

Self-efficacy and organizational commitment among Spanish nurses: the role of work engagement

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Aim: The objective of this study was to verify the mediating role of work engagement between self-efficacy and affective organizational commitment on the basis of the Job Demands-Resources Model in a sample of Spanish nursing staff.

Background: Affective organizational commitment is a key element, both for the permanence of nursing staff and for the provision of an excellent quality of care of health organizations. However, the relationships between self-efficacy, work engagement and affective commitment to the organization have been little explored within the nursing context.

Methods: A total of 527 nursing professionals from Spanish public hospitals in Andalusia were surveyed, obtaining a convenience sample of 324 participants (52.96% nurses, 47.04% nursing assistants). The mediating role of work engagement was examined using structural equation modelling and the bootstrapping method.

Results: The results showed that affective organizational commitment was positively predicted by self-efficacy and work engagement. Work engagement had a direct effect on affective organizational commitment, while the effect of self-efficacy on affective commitment was totally mediated by work engagement.

Conclusions: The results give empirical support to the Job Demands-Resources Model, which raises the mediating role of work engagement between self-efficacy (personal resource) and affective organizational commitment (organizational result).

Implications for nursing practice: Health organizations should be aware that a greater perception of efficacy beliefs and work engagement strengthens the affective bond with the organization, thus improving the corporate image of the health institution.

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Ethical approval

This study was reviewed and approved by the concerned institutional review board (2014-036-FDN).

Conflict of interest

No conflict of interest has been declared by the authors.

Implications for nursing policy: Policy changes are necessary to create work environments that enhance the self-efficacy of nursing staff and generate high levels of work engagement, such as flexible training plans and informal support groups.

Keywords: Organizational Commitment, Self-Efficacy, Spain, Structural Equation Modelling, Work Engagement

Introduction

The retention and permanence of nursing staff is a matter of vital importance for the administrators and directors of health organizations. Having highly experienced professionals with years of clinical practice determines, to a large extent, both the quality of services and the quality of care in hospitals and health units (Karami et al. 2017; Yang et al. 2014). In addition, a low dropout and rotation rates allow cost-savings derived from new processes for the selection, recruitment and training of new nurses for health organizations (Brunetto et al. 2013). The permanence, rotation and/or abandonment of nursing staff depend both on personal and organizational elements, among which organizational commitment stands out (Beukes & Botha 2013; Brunetto et al. 2013; Karami et al. 2017; Ruiller & Van Der Heijden 2016; Yang et al. 2014).

Background

Organizational commitment in nursing staff

Organizational commitment is defined as the degree of involvement of a worker with a particular organization (Liou 2008; Meyer et al. 1993). Among the various theoretical models on organizational commitment, the three-dimensional model proposed by Meyer et al. (1993) is probably the most used in research in this construct.

These authors propose the existence of three components or types of commitment to an organization (Meyer et al. 1993): the affective component, the continuous component and the normative component. Affective component expresses the strength or intensity of a person's identification with their organization, as well as their participation in the life of the company. Nurses with high levels of affective commitment continue to work in the same hospital, not because they feel compelled to do so, but because they want to do so (Liou 2008). Continuous commitment refers to the degree to which a person perceives that the cost of leaving is greater than the cost of remaining in the company or considers that staying is the only option. It can be considered to be a 'forced' commitment (Beukes & Botha 2013). Finally, normative commitment is that shown by people who remain in an organization because they believe that it is morally correct (Gutierrez et al. 2012; Liou 2008).

Several studies have shown that affective commitment is the most strong dimension associated with the intention to remain in a company, as well as with work involvement (Gutierrez et al. 2012; Liou 2008; Ruiller & Van Der Heijden 2016). In addition, it refers to the positive elements of organizational commitment in the nursing context, such as identification with the values of the institution (i.e. excellence in care and patient care; Ruiller & Van Der Heijden 2016).

Work engagement and organizational commitment in nursing staff

High levels of affective commitment with an organization are also considered as one of the main traits of nurses who are engaged at work (De Simone et al. 2018; García-Sierra et al. 2015; Simpson 2009). Work engagement is defined as 'a positive, fulfilling, work-related state of mind that is characterized by vigour, dedication and absorption' (Schaufeli et al. 2002, p. 74), and is considered to be an important predictor of both organizational commitment, as well as the intention to abandon a company (De Simone et al. 2018; García-Sierra et al. 2015; Shahpouri et al. 2016; Simpson 2009). In addition, work engagement has been related to other important attitudes and work behaviours in nursing personnel, such as job satisfaction, effective performance or the quality of hospital care (García-Sierra et al. 2015; Schaufeli 2017).

According to Schaufeli et al. (2002), vigour refers to 'high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties' (p. 74). Dedication is related to feelings of meaning, enthusiasm, inspiration and pride for work, as well as a high involvement with work. Absorption arises when a person is fully concentrated on one's work, so that he/she spends their time focusing hard on their work tasks (Schaufeli 2017; Schaufeli et al. 2002).

When engaged nursing professionals feel that the work they do is important (i.e. meaningful), they perform their tasks more effectively and experience positive feelings and emotions in the workplace (i.e. happiness, pleasure). Consequently, these people tend to develop and maintain an affective bond with the organization, manifesting high levels of organizational commitment (Beukes & Botha 2013; Brunetto et al. 2013; García-Sierra et al. 2015; Santos et al. 2016) and lower

intention of leaving the company (De Simone et al. 2018; Shahpouri et al. 2016).

The Job Demands-Resources (JDR) Model has been the most used theoretical model for research on work engagement (Schaufeli 2017). According to the JDR Model, work engagement is the result of the presence of high levels of job resources and personal resources at work (Elst et al. 2016; Schaufeli 2017). Job resources are the physical, psychological, social and organizational characteristics that allow people to face job demands (i.e. social support from colleagues) and that stimulate both personal and professional development (Elst et al. 2016; Schaufeli 2017). Personal resources are those positive characteristics of people with the capacity to reduce the negative potential of job demands. Personal resources include optimism, resilience, self-esteem or self-efficacy (De Simone et al. 2018; García-Sierra et al. 2015; Schaufeli 2017).

Self-efficacy and work engagement in nursing staff

Within personal resources, self-efficacy or the belief that the person has about their own abilities and competences to carry out a work behaviour with a certain level of success, stands out (Bandura 1997; Schwarzer et al. 1997). The belief in efficacy motivates people to action, even in situations where obstacles and work difficulties appear (Schwarzer et al. 1997). Nurses perceived as effective experience higher levels of engagement at work (De Simone et al. 2018; García-Sierra et al. 2015; Schaufeli 2017). As a result, nurses more often experience positive emotions and feelings at work, which facilitate the emergence of positive affective bonds with the organization. In this sense, several studies have shown that higher levels of self-efficacy have been associated with high scores in organizational commitment (Lee & Ko 2010; Peng et al. 2013) and lower intention of leaving the organization (De Simone et al. 2018; Peng et al. 2013; Shahpouri et al. 2016).

The research on affective commitment is of vital importance in the context of health services and especially among nursing staff. In comparison with other professional contexts, studies on organizational commitment in nursing personnel are scarce (Liou 2008). In addition, engagement and self-efficacy, as antecedents of organizational commitment, have been little explored, despite being elements with a very important role in health organizations (Boamah & Laschinger 2014). Furthermore, the understanding of the processes associated to the organizational commitment and the intention of permanence of the nursing personnel is especially important in the Spanish context due to the recent economic cuts in the healthcare services.

Aim of the study

As a consequence of the above, the aim of this study was to verify the predictive role of self-efficacy and work engagement on affective commitment within the organization, assuming the mediator role of work engagement between self-efficacy and affective organizational commitment (Schaufeli 2017).

Methods

Design and participants

A transversal and correlational survey design was used in this study. A convenience sample of 527 nursing personnel from public hospitals in Andalusia (Spain) and members of a national nurses union was surveyed. The criterion for inclusion was that these nursing professionals were active in the same ward of a public hospital for at least 1 year.

We used the Size Calculator for Structural Equation Models software (Soper 2018) to calculate the minimum sample size for the data analysis. With a medium effect of 0.30, α of 0.01, power of 0.95, three latent variables and nine observed variables, the recommended minimum sample size is 237 participants, and the minimum sample size to detect effect is also 237 participants.

Instruments

We used the following instruments for the research: the General Self-Efficacy Scale (Schwarzer et al. 1997), the Utrecht Work Engagement Scale (UWES; Schaufeli et al. 2002), the affective commitment dimension included in the Organizational Commitment Scale (Meyer et al. 1993) and a questionnaire with sociodemographic and professional questions created by the researchers.

Self-efficacy

The Spanish version of the General Self-Efficacy Scale (Schwarzer et al. 1997) is composed of ten items. The items are answered using a Likert scale with a range from 0 (never) to 6 (every day). Elevated scores indicate higher levels of self-efficacy in the participants. The internal consistency coefficient (Cronbach's alpha) for this scale was 0.91.

Work engagement

This variable was evaluated using the Spanish reduced version of the Utrecht Work Engagement Scale (UWES; Schaufeli et al. 2002). This scale is composed of nine items and three dimensions (vigour, dedication, absorption), with three items in each dimension. However, Bakker and Leiter (2010) suggest the use of the total, composite score of the UWES. In this sense, we performed an EFA to check the factorial

structure of the scale. A principal component analysis was carried out on the nine items of the UWES. The first factor accounted for 63.02% of the variance, with an eigenvalue of 5.67, and this factor saturated the nine items. All the items showed a factor loading higher than 0.60, ranging from 0.64 to 0.84. Consequently, we decided to use the total score of the UWES.

The participants responded to each item using a Likert-type scale, ranging from 0 (never) to 6 (every day). Higher scores express higher levels of work engagement in the participants. Cronbach's alpha was 0.92.

Affective organizational commitment

This variable was evaluated using the affective commitment dimension included in the Spanish version (de Frutos et al. 1998) of the Organizational Commitment Scale (Meyer et al. 1993). The six items were evaluated using a seven-point Likert-type scale, ranging from 1 (totally disagree) to 7 (totally agree). Elevated scores express high perceptions of affective commitment to the organization in the participants. The internal consistency coefficient (Cronbach's alpha) for this scale was 0.89.

Procedure

The questionnaires were handed out between February and March 2015. The researchers contacted the representatives of a national nursing union to conduct the study. After the presentation of the research to the ethics committee of the association, it was agreed to administer the questionnaires to their affiliates attending the training courses given by the association.

The researchers were present in the different training courses in the indicated period, explaining the aim of the study and requesting the participation of the assistants. The questionnaires were delivered to the union members (nurses and assistant nurses) who met the selection criterion previously indicated. At all times the researchers were present to solve any type of questions. After completing the questionnaires, these were introduced into envelopes that were later given to the researchers. Finally, participation was appreciated.

Ethical considerations

This study was reviewed and approved by the ethics committee of the Foundation for the Development of Nursing (Ref: 2014-036-FDN) before data collection. The anonymity and confidentiality of all data and the use for scientific purpose of all the information obtained was guaranteed. All participants had the opportunity to withdraw from the study if they

wanted to. The consent to participate in the study was given to the researchers verbally.

Data analysis

The statistical software package STATA v13 (StataCorp LLC, College Station, TX, USA) was used for data analysis. The level of significance used was $P < 0.05$ (two-tailed).

First, we calculated the descriptive statistics of the variables, the correlations (Pearson r coefficient) between them and the reliability coefficients (Cronbach's alpha) of the scales.

The relationships between self-efficacy, work engagement and affective organizational commitment were tested using the structural equation modelling (SEM) technique, with the maximum likelihood method. We used the following coefficients to verify the adjustment of the model: chi-square (χ^2) and degrees of freedom, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR). Values of CFI and TLI above 0.95 and values of RMSEA and SRMR less than 0.08 are indicative of a good fit (Hu & Bentler 1999).

In relation to the use of structural equation models and the model adjustment, Little et al. (2002) consider that the use of the parcelling strategy results in much more reliable models. Consequently, the three variables of the model were considered as latent variables. For the latent variables of self-efficacy and affective commitment, three parcels were created from the 10 items of self-efficacy and three parcels from the six items of commitment. Based on the results of the exploratory factor analysis (EFA) conducted on the self-efficacy and commitment scales, the parcels were created by combining items with higher loadings with items having smaller loadings (balancing technique; Little et al. 2002, 2013). Regarding work engagement, three parcels were used corresponding to the vigour, dedication and absorption dimensions.

Mediation analysis was carried out following Hayes' (2013) recommendations. We used the bootstrapping method to make inferences and confidence intervals (CIs) for the direct and indirect effects (Kline 2016). The bootstrapping technique is 'a computer-based method that combines the cases in a data set in different ways to estimate statistical precision' (Kline 2016, p. 60). This technique has more statistical power compared with other mediation approaches (e.g. Baron and Kenny approach, Sobel test). If the resulting CI for the bootstrap estimate does not include zero, it may be concluded that the effect is significant ($P < 0.05$). We calculated Bias-Corrected (BC) bootstrap confidence intervals (95%), based on 10 000 samples, as recommended by Hayes (2013).

Results

Sample characteristics

The final sample consisted of 342 participants, with a response rate of 64.89%. Their ages ranged from 19 to 64 years, with a mean age of 40.63 (SD = 9.99). About 53.67% of the participants were men ($n = 183$) compared to 46.33% of women ($n = 158$). A total of 179 participants (52.96%) stated that they were registered nurses (diploma, degree) and 159 (47.07%) indicated that they were nursing assistants (state-approved training program). No statistically significant differences were observed in the proportion of men and women between the two professional categories (nurses and nursing assistants): $\chi^2(1) = 2.10$, $P = 0.15$. The average professional experience was 11.40 years (SD = 8.10).

Preliminary analysis

Several tests were carried out to test the possible influence of the common method variance (CMV). According to Podsakoff et al. (2012), when two or more constructs are evaluated using the same type of method (i.e. self-report questionnaires), the data collection method can distort the relationships between the variables (i.e. overestimation or underestimation). Consequently, we decided to use Harman's single-factor test as a CMV diagnostic test (Podsakoff et al. 2012).

To perform Harman test, an exploratory factor analysis (EFA) was carried out using all the items of the self-efficacy, work engagement and affective organizational commitment scales. The principal component method was used, with varimax rotation, and the extraction of a single factor was forced. More than 50% of the variance in the extracted factor is indicative of a possible problem with the CMV.

Prior to the analysis, the Kaiser–Meyer–Olken (KMO) coefficient and the Bartlett test were calculated to verify the data properties for an EFA. The KMO value was 0.92, and the Bartlett test was statistically significant: $\chi^2(300) = 6233.72$, $P < 0.01$. These results support the use of EFA with the data. After the factorial analysis, the extracted factor accounted for 39.60% of the variance. In this sense, there does not seem to be a significant presence of the CMV in the study.

Descriptive statistics and correlations

Table 1 illustrates the descriptive statistics of the variables, the correlations between them and the reliability of the scales. The mean score of self-efficacy, work engagement and affective organizational commitment was 4.51 (SD = 1.02), 4.00 (SD = 1.2) and 4.89 (SD = 1.37), respectively. Both self-efficacy and work engagement showed significant and positive correlations ($P < 0.01$) with affective commitment with the

Table 1 Means, standard deviations, Cronbach's alpha coefficients and correlations of the variables ($N = 342$)

| | M | SD | 1 | 2 | 3 |
|--|------|------|--------|--------|--------|
| 1. Self-efficacy | 4.51 | 1.02 | (0.94) | | |
| 2. Work Engagement | 4.00 | 1.27 | 0.43 | (0.92) | |
| 3. Affective organizational commitment | 4.89 | 1.37 | 0.29 | 0.46 | (0.89) |

Alpha reliabilities are shown in parentheses on the diagonal. All coefficients are significant ($P < 0.01$).

organization: $r = 0.29$ for self-efficacy and $r = 0.46$ for work engagement.

Mediation analysis

To verify the objective of the study, a structural equation model was carried out where self-efficacy was the predictor variable (exogenous), work engagement was the mediator variable (endogenous), and affective organizational commitment the result variable (endogenous; Fig. 1). The model showed an adequate fit: $\chi^2(24) = 57.219$, $P < 0.01$, RMSEA = 0.064 [90% CI: 0.043–0.0851], CFI = 0.986, TLI = 0.979 and SRMR = 0.025. The results showed that self-efficacy was a significant and positive predictor ($\beta = 0.48$, $P < 0.01$) of work engagement, and a positive but not significant predictor of organizational commitment ($\beta = 0.10$, $P = 0.10$). Also, work engagement was shown as a significant and positive predictor of affective commitment with the organization ($\beta = 0.46$, $P < 0.01$).

With regard to the mediating role of work engagement (Table 2), this variable fully mediated the effect of self-efficacy on affective commitment in this sample of participants. The results of the bootstrap analysis showed that the indirect effect of self-efficacy was significant, with an observed coefficient of 0.283 (0.186 \leq BC-confidence interval \leq 0.413). The direct effect of self-efficacy was not significant, with an observed coefficient of 0.128 (−0.068 \leq BC-confidence interval \leq 0.315).

Discussion

Affective commitment with an organization is considered to be a relevant predictor of the intention of permanence/abandonment in nursing staff and a key element in the provision of an excellent quality of care in health organizations. Consequently, the aim of this study was to verify the predictive role of self-efficacy and work engagement on affective commitment with the organization. The results showed that both self-efficacy and engagement at work were significant

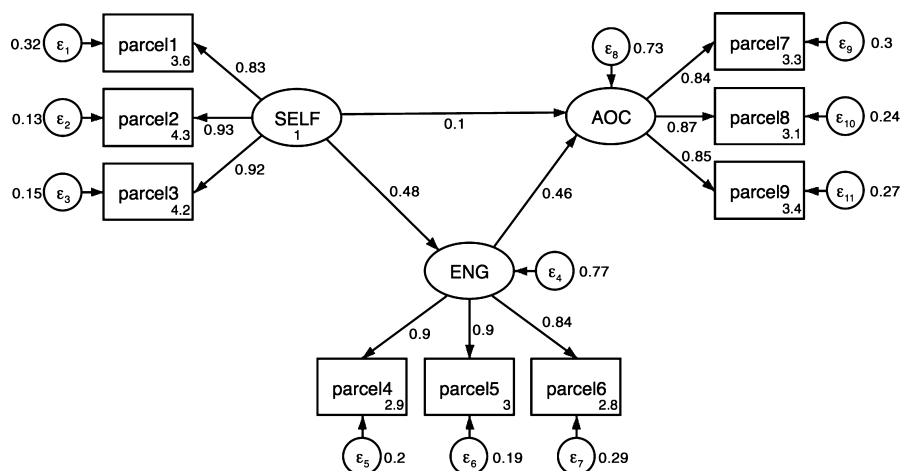


Fig. 1 Maximum likelihood estimates for the model (N = 342). All factor loadings are significant at the P < 0.01 level. AOC, affective organizational commitment; ENG, work engagement; SELF, self-efficacy.

Table 2 Direct, indirect and total effects on affective organizational commitment (N = 342)

| | Observed Coef. | Bias | Bootstrap SE | 95% BC confidence intervals |
|-------------------------------------|----------------|--------|--------------|-----------------------------|
| Direct effects | | | | |
| Work engagement | | | | |
| Self-Efficacy → | 0.600 | 0.005 | 0.087 | 0.419/0.771 |
| Affective organizational commitment | | | | |
| Work Engagement → | 0.471 | 0.001 | 0.070 | 0.332/0.610 |
| Self-Efficacy → | 0.128 | -0.005 | 0.095 | -0.068/0.315 |
| Indirect effects | | | | |
| Affective organizational commitment | | | | |
| Self-Efficacy → | 0.283 | 0.002 | 0.058 | 0.186/0.413 |
| Total effects | | | | |
| Work Engagement | | | | |
| Self-Efficacy → | 0.283 | 0.005 | 0.087 | 0.419/0.771 |
| Affective organizational commitment | | | | |
| Work Engagement → | 0.471 | 0.001 | 0.070 | 0.332/0.610 |
| Self-Efficacy → | 0.412 | -0.003 | 0.075 | 0.272/0.568 |

predictors, although they acted through different mechanisms: work engagement had a direct effect, while self-efficacy had an indirect effect and was totally mediated by engagement.

In relation to the averages scores obtained in self-efficacy, work engagement and affective organizational commitment, the average self-efficacy of the participants was similar to the scores observed in the studies of De Simone et al. (2018) with Italian nurses, and in the studies of Lee & Ko (2010)

and Peng et al. (2013) with Chinese samples. The average score in work engagement was lower than the scores observed in other studies conducted with nursing samples from South Africa, Iran, Australia, USA and Portugal (Beukes & Botha 2013; Brunetto et al. 2013; Santos et al. 2016; Shahpouri et al. 2016). However, the average score in affective organizational commitment was higher than the scores recorded in similar studies (Beukes & Botha 2013; Brunetto et al. 2013) and similar to the values obtained by Santos et al. (2016).

The direct influence of work engagement on the affective commitment observed in this study has also been registered in the studies of Beukes & Botha (2013), Brunetto et al. (2013) and Santos et al. (2016), and in the review by García-Sierra et al. (2015). When a nurse feels engaged at work, they experience high levels of energy and are absorbed in their work. In addition, they feel proud of what they do, consider their work has meaning and are involved in their position. Consequently, the nurse is personally and professionally fulfilled at work, thus experiencing positive emotions and feelings towards the hospital. This entails the appearance and development of an affective bond with the institution, generating high levels of affective commitment with the organization (Beukes & Botha 2013; Brunetto et al. 2013; García-Sierra et al. 2015; Santos et al. 2016) and lower intentions of abandonment (De Simone et al. 2018; Peng et al. 2013; Shahpouri et al. 2016).

When nurses have has high levels of self-efficacy at work, they feel able to successfully perform their tasks, meet their goals and face possible difficulties and obstacles in an adequate and effective way. In addition, they are is able to find

and mobilize new job resources if necessary, such as asking for help or advice from colleagues and supervisors. This results in a greater effort, motivation and persistence in the workplace and, in general, higher levels of vigour, dedication and absorption, that is, a greater engagement at work (De Simone et al. 2018; Lee & Ko 2010; Peng et al. 2013; Schaufeli 2017; Shahpouri et al. 2016). Finally, and as previously mentioned, higher levels of engagement lead, in turn, to higher levels of affective organizational commitment.

The observed indirect effect of self-efficacy on affective commitment with the organization, totally mediated by work engagement, is consistent with the postulates of the JDR Model (Schaufeli 2017), which assumes the mediating role of engagement among personal resources (i.e. self-efficacy) and positive organizational outcomes (i.e. organizational commitment). Our results are also consistent with those obtained by De Simone et al. (2018), Lee & Ko (2010) and Peng et al. (2013), and with the study by Shahpouri et al. (2016), who also verified the mediator role of work engagement between self-efficacy and the intention of abandonment in a sample of Iranian nurses.

Self-efficacy and work engagement have been shown to be important antecedents of affective organizational commitment. Regarding self-efficacy, providing experiences of success, overcoming obstacles, verbal persuasion and feeling emotionally well (i.e. good mood, happiness) are the greatest sources of information on personal effectiveness. In relation to engagement, greater job resources allow the appearance of high levels of dedication, vigour and absorption in nursing staff. It is expected that strategies based on self-efficacy and work engagement will help to establish an intense affective bond with the organization.

Limitations

The results of this study should be interpreted considering the following aspects. First, the cross-sectional design allows the establishment of objectives of covariance and not objectives of experimental causality. Although we have proposed a model of predictive relationships (predictor variable, mediator variable, outcome variable), the results obtained do not allow us to talk about experimental cause-effect relationships between the studied variables. Second, the generalizability of the results is limited due to the use of a convenience sample. Third, the use of questionnaires for data collection entails as the main disadvantage the existence of certain biases in the answers (i.e. social desirability, response fatigue). Finally, in relation to the CMV, although the diagnostic test showed a negative result, we cannot be totally sure of the lack of influence of the CMV.

Conclusion and future research

This study highlights the importance of personal beliefs of effectiveness and work engagement in the establishment and development of affective and positive links with the organization, which largely determine the quality of care and services in the nursing context. In addition, the results obtained give empirical support to the JDR Model (Schaufeli 2017): the impact of work engagement on affective organizational commitment was direct, and the influence of self-efficacy was indirect and totally mediated by work engagement.

Future studies should focus on exploring the relationships between these variables through longitudinal designs, given that the link of the nurse with his/her organization suffers variations over time. Also, it is also necessary to deepen the processes underlying the perceptions of self-efficacy in nursing personnel and their relationship with work engagement. Research based on diary studies on the perception of efficacy, engagement and the link with the health organization would shed more light on the processes.

Implications for nursing practice

From the direction and management of the health organizations, different strategies based on self-efficacy and work engagement can be put in place to increase the levels of affective organizational commitment of its members. The guidance of supervisors and colleagues (i.e. verbal persuasion, advice for overcoming obstacles) allows nurses to face the tasks and demands in the workplace with greater probability of success, fostering perceptions of self-efficacy. Regarding work engagement, interventions focused on the organization involve the increase in job resources for both the individual and groups: physical resources (i.e. technology), social resources (i.e. peer support, coaching), organizational resources (i.e. training opportunities) and/or work-family (i.e. flexible scheduling options).

Implications for nursing policy

Nursing policymakers should consider the important role of self-efficacy and work engagement regarding organizational commitment and intention to stay in the health institutions. In this sense, it is necessary to design training programs for supervisors in skills to support and give adequate feedback, in order to improve the beliefs of efficacy at work. Also, informal support groups (i.e. self-help groups, quality circles) would create work environments that enhance the self-efficacy of nursing staff. Nursing policymakers also need to consider the provision of sufficient job resources (i.e. economic resources, training plans and work-life balance programs) to create work environments that generate high levels of work engagement in nursing personnel.

Author contributions

Study design: AO, YB

Data collection: YB, OVA

Data analysis: AO, YB

Study supervision: AOR, YB, OVA

Manuscript writing: AO, YB, OVA

Critical revisions for important intellectual content: AO, YB, OVA

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