REVIEW

Updating Factors Influencing Nurse Work Engagement in the Hospital Settings: A Systematic Review

Yupin Aungsuroch [ID][1], Joko Gunawan [ID][1], I Gede Juanamasta [ID][1,2], Jed Montayre [ID][3]

[1]Faculty of Nursing, Chulalongkorn University, Bangkok, Thailand; [2]Nursing Program, STIKES Wira Medika Bali, Bali, Indonesia; [3]School of Nursing, The Hong Kong Polytechnic University, Hong Kong SAR, People's Republic of China

Correspondence: Yupin Aungsuroch, Email yupin.a@chula.ac.th

Background: Understanding the factors influencing work engagement among nurses is crucial for ensuring high-quality care and positive patient outcomes. Despite numerous factors associated with nurse work engagement, many were explored before the pandemic, potentially overlooking aspects relevant to the current context.

Aim: To explore and update factors related to nurse work engagement in the new normal era.

Design: Systematic review.

Data Sources: The search was restricted to articles published from 2019 to 2024 in CINAHL, PubMed, Scopus, ScienceDirect, Web of Science, and ProQuest, with full English text. The search was conducted from September 13th to 15th, 2023. Quantitative research articles that examined factors related to work engagement were included.

Review Methods: Data extraction, quality appraisal, and data analysis were performed in all included studies. Manual content analysis method was used to classify and group the factors.

Results: Sixty-one research articles were included in the final review. Five key groups of factors were generated from content analysis, including 1) individual-related factors, 2) organizational-related factors, 3) job and role-related factors, 4) work-life balance, and 5) work environment.

Conclusion: Understanding and addressing these multifaceted factors holistically is essential to develop strategies to sustain optimal engagement levels among nursing staff and improve overall patient care outcomes. Further studies are needed to confirm the findings.

Keywords: work engagement, nurse, hospital, pandemic, new normal

Background

Over the past couple of years, the nursing profession has faced various challenges and uncertainties due to the COVID-19 pandemic. These difficulties range from insufficient protective equipment to massive and heightened infection risks to strained healthcare resources and adverse impacts on health.[1] Nurses found themselves grappling with stress, anxiety, depression, and insomnia due to the ethically challenging decisions they faced, the isolation of patients in their care, and the witnessing of patient deaths.[2] Their physical well-being has also taken a hit, enduring exhaustion and pressure injuries due to prolonged hours in protective equipment.

Despite these challenges, nurses have had remarkable resilience and adaptability to what is now called the "new normal"—an adaptation to altered lifestyles and work patterns, recognizing that the pre-pandemic state will not recur.[3,4] Nonetheless, interventions are crucial to foster a psychologically safe workplace, prevent burnout, and bolster mental health. Effective leadership, prioritizing staff well-being, and fostering supportive teamwork are essential protective measures.[5] Additionally, there is a need to enhance work engagement to ensure quality, particularly given that Penturij-Kloks, de Gans, van Liempt, de Vries, Scheele, Keijsers[1] found a significant decrease in work engagement compared to pre-pandemic levels.

157

Work engagement has three components—vigor, dedication, and absorption—reflecting a positive and rewarding work attitude.[6] Increased work engagement correlates with enhanced performance, positive emotions, and improved health and productivity among employees.[7] Various research has established a positive correlation between heightened work engagement and better nurse performance across diverse healthcare settings.[8–11]

Previous studies have identified various factors influencing nurse work engagement, such as recognition, social support, job control, and nurse-physician collaboration, all positively impacting work engagement.[7,12,13] Moreover, previous systematic reviews addressing the same research topic have highlighted collective factors influencing nurse work engagement. Keyko, Cummings, Yonge, Wong[14] categorized 77 influencing factors into six categories: organizational climate, job resources, professional resources, personal resources, job demands, and demographic variables. García-Sierra, Fernández-Castro, Martínez-Zaragoza[15] identified three groups of influencing factors: organizational, individual, and nurse managers' characteristics. However, most of these studies were conducted before the pandemic, potentially missing factors relevant to the "new normal" context.

A recent systematic review by Midje, Nyborg, Nordsteien, Øvergård, Brembo, Torp[16] analyzed work engagement antecedents deductively using the Job Demands–Resources (JD–R) model, identifying thirty-six unique antecedents categorized into job resources, personal resources, and job demands. Nevertheless, this review predominantly focused on long-term care facilities, which may not adequately represent factors in the general hospital setting. This is similar to Kato, Chiba, Shimazu,[17] who also used the JD-R model but specifically focused on the Japanese context. Therefore, updating a comprehensive systematic review is crucial to establish robust evidence regarding the current factors impacting nurse work engagement.

This study aims to synthesize findings from various research efforts exploring these factors and aims to offer future research recommendations. This review is guided by the research question: "What factors contribute to nurse work engagement?"

Methods
Design
A systematic review design was employed, and it has been registered to PROSPERO (CRD42023468654). The PRISMA 2020 Statement was used to guide and report this systematic review.[18]

Search Methods
Multiple databases were used, including CINAHL, PubMed, Scopus, ScienceDirect, Web of Science, and ProQuest. The search terms were limited to articles written in English, with quantitative study designs, and focused on determinants of nurse work engagement in hospitals. The search was limited to articles published from 2019 to 2024, which were done from the 13th to September 15th, 2023. The range from 2019 to 2024 was considered due to the pandemic and new normal era focus for this study. The keywords used include "work engagement", "nurse", and "hospital". The details of the search strategy can be seen in the Table S1.

Inclusion and Exclusion Criteria
Articles must have met certain criteria to be included in this study, such as correlational or predictive studies that investigate the correlation between independent variables and nurse work engagement, articles written in English, and available in full text. Studies that involve work engagement acting as a mediator between factors and another outcome were also included. These studies can provide valuable insights into how certain factors impact nurse work engagement indirectly through a mediating variable. Experimental studies, qualitative studies, study protocols, and review articles were not considered. Studies that included a combination of other healthcare professionals without subgroup analysis were also excluded.

Screening
The third author (IGJ) searched and first screened the articles' titles and abstracts in all databases. The other authors examined all full texts and assessed all the included articles manually to verify they met the criteria for inclusion. Studies

were considered if they pertained to nurses working in clinical hospital settings such as inpatient, outpatient, intensive care, emergency, or specialty. While the definitions of nurse work engagement may not always be explicitly stated, we included studies that employed the same measurement instrument, typically the "Utrecht Work Engagement Scale",[6] to evaluate the identical construct and minimize bias and heterogeneity. All authors reached an agreement on whether these studies fulfilled the inclusion criteria.

Data Extraction

A table was utilized for data extraction purposes. The table included author names, country, publication year, research design, methods, measures, and results.

Quality Appraisal

A quality appraisal tool was used, specifically designed for correlational studies, to evaluate the quality of each article. The tool has been adapted from an instrument used in a previous systematic review.[14] Thirteen criteria were examined, and each criterion was given a possible total of one point, resulting in a maximum possible score of 14. Each study was classified as low, moderate, or high quality based on the assigned total points.

Data Analysis

Content analysis was employed to consolidate the findings. The content analysis includes organizing content and variables into thematic categories, as described by Grove, Burns, Gray.[19] Performing a meta-analysis was not viable because of the vast array of study designs, predictors, outcome variables, and the complex correlations between positive and negative, direct and indirect, and moderate and mediated variables.

Results

Search Results

Through the search strategy, 915 articles were initially found in the databases spanning 2019 to 2024. Following a title screening based on inclusion criteria, 365 articles were retained. These were further evaluated based on abstracts, resulting in 187 articles for a comprehensive review of full texts. Studies without full texts and those that were outside the criteria were excluded at this stage. After a thorough review, 61 articles were selected for inclusion (see Figure 1). The included studies were carried out in China (n = 22), Saudi Arabia (n = 8), Japan (n = 6), Peru (n = 2), Philippines (n = 2), Netherlands (n = 2), United States (n = 2), Jordan (n = 2), Spain (n = 2), Belgium (n = 1), Colombia (n = 1), Egypt (n = 1), Indonesia (n = 1), Iran (n = 1), Lagos, Nigeria (n = 1), Malaysia (n = 1), North Eastern Region (NER) of India (n = 1), Norway (n = 1), Portugal & Spain (n = 1), South Africa (n = 1), Toronto, Canada (n = 1), Victoria, and Australia (n = 1). All studies used a cross-sectional design, except for Penturij-Kloks, de Gans, van Liempt, de Vries, Scheele, Keijsers,[1] who used a single-center prospective cohort study; Paustian-Underdahl, Halbesleben, Carlson, Hamadi[20] used an online survey with six-time points spanning over two years; Ding, Cao[21] with two-wave design; Nagai, Ogata, Yamamoto, Fedyk, Bell[22] with longitudinal research design.

Quality Assessment Results

The overall rate for quality assessment was 10.41, which indicates high quality on average for all included studies. Of all studies, only four used probability sampling, and six had response rates that were less than 60%. Forty-four studies used a theoretical model, and all studies managed outliers during statistical analysis (Table 1). The details of quality assessment and data extraction in each study can be seen in Table S2 and S3.

Analytical Findings

Individual-Related Factors

Socio-Demographic Characteristics

Socio-demographic characteristics are the inherent personal attributes of nurses that describe their social and demographic characteristics. These characteristics are not easily changed and include 14 factors from our review based on 13 studies, such as
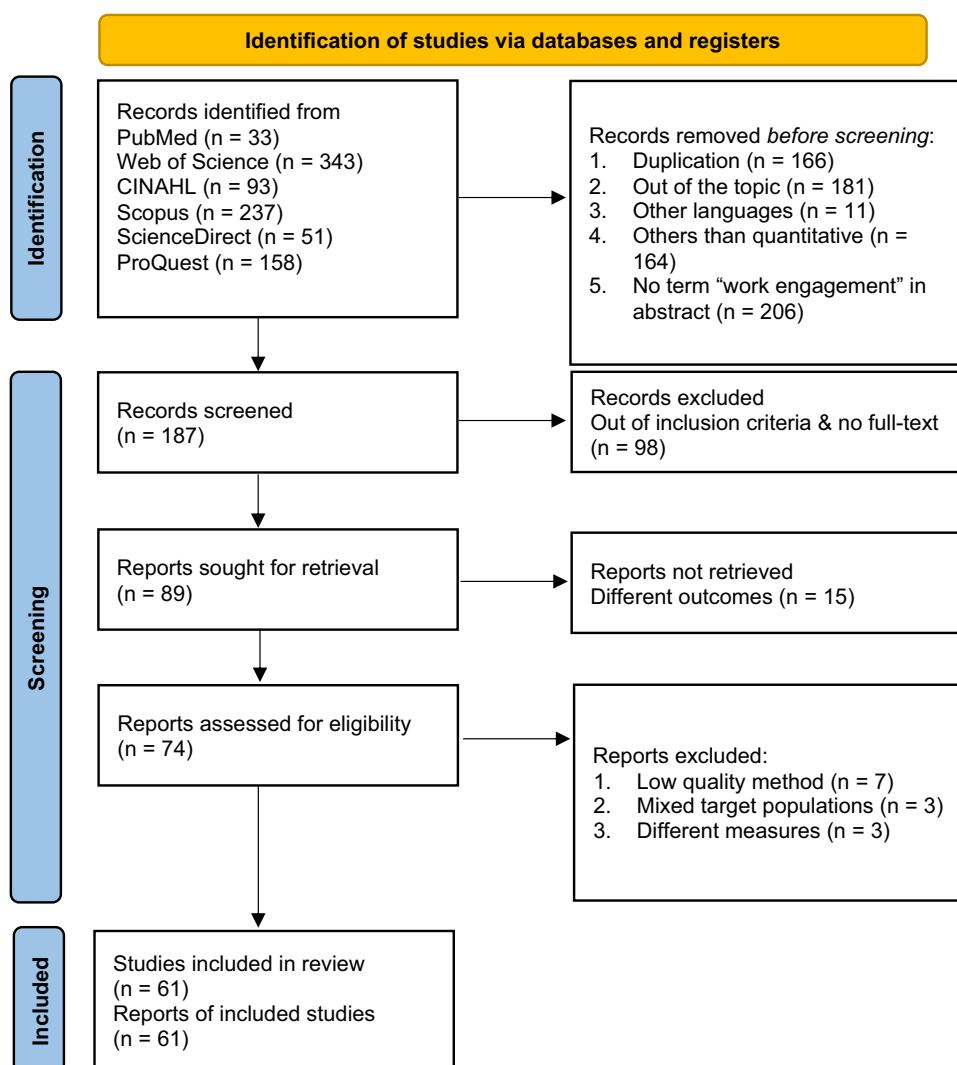
Identification of studies via databases and registers

Identification

Records identified from
PubMed (n = 33)
Web of Science (n = 343)
CINAHL (n = 93)
Scopus (n = 237)
ScienceDirect (n = 51)
ProQuest (n = 158)

→

Records removed *before screening*:
1. Duplication (n = 166)
2. Out of the topic (n = 181)
3. Other languages (n = 11)
4. Others than quantitative (n = 164)
5. No term "work engagement" in abstract (n = 206)

Screening

Records screened
(n = 187)

→

Records excluded
Out of inclusion criteria & no full-text
(n = 98)

Reports sought for retrieval
(n = 89)

→

Reports not retrieved
Different outcomes (n = 15)

Reports assessed for eligibility
(n = 74)

→

Reports excluded:
1. Low quality method (n = 7)
2. Mixed target populations (n = 3)
3. Different measures (n = 3)

Included

Studies included in review
(n = 61)
Reports of included studies
(n = 61)

Figure 1 Flow diagram of the systematic review. Adapted from Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Int Surg J*. 2021;88:105906. Creative Commons.[18]

age,[23–27] gender,[27–31] marital status,[32,33] educational level,[25,34] physical condition,[28] monthly income,[30] number of children,[35] years of experience,[23,25–27,34] position at work,[23,28,32,33] employment status,[23,27,33] years in the present unit,[23] and nationality[25,27] (Table 2). Socio-demographic characteristics can provide insights into broad trends or disparities within a group.

Individual and Professional Traits, Skills, Values, and Attributes

Three dimensions emerged from this variable: Individual-related psychological characteristics, Job-related psychological characteristics, and Job-related skills, which influence nurse work engagement (Table 3). The details of each can be seen in the following:

Table 1 Summary of Quality Assessment (n = 61)

Quality Assessment	No	Yes
Design		
1. "Was the study prospective?"	0	61
2. "Was probability sampling used?"	57	4

(*Continued*)

Table I (Continued).

Quality Assessment	No	Yes
Sample		
3. "Was the sample size justified?"	0	61
4. "Was the sample drawn from more than 1 site?"	0	61
5. "Was anonymity protected?"	0	61
6. "Response rate more than 60%"	6	55
Measurement: Factors associated with WE (IVs)		
7. "Was the factor measured for reliability?"	6	55
8. "Was the factor measured using a valid instrument?"	1	60
Work engagement (DV)		
9. "Are the effects observed rather than self-reported?[a]"	61	0
10. "Did the scale used for measuring WE as an outcome have an internal consistency ≥0.70?"	4	57
11. "Was a theoretical model/framework used for guidance?"	17	44
Statistical analysis		
12. "If multiple factors were studied, are correlations analyzed?"	6	55
13. "Are outliers managed?"	0	61
Overall study validity rating: 10.41 (high) (0–4 = LOW; 5–9 = MED; 10–14 = High)		

Notes: [a]This item scored 2 points. All others scored 1 point.

Table 2 Socio-Demographic Characteristics

No	Factors	Findings	Sources
1	Age	Positive correlation between nurse's age and work engagement. The older, the higher the engagement.	• Falguera, Labrague, De Los Santos, Firmo, Tsaras[23] • Pericak, Hogg, Skalsky, Bourdeanu[24] • Alharbi, Alrwaitey[25] • Alkorashy, Alanazi[26] • Borges, Sequeira, Queirós, Mosteiro-Díaz[27]
2	Gender (sex)	There is a significant difference in work engagement according to gender (between male and female). Self-compassion's impact on work engagement is moderated by gender[31]	• Zhang, Chen, Wang, Li, Li, Liu[28] • Allande-Cussó, García-Iglesias, Ruiz-Frutos, Domínguez-Salas, Rodríguez-Domínguez, Gómez-Salgado[29] • Borges, Sequeira, Queirós, Mosteiro-Díaz[27] • Tang, Zhang, Feng, Li, Zeng, Xie, Jin, Wang[30] • Bahrami Nejad Joneghani, Bahrami Nejad Joneghani, Dustmohammadloo, Bouzari, Ebrahimi, Fekete-Farkas[31]

(Continued)

Table 2 (Continued).

No	Factors	Findings	Sources
3	Marital status (married)	There is a significant correlation between marital status, especially those who are married, and increased engagement.	• Zhang, Zhang, Liu, Wang, Hu, Du[32] • Balay odao, Cruz, Alquwez, Al Otaibi, Al Thobaity, Alotaibi, Valencia, Danglipen[33]
4	Educational level (negative) and (positive)	Positive and negative relationships with work engagement. Yang, Hatanaka, Takahashi, Shimizu[34] revealed that the group with a university degree or higher has significantly lower scores on work engagement than those with diplomas. Alharbi, Alrwaitey[25] showed higher educational levels align with higher work engagement. Allande-Cussó, García-Iglesias, Ruiz-Frutos, Domínguez-Salas, Rodríguez-Domínguez, Gómez-Salgado[29] and Borges, Sequeira, Queirós, Mosteiro-Díaz[27] called the educational level equal to the academic training level. Nursing graduates and individuals with specialized university degrees demonstrate the highest levels of work engagement.	• Yang, Hatanaka, Takahashi, Shimizu[34] • Alharbi, Alrwaitey[25] • Allande-Cussó, García-Iglesias, Ruiz-Frutos, Domínguez-Salas, Rodríguez-Domínguez, Gómez-Salgado[29] • Borges, Sequeira, Queirós, Mosteiro-Díaz[27]
5	Physical condition	Positively related to work engagement.	• Zhang, Chen, Wang, Li, Li, Liu[28]
6	Monthly income	Positive correlation between monthly income and work engagement.	• Tang, Zhang, Feng, Li, Zeng, Xie, Jin, Wang[30]
7	Number of children	Positive correlation with work engagement.	• Fukuzaki, Iwata, Ooba, Takeda, Inoue[35]
8	Years of experience	Positive relationship between years of experience and work engagement. Alharbi, Alrwaitey[25] pointed specifically to experience of more than 10 years. In contrast, Yang, Hatanaka, Takahashi, Shimizu[34] revealed higher engagement for those with more than 6 years of nursing experience.	• Falguera, Labrague, De Los Santos, Firmo, Tsaras[23] • Alkorashy, Alanazi[26] • Borges, Sequeira, Queirós, Mosteiro-Díaz[27] • Yang, Hatanaka, Takahashi, Shimizu[34] • Alharbi, Alrwaitey[25]
9	Position at work / Staff role / Job title / Department position/ Employment status	Position at work positively is correlated with work engagement. Being a staff nurse contributes more to the dedication and absorption aspects of work engagement than being a managerial nurse. And being a rescue staff also affects engagement. Department position (ordinary nurse, team teacher, team leader, head nurse, and above) is also associated with engagement.	• Falguera, Labrague, De Los Santos, Firmo, Tsaras[23] • Zhang, Zhang, Liu, Wang, Hu, Du[32] • Zhang, Chen, Wang, Li, Li, Liu[28] • Balay odao, Cruz, Alquwez, Al Otaibi, Al Thobaity, Alotaibi, Valencia, Danglipen[33]
10	Type of employment contract / Employment status	Permanent and precarious (part-time) employment contracts significantly correlate with work engagement. Also, Falguera, Labrague, De Los Santos, Firmo, Tsaras[23] found that the nursing contract type showed a negative correlation with dedication and vigor.	• Borges, Sequeira, Queirós, Mosteiro-Díaz[27] • Falguera, Labrague, De Los Santos, Firmo, Tsaras[23] • Balay odao, Cruz, Alquwez, Al Otaibi, Al Thobaity, Alotaibi, Valencia, Danglipen[33]
13	Years in their present unit	Significant relationship to work engagement.	• Falguera, Labrague, De Los Santos, Firmo, Tsaras[23]
14	Nationality	Increased work engagement is correlated with a non-Saudi nationality. Additionally, there is a significant difference in work engagement between Portuguese and Spanish nurses.	• Alharbi, Alrwaitey[25] • Borges, Sequeira, Queirós, Mosteiro-Díaz[27]

162

DovePress

Journal of Healthcare Leadership 2024:16

Table 3 Individual and Professional Traits, Skills, Values, and Attributes

Factors	Findings	Source
Individual-related Psychological Characteristics:		
Psychological capital	Positive psychological state has multiple constructs: self-efficacy, optimism, hope, and resiliency. There is a significant correlation between PsyCap and work engagement. Mediated role: Psychological capital mediates between a healthy work environment and work engagement.	Pericak, Hogg, Skalsky, Bourdeanu[24] Xue, Qiao, Li, Zhang, Wang, Wang, Xu[36]
Self-efficacy	Positive correlation with work engagement. Mediated role: Self-efficacy mediated the inter-correlations between resilience, stress, and work engagement.[37] Also, self-efficacy partially mediates the correlation between 'professional nursing practice environment and engagement'.[37]	Dan, Huang, Ren, Tian, He[38] Cabrera-Aguilar, Zevallos-Francia, Morales-García, Ramírez-Coronel, Morales-García, Sairitupa-Sanchez, Morales-García[37] Al Hamdan, Bani Issa[39]
Optimism	Positive correlation with work engagement. Optimism has a mediate role between autonomy and organizational citizenship behavior.	Zhang, Zhao, Zou, Liu, Lin, Ye, Tang, Shao, Chen[40]
Resilience	Positive relationship with work engagement. The correlation between organizational identity and work engagement is mediated by resilience.[41]	Okojie, Ismail, Begum, Ferdous Alam, Sadik-Zada[42] Cabrera-Aguilar, Zevallos-Francia, Morales-García, Ramírez-Coronel, Morales-García, Sairitupa-Sanchez, Morales-García[37] Lyu, Yao, Zhang, Liu[41]
Motivation	Motivation to succeed and avoid failure is significantly correlated with work engagement. Mediated role: The correlation between professional nursing practice environment and work engagement is partially mediated by achievement motivation.[38] Also, the interrelationship between job resources, work engagement, and burnout is mediated by intrinsic motivation.[43]	Dan, Huang, Ren, Tian, He[38] Kohnen, De Witte, Schaufeli, Dello, Bruyneel, Sermeus[43]
Core self-evaluation	Self and control abilities predict work engagement.	Pericak, Hogg, Skalsky, Bourdeanu[24]
Proactive personality	A proactive personality affects work engagement.	Hu, Zhao, Gao, Li, Yan, Yan, Shao, Su, Li[44]
Self-compassion	Self-compassion significantly affects work engagement.	Bahrami Nejad Joneghani, Bahrami Nejad Joneghani, Dustmohammadloo, Bouzari, Ebrahimi, Fekete-Farkas[31]
Personal resource (empathy)	Empathy is significantly correlated with work engagement. Also, more empathy is associated with providing more individualized care through more work engagement.	Scheepers, Vollmann, Cramm, Nieboer[45]
Job-related Psychological Characteristics		
Emotional labor	Emotional labor includes "emotional control effort in the profession", "patient-focused emotional suppression", and emotional pretense by norms, which has a function relationship with work engagement.	Yao, Wei, Hu, Li, Zhang[46]
Conflict management styles	Conflict management styles are related to work engagement. Nurses are more likely to adopt integrating management styles—a win-win way of dealing with conflict.	Zhang, Bu, Liu[47]
Role conflict	Positively correlated with work engagement.	Giménez-Espert, Prado-Gascó, Soto-Rubio[48]

(Continued)

Table 3 (Continued).

Factors	Findings	Source
Autonomy	Positively related to work engagement.	Scheepers, Vollmann, Cramm, Nieboer[45]
Affective commitment	Significantly correlated with work engagement.	Fukuzaki, Iwata, Ooba, Takeda, Inoue[35]
Work ethics	Significantly related to work engagement. It includes hard work, morality, leisure, the centrality of work, wasted time, self-reliance, and delay of gratification.	Balay odao, Cruz, Alquwez, Al Otaibi, Al Thobaity, Alotaibi, Valencia, Danglipen[33]
Work values	Work values have a significant correlation with work engagement. After combining many variables, only extrinsic and prestige work values are correlated with work engagement moderated by negative work-to-family spillover.	Hara, Yamada, Takada, Sugiyama, Asakura[49]
Work meaningfulness	Positively related to work engagement. Work meaningfulness mediates and moderates the correlation between ethical leadership and work engagement.	Mostafa, Abed El-Motalib[50]
Job crafting	Seeking challenges (job crafting) has a positive relationship with work engagement. Job crafting mediates the correlation between learning goal orientation and work engagement.	Matsuo[51]
Learning goals	Positively correlated with work engagement. Learning goals are influenced by job crafting and reflection in relation to work engagement. Individuals with high learning goals are engaged in their work not only because they are intrinsically motivated to acquire knowledge or skills but also because they are eager to redesign their jobs toward more challenging ones and reassess their jobs when they have habits of reflecting on their work processes.	Matsuo[51]
Coping with organizational change	Positively significantly related to work engagement.	Pericak, Hogg, Skalsky, Bourdeanu[24]
Job-related Skills		
Competency	Competency affects work engagement. Competency mediates the correlation between proactive personality and work engagement.	Hu, Zhao, Gao, Li, Yan, Yan, Shao, Su, Li[44]
Communication skills	The positive influence of communication skills and work engagement.	Huaman, Morales-García, Castillo-Blanco, Saintila, Huancahuire-Vega, Morales-García, Calizaya-Milla, Palacios-Fonseca[52]

Individual-Related Psychological Characteristics. Individual-related psychological characteristics refer to inherent and distinctive aspects of a nurse's mental and emotional makeup that influence their thoughts, feelings, and behaviors in various contexts. These characteristics often shape how individuals perceive, respond to, and interact with their environment. From 12 studies, the individual-related psychological characteristics include nine distinct factors, each drawn from specific studies.

Positive psychological capital, including "self-efficacy, optimism, hope, and resiliency", strongly correlates to engagement.[24,36] Psychological capital is a mediator, connecting a healthy work environment to increased engagement.[36] Self-efficacy is positively associated with work engagement[37–39] and mediates relationships between resilience, stress, and work engagement,[37] as well as partially mediating the correlation between the "professional nursing practice environment" and work engagement.[38]

Optimism[40] and resilience[37,41,42] are positively related to work engagement and play mediating roles. Optimism mediates autonomy and "organizational citizenship behavior",[40] while resilience mediates the relationship between organizational identity and work engagement.[41] Motivation, specifically the motivation to succeed and avoid failure, significantly correlates with work engagement,[38] with achievement motivation partially mediating the correlation between the "professional nursing practice environment" and work engagement,[38] and intrinsic motivation mediating the connection of job resources with work engagement and burnout.[43] Core self-evaluation predicts work engagement,[24] and proactive personality positively influences work engagement.[44] Self-compassion significantly affects work engagement,[31] while empathy is correlated with work engagement, with higher levels associated with more individualized care provision.[45]

Job-Related Psychological Characteristics. Job-related psychological characteristics refer to the various aspects of the mental and emotional state of nurses associated with their work or profession. These characteristics include a wide range of significant factors positively related to work engagement identified from 10 studies. The factors include emotional labor (the effort invested in managing emotions at work),[46] conflict management styles,[47] role conflict,[48] autonomy,[45] affective commitment to one's job,[35] work ethics,[33] work values,[49] work meaningfulness,[50] job crafting,[51] learning goals,[51] and the ability to cope with organizational change.[24] Among these factors, only two have mediated roles which job crafting mediated the correlation between "learning goal orientation" and work engagement,[51] and work meaningfulness mediated and moderated the correlation between "ethical leadership" and work engagement.[50]

Job-Related Skills. Job-related skills refer to the specific abilities, competencies, and proficiencies that individuals acquire and apply in the context of their professional roles and responsibilities. Two studies revealed this job-related skills factor. Hu, Zhao, Gao, Li, Yan, Yan, Shao, Su, Li[44] indicated that competency directly affects work engagement and mediates the correlation between proactive personality and work engagement. On the other hand, effective communication skills independently positively influence work engagement.[52]

Organizational-Related Factors

Three dimensions emerged from this category, including human resource and professional development, leadership, and organizational culture and behavior (Table 4). The details of each is described as follows:

Table 4 Organizational-Related Factors

Factors	Findings	Sources
Human resource and professional development		
Job resources (autonomy, performance feedback, and opportunities for growth and development)	Positive significant correlation with work engagement.	Kohnen, De Witte, Schaufeli, Dello, Bruyneel, Sermeus[43]
Job resources (collegial support and autonomy)	Positively significantly correlated with work engagement.	Scheepers, Vollmann, Cramm, Nieboer[45]
Possibilities for professional development	Possibilities for professional development are positively related to work engagement. Possibilities for professional development mediate the relationship between supervisor support and work engagement and between college support and work engagement.	Contreras, Abid, Govers, Saman Elahi[53]
Talent management	Positively influences work engagement.	Sopiah, Kurniawan, Elfia, Narmaditya[54]
Promotion focus	Promotion focus increases the acceleration effects associated with work engagement.	Paustian-Underdahl, Halbesleben, Carlson, Hamadi[20]

(*Continued*)

Table 4 (Continued).

Factors	Findings	Sources
Human capital development	Human capital development (training and skill building, local employment, motivation, knowledge, and technology transfer) directly impacts nursing work engagement.	Zyoud, Alolayyan, Alqahtani, Azzam, Shelash[55]
Personal and professional resources for nurses to work vigorously (PPR-N)	PPR-N has a positive (cross-lagged) effect on their subsequent (three months later) work engagement, and there is no direct effect of work engagement on PPR-N held for the early-career nurses' population. Also, direct influence on engagement exists specifically for mid-career nurses and beyond.	Nagai, Ogata, Yamamoto, Fedyk, Bell[22]
Basic psychological needs	"Basic psychological needs" are positively associated with employee engagement, and it mediated the correlation between organizational support and engagement.	Ni, Wu, Bao, Li, You[56]
Structural empowerment	Structural empowerment (access to opportunity, resources, and informal power) influenced work engagement.	Balay odao, Cruz, Alquwez, Al Otaibi, Al Thobaity, Alotaibi, Valencia, Danglipen[33]
Leadership		
Transformational leadership	Positive correlation with work engagement. The positive impact of transformational leadership is evident, yet its strength diminishes when faced with high-challenge demands.[21] A moderate to strong relationship between "transformational leadership and employee engagement".	Asiri, Mahran, Elseesy[57] Ding, Cao[21] Al-Dossary[58]
Transactional leadership	Positive correlation with work engagement. Compared to transformational leadership, transactional leadership strongly impacts employee engagement.58	Asiri, Mahran, Elseesy[57] Al-Dossary[58]
Servant leadership	There is a strong positive effect of servant leadership on work engagement.	Qin, Li, Li[59]
Ethical leadership	Positive relationship with work engagement. Ethical leadership is mediated and moderated by work meaningfulness associated with work engagement.	Mostafa, Abed El-Motalib[50]
Humble leadership	Positively correlated with work engagement.	Yang, Zhou, Wang, Lin, Luo[60]
Laissez-faire leadership	Moderate relationship with work engagement.	Al-Dossary[58]
Organizational culture and behavior		
Organizational justice	Organizational justice significantly directly affected work engagement.	Dong, Lu, Wang, Zhang, Chen, Li, Huang, Wan, Dong, Shang[61]
Perceived organizational support	Perceived organizational support affects engagement at work positively.	Al Hamdan, Bani Issa[39]
Organizational commitment	The correlation between the organization's commitment and work engagement is significant and positive.	Tang, Zhang, Feng, Li, Zeng, Xie, Jin, Wang[30] Al-Dossary[58]
Organizational culture	Organizational culture has an impact on work engagement directly.	Slåtten, Lien, Mutonyi[62]
Nursing culture	Positive linkage between nursing culture and work engagement.	Zhai, Cai, Chen, Zhao, Yu, Zhang[63]

(*Continued*)

Table 4 (Continued).

Factors	Findings	Sources
Organizational identification	Positive impact on work engagement. Organizational identification is also mediated by psychological resilience in the relationship with work engagement.	Lyu, Yao, Zhang, Liu[41]
Organizational-retention commitment	Positively correlated with work engagement.	Tang, Zhang, Feng, Li, Zeng, Xie, Jin, Wang[30]
Social network degree centrality	"Social network degree centrality" (with colleagues and friendship) is positively associated with work engagement.	Liu, Chen, Cui, Hu[64]
Job and role factor		
Nurse job fit	Significant relationship between nurse job fit and work engagement.	Khairuddin, Baputeyb[65]
Working schedule	Fixed working schedules and rotating shift work significantly affect work engagement.	Borges, Sequeira, Queirós, Mosteiro-Díaz[27]
Job characteristic	Significant direct effect on work engagement. Job characteristics dimensions: Variety of skills, identity of tasks, significance of tasks, autonomy, and feedback in the job.	Dong, Lu, Wang, Zhang, Chen, Li, Huang, Wan, Dong, Shang[61]
Role overload	Role overload is negatively related to work engagement.	Zhang, Xu, Li, Xu[66]
Total night shifts per month	Negatively correlated with work engagement.	Zhang, Chen, Wang, Li, Li, Liu[28]
Workload (mental demand, performance, frustration)	Negative correlation with work engagement.	Zhang, Zhang, Liu, Wang, Hu, Du[32]
Workload	Workload (amount or quantity of work in a job) positively correlated with work engagement. Higher workload is linked to increased work engagement in this study, but it's not the most significant predictor. The workload is based on pace and quantity, not the number of patients. "Volume" refers to extra tasks like research or administrative duties, not patient assignments.	Pericak, Hogg, Skalsky, Bourdeanu[24]
Flexibility idiosyncratic deals	Predictor of work engagement.	Ngobeni, Dhanpat[67]
Task idiosyncratic deals	Predictor of work engagement.	Ngobeni, Dhanpat[67]
Implementation of an electronic medical record	Electronic medical record implementation, closely followed by the SARS-CoV-2 pandemic, is linked to adverse alterations in work engagement.	Jedwab, Hutchinson, Manias, Calvo, Dobroff, Redley[68]

Human Resource and Professional Development

Human resource and professional development is the systematic process of enhancing individuals' skills, knowledge, and capabilities within an organizational framework. Our findings, based on nine studies, identified various factors associated to work engagement, such as "job resources (autonomy, performance feedback, and opportunities for growth and development)",[43] job resources (collegial support and autonomy),[45] "possibilities for professional development",[53] talent management,[54] promotion focus,[20] human capital development,[55] personal and "professional resources for nurses to work vigorously (PPR-N)",[22] basic psychological needs,[56] and structural empowerment.[33] Only one factor has a mediated role, namely "basic psychological needs", which mediates between "perceived organizational support" and work engagement.

Leadership

Leadership is the dynamic process of guiding individuals or groups toward shared goals. Findings from six studies reveal diverse leadership styles influencing work engagement, including Transformational leadership,[21,57,58] Transactional leadership,[57,58] Servant leadership,[59] Ethical leadership,[50] Humble leadership,[60] and Laissez-faire leadership.[58] Notably, the positive influence of Transformational leadership may vary in high-challenge contexts,[21] and Ethical leadership is intricately associated with work engagement through mediation and moderation by work meaningfulness.[50] These insights highlight the nuanced and contextual nature of effective leadership in fostering work engagement.

Organizational Culture and Behavior

Organizational culture and behavior refer to the shared values, beliefs, and practices within a workplace that significantly influence work engagement. Based on eight studies, a comprehensive set of factors plays pivotal roles in shaping engagement. These factors include organizational justice,[61] perceived organizational support,[39] organizational commitment,[30,58] organizational culture,[62] nursing culture,[63] organizational identification,[41] organizational-retention commitment,[30] and social networks in shaping engagement.[64]

Job and Role Factors

Job and role factors consist of the unique attributes, features, and expectations associated with a specific position or role within an organization. Drawing from nine studies, ten identified factors that influence work engagement. These factors include nurse job fit,[65] working schedule,[27] job characteristics,[61] role overload,[66] total night shifts per month,[28] workload (mental demand, performance, frustration),[32] Workload (volume within a job),[24] Flexibility idiosyncratic deals,[67] Task idiosyncratic deals,[67] and Implementation of an electronic medical record.[68] It is noteworthy that workload is a multifaceted concept with both positive[24] and negative[32] dimensions. This duality in the direction of workload may be attributed to variations in the measured constructs.

Work-Life Balance

Work-life balance pertains to the equilibrium individuals strive for between their professional responsibilities and personal lives. In the context of factors influencing work engagement based on four studies, the findings reveal that positive spillover from family life correlates positively with work engagement.[35,49] Conversely, increased "work-to-family conflict" is associated with decreased work engagement, a relationship moderated by transformational leadership.[69] Family–work enrichment, indicative of positive experiences in the family domain, predicts higher work engagement.[70] Additionally, work-to-family spillover plays a nuanced role, with "family-to-work positive spillover" and specific interactions moderating the correlation between work values and work engagement[35,49] (Table 5).

Work Environment

Derived from 16 studies, the work environment variable includes 14 factors influencing work engagement (Table 6). The positive work environment factors include the professional nursing practice environment,[38] healthy work environment,[36] supportive work

Table 5 Work-Life Balance

Factors	Findings	Sources
Work-to-family spillover (positive and negative)	Positive 'work-to-family spillover' to work positively correlated with work engagement. Additionally, negative spillover from family to work acted as a mediator between affective commitment and work engagement. Hara, Yamada, Takada, Sugiyama, Asakura[49] discovered that 'the impact of work-to-family spillover altered the connection between work values and engagement. Specifically, the combination of adverse work-to-family spillover with extrinsic and prestige work values has a notable effect on work engagement.'	Fukuzaki, Iwata, Ooba, Takeda, Inoue[35] Hara, Yamada, Takada, Sugiyama, Asakura[49]
Work-to-family conflict	Increased conflict between work and family responsibilities resulted in reduced levels of work engagement. The negative relationship is also mediated by transformational leadership.	Labrague, Obeidat[69]
Family–work enrichment	Family–work enrichment predicts work engagement.	Rastogi, Saikia[70]

Table 6 Work Environment

Factors	Findings	Sources
Professional nursing practice environment	Direct effect with work engagement. The professional nursing practice environment is mediated by self-efficacy and achievement motivation.	Dan, Huang, Ren, Tian, He[38]
Healthy work environment	Positively correlated with work engagement. A healthy work environment is also mediated by psychological capital.	Xue, Qiao, Li, Zhang, Wang, Wang, Xu[36]
Supportive work environment (supervisor and colleague support)	Supervisor and colleague support have a positive correlation with work engagement.	Contreras, Abid, Govers, Saman Elahi[53] Rastogi, Saikia[70]
Collaboration climate	The climate of collaboration has a direct correlation with work engagement.	Slåtten, Lien, Mutonyi[62]
Organizational climate	'Organizational climate' and work engagement are positively associated. It also indirectly affects work engagement, partially mediated by the adversity quotient.[71] Organizational climate mediates the connection between psychological violence and work engagement.[74]	Li, Xu, Jing, Wei, Li, Guo[71] Hu, Gong, Ma, Wu[74]
Hospital spiritual climate	A positive spiritual climate in the hospital is associated with improved nurse work engagement.	Cruz, Alquwez, Balay-odao[72]
Quality of work-life	Work-life quality and work engagement are directly correlated.	Buckley, Berta, Cleverley, Widger[73]
Type of hospital	The type of hospital (private and public hospitals) influences work engagement.	Balay odao, Cruz, Alquwez, Al Otaibi, Al Thobaity, Alotaibi, Valencia, Danglipen[33] Falguera, Labrague, De Los Santos, Firmo, Tsaras[23]
Type of unit	The type of unit predicts work engagement.	Allande-Cussó, García-Iglesias, Ruiz-Frutos, Domínguez-Salas, Rodríguez-Domínguez, Gómez-Salgado[29]
Hospital capacity	Negative predictor of work engagement.	Falguera, Labrague, De Los Santos, Firmo, Tsaras[23]
Burnout (Emotional Exhaustion, Depersonalization, Personal Accomplishment)	Burnout has a negative correlation with work engagement. Emotional exhaustion has a strong inverse association, while depersonalization demonstrates a moderate inverse relationship with engagement. Personal accomplishment is strongly correlated with engagement. The connection between quality of work life and work engagement is mediated by burnout.[75]	Pericak, Hogg, Skalsky, Bourdeanu[24] Buckley, Berta, Cleverley, Widger[73] Sun, Fu, Yan, Wang, Fan[75]
Stress (infection control, PPE discomfort)	Stress (control of infection and discomfort related to personal protective equipment) is associated with work engagement negatively.	Zhang, Zhang, Liu, Wang, Hu, Du[32]
Emotional disorder/psychological distress	Emotional disorders (stress, anxiety, depression) have a negative correlation with work engagement. It also plays "a partial mediating role in the connections between conflict management styles and work engagement".	Zhang, Bu, Liu[47]
Psychological violence	Psychological violence negatively influences work engagement, mediated by organizational climate.	Hu, Gong, Ma, Wu[74]

environment,[53,70] collaboration climate,[62] "organizational climate",[71] hospital spiritual climate,[72] and quality of work-life.[73] Notably, the "professional nursing practice environment" is mediated by self-efficacy and achievement motivation,[38] while a healthy work environment is influenced through mediation by psychological capital.[36] Organizational climate, positively related to work engagement, is indirectly mediated by the adversity quotient.[71] Moreover, organizational climate mediated the linkage between psychological violence and work engagement.[74]

In contrast, hospital capacity,[23] burnout,[24,73,75] stress,[32] emotional disorders such as anxiety and depression,[47] and exposure to psychological violence[74] have an adverse effect on work engagement. Sun, Fu, Yan, Wang, Fan[75] contribute to understanding this relationship by highlighting the mediating role of burnout in the connection between the quality of work life and work engagement. Additionally, emotional disorders are identified as partial mediators between conflict management styles and work engagement.[47] Lastly, the negative correlation observed between "psychological violence and work engagement" is revealed to be mediated by organizational climate.[74] Type of hospital[23,33] and type of unit[29] are also positive predicting factors of work engagement.

Discussion
Summary of the Findings
Our research aimed to comprehensively explore the factors influencing nurses' work engagement in the new normal context, as reflected in articles published from 2019 to 2024. The primary objective was to offer updated evidence that could contribute to retaining nurses in the hospital settings.

The systematic review identified multiple factors categorized into five groups: 1) individual-related factors, 2) organizational-related factors, 3) job and role factors, 4) work-life balance, and 5) work environment. It is noteworthy that these categories may overlap because of the multiple constructs of each factor (Figure 2). However, efforts were made to distinguish each category for clarity. Individual-related factors focus on the nurses themselves, organizational-related factors on the organization independent of individual nurses, job and role factors on the jobs and roles, work-life balance as a cross-cutting component between individual factors and organizational/job factors, and work environment as the overall context influencing all variables.

Individual-Related Factors
The "individual-related factors" comprised 1) socio-demographic characteristics and 2) individual and professional traits, skills, values, and attributes, each with multiple constructs. Among the socio-demographic characteristics (age, gender,
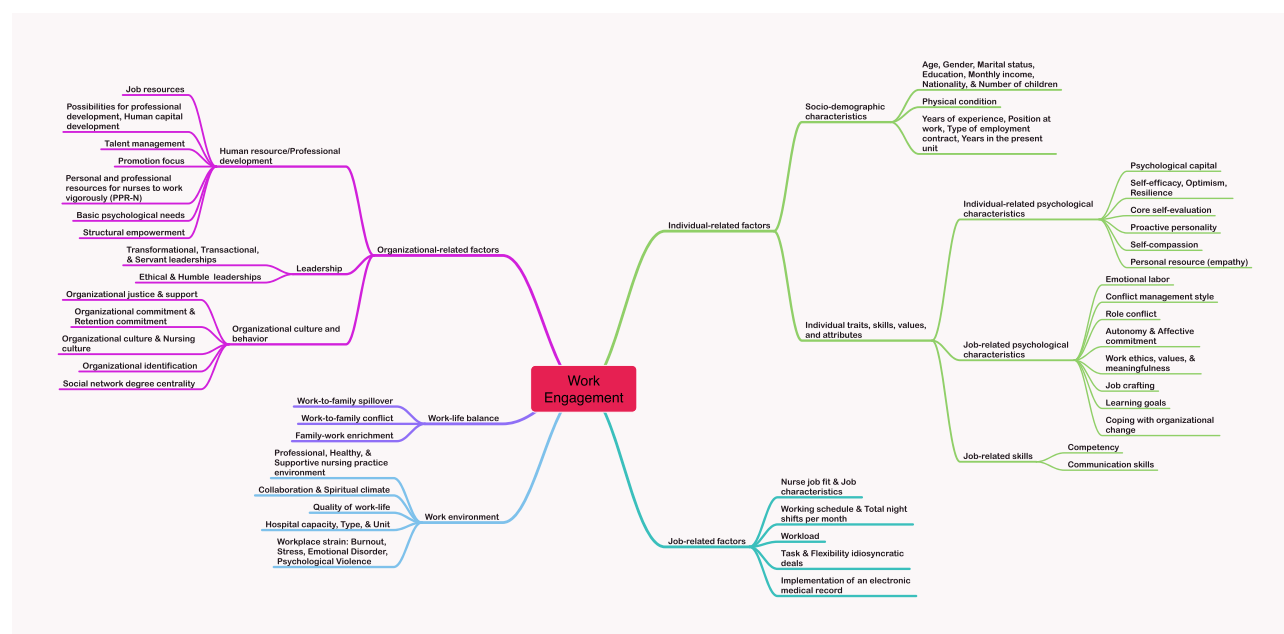
Figure 2 Factors influencing work engagement among nurses.

marital status, educational level, physical condition, monthly income, number of children, years of experience, position at work, employment status, years in the present unit, and nationality) positively correlated with work engagement, only the education variable showed an inconsistent relationship; higher education of nurses did not guarantee higher engagement. Marital status highlighted that married nurses tended to be more engaged than their single counterparts. Additionally, the variable of years of experience, ranging from more than six years[34] to more than ten years,[26] had a positive association with engagement. Gender mediated the connection between self-compassion and work engagement.[31] The nationality variable may make differences in work engagement,[27] but further exploration is needed.

Among individual-related psychological characteristics, all variables correlate positively and linearly with work engagement, with several mediating roles. Understanding the mediating roles of factors such as psychological capital,[36] self-efficacy,[37] optimism,[40] resilience,[41] achievement motivation,[38] and intrinsic motivation[43] holds immense potential for interventions targeting enhanced workplace engagement and overall well-being.

Within the job-related psychological characteristics, various factors have consistently emerged as positively associated contributors to increased work engagement. These factors include emotional labor, conflict management styles, role conflict, autonomy, affective commitment to one's job, work ethics, work values, work meaningfulness, job crafting, learning goals, and the ability to cope with organizational change. Empirical evidence highlights the mediating influence of job crafting in establishing a significant connection between a nurse's learning goal orientation and their level of work engagement.[51] Furthermore, work meaningfulness assumes a dual role as both "mediator and moderator" in the correlation between ethical leadership and work engagement.[50] Understanding these psychological characteristics offers insights into how nurses interact with their work environment, confront challenges, and engage in professional roles.

Furthermore, competency and effective communication skills positively correlate with work engagement.[44,52] Competent nurses can more adeptly navigate challenges and problem-solving situations, leading to better outcomes.[44] In addition, communication skills facilitate effective teamwork and collaboration. Clear communication fosters understanding among team members, reducing errors and enhancing productivity.[52]

Organizational-Related Factors

The "organizational-related factors" consist of three aspects: human resource and professional development, leadership, and organizational culture and behavior. The critical points of human resource and professional development collectively emphasize the importance of creating an organization that not only supports nurses with necessary resources but also encourages their growth,[53] supports their basic needs and well-being,[56] and empowers them within the organizational framework.[33] Regarding leadership, various studies have revealed a spectrum of leadership styles—Transformational, Transactional, Servant, Ethical, Humble, and Laissez-faire—each uniquely impacting work engagement. While Transformational leadership often inspires, its effectiveness might vary in challenging contexts, necessitating adaptability.[21] Ethical, servant, and humble leadership are kind of new approaches in which ethical leadership prioritizes moral values,[50,76] servant leadership focuses on serving others' needs,[59] and humble leadership embraces humility, collaboration, and openness to foster inclusive and innovative environments within teams.[60] However, this mosaic of leadership styles highlights its dynamic, context-sensitive nature, urging nurse leaders and managers to embrace versatility and tailor their styles and competencies to their teams' ever-evolving needs.[4]

The roles of organizational culture and behavior are also emphasized, including organizational justice, perceived support, commitment, culture, identification, and social networks.[30,39,41,61,62] Recognizing unique subcultures, such as nursing culture,[63] highlights the need for tailored approaches. Meanwhile, acknowledging the impact of social networks emphasizes the importance of interpersonal connections.[64] These factors might seem simple, but providing genuine justice, commitment to retention, and full support to nurse employees is challenging.

Job and Role Factors

The "job and role factors" include job fit, schedules, characteristics, workload complexities, and the integration of electronic records.[27,32,65,67] Workload emerges as pivotal, demonstrating positive[24] and negative[32] directions based on how it is measured. This duality emphasizes the multifaceted nature of workload, encompassing mental demand, performance, and frustration. Varied findings on workload's impact suggest the need for standardized measurement

approaches. Understanding these factors is crucial for organizations that enhance work engagement and employee well-being. By addressing these elements—such as workload distribution, task agreements, flexibility, and job fit—organizations can create environments that foster higher levels of engagement and satisfaction among employees. The evolving nature of work dynamics, especially in fields like healthcare, suggests the need for ongoing research and adaptation. Implementing electronic medical records, for instance, can significantly impact workload[68] and, subsequently, work engagement, requiring continuous evaluation and adjustment strategies.

Work-Life Balance

The "work-life balance" serves as a cross-cutting component between individual factors and organizational and job factors. However, the correlation between personal life and work engagement is complex. Positive family experiences can enhance engagement,[70] while work-family conflict, when mitigated by supportive leadership, may decrease it.[35,49,69] A fulfilling personal life correlates with higher work engagement, highlighting its significance. Understanding how work and family interactions influence values and engagement is crucial for nurse leaders and organizations aiming to create workplaces that promote better productivity and engagement.

Work Environment

The "work environment" includes the entire context and the nature of the system that influences all variables (individual-related factors, organizational-related factors, job and role factors, and work-life balance). This work environment has been significantly emphasized both pre and post-pandemic, indirectly suggesting that time plays a significant role in work engagement.[1]

Positive work environments, which include elements like professional nursing practices, supportive climates, collaboration, and quality of work-life, directly influence engagement. This influence is mediated by self-efficacy, psychological capital, and organizational climate.[36,38,71] Conversely, negative elements such as burnout, stress, emotional disorders, and exposure to psychological violence decrease work engagement.[24,32,73–75] The type of hospital or unit also indicated a positive correlation with engagement levels.[23,29,33] However, hospital capacity negatively affects work engagement.[23] Understanding these factors comprehensively is essential for hospital and nurse managers to grasp the dynamics of the work environment.

Implications for Nursing Practice and Hospital Management and Policy

This study has several implications: First, as individual-related factors impact work engagement, an individualized support program is necessary based on nurses' diverse needs, considering socio-demographic characteristics, individual traits, values, and attributes.

Second, nurses' work engagement should be promoted by prioritizing their professional development, emphasizing skill enhancement, resilience building, cultivating psychological capital, and fostering competencies, effective communication, and coping mechanisms. Third, nurse managers should encourage nurses to engage in job crafting, enabling them to reshape their roles to prioritize meaningfulness, autonomy, and ethical values, aligning job characteristics with their strengths to foster a heightened sense of purpose and engagement.

Fourth, to enhance work engagement, there is a need to acknowledge the impact of diverse leadership styles, like Transformational, Transactional, Servant, Ethical, Humble, and Laissez-faire. While each style has unique benefits, the dynamic nature of nursing environments requires adaptable leadership. Prioritizing moral values, meeting others' needs, fostering inclusivity, task orientation, autonomy, and collaboration are all essential elements.

Fifth, hospitals must prioritize cultivating a supportive organizational culture by emphasizing human resource and professional development, providing resources, addressing basic needs, empowering nurses within the organizational structure, acknowledging subcultures like nursing culture, and highlighting the significance of social networks in the workplace.

Sixth, hospital and nurse managers should recognize the multiple aspects of workload complexities, establish standardized measurement methodologies to comprehend and address workload effectively, prioritize equitable workload distribution, define task agreements, and foster flexibility to create an environment conducive to elevated engagement and

satisfaction among staff. Seventh, hospital and nurse managers ought to recognize the interrelationship between work-life balance and work engagement, utilizing supportive leadership to alleviate work-family conflicts, stressing the significance of positive family experiences in bolstering engagement, and implementing strategies to aid nurses in fulfilling personal lives.

Last, hospital and nurse managers need to establish positive work environments by cultivating professional nursing practices, supportive climates, and collaboration while addressing negative aspects like burnout, stress, and emotional disorders, conducting regular assessments and adapting to evolving work dynamics, considering hospital capacity and unit-specific variations to sustain optimal engagement levels among staff.

Strengths and Limitations

The strength of this study lies in its comprehensive exploration of factors influencing nurse work engagement. We have highlighted the additional antecedents that may not be addressed in the previous systematic reviews.[14–17] These include 1) a wide-ranging examination of leadership styles (transactional, servant, ethical, humble, and Laissez-faire), 2) a broader scope covering organizational commitment, organizational and nursing culture, social network degree centrality, organizational climate (collaboration and spiritual climate), and hospital type and capacity; 3) detailed consideration of individual socio-demographic characteristics (marital status-married, physical condition, monthly income, number of children, and status and type of employment); 4) examination of individual-psychological characteristics (proactive personality, empathy, and self-compassion); 5) exploration of job-related psychological characteristics (emotional labor, role conflict, psychological violence, work ethics, values, meaningfulness, learning goals, and coping with organizational changes); 6) assessment of job-related skills (communication skills); 7) inclusion of human resource management factors (talent management, promotion focus, basic psychological needs, and Personal and professional resources for nurses to work vigorously - PPR-N); 8) consideration of job-related factors (Flexibility and Task idiosyncratic deals and Implementation of an electronic medical record); and 9) a detailed evaluation of work-life balance (work-family spillover, conflict, enrichment, and quality of work-life).

Importantly, our study goes beyond identification by discussing the moderating and mediating factors associated with each variable, both directly and indirectly affecting nurse work engagement in the new normal context.

This systematic review exclusively incorporated studies utilizing the same instrument, specifically the "Utrecht Work Engagement Scale", to ensure consistency in measuring the construct of work engagement. However, this approach may be a limitation since it narrows the scope of factors related to work engagement. Numerous other factors could have been identified if different measures of work engagement had been employed. Additionally, this review did not prioritize determining which factors have a larger effect size. Instead, it focused solely on exploring factors that demonstrated statistical significance in relation to work engagement. Further studies are necessary to address these limitations and validate the findings.

Conclusion

This systematic review of factors influencing nurses' work engagement in the new normal era highlighted the multidimensional nature of this phenomenon. The comprehensive analysis identified five key groups of factors—individual-related, organizational-related, job and role-related, work-life balance, and work environment—each influencing nurses' engagement levels. The study has highlighted the critical role of tailored support programs, adaptable leadership styles, workload management strategies, and initiatives promoting work-life balance in enhancing nurse engagement. Creating positive work environments, allocating resources for professional development, and fostering inclusivity emerge as pivotal strategies for hospitals seeking to optimize nurse engagement, ultimately leading to improved patient care, better outcomes, and sustained well-being within healthcare settings. Continual evaluation and adaptation of policies remain imperative in navigating the ever-evolving healthcare landscape.

Data Sharing Statement

The data generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Acknowledgment

Funding

Disclosure

The authors declare that there is no conflict of interest in this work.

References

1. Penturij-Kloks M, de Gans ST, van Liempt M, de Vries E, Scheele F, Keijsers CJ. Pandemic lessons for future nursing shortage: a prospective cohort study of nurses' work engagement before and during 16 months of COVID-19. *J Nurs Manag*. 2023;2023:6576550. doi:10.1155/2023/6576550
2. Ruiz-Frutos C, Ortega-Moreno M, Soriano-Tarín G, et al. Psychological distress among occupational health professionals during Coronavirus Disease 2019 pandemic in Spain: description and effect of work engagement and work environment. *Front Psychol*. 2021;12:765169. doi:10.3389/fpsyg.2021.765169
3. Marzilli C. Creating the future of nursing in the post-pandemic world. *Belitung Nurs J*. 2022;8(3):185–186. doi:10.33546/bnj.2186
4. Gunawan J, Aungsuroch Y, Fisher ML, Marzilli C. Refining core competencies of first-line nurse managers in the hospital context: a qualitative study. *Int J Nurs Sci*. 2023;10(4):492–502. doi:10.1016/j.ijnss.2023.08.001
5. Blake H, Bermingham F, Johnson G, Tabner A. Mitigating the psychological impact of COVID-19 on healthcare workers: a digital learning package. *Int J Environ Res Public Health*. 2020;17(9):2997. doi:10.3390/ijerph17092997
6. Schaufeli WB, Salanova M, González-Romá V, Bakker AB. The measurement of engagement and burnout: a two sample confirmatory factor analytic approach. *J Happiness Stud*. 2002;3:71–92. doi:10.1023/A:1015630930326
7. Mukaihata T, Fujimoto H, Greiner C. Factors influencing work engagement among psychiatric nurses in Japan. *J Nurs Manag*. 2020;28(2):306–316. doi:10.1111/jonm.12923
8. Abdelhadi N, Drach-Zahavy A. Promoting patient care: work engagement as a mediator between ward service climate and patient-centred care. *J Adv Nurs*. 2012;68(6):1276–1287. doi:10.1111/j.1365-2648.2011.05834.x
9. Toyama H, Mauno S. Associations of trait emotional intelligence with social support, work engagement, and creativity in Japanese eldercare nurses. *Jpn Psychol Res*. 2017;59(1):14–25. doi:10.1111/jpr.12139
10. Salanova M, Lorente L, Chambel MJ, Martínez IM. Linking transformational leadership to nurses' extra-role performance: the mediating role of self-efficacy and work engagement. *J Adv Nurs*. 2011;67(10):2256–2266. doi:10.1111/j.1365-2648.2011.05652.x
11. Van Bogaert P, Clarke S, Willems R, Mondelaers M. Staff engagement as a target for managing work environments in psychiatric hospitals: implications for workforce stability and quality of care. *J Clin Nurs*. 2013;22(11–12):1717–1728. doi:10.1111/j.1365-2702.2012.04341.x
12. Adriaenssens J, Gucht VD, Maes S. Association of goal orientation with work engagement and burnout in emergency nurses. *J Occup Health*. 2015;57(2):151–160. doi:10.1539/joh.14-0069-OA
13. Van Bogaert P, Peremans L, Van Heusden D, et al. Predictors of burnout, work engagement and nurse reported job outcomes and quality of care: a mixed method study. *BMC Nurs*. 2017;16:1–14. doi:10.1186/s12912-016-0200-4
14. Keyko K, Cummings GG, Yonge O, Wong CA. Work engagement in professional nursing practice: a systematic review. *Int J Nurs Stud*. 2016;61:142–164. doi:10.1016/j.ijnurstu.2016.06.003
15. García-Sierra R, Fernández-Castro J, Martínez-Zaragoza F. Work engagement in nursing: an integrative review of the literature. *J Nurs Manag*. 2016;24(2):E101–E111. doi:10.1111/jonm.12312
16. Midje HH, Nyborg VN, Nordsteien A, Øvergård KI, Brembo EA, Torp S. Antecedents and outcomes of work engagement among nursing staff in long-term care facilities—A systematic review. *J Adv Nurs*. 2024;80(1):42–59. doi:10.1111/jan.15804
17. Kato Y, Chiba R, Shimazu A. Work engagement and the validity of job demands–resources model among nurses in Japan: a literature review. *Workplace Health Saf*. 2021;69(7):323–342. doi:10.1177/21650799211002471
18. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Int Surg J*. 2021;88:105906. doi:10.1016/j.ijsu.2021.105906
19. Grove SK, Burns N, Gray J. *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. 7th ed. St.Louis, Missouri: Elsevier Health Sciences; 2012.
20. Paustian-Underdahl SC, Halbesleben JRB, Carlson DS, Hamadi HY. Examining regulatory focus in the acceleration and deceleration of engagement and exhaustion cycles among nurses. *Health Care Manag Rev*. 2023;48(3):282–290. doi:10.1097/hmr.0000000000000375
21. Ding B, Cao C. An examination of interaction between transformational leadership and hindrance and challenge stressors for nurses. *Curr Psychol*. 2023;1–13. doi:10.1007/s12144-023-05103-0
22. Nagai S, Ogata Y, Yamamoto T, Fedyk M, Bell JF. A longitudinal study of the impact of personal and professional resources on nurses' work engagement: a comparison of early-career and mid-later-career nurses. *Healthcare*. 2023;11(1):76. doi:10.3390/healthcare11010076
23. Falguera CC, Labrague LJ, De Los Santos JAA, Firmo CN, Tsaras K. Predictive roles of organizational and personal factors in work engagement among nurses. *Front Nurs*. 2022;9(4):379–387. doi:10.2478/fon-2022-0048
24. Pericak A, Hogg CW, Skalsky K, Bourdeanu L. What influences work engagement among registered nurses: implications for evidence-based action. *Worldviews Evid Based Nurs*. 2020;17(5):356–365. doi:10.1111/wvn.12469

25. Alharbi MF, Alrwaitey RZ. Work engagement status of registered nurses in pediatric units in Saudi Arabia: a cross-sectional study. *PLoS One*. 2023;18(3):e0283213. doi:10.1371/journal.pone.0283213

26. Alkorashy H, Alanazi M. Personal and job-related factors influencing the work engagement of hospital nurses: a cross-sectional study from Saudi Arabia. *Healthcare*. 2023;11(4):572. doi:10.3390/healthcare11040572

27. Borges EM, Sequeira CA, Queirós CML, Mosteiro-Díaz MP. Workaholism, engagement and family interaction: comparative study in Portuguese and Spanish nurses. *J Nurs Manag*. 2021;29(4):731–740. doi:10.1111/jonm.13213

28. Zhang M, Chen H, Wang N, Li Y, Li X, Liu Y. The mediating role of job satisfaction between psychological capital and work engagement among Chinese nurses during COVID-19 outbreak: a comparative study between nurse specialists and general nurses. *Front Psychiatr*. 2023;13:990216. doi:10.3389/fpsyt.2022.990216

29. Allande-Cussó R, García-Iglesias JJ, Ruiz-Frutos C, Domínguez-Salas S, Rodríguez-Domínguez C, Gómez-Salgado J. Work engagement in nurses during the COVID-19 pandemic: a cross-sectional study. *Healthcare*. 2021;9(3):253. doi:10.3390/healthcare9030253

30. Tang P, Zhang X, Feng F, et al. The relationship between organizational commitment and work engagement among clinical nurses in China: a cross-sectional study. *J Nurs Manag*. 2022;30(8):4354–4363. doi:10.1111/jonm.13847

31. Bahrami Nejad Joneghani R, Bahrami Nejad Joneghani R, Dustmohammadloo H, Bouzari P, Ebrahimi P, Fekete-Farkas M. Self-compassion, work engagement and job performance among intensive care nurses during covid-19 pandemic: the mediation role of mental health and the moderating role of gender. *Healthcare*. 2023;11(13):1884. doi:10.3390/healthcare11131884

32. Zhang M, Zhang P, Liu Y, Wang H, Hu K, Du M. Influence of perceived stress and workload on work engagement in front-line nurses during COVID-19 pandemic. *J Clin Nurs*. 2021;30(11–12):1584–1595. doi:10.1111/jocn.15707

33. Balay Odao EM, Cruz JP, Alquwez N, et al. Structural empowerment and work ethics influence on the work engagement of millennial nurses. *J Nurs Manag*. 2022;30(2):501–510. doi:10.1111/jonm.13532

34. Yang Y, Hatanaka K, Takahashi K, Shimizu Y. Working conditions among Chinese nurses employed in Japan: a cross-sectional survey-based study. *SAGE Open Nurs*. 2023;9:23779608231169382. doi:10.1177/23779608231169382

35. Fukuzaki T, Iwata N, Ooba S, Takeda S, Inoue M. The effect of nurses' work–life balance on work engagement: the adjustment effect of affective commitment. *Yonago Acta Med*. 2021;64(3):269–281. doi:10.33160/yam.2021.08.005

36. Xue X, Qiao J, Li Y, et al. Relationship between work engagement and healthy work environment among Chinese ICU nurses: the mediating role of psychological capital. *Nurs Open*. 2023;10(9):6248–6257. doi:10.1002/nop2.1866

37. Cabrera-Aguilar E, Zevallos-Francia M, Morales-García M, et al. Resilience and stress as predictors of work engagement: the mediating role of self-efficacy in nurses. *Front Pediatr*. 2023;14:1202048. doi:10.3389/fpsyt.2023.1202048

38. Dan X, Huang Y, Ren J-H, Tian Y-L, He Y-L. Professional nursing practice environment and work engagement: the mediating roles of self-efficacy and achievement motivation. *J Nurs Res*. 2023;31(4):1–11. doi:10.1097/jnr.0000000000000563

39. Al Hamdan Z, Bani Issa H. The role of organizational support and self-efficacy on work engagement among registered nurses in Jordan: a descriptive study. *J Nurs Manag*. 2022;30(7):2154–2164. doi:10.1111/jonm.13456

40. Zhang H, Zhao Y, Zou P, et al. The relationship between autonomy, optimism, work engagement and organisational citizenship behaviour among nurses fighting COVID-19 in Wuhan: a serial multiple mediation. *BMJ Open*. 2020;10(9):e039711. doi:10.1136/bmjopen-2020-039711

41. Lyu H, Yao M, Zhang D, Liu X. The relationship among organizational identity, psychological resilience and work engagement of the first-line nurses in the prevention and control of COVID-19 based on structural equation model. *Risk Manag Healthc Policy*. 2020;2379–2386. doi:10.2147/RMHP.S254928

42. Okojie G, Ismail IR, Begum H, Ferdous Alam ASA, Sadik-Zada ER. The mediating role of social support on the relationship between employee resilience and employee engagement. *Sustainability*. 2023;15(10):7950. doi:10.3390/su15107950

43. Kohnen D, De Witte H, Schaufeli WB, Dello S, Bruyneel L, Sermeus W. What makes nurses flourish at work? How the perceived clinical work environment relates to nurse motivation and well-being: a cross-sectional study. *Int J Nurs Stud*. 2023;148:104567. doi:10.1016/j.ijnurstu.2023.104567

44. Hu X, Zhao R, Gao J, et al. Relationship between proactive personality and job performance of Chinese nurses: the mediating role of competency and work engagement. *Front Psychol*. 2021;12:533293. doi:10.3389/fpsyg.2021.533293

45. Scheepers RA, Vollmann M, Cramm JM, Nieboer AP. Empathic nurses with sufficient job resources are work-engaged professionals who deliver more individualized care. *J Clin Nurs*. 2023;32(19–20):7321–7329. doi:10.1111/jocn.16830

46. Yao Y, Wei W, Hu Y, Li Y, Zhang Y. Curvilinear relationship between emotional labour and work engagement in nurses: a correlational study. *J Clin Nurs*. 2021;30(21–22):3355–3365. doi:10.1111/jocn.15848

47. Zhang L, Bu P, Liu H. Work engagement, emotional disorders and conflict management styles in paediatric nurse: a mediating effect model. *Nurs Open*. 2023;10(4):2264–2272. doi:10.1002/nop2.1480

48. Giménez-Espert MC, Prado-Gascó V, Soto-Rubio A. Psychosocial risks, work engagement, and job satisfaction of nurses during COVID-19 pandemic. *Front Public Health*. 2020;8:566896. doi:10.3389/fpubh.2020.566896

49. Hara Y, Yamada M, Takada N, Sugiyama S, Asakura K. The moderating role of work-to-family spillover in the association between nurses' work values and work engagement: a cross-sectional study. *Jpn J Nurs Sci*. 2023;e12554. doi:10.1111/jjns.12554

50. Mostafa AMS, Abed El-Motalib EA. Ethical leadership, work meaningfulness, and work engagement in the public sector. *Rev Public Pers Adm*. 2020;40(1):112–131. doi:10.1177/0734371X18790628

51. Matsuo M. Effect of learning goal orientation on work engagement through job crafting: a moderated mediation approach. *Pers Rev*. 2019;48(1):220–233. doi:10.1108/PR-11-2017-0346

52. Huaman N, Morales-García WC, Castillo-Blanco R, et al. An explanatory model of work-family conflict and resilience as predictors of job satisfaction in nurses: the mediating role of work engagement and communication skills. *J Prim Care Commun Health*. 2023;14:21501319231151380. doi:10.1177/21501319231151380

53. Contreras F, Abid G, Govers M, Saman Elahi N. Influence of support on work engagement in nursing staff: the mediating role of possibilities for professional development. *Acad Rev Latinoam de Adm*. 2021;34(1):122–142. doi:10.1108/ARLA-04-2020-0057

54. Sopiah S, Kurniawan DT, Elfia N, Narmaditya BS. Does talent management affect employee performance?: the moderating role of work engagement. *J Asian Finance Econ Bus*. 2020;7(7):335–341. doi:10.13106/jafeb.2020.vol7.no7.335

55. Zyoud AH, Alolayyan MN, Alqahtani MM, Azzam IA, Shelash SI. Nursing perspectives on the association between human capital development and the work engagement: a cross-sectional study. *Inf Sci Lett*. 2023;12(6):2289–2298.
56. Yx N, Wu D, Bao Y, Jp L, You G. The mediating role of psychological needs on the relationship between perceived organizational support and work engagement. *Int Nurs Rev*. 2023;70(2):204–210. doi:10.1111/inr.12797
57. Asiri AM, Mahran SM, Elseesy NA. A study of staff nurses' perceptions of nursing leadership styles and work engagement levels in Saudi general hospitals. *Int J Adv Appl Sci*. 2022;10(1):55–61. doi:10.21833/ijaas.2023.01.008
58. Al-Dossary RN. Leadership style, work engagement and organizational commitment among nurses in Saudi Arabian hospitals. *J Healthc Leadersh*. 2022;14:71–81. doi:10.2147/JHL.S365526
59. Qin L, Li J, Li C. Servant leadership behaviour of head nurse assessment and its linkage with nurse work engagement in China. *J Adv Nurs*. 2023;79(11):4356–4364. doi:10.1111/jan.15753
60. Yang K, Zhou L, Wang Z, Lin C, Luo Z. Humble leadership and innovative behaviour among Chinese nurses: the mediating role of work engagement. *J Nurs Manag*. 2019;27(8):1801–1808. doi:10.1111/jonm.12879
61. Dong X, Lu H, Wang L, et al. The effects of job characteristics, organizational justice and work engagement on nursing care quality in China: a mediated effects analysis. *J Nurs Manag*. 2020;28(3):559–566. doi:10.1111/jonm.12957
62. Slåtten T, Lien G, Mutonyi BR. Precursors and outcomes of work engagement among nursing professionals—a cross-sectional study. *BMC Health Serv Res*. 2022;22(1):1–15. doi:10.1186/s12913-021-07405-0
63. Zhai Y, Cai S, Chen X, Zhao W, Yu J, Zhang Y. The relationships between organizational culture and thriving at work among nurses: the mediating role of affective commitment and work engagement. *J Adv Nurs*. 2023;79(1):194–204. doi:10.1111/jan.15443
64. Liu Z, Chen C, Cui H, Hu Y. The relationship between nurses' social network degree centrality and organizational citizenship behavior: the multiple mediating effects of job satisfaction and work engagement. *Heliyon*. 2023;9(9). doi:10.1016/j.heliyon.2023.e19612
65. Khairuddin SMHS, Baputeyb S. Work engagement mediating the relationship between person-job fit and intentions to leave among government nurses in peninsular Malaysia. *Work*. 2019;6(9):190–214.
66. Zhang N, Xu D, Li J, Xu Z. Effects of role overload, work engagement and perceived organisational support on nurses' job performance during the COVID-19 pandemic. *J Nurs Manag*. 2022;30(4):901–912. doi:10.1111/jonm.13598
67. Ngobeni P, Dhanpat N. Keeping nurses engaged during COVID-19: an i-deal perspective. *SA J Ind Psychol*. 2022;48(1):1–11. doi:10.4102/sajip.v48i0.1971
68. Jedwab RM, Hutchinson AM, Manias E, Calvo RA, Dobroff N, Redley B. Change in nurses' psychosocial characteristics pre-and post-electronic medical record system implementation coinciding with the SARS-CoV-2 pandemic: pre-and post-cross-sectional surveys. *Int J Med Inform*. 2022;163:104783. doi:10.1016/j.ijmedinf.2022.104783
69. Labrague LJ, Obeidat AA. Transformational leadership as a mediator between work–family conflict, nurse-reported patient safety outcomes, and job engagement. *J Nurs Scholarsh*. 2022;54(4):493–500. doi:10.1111/jnu.12756
70. Rastogi M, Saikia A. Determinants of work engagement among nurses in Northeast India. *J Health Manag*. 2019;21(4):559–570. doi:10.1177/0972063419868556
71. Li H, Xu YL, Jing MJ, Wei XJ, Li LM, Guo YF. The mediating effects of adversity quotient and self-efficacy on ICU nurses' organizational climate and work engagement. *J Nurs Manag*. 2022;30(7):3322–3329. doi:10.1111/jonm.13773
72. Cruz JP, Alquwez N, Balay-odao E. Work engagement of nurses and the influence of spiritual climate of hospitals: a cross-sectional study. *J Nurs Manag*. 2022;30(1):279–287. doi:10.1111/jonm.13492
73. Buckley L, Berta W, Cleverley K, Widger K. The relationships amongst pediatric nurses' work environments, work attitudes, and experiences of burnout. *Front Pediatr*. 2021;9:807245. doi:10.3389/fped.2021.807245
74. Hu H, Gong H, Ma D, Wu X. Association between workplace psychological violence and work engagement among emergency nurses: the mediating effect of organizational climate. *PLoS One*. 2022;17(6):e0268939. doi:10.1371/journal.pone.0268939
75. Sun B, Fu L, Yan C, Wang Y, Fan L. Quality of work life and work engagement among nurses with standardised training: the mediating role of burnout and career identity. *Nurse Educ Pract*. 2022;58:103276. doi:10.1016/j.nepr.2021.103276
76. Islam T, Khatoon A, Cheema AU, Ashraf Y. How does ethical leadership enhance employee work engagement? The roles of trust in leader and harmonious work passion. *Kybernetes*. 2023. doi:10.1108/K-09-2022-1343