

ORIGINAL RESEARCH

Linking transformational leadership to nurses' extra-role performance: the mediating role of self-efficacy and work engagement

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Abstract

Aims. This paper is a report of a social cognitive theory-guided study about the link between supervisors' transformational leadership and staff nurses' extra-role performance as mediated by nurse self-efficacy and work engagement.

Background. Past research has acknowledged the positive influence that transformational leaders have on employee (extra-role) performance. However, less is known about the psychological mechanisms that may explain the links between transformational leaders and extra-role performance, which encompasses behaviours that are not considered formal job requirements, but which facilitate the smooth functioning of the organization as a social system.

Methods. Seventeen supervisors evaluated nurses' extra-role performance, the data generating a sample consisting of 280 dyads. The nurses worked in different health services in a large Portuguese hospital and the participation rate was 76.9% for nurses and 100% for supervisors. Data were collected during 2009. A theory-driven model of the relationships between transformation leadership, self-efficacy, work engagement and nurses' extra-role performance was tested using Structural Equation Modelling.

Results. Data analysis revealed a full mediation model in which transformational leadership explained extra-role performance through self-efficacy and work engagement. A direct relationship between transformational leadership and work engagement was also found.

Conclusion. Nurses' supervisors with a transformational leadership style enhance different 'extra-role' performance in nurses and this increases hospital efficacy. They do so by establishing a sense of self-efficacy but also by amplifying their levels of engagement in the workplace.

Keywords: extra-role performance, nursing, self-efficacy, transformational leadership, work engagement

Introduction

The behaviour of nurses who 'go the extra mile' facilitates achievement of the hospital mission, promotes positive experiences, and encourages relationships among nurses and between nurses and patients by involving them in hospital activities that promote healthy work environments. These positive practices must be established throughout the health sector when international health goals have to be met. Therefore, it is essential that healthcare policy-makers and administrators all around the world understand the importance of the so-called 'nurses' extra-role performance'. This term refers to certain behaviours that are not part of a nurse's formal job requirements, but which help the hospital to operate smoothly as a social system. Accordingly, hospitals attempt to attract and retain nurses with potential for such behaviours. On this subject, research has revealed that, for example, transformational leadership relates positively to work-related outcomes such as employee performance (Dumdum *et al.* 2002). However, fewer studies have attempted to discover the underlying processes and motivational mechanisms by which transformational leaders exert their influence on follower performance (see Walumbwa *et al.* 2008, for a review). The current study tries to overcome this gap by investigating two specific psychological mechanisms, namely, self-efficacy and work engagement.

Background

According to Albert Bandura's (1997, 2001) *Social Cognitive Theory (SCT)*, employee behaviour (in our case, extra-role performance) is the result of a combination of personal resources (e.g., self-efficacy), contextual resources (e.g., transformational leadership) and motivation (e.g., work engagement). This study focuses on self-efficacy as the main personal resource that influences nurses' extra-role performance through work engagement. But this study also aims to examine whether the transformational leadership style is a powerful contextual resource that basically influences self-efficacy through two of its four sources, as postulated by Bandura (1997), i.e., vicarious experiences and verbal persuasion.

Efficacy beliefs as a strong motivational resource in nursing work

The SCT (Bandura 1997, 2001) defines self-efficacy as 'beliefs in one's capacities to organize and execute the courses of action required to produce given attainments'

(Bandura 1997, p. 3). Research shows that people with high self-efficacy perceive troubles as challenges, are highly committed to the activities they carry out and invest more time and effort in their daily activities (Bandura 2001). In the specific context of healthcare workers, such as nurses, self-efficacy proved to be a powerful motivational predictor of well-being (Munir & Nielsen 2009) and future collaborative practices (LeBlanc *et al.* 2010). For these reasons, we strongly believe that self-efficacy will influence nurses' extra-role performance by enhancing work engagement. Thus, the higher self-efficacy, the higher work engagement and, consequently, the higher nurses' extra-role performance.

Accordingly, following the SCT, we consider efficacy beliefs to be the main personal resource that explains intrinsic motivational processes such as work engagement. We understand work engagement as 'a motivational and positive state of mind related to work, which is characterized by vigour, dedication and absorption' (Schaufeli *et al.* 2002, p. 74). Vigour is characterized by high levels of energy and mental resilience, the willingness to invest effort, and persistence even in the face of difficulties. Dedication is characterized by a sense of significance, enthusiasm, inspiration, pride and challenge. Finally, absorption is characterized by being fully concentrated and deeply engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work. Recent evidence, however, suggests that absorption plays a slightly different role and might perhaps be considered a consequence of work engagement rather than a constituting component (Salanova *et al.* 2003, Freaney & Tiernan 2009).

Our conceptualization of work engagement is consistent with the recommendation by Simpson (2009), who claimed that, due to the current state of development of definitions and measures of work engagement, the concept and measurement of work engagement as defined by Schaufeli *et al.* (2002) should be used in the study of engagement among the nursing workforce.

Consistent with the arguments presented above, direct relationships from self-efficacy to work engagement are specified in the following way:

Hypothesis 1: There is a positive relationship between self-efficacy and work engagement.

Transformational leadership as a source of self-efficacy

A transformational leader will foster closer relationships with subordinates that are characterized by having less distance

between them despite 'their power' and by an individualized consideration of member needs and capabilities (Bass 1990). This relationship is sustained by both mutual trust and openness and the richness of verbal communication and bi-directional feedback between leaders and members (Klauss & Bass 1982, House & Shamir 1993), thus promoting the development of their self-efficacy mainly through vicarious experiences and social persuasion (Schyns 2001, Kark & Dijk 2007, Walumbwa *et al.* 2008). Hence, we expect nurses' leaders to be able to increase levels of nurses' self-efficacy by acting as role models so that employees can learn from their leaders' experiences. The acquisition of knowledge about skills and strategies by observing proficient models is obviously possible (Bandura 1989) and the transformational leader is an efficient behaviour model. Additionally, the leader can use verbal persuasion to increase nurses' self-efficacy through inspirational motivation and/or individualized consideration.

To date, in studies conducted in a healthcare environment, Mok and Au-Yeung (2002) have demonstrated the importance of transformational leadership in promoting the self-efficacy of nurses, and Nielsen *et al.* (Nielsen & Munir 2009, Nielsen *et al.* 2009) verified not only this relationship but also the mediating role of self-efficacy in the relationship between transformational leadership and well-being of healthcare employees. Consequently, we examine the relationship between transformational leadership and self-efficacy, the former being considered an antecedent of the latter. We therefore hypothesize the following.

Hypothesis 2: There is a positive relationship between transformational leadership and self-efficacy.

However, this research goes one step further. While previous studies have proven the influence of the transformational leader on efficacy beliefs and work engagement and even on followers' well-being, this research attempts to analyse how transformational leadership explains extra-role performance through the motivational mechanism underlying self-efficacy and work engagement.

Nurses' extra-role performance

In a systematic review of healthcare leadership studies (Gilmartin & D'Aun 2007), transformational leadership was shown to be positively and significantly associated with job performance. However, it was hypothesized that this effect is indirect, and that different mediators play a role. For example, Walumbwa *et al.* (2004, 2008) suggested that the relationship between transformational leadership and work behaviours would be mediated by efficacy beliefs. To pursue

this suggestion, Pillai and Williams (2004) showed that transformational leadership was related to performance through self-efficacy.

As regards the relationship between work engagement and extra-role performance in another area of the services sector, Salanova *et al.* (2005) showed that levels of work engagement of contact employees working in hotels and restaurants are related to employee extra-role performance, as perceived by customers. Demerouti and Bakker (2006) concluded that work engagement seems to reveal a stronger relationship with extra-role performance in comparison with its experiential opposite, i.e., burnout. Accordingly, Xanthopoulou *et al.* (2008) found that work engagement mediates the relationship between self-efficacy and (in-role and extra-role) performance. Seeley (2007) also discovered a significant, positive correlation between work engagement and extra-role performance, understood as organizational citizenship behaviour.

In this study, we followed the recommendations for future research put forward by Simpson (2009) in the arena of nursing and healthcare staff, as well as by Zhu *et al.* (2009) in research of transformational leadership in general occupations. For example, Simpson recommended conducting more research to provide nurses' leaders with a better understanding of the antecedents and consequences of nurses' work engagement, and particularly the impact of the behaviours of nurses' leaders, as well as the consequences of nurses' work engagement on job performance. Finally, although Zhu *et al.* (2009) corroborated the influence of transformational leadership on work engagement, their study was conducted among industrial workers, and no links with employee performance were studied. Thus, these authors (p. 611) encouraged future studies to examine 'the mediating role of workforce engagement in the relationship between transformational leadership and followers' work performance'.

Finally, Cummings *et al.* (2010) concluded that only a few studies focused on outcomes related to the specific performance of individual nurses, and primarily using the nurse-assessed productivity of their nursing unit, which may also introduce a level of social desirability. In the current study, we overcome this gap by using a performance measure carried out not by nurses but by their direct supervisors, thus preventing social desirability issues.

To sum up, we will try to overcome these gaps in previous research by investigating the mediating role of work engagement between transformational leadership and extra-role performance, and also by using a measure of performance assessed by nurses' supervisors.

We therefore hypothesize the following.

Hypothesis 3: The relationship between transformational leadership and nurses' extra-role performance is mediated by self-efficacy and work engagement.

Figure 1 displays our research model showing the full mediation of nurses' self-efficacy and work engagement in the relationship between transformational leadership and extra-role performance (as assessed by nurses' supervisors).

The study

Aim

The aim of this study was to examine the relation between supervisors' transformational leadership and staff nurses' extra-role performance as fully mediated by staff nurses' self-efficacy and work engagement.

Design

The study employs a cross-sectional design, which uses structural equation modelling (SEM) for the data analyses.

Participants

Convenience sampling was chosen, and involved all the nurses ($N = 364$) and their supervisors ($N = 17$) working in a large Portuguese hospital. In the end, 280 nurses and their 17 supervisors composed the final sample.

Data collection

The data were collected during 2009 and the research procedure involved different steps. After seeking permission from the directors of the hospital and the ethical committee, we asked the supervisors (i.e., head nurses) of each service if they would be willing to voluntarily collaborate in the study.

Second, a researcher met with the supervisors, in several groups, to explain the purpose and requirements of the study. Each of the 17 supervisors were given two kinds of questionnaires, one for him/herself to complete and one for each of the subordinated nurses. We put a matching code number on both the subordinate and the supervisor questionnaires. Third, each of the supervisors passed the questionnaires on to their subordinates. Each respondent was given a sealable envelope in which to deposit the completed survey. Finally, the researcher returned to the hospital a fortnight later to collect the surveys.

Moreover, we asked each supervisor to evaluate the extra-role performance of each of his/her subordinates. The name of each specific and individual subordinate was written on the supervisor's questionnaire. After completing the survey, the supervisors deleted the names of the subordinates.

Finally, to guarantee the independence of the evaluation carried out by each supervisor, we calculated the ICC (*Intraclass Correlation Coefficient*) value. The ICC provides the appropriate measure when the error variance for measures is uniform across the conditions of measurement (McGraw & Wong 1996), and therefore there is no need to carry out multi-level analysis (Bliese 2000). The ICC obtained a non-significant value of 0.19 (0 is complete independence of observations and 1 represents complete dependence) (Cohen *et al.* 2003). Hence, in our study, supervisor variance can be considered a small component of the total variance, because 81% of the variability in scores is due to differences between employees.

Measures

Transformational leadership

We used the five dimensions of Transformational Leadership from the *Multifactor Leadership Questionnaire* (Bass & Avolio 1990). *Inspirational motivation* was measured

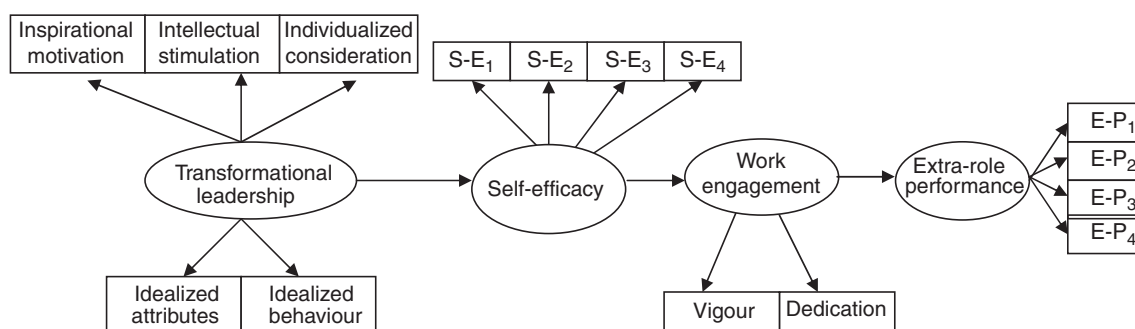


Figure 1 The research model. E-P₁, E-P₂, E-P₃ and E-P₄ = Four items that make up the extra-role performance scale. S-E₁, S-E₂, S-E₃ and S-E₄ = Four items that make up the self-efficacy scale.

with a four-item scale ($\alpha = 0.84$) (item example: 'My supervisor speaks so optimistically about the future'). *Individualized consideration* was measured using a four-item scale ($\alpha = 0.83$) (item example: 'My supervisor believes that each worker has different needs, skills and aspirations'). *Intellectual stimulation* was measured using another scale composed of four items ($\alpha = 0.80$) (item example: 'My supervisor suggests new ways to perform the tasks'). Finally, to measure *Idealized influence*, Bass and Avolio (1990) suggested two sub-dimensions: *idealized attributes*, which we measured with a four-item scale ($\alpha = 0.72$) (item example: 'My supervisor conveys a sense of power and confidence'), and *idealized behaviour*, measured by another four-item scale ($\alpha = 0.73$) (item example: 'My supervisor speaks about his/her most important values and beliefs'). Participants answered the questionnaire items using a 5-value Likert scale, ranging from 0 (*never*) to 4 (*always*).

Self-efficacy

We measured self-efficacy using a self-constructed scale composed of four items ($\alpha = 0.91$), following Albert Bandura's recommendations about the need to construct a specific new self-efficacy scale in each particular study (Bandura 2006) (item example: 'I can do my nursing work although I must solve difficult problems'). The participants answered the questionnaire items using a 7-value Likert scale, ranging from 0 (*never*) to 6 (*always*).

We measured the *vigour* and *dedication* dimensions of *Work Engagement* using the Utrecht Work Engagement Scale (UWES, Schaufeli *et al.* 2002) made up of six ($\alpha = 0.80$) and five items ($\alpha = 0.84$), respectively (item examples: 'At my work, I feel bursting with energy' and 'I find the work that I do full of meaning and purpose'). The participants answered the questionnaire items using a 7-value Likert scale, ranging from 0 (*never/nothing*) to 6 (*always, everyday*).

Extra-role performance

The immediate supervisor of each follower was asked to give a performance rating on a 4-item measure about extra-role performance ($\alpha = 0.88$) (i.e., organizational citizenship behaviour) by Morrison (1994), which has also been used in another Portuguese study (Chambel & Castanheira 2007). Specifically, we asked the immediate supervisors to indicate the frequency with which each nurse displays certain extra-role behaviour at the hospital (item example: 'This employee thinks about what is the best for the hospital'). The supervisors answered this scale using a 5-value Likert scale, ranging from 1 (*never*) to 5 (*always*).

Finally, it is important to note that the scales that were not previously used in Portugal were translated into Portuguese, and then a translator was asked to translate the Portuguese version back into English (Brislin 1980). The nurses' director then read the questionnaire and confirmed the clarity and familiarity of items.

Ethical considerations

Ethical committee approval was obtained for the study from Hospital Management. As the researchers had direct contact with the supervisors and the supervisors knew the identities of the staff nurses, steps were taken to guarantee the confidentiality of nurses.

Data analysis

As self-reports were used in this study, we considered the recommendations of Podsakoff *et al.* (2003), to test for the common method variance bias. Consequently, we applied Harman's single-factor test (Podsakoff *et al.* 2003), with Confirmatory Factor Analyses (CFA; e.g., Iverson & Maguire 2000) for the study variables. Secondly, descriptive analyses and the internal consistency of the scales were studied, in addition to the inter-correlations of all the variables. Finally, SEM methods, as implemented by AMOS 16.0 (Arbuckle 2005), were used to test our hypotheses. We used maximum likelihood estimation methods, and the input for each analysis was the covariance matrix of the items. The goodness-of-fit of the model was evaluated using absolute and relative indices. The absolute goodness-of-fit indices that were calculated were as follows: (1) the χ^2 goodness-of-fit statistic; (2) the Root Mean Square Error of Approximation (RMSEA); (3) the Goodness-of-Fit Index (GFI); and (4) the Adjusted Goodness-of-Fit Index (AGFI) (Jöreskog & Sörbom 1986). As the χ^2 test is sensitive to sample size, the calculation of relative goodness-of-fit indices is strongly recommended (Bentler 1990), and accordingly the following were calculated in this study: (1) Incremental Fit Index (IFI), and (2) Comparative Fit Index (CFI) (Marsh *et al.* 1996). As the distribution of the GFI and the AGFI is unknown, no statistical test or critical value is available (Jöreskog & Sörbom 1986). Values near 0.08 for RMSEA are considered to indicate an acceptable model fit (as a rule of thumb), and those smaller than 0.08 are considered to indicate a good model fit (Cudeck & Browne 1993), especially values between 0.05 and 0.08. Finally, relative fit index values greater than 0.90 are considered to indicate a good fit (Hoyle 1995).

Results

Participant demographics

A total of 364 questionnaires were distributed and 280 sets of supervisor-subordinate questionnaire dyads were used as the sample for our study (76.9% response rate). Of the participants in the sample, 79% were women and 21% were men, with a mean age of 34 years (SD = 11.1). The final sample was representative of the hospital, with nurses belonging to the different health services, i.e., Pediatrics ($n = 78, 21\%$), Accident and Emergency ($n = 73, 20.1\%$), Nephrology ($n = 26, 7.1\%$), Obstetrics ($n = 25, 6.9\%$), Vascular Surgery ($n = 22, 6\%$), Outpatients ($n = 18, 4.9\%$), Neurology ($n = 17, 4.7\%$), Medicine 1C ($n = 16, 4.4\%$), Infectious Diseases ($n = 16, 4.4\%$), Intensive Care Unit ($n = 16, 4.4\%$), Medicine 1B ($n = 15, 4.1\%$), Medicine 2B ($n = 15, 4.1\%$), HRED ($n = 12, 3.3\%$), Oncology ($n = 7, 1.9\%$), Palliative Medicine ($n = 4, 1.1\%$), Radiotherapy ($n = 2, 0.5\%$) and Psychiatry ($n = 2, 0.5\%$).

Preliminary and descriptive results

Results of preliminary data analyses reveal a significantly poorer fit of the single-factor model (Delta $\chi^2 = 15.99, P < 0.05$) compared with the model with four latent factors (i.e., transformational leadership, efficacy beliefs, work engagement and extra-role performance) [$\chi^2_{(71, n = 280)} = 153.70; RMSEA = 0.06; GFI = 0.93; AGFI = 0.89; CFI = 0.97; IFI = 0.97$]. Hence, one single factor cannot account for the variance in the data and so we cannot consider the common method variance to be a serious deficiency in this dataset.

Table 1 shows the means, standard deviations, and inter-correlations of the study variables. As expected, all the inter-correlations among the study variables were positive and many of them were also statistically significant. It should be

noted that while significant numerically, some of them were rather weak.

Hypotheses testing

Transformational leadership, self-efficacy, work engagement and extra-role performance are represented as latent variables in the structural model. Specifically, transformational leadership has five indicators, i.e., inspirational motivation, individual consideration, intellectual stimulation, idealized attributes and idealized behaviour. Self-efficacy has four indicators corresponding to the items that compose the scale, and work engagement has two indicators, i.e., vigour and dedication. Finally, extra-role performance has four indicators, which are the four items that make up the scale.

According to Baron and Kenny (1986) and Judd and Kenny (1981), when a mediational model involves latent constructs, SEM provides the basic data analysis strategy. In accordance with the four fundamental steps to establish the mediation effects proposed by these authors and to test the hypotheses, our research model (M1) was fitted to the data, as depicted in Figure 2. The results presented in Table 2 show that the research model fitted the data and that all the fit indices met the criteria [$\chi^2_{(61, N = 280)} = 122.86; RMSEA = 0.06; GFI = 0.93; AGFI = 0.90; IFI = 0.97; CFI = 0.97$]. All the path coefficients were statistically significant. So we observed fulfilment of the first three steps described by Baron and Kenny (1986) and by Judd and Kenny (1981). However, in the fourth step described by the authors, we observed that the direct relationship between transformational leadership and work engagement was also statistically significant. These results therefore showed that self-efficacy partially mediated the relationship between transformational leadership and work engagement.

To test whether work engagement mediates the impact of transformational leadership and self-efficacy on extra-role

Table 1 Means (M), Standard deviations (SD) and inter-correlations of the study variables ($n = 280$)

	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Inspirational motivation	2.61	0.75									
2. Individ. consideration	2.53	0.79	0.72**								
3. Intellectual stimulation	2.52	0.69	0.73**	0.82**							
4. Idealized attributes	2.55	0.70	0.74**	0.74**	0.82**						
5. Idealized behaviour	2.59	0.70	0.73**	0.74**	0.78**	0.81**					
6. Self-efficacy	4.29	0.94	0.18**	0.07	0.09	0.13*	0.09†				
7. Vigour	4.27	0.95	0.21**	0.15**	0.20**	0.18**	0.15**	0.39**			
8. Dedication	4.81	0.96	0.21**	0.21**	0.24**	0.14*	0.13*	0.27**	0.70**		
9. Extra-role performance	3.31	0.91	0.05	0.10†	0.09	0.08	0.20**	0.05	0.12*	0.07	

Correlations; ** $P < 0.01$; * $P < 0.05$; † $P < 0.10$.

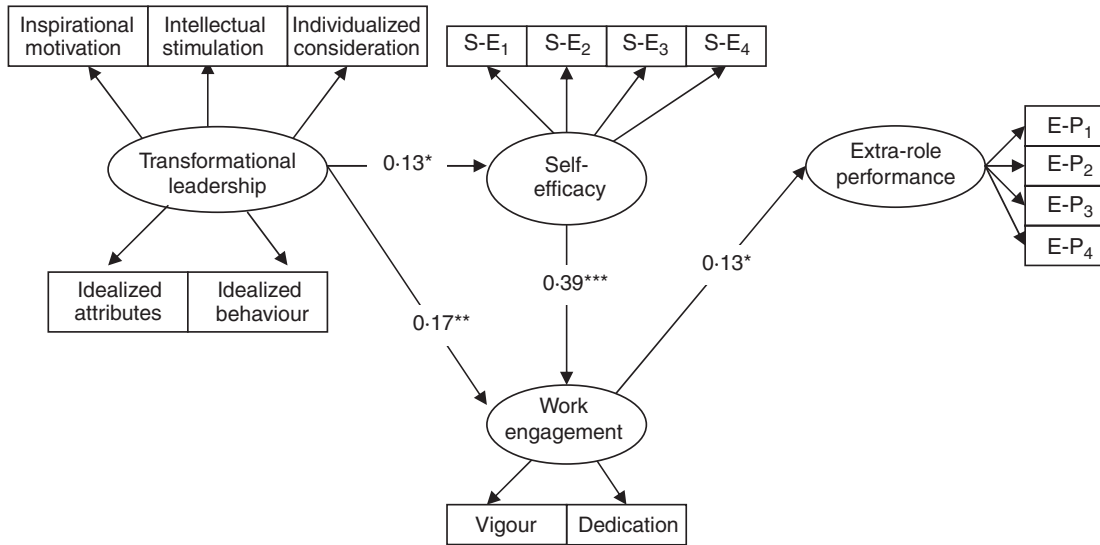


Figure 2 The research model with standardized path coefficients *** $P < 0.001$; * $P < 0.05$. E-P₁, E-P₂, E-P₃ and E-P₄ = Four items that make up the extra-role performance scale. S-E₁, S-E₂, S-E₃ and S-E₄ = Four items that make up the self-efficacy scale.

Table 2 Model fit

Model	χ^2	d.f.	RMSEA	GFI	AGFI	IFI	CFI	$\Delta\chi^2$	d.f.
M1	122.86	61	0.06	0.93	0.90	0.97	0.97		
M2	119.24	59	0.06	0.94	0.90	0.97	0.97	M2-M1 = 3.6	2 n.s.
M3	122.86	61	0.06	0.93	0.90	0.97	0.97	M3-M2 = 3.6	2 n.s.

M1 = research model, M2 = direct paths from transformational leadership and self-efficacy to extra-role performance, and M3 = new alternative model; the value of the parameter estimating the impact of work engagement on the extra-role performance of the research model (M1) (unstandardized coefficient) was fixed.

d.f., degrees of freedom; RMSEA, Root Mean Square Error of Approximation; GFI, Goodness-of-Fit Index; AGFI, Adjusted Goodness-of-Fit Index; IFI, Incremental Fit Index; CFI, Comparative Fit Index.

performance, we carried out additional analyses. First, the direct paths from transformational leadership and efficacy beliefs to extra-role performance were added to the initial model (M1). This new model (M2) fitted the data [$\chi^2_{(5984, N = 280)} = 119.24$; RMSEA = 0.06; GFI = 0.94; AGFI = 0.90; IFI = 0.97; CFI = 0.97] and none of the new parameter estimates were statistically significant. Therefore, at least partial mediation exists.

Finally, we fixed the value of the parameters estimating the impact of work engagement on the extra-role performance of the research model (M1) to the value presented by this parameter (unstandardized coefficient) of the M1 and a new alternative model was fitted to the data (M3). Although the model fits the data with all the fit indices meeting the criteria [$\chi^2_{(61, N = 280)} = 122.86$; RMSEA = 0.06; GFI = 0.93; AGFI = 0.90; IFI = 0.97; CFI = 0.97], the difference between the chi-square statistics associated with M3 and M2 was not

statistically significant. Thus, the influence of transformational leadership and self-efficacy on extra-role performance was fully mediated by work engagement. The model explained 12% of the variance of self-efficacy, 19% of work engagement and 2% of extra-role performance.

Discussion

Limitations of the study

The main limitation of this study is the use of self-reports, and common method variance could bias our results. However, Harman's single-factor test (Podsakoff *et al.* 2003) was used and the results revealed that common method variance can not be considered a serious deficiency in this dataset. Another limitation is that we obtained the staff data from only one hospital, and, although it was a large

hospital, the possibilities of generalizing to other hospitals need to be demonstrated. Also on the issue of generalization, this research study was conducted in Portugal, and although Portugal is in the European Community and the laws and rules guiding the management of public hospitals are the same as those applied in other countries, it would be interesting to replicate the study in other countries.

Theoretical implications

There are several interesting theoretical findings in the current paper. First, as we predicted in Hypothesis 1, the powerful motivational process of self-efficacy (Bandura 2001) was confirmed. Second, this study clearly demonstrates that transformational leadership is an important source of nurses' self-efficacy (as we expected in Hypothesis 2). This agrees with the results and also suggestions by Walumbwa *et al.* (2008), who found that a transformational leader might enhance follower self-efficacy through vicarious experience (role modelling) and verbal persuasion, which are two of the major sources of self-efficacy. We also analysed whether transformational leadership is positively associated with work engagement by influencing self-efficacy. Although previous research had studied the relationship between transformational leadership and well-being (Druskat 1994, Nielsen *et al.* 2009), our results confirm that efficacy beliefs partially mediate this relationship. Furthermore, this study goes one step further by showing how the transformational leader explains self-efficacy directly, but also provides an explanation for levels of work engagement. Therefore, our results agree with those of Turner *et al.* (2002), who suggested that transformational leadership has the potential to make a considerable contribution to individual well-being and motivation (in our study, work engagement). But the current study also showed that this relationship is being partially mediated by the impact of leader behaviour on follower self-efficacy.

Finally, we also included extra-role performance, as assessed by supervisors, in our model. Although it is important to note the difficulty involved in obtaining an individual measure of extra-role performance for each nurse, it is recommended for assessing employees' extra-role performance more precisely and to avoid social desirability. The results show work engagement *fully* mediates the relationship between transformational leadership, self-efficacy and extra-role performance, thereby supporting Hypothesis 3. These relationships are in agreement with Williams (1994), who showed that transformational leaders influence the extra-role behaviours among followers. But it is important to note that only *engaged employees* will show extra-role performance.

Our study contributes to previous research (Walumbwa *et al.* 2008, Zhu *et al.* 2009) in the sense that work engagement is a powerful psychological mechanism that *fully* mediates the link between self-efficacy and job performance, at least in the case of *extra-role* performance among nurses.

Practical implications and avenues for future research

Delivery of high quality health services depends on the competence of health workers and a work environment that supports performance excellence. Positive practice environments must be established throughout the health sector at an international level. They have the power to attract and retain staff, improve patients' and workers' satisfaction, safety and outcomes, and deliver cost-effective services.

Our results agree with research about how positive personal and environmental factors increase work engagement, which in turn increase specific positive behaviours such as extra-role performance (Salanova *et al.* 2005). Moreover, this study is assumed to be innovative because we have found a social context variable in work that provides extra-role performance through self-efficacy and work engagement, i.e., transformational leadership. Our study confirms that transformational leadership plays a key role in the introduction of this new practice by ensuring positive psychological states and behaviours in employees (Bass & Avolio 1990).

From a practical point of view, our results can be applied to strengthen nursing staff worldwide by developing, monitoring and disseminating programmes and policy tools on nursing human resources, management, research and practice. We could apply these results to hospital staff to improve nurses' efficacy beliefs and work engagement and, in turn, their extra-role performance. The finding suggests that training immediate nurse supervisors to become more transformational will provide hospitals with important competitive advantages. More importantly, such training initiatives are related to increased levels of motivation, satisfaction and performance among followers (Dvir *et al.* 2002, Towler 2003). In this sense, this study is in line with the conclusions reached by Cummings *et al.* (2010) that claim that improving existing leadership is essential for the future sustainability of the nursing workforce, and providing training for existing leaders also becomes a priority consideration for chief executives and nursing administrators.

Future research may test our hypotheses in other occupational healthcare settings to check the invariance of the proposed model. We could also verify the role of the leader/manager in this kind of population (nurses) and in others. Moreover, future longitudinal studies could also test these

What is already known about this topic

- Nursing leadership is repeatedly called for in the management of healthcare workplaces and workforce issues.
- Research has examined the relationships between transformational leadership and nurses' well-being.
- Transformational leaders have a positive influence on employee (extra-role) performance.

What this paper adds

- This study shows that there is a full mediation model, in which transformational leadership explains nurses' extra-role performance through self-efficacy and work engagement.
- There is a direct relationship between transformational leadership and work engagement.

Implications for practice and/or policy

- Improvement leadership by applying a transformational style is essential for the future sustainability of the nursing workforce. Thus, training in transformational leadership should accomplish competitive advantages for hospitals, i.e., by increasing the levels of nurses' extra-role performance via efficacy beliefs and work engagement.
- Future research is needed to design and evaluate interventions for the enhancement of transformational leadership in hospital settings, and more specifically among nurses.

relationships with a view to analysing the causal effects among the study variables.

Conclusion

Our findings expand the Social Cognitive Theory by Albert Bandura in the specific area of nursing showing the relevance of a transformational manager to enhance nurse extra-role performance by increasing their levels of self-efficacy and work engagement. A transformational leadership style can help to create a more positive and psychologically healthy work environment in hospitals.

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Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

MJC & IMM were responsible for the study conception and design. LL performed the data collection. LL performed the data analysis. MS were responsible for the drafting of the manuscript. MS, LL, MJC, IMM made critical revisions to the paper for important intellectual content. LL provided statistical expertise. IMM provided administrative, technical or material support.

References

- Arbuckle J.L. (2005) *Amos Users' Guide Version 6.0*. Ill Smallwaters Corporation, Chicago.
- Bandura A. (1989) Human agency in the social cognitive theory. *American Psychologist* **44**, 1175–1184.
- Bandura A. (1997) *Self-efficacy: The Exercise of Control*. Freeman, New York.
- Bandura A. (2001) Social cognitive theory: an agentic perspective. *Annual Review of Psychology* **52**, 1–26.
- Bandura A. (2006) Guide for constructing self-efficacy scales. In *Self-efficacy Beliefs of Adolescents* (Pajares F. & Urdan T., eds), Information Age, Greenwich, pp. 307–337.
- Baron R. & Kenny D. (1986) The moderator-mediator variable distinction in social Psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology* **6**, 1173–1182.
- Bass B.M. (1990) From transactional to transformational leadership: learning to share the vision. *Organizational Dynamics* **18**, 19–32.
- Bass B.M. & Avolio B. (1990) *Bass and Stodgill's Handbook of Leadership*. Free Press, New York and London.
- Bentler P. (1990) Fit indexes, Lagrange multipliers, constraint changes and incomplete data in structural models. *Multivariate Behavioural Research* **25**, 163–172.
- Bliese P.D. (2000) Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In *Multilevel Theory, Research, and Methods in Organizations* (Klein K.J. & Kozlowski S.W., eds), Jossey-Bass, San Francisco, pp. 349–381.
- Brislin R. (1980) Translation and content analysis of oral and written materials. In *Handbook of Cross-Cultural Psychology* (Triandis H., Lambert W., Berry J. & Lonner W., eds), Allyn and Bacon, Boston, pp. 389–444.
- Chambel M.J. & Castanheira F. (2007) They don't want to be temporaries: Similarities between temps and core workers. *Journal of Organizational Behavior* **28**, 943–959.
- Cohen J., Cohen P., West S.G. & Aiken L.S. (2003) *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. Lawrence Erlbaum Associates, Publishers, Mahwah, New Jersey.
- Cudeck R. & Browne M.W. (1993) Alternative ways of assessing model fit. In *Testing Structural Equation Models* (Bollen K.A. & Scott Long J., eds), Sage, Newbury Park, CA, pp. 1–9.

- Cummings G.G., MacGregor T., Davey M., Lee H., Wong C.A., Lo E., Muise M. & Stafford E. (2010) Leadership styles and outcome patterns for the nursing workforce and work environment: a systematic review. *International Journal of Nursing Studies* 3, 363–385.
- Demerouti E. & Bakker A.B. (2006) Employee well-being and job performance: where we stand and where we should go. In *Occupational Health Psychology: European Perspectives on Research, Education and Practice* (McIntyre S. & Houdmont J., eds), ISMAI Publications, Maia, Portugal, pp. 83–111.
- Druskat V.U. (1994) Gender and leadership style: transformational and transactional leadership in the Roman Catholic Church. *Leadership Quarterly* 5, 99–119.
- Dumdum U.R., Lowe K.B. & Avolio B.J. (2002) A meta-analysis of transformational and transactional leadership correlates of effectiveness and satisfaction: an update and extension. In *Transformational and Charismatic Leadership: The Road Ahead* (Avolio B.J. & Yammarino F.J., eds), Elsevier Science, Oxford, pp. 36–66.
- Dvir T., Eden D., Avolio B.J. & Shamir B. (2002) Impact of transformational leadership on follower development and performance: a field experiment. *Academy of Management Journal* 45, 735–744.
- Freeney Y.M. & Tiernan J. (2009) Exploration of the facilitators of and barriers to work engagement in nursing. *International Journal of Nursing Studies* 12, 1557–1565.
- Gilmartin M. & D'Aun T.A. (2007) Leadership research in healthcare. *The Academy of Management Annals* 1, 387–438.
- House R.J. & Shamir B. (1993) Toward the integration of transformational, charismatic, and visionary theories. In *Leadership Theory and Research: Perspectives and Directions* (Chemers M.M. & Ayman R., eds), Academic Press, CA, San Diego, pp. 81–103.
- Hoyle R.H. (1995) The structural equation modelling approach: basic concepts and fundamental issues. In *Structural Equation Modelling, Concepts, Issues, and Applications* (Hoyle R.H., ed.), Thousand Oaks, CA, pp. 1–15.
- Iverson R.D. & Maguire C. (2000) The relationship between job and life satisfaction: evidence from a remote mining community. *Human Relations* 53, 807–839.
- Jöreskog K.G. & Sörbom D. (1986) *LISREL User Guide Version VI*, 4th edn. Scientific Software International, Mooresville.
- Judd C.M. & Kenny D.A. (1981) Process analysis: estimating mediation in treatment evaluations. *Evaluation Review* 5, 602–619.
- Kark R. & Dijk D. (2007) Motivation to lead, motivation to follow: the role of the self-regulatory focus in leadership processes. *Academy of Management Review* 32, 500–528.
- Klauss R. & Bass B.M. (1982) *Interpersonal Communication in Organizations*. Academic Press, New York.
- LeBlanc P., Schaufeli W.B., Salanova M., Llorens S. & Nap R.E. (2010) Efficacy beliefs predict collaborative practice among intensive care unit nurses. *Journal of Advanced Nursing* 3, 583–594.
- Marsh H., Balla J. & Hau K. (1996) An evaluation of incremental fit indexes: a clarification of mathematical and empirical properties. In *Advanced Structural Equation Modelling Issues and Techniques* (Marcoulides G.A. & Schumacker R.E., eds), Lawrence Erlbaum, Mahwah, NJ, pp. 315–353.
- McGraw K.O. & Wong S.P. (1996) Forming inferences about some intraclass correlation coefficients. *Psychological Methods* 1, 30–46.
- Mok E. & Au-Yeung B. (2002) Relationship between organizational climate and empowerment of nurses in Hong Kong. *Journal of Nursing Management* 10, 129–137.
- Morrison E.W. (1994) Role definitions and organizational citizenship behaviour: the importance of employees' perspective. *Academy of Management Journal* 37, 1543–1567.
- Munir F. & Nielsen K. (2009) Does self-efficacy mediate the relationship between transformational leadership behaviours and healthcare workers' sleep quality? A longitudinal study *Journal of Advanced Nursing* 9, 1833–1843.
- Nielsen K. & Munir F. (2009) How do transformational leaders influence followers' affective well-being? Exploring the mediating role of self-efficacy *Work & Stress* 4, 313–329.
- Nielsen K., Yarker J., Randall F. & Munir R. (2009) The mediating effects of team and self-efficacy on the relationship between transformational leadership, and job satisfaction and psychological well-being in healthcare professionals: a cross-sectional questionnaire survey. *International Journal of Nursing Studies* 46, 1236–1244.
- Pillai R. & Williams E.A. (2004) Transformational leadership, self-efficacy, group cohesiveness, commitment, and performance. *Journal of Organizational Change Management* 17, 144–159.
- Podsakoff P.M., Mackenzie S.B., Lee J. & Podsakoff N.P. (2003) Common Method Biases in Behavioural Research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology* 5, 879–903.
- Salanova M., Llorens S., Cifre E., Martínez I.M. & Schaufeli W.B. (2003) Perceived collective efficacy, subjective well-being and task performance among electronic work groups: an experimental study. *Small Group Research* 34, 43–73.
- Salanova M., Agut S. & Peiró J.M. (2005) Linking organizational resources and work engagement to employee performance and customer loyalty: the mediation of service climate. *Journal of Applied Psychology* 90, 1217–1227.
- Schaufeli W.B., Salanova M., González-Romá V. & Bakker A. (2002) The measurement of burnout and engagement: a confirmatory factor analytic approach. *Journal of Happiness Studies* 3, 71–92.
- Schyns B. (2001) The relationship between employees' self-monitoring and occupational self-efficacy and perceived transformational leadership. *Current Research in Social Psychology* 7, 30–42.
- Seeley T.A. (2007) The impact of followership dimensions on affective commitment and in-role and extra-role performance. *Dissertations Abstracts International: Section B: Sciences and Engineering* 68, 662 B.
- Simpson M.R. (2009) Engagement at work: a review of the literature. *International Journal of Nursing Studies* 46, 1012–1024.
- Towler A.J. (2003) Effects of charismatic influence training on attitudes, behavior, and performance. *Personnel Psychology* 56, 363–381.
- Turner N., Barling J. & Zacharatos A. (2002) Positive Psychology at work. In *Handbook of Positive Psychology* (Snyder C. & Shane J., eds), New-York, Oxford University Press, pp. 715–728.
- Walumbwa F.O., Wang P., Lawler J.J. & Shi K. (2004) The role of collective efficacy in the relations between transformational leadership and work outcomes. *Journal of Organizational and Occupational Psychology* 77, 515–553.

- Walumbwa F.O., Bruce J., Avolio B. & Zhu W. (2008) How transformational leadership weaves its influence on individual job performance: the role of identification and efficacy beliefs. *Personnel Psychology* 61, 793–825.
- Williams E.S. (1994) *Tying Up Loose Ends: The Role of Transformational Leadership in OCBs, Commitment, Trust and Fairness Perceptions*. Unpublished Paper, Southern Management Association, New Orleans, LA.
- Xanthopoulou D., Bakker A.B., Heuven E., Demerouti E. & Schaufeli W.B. (2008) Working in the sky: a dairy study among flight attendants. *Journal of Occupational Health Psychology* 13, 345–356.
- Zhu W., Avolio B.J. & Walumbwa F.O. (2009) Moderating role of follower characteristics with transformational leadership and follower work engagement. *Group & Organization Management* 34, 590–619.

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