchange Theory (SET) (Bal et al. 2013), the JD-Rs model (Opie et al. 2011), and Leadership style frameworks (Hornung, Rousseau, Glaser, Angerer, and Weigl 2011). The broad conclusion has been that developmental opportunities positively affect employee engagement either directly (Opie et al. 2011), indirectly (Bal et al. 2013) or by mediating the effects of other proposed theoretical factors (Hornung et al. 2011). For the purposes of our study, we treat training and development opportunities as a distinct job design resource (Opie et al. 2011), and we expect them to be independently associated with health professionals' engagement.

H3: Health professionals' perceptions of development and training opportunities are positively associated with employee engagement.

Leadership concepts

Delegation of authority. Conger and Kanungo (1988) have characterized empowerment as a process that involves a manager sharing power with subordinates. According to this notion, empowerment refers either to the process of strengthening employees' self-efficacy beliefs or to lowering their feelings of powerlessness (Conger and Kanungo, 1988). Konczak, Stelly, and Trusty (2000) created a construct to measure the leader-empowerment behaviors adopted by managers. This theoretical framework consists of three dimensions: the delegation of authority, accountability for outcomes, encouraging self-directed decisions (Konczak et al. 2000). Delegation of authority involves giving employees the responsibility to accomplish the tasks that are assigned to them in the way they consider most fit. Along with this responsibility, they also share the corresponding

degree of authority to guide decisions (Lyons 2016). According to the delegation of authority dimension, the distribution of power to employees should in turn increase intrinsic motivation by influencing task assessments related to meaning, competence, self-determination, and impact (Thomas and Velthouse 1990). Moreover, this delegation process could encourage subordinates and peers to work collectively toward goals while reducing the workload by spreading it to more individuals (Lyons 2016). Successful delegation of authority is associated with greater organizational commitment and lower levels of turnover, but it has been argued that it can also lead to hindering performance, due to the incompetence of employees to carry out particular tasks (Bell and Bodie 2012).

The theoretical concept of empowering leadership practices was later expanded, and was adopted by scholars assessing empowering leadership in the public management literature (Hassan, DeHart-Davis, and Jiang 2019; Fernandez and Moldogaziev 2011). This more recent work looks at employee empowerment as a managerial rather than a psychological approach. According to the psychological perspective, empowerment is a motivational construct analogous to a state of mind or a set of cognitions, whereas the managerial approach is a relational construct that describes whether those with power in organizations share power and authority with lower-level employees and allow them to make decisions about how services are delivered.

Ideally, the empowering leadership style enhances the meaningfulness of work, fosters participation in decision making, promotes confidence in high performance, and provides autonomy from bureaucratic constraints (Fernandez and Moldogaziev 2013). Overall, the literature suggests that competency of facilitating leader-empowering behaviors will influence how employees perceive the tasks presented to them by their leader. Evidently, it has been found to predict work engagement in the business setting (Mendes and Stander 2011). In this study, the construct generated refers to power-sharing practices and is labeled “leadership role encouragement”, since our construct captures the notion of power-sharing but lacks the element of responsibility that is encompassed in the comprehensive delegation of authority dimension as constructed by Konczak et al. 2000 (Konczak et al. 2000). We therefore hypothesize that health professionals who are encouraged to take a leadership role in their work tasks will show greater levels of engagement.

H4: Health professionals' perceptions of leadership role encouragement are directly positively associated with employee engagement.

In addition to the direct effect of empowering leadership on employee engagement, an indirect effect through job resources is also hypothesized in the present study, on the basis of the theoretical premise that leaders play a crucial role in managing allocations to and the impact of job demands and job resources on, their employees (Schaufeli 2015, Hawkes et al. 2017). Previous studies suggest that “good leaders” formulate a job environment and set the conditions to avoid burnout and to increase work engagement (Shuck and Herd 2012). In our study, empowerment leadership corresponds to managers encouraging employees to play a leadership role in their workplace, which could also affect the provision of job resources, such as: shared organizational vision, training and opportunities, and line management resources. More specifically, we assume that leadership role encouragement corresponds to providing employees with greater organizational resources, such as emphasizing goal alignment and sharing the organizational vision. This is based on the notion that engaging and transformative leaders connect with their followers by providing them with social and organizational resources (e.g. good team atmosphere, role clarity) (Schaufeli 2015, Breevaart, Bakker, Hetland, and Hetland 2014), which will eventually lead to greater levels of employee engagement. Therefore, we suggest that the effect of empowering leadership on employee engagement could be mediated *via* shared organizational vision.

Strengthening leaders provide their followers with work resources (e.g. job control, use of skills, task variety) and development resources (e.g. performance feedback, career perspective), while monitoring their qualitative and quantitative job demands (e.g. work overload, emotional

demands, and work-home interference) (Schaufeli 2015). Therefore, we argue that those managers who encourage employees to play a leadership role are going to provide employees with the means to perform that role by enhancing their training and development opportunities. The mediating role of training and development opportunities in the effects of transformational and engaging leadership on employee engagement has been depicted in theoretical frameworks where the JD-R model is integrated with leadership (Hawkes et al. 2017, Schaufeli 2015). Accordingly, we suggest that empowering leadership will lead to greater levels of employee engagement by providing employees with training and development opportunities.

Finally, we propose that public sector line managers who themselves experience engaging leadership are likely to provide greater line management resources to their own subordinates. This theoretical insight originates from the researched notion that empowering leadership practices may trickle down across management levels in public organizations (Park and Hassan 2018), suggesting therefore that psychologically empowered line managers are in turn more likely to provide empowering job resources to their subordinates. Social cognitive theory suggests that the efficacy beliefs of public managers are likely to be influenced by the behavior of their role models (Park and Hassan 2018). In accordance with this suggestion, line managers are likely to imitate their seniors' behavior and emulate their leadership styles, due to the influence seniors exert on themselves (Quinn and Spreitzer 1997). We hypothesize therefore that the extent to which public healthcare line managers will adopt empowerment practices and provide job resources is likely to depend on the empowering behavior of their senior supervisors. As noted above, the empowering line management job resources considered in this study include managers' feedback, employee support, encouragement of employee autonomy, and participation in the decision-making process. We set out to test therefore, whether, engaging leadership would trickle down across management levels and have an effect on employee engagement *via* enhancing line management resources.

H5: Health professionals' perceptions of leadership role encouragement are indirectly positively associated with employee engagement via job resources.

Employee orientation leadership. An important construct in leadership theory is that of employee orientation leadership, where employee orientation is part of a two- or even three-dimensional leadership framework (Ekvall and Arvonen 1991). Within this employee orientation leadership notion, the managers focus on the people who work for them rather than on the tasks in hand (task/performance-oriented leadership). Employee-oriented leadership has been considered a more "participatory" style than the production orientation leadership style (Ekvall and Arvonen 1991). Employee-oriented leaders are thought to be empowering and supportive of their subordinates, by respecting them, focusing on their needs, and caring about their well-being (Judge, Piccolo, and Ilies 2004). In doing so, senior managers should, among other matters, establish effective communication with employees and involve them in the decision-making process (Ekvall and Arvonen 1991, Othman, Hamzah, Abas, and Zakuan 2017). Such effective communication is essential in driving organizational change (Schaufeli 2013), and thus it is very valuable for leaders who want to change things and exert influence. Moreover, transparent and clear communication by leaders is likely to induce trust in employees, which indirectly leads to greater levels of employee engagement through perceived authentic leadership (Hsieh and Wang 2015). A 'joining' communication style, where the employee is given the opportunity for their voice to be heard, was found to be able to influence their engagement (Othman et al. 2017). Furthermore, the use of both directive and discursive communication creates an environment where employees are prone to be engaged, since such communication makes them feel valued and involved (Reissner and Pagan 2013). In the public healthcare sector this has become even more apparent during the recent health emergency, the COVID crisis, where managers' effective communication was a vital component of health professionals' willingness to provide care (Lord, Loveday, Moxham, and

Fernandez 2021). We therefore hypothesize that senior management's effective communication and the involvement of employees in decision making are important drivers of engagement.

H6: Health professionals' perceptions of senior management's effective communication and involvement in decision making are directly positively associated with engagement.

Transformational and authentic leadership highlights the role of communication: senior management should take to direct and inspire employee effort by raising trust and awareness of the importance of organizational values and goals (Hsieh and Wang 2015, Moynihan, Pandey, and Wright 2012). According to public management scholars, during this process leaders set out to create a sense of vision, mission, and purpose that will generate employee confidence and alignment with future organizational goals (Moynihan et al. 2012, Wright, Moynihan, and Pandey 2012). Moreover, this appeal to a greater purpose activates a higher-order need in employees, which motivates them to set aside their own self-interest for the sake of the wellbeing of the organization and its customers (Wright et al. 2012). In other words, leadership communication can enhance employee engagement through raising trust and awareness of organizational values and goals. Accordingly, we set out to test whether senior management's effective and 'joining' communication was affecting employee engagement by facilitating the organizational resource of shared organizational vision in the public healthcare sector.

H7: Health professionals' perceptions of senior management's effective communication and involvement in decision making are indirectly positively associated with engagement via job resources.

Data and methods

Sample and procedures

The data used in this study were obtained from a cross-sectional survey conducted in Cyprus in 2019 with the collaboration of several stakeholders, including the Schools of Medicine and Business of the University of Cyprus, the Ministry of Health of the Republic of Cyprus, and the State Health Services Organization. The survey instrument used in this study was similar to the instrument used for the United Kingdom (UK) National Health Service (NHS) 2018 Staff Survey. Ethics approval to conduct the survey was obtained from the Cyprus National Bioethics Committee (29/11/2018, EBK/EΠ/2018.01.176).

The questionnaires were distributed in person to selected employees by field workers. A secure message box was placed at each hospital/health center where employees could return their completed questionnaire anonymously. A stratified (by profession) random sample of 1,425 employees from all public hospitals and health centers in Cyprus was used in the survey. The overall response rate was 50.5% ($N=713$), which was deemed adequate for use in assessing theoretical constructs (Wolf, Harrington, Clark, and Miller 2013). Of the 713 participants, a total of 605 were used in our analysis: nurses ($n=348$), physicians ($n=114$), and other health professionals ($n=143$). In agreement with the stratified random sample, the majority of the respondents were female. The analyzed sample was made up of 173 males (28.8%), 378 females (62.9%) and 50 (8.3%) individuals who preferred not to specify their gender. Most of the respondents were in the age group 30-49 years old (73.5%), whereas younger individuals (≤ 29 years old) constituted only 5% of the sample. Those with moderate or high organizational experience, corresponding to 6-15 years and 15+ years respectively, made up most of the sample (85%), with the two groups having almost equal representation. The vast majority of respondents included in the analysis were non-managerial employees (74%), with intermediate managers constituting 23% of the sample and top managers being 3% of those individuals who responded. The demographic data of the responders included in the analysis are presented in Table 1. A drawback for the generalizability of the results of the study is the under-representation of physicians in the final sample, due to their lower response rate. In the stratified randomly selected

Table 1. Demographic data of employees in the final sample.

Occupation	Number (N)	Percentage (%)
Physician	114	18.82
Nurse	348	57.54
Other health professionals ^a	143	23.64
Gender		
Male	173	28.79
Female	378	62.90
Prefer not to say	50	8.32
Age		
≤29 years	30	5.03
30–49 years	439	73.53
50+ years	128	21.44
Years working at the organization		
≤5 years	87	14.50
6–15 years	273	45.40
15+ years	240	40.00
Hierarchical position		
Not managerial	355	73.80
Intermediate management	110	22.87
Higher management	16	3.33

^aOther Health Professional category includes occupational therapist, physiotherapist, pharmacist, psychologist, psychotherapist, laboratory specialties, other specialized scientific personnel (e.g. biochemist, nutritionist, speech therapist, etc.)

sample, the percentage of physicians was around 30%, whereas in the final sample that percentage was 20%.

Measurement of the study variables

For this study, we focused on 20 survey items (see [Table 1](#), Supplemental Digital Content) from the questionnaire sections that were related to our theoretical concepts, such as those sections for line managers, senior managers, career development, empowering leadership role, and organizational vision. Each of these items was rated on a five-point Likert scale ranging from strongly disagree to strongly agree. We aimed to grasp the associations between overarching theoretical concepts rather than to examine differences within groups.

The measurement of employee engagement was performed using the NHS England construct structure. Historically, NHS England management has adopted the broader model proposed by the Institute for Employment Studies (IES), focusing more on employee attitudes toward the wider context of the workplace, as opposed to the intrinsic elements of their work role, which latter is more similar to the concept of organizational commitment (West and Dawson 2012). As a result, the NHS 2018 Staff Survey includes the first aspect of the construct of psychological engagement as defined by Schaufeli (Schaufeli et al. 2002), including the dimensions of dedication, vigor, and absorption (3 items). A second aspect encompasses the idea of influencing decision-making within the organization (3 items). Finally, a third aspect adopts the concept of advocacy (3 items), which evaluates the degree to which employees are willing to recommend their organization as a place to work or receive treatment.

The job resources utilized in our study were “Training and development opportunities”, “Line management resources” and “Shared Organisational Vision”. Four item questions included in our exploratory factor analysis (EFA) were aimed to capture the “Training and development opportunities” construct. Namely those items were addressing, in general: opportunities for career development in the organization (C1a), opportunities for growth provided by immediate supervision (C1b), accessibility of learning and development materials (C1c), and learning and development activities completed in the last 12 months by the employees (C1d). With respect to “Line management resources” 7 item questions were included in the analysis, with the aim of capturing various aspects of line manager supervision, such as work encouragement

(A8a), support in work tasks (A8b), support in personal crisis (A8e), work feedback (A8c), inclusion in decision making (A8d), interest in health and well-being (A8f) and, lastly, acknowledgement of work (A8g). Finally, 2 question items were included in the analysis regarding the construct of “Shared Organisational Vision”, addressing the clarity of the future organizational vision (C3a) and the feeling of being part of the organizational vision for the future (C3b).

The leadership concepts addressed were (as a part of delegation of authority) ‘leadership role encouragement’ and (as a part of employee orientation leadership) ‘senior management’s effective communication and involvement in decision making’. Three question items were used to capture “Leadership role encouragement”: namely, encouragement to become a leader in the workplace (C2b), the capability to become a leader in the workplace (C2c), and the feeling of being encouraged to motivate others in the workplace (C2d). Senior management involvement and effective communication was assessed using 4 items, referring to whether employees recognize who are the senior managers (A9a), whether the communication with senior management is effective (A9b), whether senior managers involve the employees in important decisions (A9c), and whether senior managers are acting upon feedback from the staff (A9d).

Although our interest was not in testing for within-group differences, demographic and job characteristics were used to control for confounding effects on the relationships between latent constructs. The control variables utilized were: Gender, made up of 3 categories (‘Male’, ‘Female’ and ‘Prefer not to say’), Occupation (‘Nurse’, ‘Doctor’ and ‘Other Health Professional’), Age (categorised in 3 groups: ‘≤ 29 years’, ‘30-49 years’ and ‘50+ years’), years of experience in the organization (classified in three categories: ‘≤5 years’, ‘6-15 years’ and ‘15+ years’) and position in the hierarchy (marking the three levels in the management structure: ‘Not managerial’, ‘Intermediate management’ and ‘Higher management’). The control variables were used firstly to examine differences in a bivariate analysis, and later were included in the model as predictors of the latent constructs, to control for confounding effects.

Empirical strategy

Overall, the empirical strategy was initially to establish construct and discriminant validity for the latent variables and later to utilize those measures along with the control variables in a structural equation model (SEM), to test for our hypothesis. To do so, an exploratory factor analysis (EFA) was deployed to assess whether the question items were indeed grouped and identified onto the underlying theoretical constructs specified. We aimed to validate the employee engagement construct in a second-order Confirmatory Factor Analysis (CFA). Further, we aimed to establish discriminant validity amongst the latent variables by performing a separate CFA. Lastly, the associations were tested in a SEM model with the inclusion of all the control variables while adjusting for confounding effects on the prediction of latent variables.

Factor analysis of antecedent constructs

We employed exploratory factor analysis (EFA) to extract potential factors from groups of variables that described some basic hidden variables that were not directly measurable (Williams, Onsmann, and Brown 2010). More specifically, principal component factor analysis was conducted on the correlation matrices with Promax (oblique) rotation, allowing for the factors to be correlated. Using the recommended criteria on factor loadings, variance explained, and theoretical considerations, we made decisions for the exclusion of items and the resulting factor-solution structure. The adequacy of the sample size for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) Test (Williams et al. 2010). Since item non-response was not extensive, only complete data were included in the analysis. Cronbach’s alpha test was utilized to assess the internal reliability of the constructs generated.

Confirmatory factor analysis

Confirmatory factor analysis (CFA) is commonly used to test whether the data fit a hypothesized measurement model, and can be used to adjust the proposed engagement measurement structure that could, further on, be used for structural equation modeling (SEM) (Kline 2015). In our study, we performed Confirmatory Factor Analysis on the adopted NHS Staff survey construct for measuring engagement. We proceeded to test the construct's validity in our sampled population in a second-order confirmatory factor analysis testing for goodness-of-fit of the hypothesized factor structure. Cronbach's alpha was used to assess the internal consistency of the comprehensive engagement construct.

To establish discriminant validity for the various construct measures a separate CFA was performed, allowing all latent construct measures to correlate. This way we aimed to test and verify that the latent factors were distinct, with no significant overlap amongst the measures, that could suggest more than one latent factor measuring the same theoretical concept. There was a particular interest in testing whether latent variables making up the employee engagement factor were highly correlated with predictor factors: implying, therefore, significant overlap amongst those measures.

Structural equation modeling

The research hypotheses of the impact of generated antecedent constructs on employee engagement were assessed using SEM procedures (Kline 2015). SEM simultaneously estimates the relationships between indicators and latent variables (the measurement part of the model) and among latent variables themselves (the structural part of the model). To assess the goodness of fit of our model, we used several fit indices such as the Chi-squared test, the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), and the Root Mean Squares Error of Approximation (RMSEA) (Hu and Bentler 1999). All the discussed analyses were carried out using Stata 14 statistical package program with the use of SEM model builder (Huber 2014).

Findings

Results of exploratory and confirmatory factor analyses

Initial exploratory factor analysis on the 20 items, to extract potential antecedent factors identified that the item "Recognition of Senior Managers" (A9a) had very low communality (0.26) and did not load high (<0.40) in any of the factors proposed. This finding suggests that "Recognition of Senior Managers" has no relation to any of the other items. As a result, it was removed from the measurement model. The final sample used in EFA included 570 responses with fully completed sets of answers. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.903 and hence, suitable for factor analysis. The value of Bartlett's sphericity test was 7,857 ($p < 0.001$), suggesting correlation between items and that potential factors could be extracted. The five unrotated consensus factors had eigenvalues of 7.98, 2.92, 1.59, 1.19, and 0.95, respectively. Despite the suggested criteria of eigenvalue greater than 1 for factor extraction (Williams et al. 2010), due to certain theoretical considerations we decided to force a five-factor solution (see [Supplementary Table 3](#)), which raised the variance explained by the model up to 77.01%, greater than the minimum 60% criterion in humanities studies (Williams et al. 2010). The decision to opt for a five-factor solution was based on theoretical considerations. Specifically, existing research suggests that senior management's involvement and communication with employees, and shared organizational vision, are distinct concepts (Pearce and Ensley 2004; Aragón-Correa et al. 2008). The four-factor EFA solution is also presented in the [Supplementary Material \(Table 4, Supplemental Digital Content\)](#).

Similarly to previous research efforts, we labeled the five factors: (1) 'Line Management Resources' (7 items), (2) 'Development and Training Opportunities' (4 items), (3) 'Senior

management's Effective Communication and Involvement' (3 items), (4) 'Shared Organizational Vision' (2 items) and (5) 'Leadership Role Encouragement' (3 items). All the items loaded very high (loadings >0.70) and distinctly (>0.20 difference) on the proposed factors. Moreover, items had moderate to high communalities (>0.60), encouraging endorsement of the proposed factor structure. Internal consistency of the generated factors was high, with Cronbach's alpha of 0.95 for Line Management, 0.83 for Development and Training Opportunities, 0.90 for Senior Management Effective Communication and Involvement, 0.92 for Shared Organizational Vision, and 0.79 for Leadership Role Encouragement. In general, Cronbach's alpha values of 0.70 and above indicate high internal consistency for a measurement construct.

The construct validity of employee engagement was tested in a second-order Confirmatory Factor Analysis. CFA revealed a good fit of the hypothesized factor structure ($\chi^2=56$, $d.f.=24$, $CFI = 0.982$, $TLI = 0.973$, $RMSEA = 0.048$), with satisfactory standardized factor loadings (>0.40) for the factor structure (Table 2, Supplemental Digital Content). The second-order factor model outperformed the single-factor model ($\chi^2=815$, $d.f.=27$), suggesting that the second-order factor model was indeed superior in fitting the data. The internal consistency (Cronbach's alpha) of the overall engagement scale was 0.793, while for its corresponding subscales the alphas ranged from 0.786 to 0.789 (Table 2, Supplemental Digital Content). The CFA results revealed that the measurement construct for engagement showed very good overall fit and internal validity, and thus was adequate for estimating the associations between the generated antecedent factors and the engagement of the employees.

Discriminant validity of the various latent variables was tested in a CFA, with all the latent measures allowed to correlate (Table 2). The results of the CFI performed (Table 2) suggest that all the latent measures were positively correlated, with associations varying from weak ($r=0.18$) to moderately strong ($r=0.67$). The strongest associations appeared to be those between 'Employee advocacy' and 'Shared Organizational Vision' ($r=0.67$), 'Employee Advocacy' and 'Development and Training Opportunities' ($r=0.60$) and 'Senior management's Effective Communication and Involvement' and 'Development and Training Opportunities'

Table 2. Correlation matrix of all latent factors.

	Line management	Development and Training Opportunities	Senior Management's Effective Communication and Involvement	Shared Organizational Vision	Leadership role Empowerment	Psychological Engagement	Employee Involvement
Line management	1.00						
Development and training opportunities	0.46	1.00					
Senior management's effective communication and involvement	0.40	0.60	1.00				
Shared organizational vision	0.29	0.59	0.57	1.00			
Leadership role empowerment	0.42	0.56	0.41	0.43	1.00		
Psychological engagement ^a	0.27	0.22	0.18	0.27	0.30	1.00	
Employee involvement ^a	0.51	0.49	0.43	0.38	0.55	0.35	1.00
Employee advocacy ^a	0.40	0.60	0.56	0.67	0.43	0.29	0.50

^aThe latent variables: psychological engagement, employee involvement and employee advocacy were used to formulate the higher order employee engagement factor used in the SEM analysis

($r=0.60$). On the other hand, the weakest associations were between ‘Senior management’s Effective Communication and Involvement’ and ‘Psychological Engagement’ ($r=0.18$), ‘Development and Training Opportunities’ and ‘Psychological Engagement’ ($r=0.22$) and ‘Line management’ and ‘Psychological Engagement’ ($r=0.27$). Therefore, with respect to our concern for the potentially high overlap amongst latent factors, the correlations were fair to moderate. Taking into account that the correlation values are not high, in addition to many measures being theoretically discriminant, such as Shared Organization Vision and Employee Advocacy, we argue in favor of establishing satisfactory discriminant validity amongst our latent constructs.

Bivariate relationships among the measures

The summary statistics of the latent constructs with the control variables suggest some interesting associations (Table 3). At first glance, physicians appear to have scored the latent constructs lower than did the rest of the health professionals, with the exception of ‘Leadership Role Encouragement’. Particularly, the job resource, ‘Development and Training Opportunities’ was scored noticeably lower than with the other health professionals. On another interesting note, those preferring not to state their gender scored all the latent measures lower than did both males and females. Females appeared to be scoring higher on their employee engagement factor and on sharing of the organizational vision, whereas males scored higher on effective communication with senior management. Age appears to have had a relevant impact on the variability of the latent constructs, since as age increases, employee engagement and leadership role

Table 3. Distribution of mean scores of outcome latent variables amongst control variables.

	Employee engagement	Development and training opportunities	Line management	Shared organizational vision	SM Effective communication and involvement	Leadership role encouragement
Overall	3.56 (0.60)	2.63 (0.80)	3.49 (0.93)	2.69 (0.99)	2.60 (0.92)	3.46 (0.81)
Control variable						
Occupation						
Physician	3.48 (0.62) ^a	2.50 (0.80)	3.31 (1.07)	2.50 (0.93)	2.42 (0.90)	3.35 (0.83)
Nurse	3.57 (0.59)	3.57 (0.77)	3.53 (0.85)	2.73 (0.97)	2.70 (0.95)	3.55 (0.74)
Other health professionals	3.60 (0.61)	3.59 (0.79)	3.56 (0.97)	2.76 (1.07)	2.49 (0.81)	3.36 (0.92)
Gender						
Male	3.52 (0.60)	2.67 (0.78)	3.58 (0.90)	2.62 (1.01)	2.66 (0.95)	3.50 (0.79)
Female	3.60 (0.60)	2.63 (0.82)	3.50 (0.92)	2.77 (0.99)	2.59 (0.89)	3.49 (0.79)
Prefer not to say	3.39 (0.55)	2.47 (0.76)	3.14 (1.01)	2.44 (0.90)	2.45 (0.97)	3.15 (0.95)
Age						
≤29 years	3.41 (0.49)	2.83 (0.80)	3.41 (0.49)	2.73 (1.04)	2.90 (0.81)	3.31 (0.80)
30–49 years	3.52 (0.59)	2.64 (0.80)	3.54 (0.90)	2.67 (0.97)	2.61 (0.90)	3.42 (0.78)
50+ years	3.74 (0.60)	2.56 (0.78)	3.37 (0.99)	2.81 (1.04)	2.50 (0.98)	3.68 (0.88)
Years working at the organization						
≤5 years	3.61 (0.57)	2.79 (0.80)	3.65 (0.97)	2.81 (1.07)	2.88 (0.92)	3.34 (0.78)
6–15 years	3.46 (0.61)	2.58 (0.83)	3.46 (0.93)	2.62 (0.96)	2.53 (0.90)	3.31 (0.78)
15+ years	3.67 (0.57)	2.63 (0.75)	3.48 (0.91)	2.75 (0.98)	2.58 (0.91)	3.71 (0.79)
Hierarchical position						
Not managerial	3.48 (0.59)	2.51 (0.78)	3.44 (0.96)	2.56 (0.94)	2.50 (0.88)	3.29 (0.78)
Intermediate management	3.72 (0.57)	2.71 (0.78)	3.50 (0.87)	2.86 (0.94)	2.66 (0.96)	3.92 (0.65)
Higher management	3.96 (0.63)	3.10 (0.90)	3.53 (0.88)	3.09 (0.99)	2.94 (1.03)	4.01 (0.84)

Note: $N=552$ including only the completed data points that were used in the SEM model.

^aIn parentheses next to the mean of the construct score signifies the standard deviation of the score

Table 4. Hypothesized construct model.

Structural paths	Unstandardized coefficient	Standard error	Standardized coefficient	P-value
Direct effects				
Leadership role Encouragement → Overall Engagement	0.090	0.030	0.217	0.003*
Leadership role Encouragement → Development and Training Opportunities	0.480	0.050	0.579	<0.001**
Leadership role Encouragement → Line management	0.489	0.054	0.475	<0.001**
Leadership role Encouragement → Shared Organizational Vision	0.273	0.061	0.234	<0.001**
Senior Management's Effective Communication and Involvement → Overall Engagement	0.066	0.025	0.162	0.007*
Senior Management's Effective Communication and Involvement → Shared Organizational Vision	0.543	0.054	0.475	<0.001**
Development and Training Opportunities → Overall Engagement	0.116	0.043	0.232	0.007*
Shared Organizational Vision → Overall Engagement	0.113	0.027	0.318	<0.001**
Line management → Overall Engagement	0.108	0.025	0.270	<0.001**
Indirect effects				
Leadership role Encouragement → Overall Engagement	0.139	0.028	0.337	<0.001**
Senior Management's Effective Communication and Involvement → Overall Engagement	0.061	0.016	0.151	<0.001**
Total effects				
Leadership role Encouragement → Overall Engagement	0.229	0.040	0.554	<0.001**
Senior Management's Effective Communication and Involvement → Overall Engagement	0.127	0.028	0.313	<0.001**

Note. *Significant at the .05 level (two-tailed). **Significant at the .001 level (two-tailed)

encouragement also increased, as opposed to development opportunities and communication with senior management, which appear to decline with age. On the other hand, with respect to years of experience, the association appears to be more complex, with less experienced (<5 years) and more experienced (15+ years) individuals, scoring the latent constructs higher, particularly on engagement and shared vision, compared to moderately experienced (5-15 years) employees. Finally, the bivariate summary statistics suggests that position in the hierarchy could be having a profound impact on the scoring of latent variables, since scoring increases as individuals are positioned higher in the hierarchical chain of command.

Results of structural equation modeling

A structural equation model was built with the five antecedent constructs directly predicting the employee engagement construct, using data from 552 participants, excluding 53 participants who did not fully respond to all questions of interest. Additionally, the indirect pathways of the leadership factors affecting employee engagement through job resources were modeled. The job resources, as well as the leadership factors, were allowed to correlate, since exploratory factor analysis revealed shared covariance among the factors (see [Figure 2](#) for a visual representation of the model structure). The measurement part of the model showed satisfactory standardized factor loadings, and the overall goodness of fit was acceptable-to-good according to the recommended standards (Kline 2015, Hu and Bentler 1999): $\chi^2 = 1301.12$, d.f. = 551; $\chi^2/\text{d.f.} = 2.36$; CFI = 0.925; TLI = 0.910; RMSEA = 0.050 (0.046-0.053).

A competing model incorporating only the direct effects between antecedent factors and health professionals' engagement was tested. The competing model produced inferior fit indices

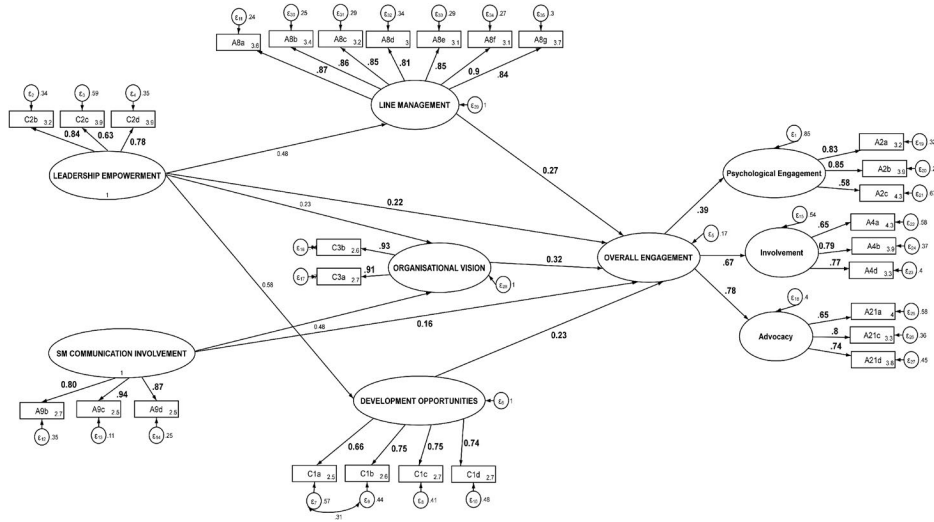


Figure 2. Outline of the comprehensive hypothesized model with all the observed and latent variables. ^aValues on the figure illustrate standardized coefficients and standardized factor loadings. ^bCovariances amongst the predicting latent variables not shown.

with respect to the proposed model: $\chi^2 = 1638.89$, d.f. = 557; $\chi^2/\text{d.f.} = 2.94$; CFI = 0.892; TLI = 0.872; RMSEA = 0.059 (0.056-0.063), which provides evidence in favor of integrating leadership approach with the JD-R model. Thus, the integrating proposed model accounts adequately for the observed co-variances among the construct variables and shows superior fit indices with respect to the competing theoretical models, limiting the risk of capitalizing on chance (MacCallum, Roznowski, and Necowitz 1992, Browne and Cudeck 1992).

The estimates for the regression coefficients among latent variables for the structural part of the model are shown in Table 4. The estimated coefficients for the structural paths provided evidence in favor of all the formulated hypotheses. The parameter estimates indicate that all the predictive antecedents had a statistically significant direct effect (p -values < 0.05) on health professionals' engagement, hence providing evidence in favor of Hypotheses 1-4, and 6. Moreover, Hypotheses 5 and 7 were supported, since leadership factors were positively associated with job resources constructs, yielding also a significant indirect effect on overall employee engagement. Higher levels of employees' perceived "Leadership Role Encouragement" were associated directly and indirectly with increased employee engagement, producing a significant total effect ($\beta = 0.554$, p -value < 0.001) after adjustment for the other four antecedents and control variables. More informatively, most of the effect was mediated *via* the job resources, with the ratio of indirect to direct effects being 1.55, whereas the ratio of indirect to total effect was 0.61. Correspondingly, an increase in employees' perceived "Senior management's Effective Communication and Involvement" led to a substantial total effect on engagement ($\beta = 0.313$, p -value < 0.001). The effect was equally attributed to the mediated effect *via* shared organizational vision and the direct effect, with the ratio of indirect to direct effects being 0.93 and the ratio of indirect to total effect, 0.48. Higher levels of "Development and Training Opportunities" reported by employees were associated with higher levels of employee engagement ($\beta = 0.232$, p -value < 0.01), while the effect of "Shared Organizational Vision" was also significant ($\beta = 0.313$, p -value < 0.001). The line management construct score was associated with engagement, with a standardized coefficient of 0.270 (p -value < 0.001).

With the exception of "Line Management" and "Shared Organisational Vision", the latent variables shared a statistically significant amount of covariance at the 0.05 level, with some of them moderately correlated (Table 3, Supplemental Digital Content). The inclusion of control variables in the SEM model revealed that certain demographic and job characteristics had a significant impact on a number of latent variables. The direct effects of controls on all latent

variables are illustrated in [Supplementary Table 5](#). Being a nurse as opposed to being a physician was associated with greater levels of ‘Development and Training Opportunities’, ‘SM Effective Communication and Involvement’ and ‘Leadership Role Encouragement’, whereas ‘Other health professionals’ scored higher line management resources compared to physicians. Females had a greater degree of sharing the organizational vision, and those preferring not to state their gender scored significantly less on the ‘Leadership Role Encouragement’ concept compared to their male peers. Despite age not being found to have had a significant impact on the latent variables, a negative association was revealed between years of experience and job resources (‘Line management resources’ and ‘Development and Training Opportunities’) and with senior management effective communication. Higher hierarchical position was associated with higher scores on the leadership concepts (‘SM Effective Communication and Involvement’ and ‘Leadership Role Encouragement’), whereas intermediate managers scored less on line management resources, compared to non-managerial staff. More importantly, employee engagement wasn’t directly affected by any of the adjusted control variables: nevertheless, the impact of control variables on engagement was indirect, through their effect on the latent predictor variables. In conclusion, the within-control-group differences were not the center of examination of this study, despite their relevance, and further investigation could be of profound interest for future research.

Discussion

This study has drawn from previously assessed theoretical linkages and examined the impact of several potential antecedents on health professionals’ engagement in the public hospitals and healthcare centers of Cyprus. Using exploratory factor analysis, five parsimonious factors were extracted: “Line Management”, “Development and Training Opportunities”, “Senior management’s Effective Communication and Involvement”, “Shared Organisational Vision” and “Leadership Role Encouragement”. The results of the structural equation model indicate that the suggested framework indeed predicted, to a substantial degree, the engagement of health professionals in the public healthcare sector of Cyprus.

Public administration literature highlights the need for a contextual understanding of the JD-R model and its effects on engagement across different contexts, to further specify resources/demands that are most salient in various public services (Fletcher et al. 2020). This is due to the diversity of services and modes of delivery across the public sector and the differences in the experience of engagement between the public sector and other sectors (Vigoda-Gadot, Eldor, and Schohat 2013; Brunetto et al. 2018). Further, the public healthcare setting differs in several ways to other public sectors, and its distinct characteristics introduce a series of unique challenges. First, health services and public hospitals are high-contact services where the interaction between patient and healthcare professionals is at the heart of the delivery process (Ancarani, Mauro, and Giammanco 2019), giving rise to a high potential for co-creation of value (Damali et al. 2016). The intensity and the duration of the encounters of patients with health professionals suggest there could be a significant effect of engagement on measures such as productivity or profitability, but also on patients’ perceived quality and satisfaction with the service (Goldstein 2009).

Another particularity of health services is the power and status in the hierarchy that doctors possess, which can lead to their blocking or confounding the efforts of top-down management by managers or politicians (Reinertsen, Gosfield, Rupp, and Whittington 2007). However, engaging health professionals in the decision-making process, appointing doctors into leadership roles, and working with influential clinicians, could lead to improvements in performance (Ham 2003). Moreover, the complexity of healthcare organizations as professional bureaucracies means that leadership is needed at different levels and not simply at the top (Ham and Dickinson 2008). Evidence suggests that leadership of clinical microsystems is a key factor in achieving high levels of performance, especially when there is alignment between top-level leadership and those working in other parts of the organization (Bate 2000, Ham and Dickinson 2008). The theoretical

framework, as well as the resources and leadership constructs considered in this study, are in line with these contextual particularities. For instance, shared organizational vision as an organizational resource agrees with the institutional logic of public organizations, which separates the organizational culture from senior management (Parker and Bradley 2000). At the same time, the leadership role encouragement construct addresses the call for leadership at different levels of health services organization, while senior management effective communication is in line with the call for alignment between top leadership and members of the workforce (Ham and Dickinson 2008).

Despite transformational and engaging leadership previously associated with increased public service motivation, there is still the need to examine the explicit impact of various managerial and leadership practices, as well as to explore possible causalities, and the direction of associations (Hameduddin and Engbers 2022). In this regard, integrating the JD-R model with engaging leadership can offer new ground, where the causal pathway of leadership to engagement could be explored. Previous work has shown an indirect association of “engaging leadership” and transformational leadership with employee engagement by enhancing job resources and reducing job demands (Schaufeli 2015; Piccolo, R.F. and Colquitt, J.A., 2006; Hawkes et al. 2017). Nonetheless, no study was identified that explicitly evaluates the framework of the JD-R model integrated with leadership, while testing for direct and mediating relationships in the public healthcare sector. This study provides new and supportive evidence for the newly formulated framework of integrating leadership within the JD-R model in the public healthcare sector.

The integrated framework was supported, in terms of fitting indices, since it outperformed the competing model, which included only the direct effects. Despite the significant mediation effect, the direct effect on health professionals’ engagement persisted as statistically significant, indicating that the leadership factors are independently associated with employee engagement. Job resources were found to mediate the relationship between leadership factors and employee engagement, as has been previously suggested (Schaufeli 2015). However, contrary to previous studies, the mediation wasn’t complete, and the direct effects of leadership on engagement persisted. This finding provides support to the scarce evidence in the literature suggesting that while engaging leadership indirectly improves employee engagement by enhancing job resources, it also directly improves employee engagement (Hawkes et al. 2017).

Shared organizational vision was the job resource with the highest predictive capability for health professionals’ engagement. In the review of the literature, no prior work was identified that directly assessed the effect of shared organizational vision on engagement in healthcare. This has been appraised rather indirectly when engagement is evaluated through leadership frameworks, such as transformational leadership (Gillet et al. 2013; Hayati et al. 2014). The analysis performed strongly suggests that shared organizational vision, when treated as an independent organizational level resource capability, has a strong positive predictive ability upon health professionals’ engagement, which also strongly mediates the effect of leadership. This finding suggests that public sector health professionals’ engagement is very much driven by the abstract sense of belonging and shared organizational vision. Given the fact that this association remained robust after adjusting for the effects of the line and senior management factors, shared organizational vision could be of particular importance in the public healthcare setting and possibly should be addressed as a distinct organizational resource competency, rather than just a component of leadership constructs.

Line management, in our study, comprised items measuring health professionals’ perceptions about managers’ encouragement, support, feedback, and involvement in decisions, and was anticipated to predict health professionals’ engagement. Previous research in the healthcare context suggests that supervisory support for nurses (Laschinger 2010), midwives (McDermott, Keating, Freaney, and Fellenz 2013), physiotherapists (Martinussen, Borgen, and Richardsen 2011), and overall health professionals (doctors and nurses) (Hu et al. 2011) increases engagement. The autonomy of health professionals is also associated with improved employee engagement in numerous countries’ healthcare settings (Taipale, Selander, Anttila, and Nätti 2011). Our

study further supports earlier research findings that engagement of healthcare professionals is positively affected by support, feedback, autonomy, and the involvement of immediate supervisors. This association was strong amongst job resources, second to shared organizational vision, suggesting that line management resources have an essential role to play in engaging public healthcare professionals.

In the healthcare context, development and training opportunity capabilities and their effect on engagement have been assessed within various theoretical frameworks, such as the SET (Bal et al. 2013), JD-R model (Opie et al. 2011), and the leader consideration framework (Hornung et al. 2011). Direct positive associations with engagement in respect of possibilities for development and opportunities for professional development were evident for nurses (Opie et al. 2011), midwives (Rickard et al. 2012), physicians (Hu et al. 2011) and overall, for the employees of health-care organizations (Bal et al. 2013). A previous study has also suggested that professional development opportunities mediated the positive relationship between leader consideration and engagement for medical doctors (Hornung et al. 2011). The findings of our study support the direct positive effect of career development opportunities on engagement, even after controlling for the effect of other predictive constructs, such as line management supervision and senior management empowerment. More importantly, development and training opportunities were found to strongly mediate the effects upon engagement of leadership factors such as leadership role encouragement. This provides further support for those capabilities being the outcome of empowering senior leadership, which could facilitate employee engagement in the public healthcare sector.

The leadership role encouragement construct generated by the EFA in this study is analogous to the delegation of authority dimension of Konczak et al.'s leadership empowering behaviors construct (Konczak et al. 2000), which has been associated with higher organizational commitment (Mendes and Stander 2011). Delegation of authority characterizes the empowerment process of a manager sharing power with subordinates (Konczak et al. 2000; Conger and Kanungo, 1988). The construct used in this study resonates with the literature that treats empowering leadership as a managerial attribute and responds to the normative discourse in public administration calling for democratization, sharing of power with employees and the flattening of bureaucratic hierarchies in the public sector (Hassan et al. 2019; Dudau et al. 2021).

Empowering leadership behaviors in the healthcare context were addressed by Albrecht and Andreetta (2011), who reported a positive impact on engagement by leadership encouraging employee behaviors, such as, independent action, and self-development. In this study, the leadership role encouragement construct was found to significantly enhance all the modeled job resources, with the strongest impact being on "Training and Development Opportunities", suggesting that managers who empower their employees to take up a leadership role in their work are more likely to provide them with training and development opportunities. Regarding employee engagement, the total effect of leadership role encouragement was very strong, with more than half of that effect (61%) mediated by enhancing the modeled job resources. Generally, this suggests that leaders who decide to empower employees by sharing their power are more likely to allocate job resources to them, which effectively would lead them to being more engaged. This is likely due to the power-sharing process facilitating a favorable work environment, better balancing the impact between job demands and job resources and, thereby, initiating the motivational process (Piccolo and Colquitt 2006; Breevaart, Bakker, Hetland, and Hetland 2014). Moreover, the mediating role of line management resources in the relationship of leadership role encouragement with engagement, resonates well with the literature that suggests that public managers are more likely to use empowering leadership practices with their subordinates when their senior supervisors engage in such practices (Park and Hassan 2018). Essentially, the impact of leadership role encouragement was the strongest identified, suggesting that managers in the public health sector who encourage their employees to lead, accomplish having their employees more engaged and committed.

The senior management factor had a strong total effect on engagement, with almost half of that effect (48%) mediated through enhancing the shared organizational vision resource. The

formed construct encompasses elements of the employee orientation leadership style, as designed by Ekvall and Arvonen (1991). This type of leadership style was found to be more effective in predicting and positively influencing employee engagement than the “change orientation” or “production orientation” styles (Othman et al. 2017). Previous studies have generally outlined the mediating role of job and organizational resources regarding the effect of transformational leadership on employee engagement (Schaufeli 2015, Hawkes et al. 2017; Breevaart, Bakker, Hetland, and Hetland 2014). Similarly, the current study provides evidence for the role of senior management’s effective communication and involvement as an upstream organizational factor related to increased engagement *via* building a sense of influence and participation in employees (Breevaart, Bakker, Hetland, and Hetland 2014). In our study, the participative management style also appears to have had a positive impact on, or at the least to be going hand in hand with, enhancing the shared organizational vision. Furthermore, the participative management style could be acting as a “buffer”, mitigating job demands and reducing employee experiences of stress and burnout (Skakon, Nielsen, Borg, and Guzman 2010), hence facilitating engagement. Finally, this study provides further evidence for a positive effect of employee orientation leadership style on public sector healthcare professionals’ engagement.

Limitations and future directions

Our study does not come without limitations. The use of secondary data and the involvement of numerous stakeholders defined the inductive approach adopted, and precluded starting with a validated set of constructs. Those were formulated along the way and were subjected to criticism and to restricted direct comparisons with the results of other relevant studies. The cross-sectional design of the original study also limits our ability to make inferences on causal effects; longitudinal data would have been more appropriate to assess such associations. Although the study used a stratified random sample from the employees’ registry of hospitals, and despite our response bias checks, we cannot completely rule out some sample bias—such as, for example, social desirability bias, etc.—given the self-selection process followed to get participation in the study. Furthermore, the results may not be easily generalizable, as these were based on a national sample but were limited to the public hospitals and health centers of a single European country. Finally, the estimated effects characterize constructs’ associations for health professionals as a totality. However, measurement invariance of the constructs, as well as differences in their effects upon engagement, are likely to exist between different occupational groups, or even in relation to the characteristics of these groups, such as their position in the hierarchy and their years of experience in the organization.

The framework integrating leadership with the JD-R model was confirmed, providing new evidence of the interplay of job resources with leadership factors, and the mediating effect of the former. The mediating impact on engagement *via* job resources, however, did not eliminate the direct effects of leadership. Including more job resources and/or job demands in the framework, similarly to the Schaufeli study (2015), will perhaps suppress this direct association and assist toward exploring further associations (Schaufeli 2015). Nevertheless, using this approach enabled for the first time the assessment of antecedents of engagement in the public healthcare context of Cyprus, giving potentially useful insights into management implications in a setting where a universal National Health System is currently in the process of being implemented (Pallari et al. 2020). Since the data used originated from a National Health Staff survey, with the help of questionnaires identical to the ones used by the UK’s NHS Staff Survey, this analysis can be replicated on a longitudinal basis and the results may be comparable to other health contexts. It is consistent with what has been pointed as a limitation, that many studies have investigated associations among theoretical constructs either separately for occupational groups or for the totality of healthcare employees. Examining and comparing the associations amongst different occupational groups could foster better guidance on how executives should diversify in managing their healthcare workforce, to yield greater overall engagement and, consequently, performance outcomes.

Managerial implications

The results of the present study provide new evidence on healthcare professionals' engagement. From a practical perspective, the findings provide managers with important insights into how public sector health professionals' perceptions of (1) line managers' supervision, (2) development and training opportunities, (3) senior management's effective communication with employees and involvement in decision making, (4) shared organizational vision and (5) empowerment of employees in playing a leadership role, significantly predict and positively affect engagement. Importantly, the distinct associations and their interplay were thoroughly investigated, signifying that each of these constructs significantly and distinctively affected the engagement of public healthcare professionals. The mediating role of job resources is highlighted for the effect of leadership on employee engagement. Similarly, the utilization of secondary data originating from health staff questionnaires could help with further assessing associations and theoretical manifestations within a public healthcare setting. If performed in a systematic manner, this approach can provide important evidence for the ways public healthcare executives can encourage their health workforce, design appropriate engagement programs, and ultimately improve healthcare performance.

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Conflicts of interests

The authors declare they have no conflicts of interest.

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