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REVIEW ARTICLE

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A meta-analysis on predictors of turnover intention of hospital nurses in South Korea (2000–2020)

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Abstract

Aims: To identify the predictors of Registered Nurses' turnover intention and analyse the effect sizes.

Design: A systematic review and meta-analysis of previous research, conducted to comprehensively identify the predictors of turnover intention.

Methods: In total, 417 studies from 1 January 2000 to 30 April 2020 that investigated predictors of turnover intention of South Korean nurses were reviewed. The data were analysed using the R statistical package. Network graphs were used to analyse the relationships among turnover predictors, and meta-analysis was performed to determine the effect sizes of the correlations.

Results: This review analysed common predictors identified in previous studies. Burnout (0.541), emotional exhaustion (0.511), job stress (0.390) and career plateau (0.386) showed positive effect sizes, while organizational commitment (−0.540), person–organizational fit (−0.521), career commitment (−0.508), work engagement (−0.503), job satisfaction (−0.491) and job embeddedness (−0.483) showed negative effect sizes.

KEYWORDS
employee turnover, hospitals, meta-analysis, nurses, predictors

1 | INTRODUCTION

Nurse shortages and high turnover rates continue to be important global problems that healthcare organizations need to solve (Fasbender et al., 2019; Halter et al., 2017; Havva et al., 2019; Miyuki et al., 2016; Perreira et al., 2018; Simone et al., 2018; Zhao et al., 2018).

The lack of Registered Nurses (RNs) also remains an issue in South Korea, although the Ministry of Education has steadily increased the enrolment quotas of nursing colleges since 2000, in response to the increased elderly population and demand for higher quality health care. One of the main reasons for nurse shortages is high turnover rates in nursing.

Recently, in South Korea, the number of studies investigating predictors of turnover intention has sharply increased, keeping pace with the trend of rising turnover rates in nursing. However, few studies identify the systematic and integrated effects of the overall predictors of turnover intention in hospital nurses.

2 | BACKGROUND

In 2019, the turnover rate for clinical nurses in South Korea was 15.4%, while the turnover rate for nurses who had worked less than one year was higher, at 45.5% (Korean Hospital Nurses Association, 2020). Moreover, it was found that 70% of new nurses

experienced turnover intention (Hayes et al., 2006), indicating the possibility of an even higher turnover rate if the factors that lead to nurses' turnover intention cannot be identified and resolved. Turnover intention is a tendency towards changing occupations or leaving one's current workplace due to dissatisfaction with the job (Tett & Meyer, 1993), and it is an important predictor of turnover (Hayes et al., 2006).

High turnover rates in nursing cause nationwide nurse shortages and can have serious negative effects on the management of healthcare organizations, such as the cost of deploying substitute nurses (Brewer et al., 2012). Furthermore, because it is difficult to expect maximum productivity from nurses with turnover intention (Hayes et al., 2006), high turnover also reduces nursing quality and negatively influences patient safety and patient outcomes (North et al., 2012; Park et al., 2014). Accordingly, retaining competent nurses with high job satisfaction and organizational commitment is important for the sustained growth of healthcare organizations. Consequently, nurse managers and researchers have worked to develop a better understanding of nurses' turnover intention and coping strategies that can be used by these nurses (Brewer et al., 2012; Hayes et al., 2006; Lee & Kang, 2018; Yun & Kim, 2012).

Several studies have reported predictors of nurses' turnover intention; however, because research has been limited to investigating the influences and relationships among a few variables, the factors that affect nurses' turnover intention have not been comprehensively identified (Brewer et al., 2012; Deery et al., 2011; Fallatah et al., 2017; Fasbender et al., 2019; Foster et al., 2020; Galletta et al., 2019; Guo et al., 2018; Havva et al., 2019; Kim et al., 2019; Sellers et al., 2019; Mark & Smith, 2012; Mun et al., 2018; Oyeleye et al., 2013; Perreira et al., 2018; Simone et al., 2018; Wang et al., 2017; Yun & Kim, 2012; Zhao et al., 2018). Investigating and managing only some predictors are not effective in reducing nurses' turnover, because its causes are very complex (Brewer et al., 2012). The main predictors of the individual level of nurse turnover intention revealed in previous studies included personal characteristics such as depression, fatigue, grit, resilience and self-leadership (Chiang & Chang, 2012; Foster et al., 2020; Guo et al., 2018), and job perceptions such as job stress, emotional labour, job satisfaction and work engagement (Fasbender et al., 2019; Han & Jekel, 2011; Sellers et al., 2019; Mark & Smith, 2012; Oyeleye et al., 2013; Simone et al., 2018; Wang et al., 2017). In addition, burnout, work environment, leadership, violence, and organizational culture were identified as predictors at the unit level (Cowden et al., 2011; Deery et al., 2011; Fallatah et al., 2017; Kim et al., 2019; Zhao et al., 2018), and organizational commitment, organizational justice, internal marketing and work–family conflict were identified as predictors at the organizational level (Chang & Chang, 2009; Galletta et al., 2019; Perreira et al., 2018; Xie & Long, 2008).

Accordingly, the present study aimed to present integrated and specific management plans for reducing turnover rates of hospital nurses by classifying factors identified as predictors of turnover intention in hospital nurses and analysing the magnitude of their effects.

3 | METHODS

3.1 | Research design

The present study was a systematic review and meta-analysis of previous research, conducted to comprehensively identify the predictors of turnover intention in South Korean hospital nurses.

3.2 | Data search and data collection procedure

3.2.1 | Literature search

The core question of the literature search was set to "What are the factors predicting the turnover intention of Korean hospital nurses?" in accordance with the question format of PEO (Population, Exposure, Outcome). Specific inclusion criteria were as follows: (1) a study of hospital nurses in South Korea; (2) a study on the variables influencing turnover intention; (3) a study with turnover intention as a dependent variable; and (4) published from 1 January 2000 to 30 April 2020. Specific exclusion criteria were as follows: (1) involving staff other than nurses; (2) non-acute hospitals; (3) review articles; (4) qualitative researches; (5) intervention researches; and (6) studies not having the full text available.

Major South Korean databases were searched for research articles: NDSL, RISS, DBpia, KCI, NLK, NAL, KMBASE and KNBASE. Searches for research articles written in Korean were conducted using the Korean search terms "nurse" [All fields] and "turnover intention" [All fields]. Searches for research articles written in English were conducted using the search terms "nurse" [All fields] AND "Korea*" [All fields] AND "turnover intention" [All fields] OR "intent to leave" [All fields].

3.2.2 | Literature selection

The present study was conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) flow chart (Mohor et al., 2009). A total of 3,087 research articles were initially retrieved from the databases. Among the retrieved articles, 1,963 duplicate articles and 566 papers that did not meet the selection criteria (based on a review of the title and abstract) were excluded, and 558 articles were reviewed.

For evaluating the quality of the literature, six out of eight criteria for cross-sectional studies (The Joanna Briggs Institute, 2020) were evaluated by two researchers, and when all the criteria were satisfied, the analysis subjects were included. Evaluation criteria were as follows: (1) Were the criteria for inclusion in the sample clearly defined? (2) Were the study subjects and the collection methods

described in detail? (3) Was the exposure measured in a valid and reliable way? (4) Were objective, standard criteria used for measurement of the condition? (5) Were the outcomes measured in a valid and reliable way? and (6) Was appropriate statistical analysis used? Exclusion two criteria for multivariate analysis were as follows: (1) Were confounding factors identified?, (2) Were strategies to deal with confounding factors stated? As a result of the quality evaluation and selection criteria review, 417 papers were analysed after excluding 141 studies that did not meet the quality evaluation criteria (20 studies) and inclusion criteria (121 studies).

3.2.3 | Data extraction

The present study extracted publication year, healthcare organization type, number of participants, developers and reliability of turnover intention scales and correlation coefficients with predictors and significance values (*p*-values) to comprehensively identify the independent variables that affect hospital nurses' turnover intention and the relationships among these variables. If predictors related to turnover intention only presented the correlation coefficients of a subdomain, they were replaced with representative factor names, and the values were treated as missing.

3.3 | Data analysis

Participants' general characteristics were analysed using SPSS statistics software. The importance and relevance of the predictors related to hospital nurses' turnover intention were determined by network graphs, and meta-analysis was performed to determine the effect sizes of the correlations among predictors using the R statistical package. The heterogeneity of the effect size for each factor was determined using Q and I^2 statistics. The effect size was determined to be heterogeneous if the I^2 statistic was 50% or higher and the significance probability (*p*-value) was less than .10, in which case a random-effects model was used for analysis. For other cases, a fixed-effects model was used.

4 | RESULTS

4.1 | Characteristics of studies and participants

The total numbers of studies and participant nurses were 417 and 106,968, respectively. Research on nurses' turnover intention was published most frequently in the last five years, accounting for 63.8% of the studies. The average number of participants per study was 256.52. In the 417 studies, 51 tools were used to measure turnover intention. According to the criteria for evaluating the quality of the study, the measurement tools for nurses' turnover intention included 5- or 7-point Likert scale of 2 or more items that proved validity and reliability. The most used tools were Lawler (34.5%), Mobley (18.2%), Kim (16.5%), and Yeun and Kim (7.2%; Table 1).

4.2 | Identification of variables related to turnover intention by level

Excluding the dependent variable (i.e. turnover intention), 1,039 independent variables were used in the target studies, indicating that an average of 2.49 independent variables were used per study to determine their relationship with turnover intention. Excluding the redundant variables, there were a total of 170 variables that were identified as predictors of turnover intention in hospital nurses. The derived factors related to turnover intention were classified as individual level (personal characteristics, occupational perception), unit level (work conditions, interpersonal relationship, unit culture) and organizational level (internal organization, external organization), considering the conceptual definition and principal revealing agent of the factors and the level of problem-solving (Table 2).

4.3 | Network between turnover intention and predictors

The relevance of the variables identified as predictors of turnover intention in hospital nurses is presented in Figure 1, as a network graph that shows eigenvector centrality. The eigenvector centrality shows the importance of the variables identified as the predictor of turnover intention, not only as relationship frequency with turnover intention but also connectivity with other relevant factors in an integrated form (Zafarani et al., 2014). Accordingly, node size is the core factor of turnover intention. Figure 1 is a network graph centred on the predictors having a correlation with turnover intention in three or more studies. Stand-out factors among the 170 predictors of turnover intention were job satisfaction, organizational commitment, job stress, burnout, emotional labour, work environment, job embeddedness, professionalism, emotional intelligence, resilience, social support, violence, internal marketing, bullying, organizational culture, work–family conflict, work engagement and empowerment.

4.4 | Effect size of turnover intention predictors

The effect sizes of correlations among the predictors that showed three or more correlations with turnover intention among 417 papers were analysed using hospital nurses' turnover intention as the dependent variable (Table 3). In addition, the effect sizes of significant predictors of nurses' turnover intention were presented in order (Figure 2). The predictors related to personal characteristics at the individual level that showed moderate (effect size ≥ 0.24; Lenhard & Lenhard, 2016) or greater positive effect sizes with turnover intention were emotional exhaustion (0.511), depression

TABLE 1 Characteristics of selected studies ($K = 417$, $N = 106{,}968$)

Categories	Classification	Number of studies *n* (%)	No. of participants
Publication year	2000–2004	4 (1.0)	1,063
	2005–2009	20 (4.8)	7.322
	2010–2014	127 (30.4)	37.144
	2015–2020	266 (63.8)	61,439
Hospital type	Advanced general hospitals	142 (34.0)	33,543
	General hospitals	173 (41.5)	47,549
	Hospitals	82 (16.7)	20,798
	All types of hospitals	20 (4.8)	5,078
Target population	All Registered Nurses included	363 (87.0)	95,565
	New Registered Nurses only (<1 year)	25 (6.0)	5,599
	Male nurses only	9 (2.2)	1,363
	Nurses with children	7 (1.7)	1,469
	Others	13 (3.1)	2,752
Sample size (person)	< 200	161 (38.6)	23,984
	200–299	157 (37.6)	37,649
	≥300	99 (23.8)	45,335
	$M \pm SD$ (range)	256.52 ± 171.20 (64–2,011)	
Measurements for turnover intention	Lawler (1983)	144 (34.5)	34,586
	Mobley (1982)	76 (18.2)	22,319
	Kim (2007)	68 (16.3)	15,241
	Yeun and Kim (2013)	30 (7.2)	4,896
	Others	99 (23.8)	29,926
Analysis method	Correlation only	239 (57.3)	35,046
	Correlation and regression	145 (34.8)	61,497
	Structural model	33 (7.9)	10,425
Publication	Yes	254 (60.9)	61,587
	No	163 (30.1)	45,381

(0.394), fatigue (0.360). Grit (−0.331), motivation (−0.307), resilience (−0.300), self-leadership (−0.278) and empowerment (−0.286) had negative effect sizes. Positive predictors of turnover intention related to occupational perceptions were job stress (0.390) and emotional labour (0.352); work engagement (−0.503), job satisfaction (−0.491), professional self-concept (−0.373), organizational citizenship behaviour (OCB) (−0.316), and professionalism (−0.286) were negative predictors.

Positive predictors of turnover intention related to work condition at the unit level were burnout (0.541), role conflict (0.367), role ambiguity (0.353) and overloading (0.293), while work environment (−0.367) was a negative predictor. Negative predictors of turnover intention related to interpersonal relationships were transformational leadership (−0.345), leader–member exchange (−0.310), social support (−0.301), emotional leadership (−0.279), supervisor trust (−0.264) and followership (−0.261). Positive predictors of turnover intention related to unit culture were workplace violence (0.329) and bullying (0.283), while negative predictors were organizational culture (−0.351) and relationship-oriented culture (−0.275).

At the organizational level, a statistically significant positive predictor of turnover intention related to internal organization was career plateau (0.386), while negative predictors were organizational commitment (−0.540), person–organizational fit (−0.521), career commitment (−0.508), job embeddedness (−0.483), organizational justice (−0.422), organizational socialization (−0.384) and internal marketing (−0.352). Positive predictors of turnover intention related to external organization were work–family conflict (0.378) and parenting stress (0.273), while awareness of accreditation (−0.421) was a negative predictor.

TABLE 2 Classification of related factors on turnover intention

Level		Variables (*n*)
Individual Level (540)	Personal Characteristics (175)	Resilience (23), Emotional intelligence (23), Empowerment (13), Self-efficacy (12), Self-esteem (8), Fatigue (7), Coping (6), Emotional exhaustion (6), Psychological capital (5), Communication competence (4), Depression (4), Self-leadership (4), Calling (3), Motivation (3), Grit (3), Positive thinking (2), Character strengths (2), Happiness index (2), Reality shock (2), Sleep disorder (2), Proactivity (2), Adult attachment (2), Adaptation (2), Affective commitment (1), Affectivity, Anger, Assault response, Better life index, Emotional dissonance, Emotional reaction after violence, Empathy, Exercise behavior, Health problem, Health promotion behavior, Humor, Interpersonal relationship ability, Job challenge, Job fitness, LIFO behavior pattern, Mental health, Moral identity, Moral sensitivity, Musculoskeletal pain, Parenting attitudes, Personal accomplishment, Personality type, Physical health, Psychosocial stress, Quality of life, Self-directed learning readiness, Sleep efficiency, Social anxiety, Social intelligence, Somatic symptoms, Stress on violence, Subjective well-being, Transition shock, Work ethic,
	Occupational Characteristics (365)	Job stress (108), Job satisfaction (107), Emotional labor (57), Work engagement (20), Professionalism (19), Professional self-concept (9), Job characteristics (8), OCB (6), Moral distress (5), Terminal care stress (4), Work value (4), Job autonomy (2), Job demands (2), Post-traumatic job stress (2), Clinical competence (2), Career success (1), Job efficacy, Job stress coping type, MERS job stress, Missed nursing care, Role stress, Secondary traumatic job stress, VOC, Work-life balance, Workplace spirituality
Unit level (286)	Work conditions (143)	Burnout (65), Work environment (32), Role conflict (14), Performance (13), Overloading (5), Role ambiguity (5), Quality of care (2), Reciprocity (2), Traumatic events (2), Hardiness (1), Nursing productivity, Resourcefulness
	Interpersonal relationship (72)	Social support (24), LMX (6), Mentoring (5), Transformational leadership (5), Emotional leadership (4), Manager leadership (3), Authentic leadership (3), Supervisor trust (3), Followership (3), Coaching leadership (2), Sexual harassment (2), Customer badness behavior (1), Educational leadership, Fun leadership, Incivility, Interpersonal problem, Negative emotional event, Preceptor-new nurse exchange, Relationship with senior, Relationships with colleagues, Servant leadership, Supervisor's CRS, Transactional leadership
	Unit culture (71)	Violence (28), Bullying (17), Organizational culture (13), Relationship-oriented culture (4), Hierarchy-oriented culture (4), Innovation-oriented culture (3), Task-oriented culture (2)
Organizational level (213)	Internal Organization (178)	Organizational commitment (62), Job embeddedness (29), Internal marketing (15), Organizational justice (8), Career plateau (8), Career commitment (7), Organizational socialization (5), Ethical dilemma (3), Organizational silence (3), Person-organization fit (3), Customer orientation (3), Career planning (2), Clinical ladder system (2), Ethical Climate (2), Compensation equity (2), Quality of work life (2), Flexible work program (2), Social capital (2), Career barrier (1), Career satisfaction, Compensation recognized, Department move attitude, Human resource management, Internal oriented policy, Organization climate, Organizational communication, Organizational cynicism, Organizational health, Organizational injustice, Organizational support, Perception of reward, Psychosocial work environment, Relational bonds, Salary satisfaction, Supportive organizational environment, Word operation support system
	External organization (35)	Work-family conflict (11), Parenting stress (7), Awareness of accreditation (7), Gender role conflict (3), Job opportunity (3), Gender stereotype (2), Parenting efficacy (1), Safe management perception
Total	1,039	

Abbreviations: CRS, conflict resolution style; LMX, leader–member exchange; MERS, Middle East respiratory syndrome; *n*, number of study; OCB, organizational citizenship behaviour; VOC, voice of customers.

5 | DISCUSSION

Recently, there has been an increase in research in South Korea that addresses the problem of turnover intention in hospital nurses, and this trend has led to the identification of various predictors of turnover. In the present review, 170 related factors were identified in 417 studies that investigated the predictors of the turnover intention in hospital nurses. In the past 10 years, the number of relevant studies increased 16.38 times more than in the 10 years prior; however, only 1.76 times more predictors were identified. This indicates that several important factors influencing turnover intention in hospital nurses have been measured repeatedly. As such, even though the effect sizes may differ, predictors that were repeatedly measured, such as job satisfaction, job stress, burnout, organizational commitment, emotional labour, work environment, job embeddedness and resilience, have been shown to be statistically significant predictors of nurses' turnover intention worldwide (Brewer et al., 2012; Chiang & Chang, 2012; Deery et al., 2011; Foster et al., 2020;

TABLE 3 Effect sizes for predictors of turnover intention

Level	Related factors	Variables	*K* (*n*)	Effect size	95% CI	*Z* (*p*)	Heterogeneity				Analysed model
							τ^2	Q	*df* (*p*)	I^2	
Individual	Personal characteristics	Resilience	19 (4,276)	−0.300	−0.367 to −0.229	−7.96 (<0.001)	0.023	105.51	18 (<0.001)	82.9	Random
		Emotional intelligence	19 (4,972)	−0.195	−0.273 to −0.116	−4.74 (<0.001)	0.029	116.27	18 (<0.001)	84.5	Random
		Self-efficacy	10 (3,570)	−0.208	−0.312 to −0.099	−0.370 (<0.001)	0.029	97.45	9 (<0.001)	90.8	Random
		Empowerment	9 (2,446)	−0.286	−0.365 to −0.202	−6.45 (<0.001)	0.015	50.94	8 (<0.001)	84.3	Random
		Self-esteem	8 (1,786)	−0.187	−0.262 to −0.109	−4.66 (<0.001)	0.008	17.59	7 (<0.001)	60.2	Random
		Fatigue	7 (1,854)	0.360	0.234 to 0.474	5.34 (<0.001)	0.029	32.19	6 (<0.001)	81.4	Random
		Coping	5 (1,879)	−0.146	−0.429 to 0.163	−0.93 (0.355)	0.122	88.10	4 (<0.001)	95.5	Random
		Emotional exhaustion	5 (1,287)	0.511	0.429 to 0.585	10.46 (<0.001)	0.009	13.98	4 (0.007)	71.4	Random
		Psychological capital	5 (882)	−0.229	−0.350 to −0.100	−3.45 (<0.001)	0.017	16.43	4 (0.003)	75.7	Random
		Depression	4 (632)	0.394	0.325 to 0.458	10.36 (<0.001)	0.002	1.94	3 (0.584)	0.0	Fixed
		Communication competence	4 (927)	−0.300	−0.579 to 0.046	−1.71 (0.090)	0.126	70.55	3 (<0.001)	95.7	Random
		Self-leadership	4 (795)	−0.278	−0.477 to −0.052	−2.39 (0.017)	0.051	38.18	3 (<0.001)	92.1	Random
		Motivation	3 (852)	−0.307	−0.414 to −0.191	−5.04 (<0.001)	0.008	6.12	2 (0.05)	67.3	Random
		Grit	3 (710)	−0.331	−0.395 to −0.264	−9.11 (<0.001)	0.005	3.48	2 (0.175)	42.6	Fixed
	Occupational perceptions	Job satisfaction	89 (24,914)	−0.491	−0.514 to −0.467	−34.07(<0.001)	0.017	438.71	88 (<0.001)	79.9	Random
		Job stress	89 (20,455)	0.390	0.359 to 0.420	21.41 (<0.001)	0.024	518.64	88 (<0.001)	83.0	Random
		Emotional labour	48 (13,479)	0.352	0.302 to 0.400	12.91 (<0.001)	0.034	411.05	47 (<0.001)	88.6	Random
		Professionalism	19 (5,760)	−0.286	−0.341 to −0.228	−9.35(<0.001)	0.014	84.57	18(<0.001)	78.7	Random
		Work engagement	18 (5,523)	−0.503	−0.576 to −0.422	−10.48 (<0.001)	0.046	187.11	17 (<0.001)	90.9	Random
		Professional self-concept	6 (1,471)	−0.373	−0.513 to −0.214	−4.40 (<0.001)	0.043	47.68	5 (<0.001)	89.5	Random
		OCB	6 (1,720)	−0.316	−0.481 to −0.130	−3.26 (<0.001)	0.057	121.88	5 (<0.001)	95.9	Random
		Job characteristics	5 (1,159)	−0.177	−0.313 to −0.033	−2.41 (<0.001)	0.023	30.10	4 (<0.001)	86.7	Random
		Terminal care stress	3 (530)	0.173	0.088 to 0.255	3.97 (<0.001)	0.000	0.19	2 (0.909)	0.0	Fixed
Unit	Work conditions	Burnout	56 (13,901)	0.541	0.495 to 0.584	18.76(<0.001)	0.053	893.99	55 (<001)	93.8	Random
		Work environment	28 (6,544)	−0.367	−0.455 to −0.271	−7.08 (<0.001)	0.077	368.14	27 (<0.001)	92.7	Random

(Continues)

TABLE 3 (Continued)

Level	Related factors	Variables	*K* (*n*)	Effect size	95% CI	*Z* (*p*)	Heterogeneity				Analysed model
							τ^2	Q	*df* (*p*)	I^2	
		Role conflict	12 (2,321)	0.367	0.279 to 0.449	7.66 (<0.001)	0.024	64.53	11 (<0.001)	83.0	Random
		Performance	11 (3,462)	−0.147	−0.237 to −0.055	−3.10 (<0.001)	0.020	43.04	10 (<0.001)	76.8	Random
		Overloading	5 (1,270)	0.293	0.179 to 0.399	4.88 (<0.001)	0.014	19.09	4 (<0.001)	79.0	Random
		Role ambiguity	4 (959)	0.353	0.296 to 0.407	11.35 (<0.001)	0.004	4.33	3 (0.228)	30.7	Fixed
		Moral distress	3 (326)	0.301	0.193 to 0.397	5.52 (<0.001)	0.001	0.56	2 (0.755)	0.0	Fixed
	Interpersonal relationships	Social support	19 (3,902)	−0.301	−0.357 to −0.244	−9.74 (<0.001)	0.014	63.42	18 (<0.001)	71.6	Random
		LMX	6 (1,660)	−0.310	−0.353 to −0.265	−12.98 (<0.001)	0.002	7.01	5 (0.138)	28.7	Fixed
		Transformational leadership	4 (1,727)	−0.345	−0.425 to −0.261	−7.57 (<0.001)	0.006	6.71	3 (0.082)	55.3	Random
		Emotional leadership	4 (1,021)	−0.279	−0.335 to −0.221	−9.09 (<0.001)	0.001	2.46	3 (0.480)	0.0	Fixed
		Mentoring	3 (803)	−0.213	−0.419 to 0.013	−1.85 (0.065)	0.037	19.84	2 (<0.001)	89.9	Random
		Authentic leadership	3 (708)	−0.238	−0.367 to −0.100	−3.35 (<0.001)	0.012	7.03	2 (0.030)	71.6	Random
		Supervisor trust	3 (507)	−0.264	−0.402 to −0.116	−3.43 (<0.001)	0.013	6.65	2 (0.036)	69.9	Random
		Followership	3 (790)	−0.261	−0.325 to −0.194	−7.45 (<0.001)	0.000	0.30	2 (0.861)	0.0	Fixed
	Unit culture	Bullying	15 (3,544)	0.283	0.239 to 0.326	12.07 (<0.001)	0.004	23.02	14 (0.060)	39.2	Random
		Violence	13 (1,681)	0.329	0.239 to 0.414	6.82 (<0.001)	0.028	82.37	12 (<0.001)	85.4	Random
		Organizational culture	5 (2,637)	−0.351	−0.409 to −0.290	−10.60 (<0.001)	0.004	12.20	4 (0.016)	67.2	Random
		Hierarchy-oriented culture	4 (1,137)	0.086	0.028 to 0.144	2.89 (0.004)	0.004	5.40	3 (0.145)	44.4	Fixed
		Relationship-oriented culture	3 (807)	−0.275	−0.405 to −0.134	−3.75 (<0.001)	0.013	9.73	2 (0.008)	79.4	Random
		Innovation-oriented culture	3 (807)	−0.214	−0.520 to 0.142	−1.18 (0.237)	0.097	65.61	2 (<0.001)	97.0	Random
Organization	Internal organization	Organizational commitment	53(16,642)	−0.540	−0.602 to −0.471	−12.85 (<0.001)	0.113	998.09	52 (<0.001)	97.5	Random
		Job embeddedness	22 (5,469)	−0.483	−0.523 to −0.442	−0.19.68 (<0.001)	0.011	71.80	21 (<0.001)	71.8	Random
		Internal marketing	13 (5,903)	−0.352	−0.399 to −0.304	−13.28 (<0.001)	0.007	50.83	12 (<0.001)	76.4	Random
		Career plateau	8 (2,428)	0.386	0.324 to 0.404	11.29 (<0.001)	0.007	21.57	7 (0.003)	67.5	Random
		Organizational justice	7 (1,921)	−0.422	−0.475 to −0.365	−13.21 (<0.001)	0.004	11.55	6 (0.073)	48.1	Random
		Career commitment	6 (1,474)	−0.508	−0.588 to −0.419	−9.69 (<0.001)	0.016	26.11	5 (<0.001)	80.8	Random

(Continues)

TABLE 3 (Continued)

Level	Related factors	Variables	*K* (*n*)	Effect size	95% CI	*Z* (*p*)	Heterogeneity				Analysed model
							τ^2	Q	*df* (*p*)	I^2	
		Person-organization fit	3 (771)	−0.521	−0.571 to −0.468	−15.96 (<0.001)	0.004	2.82	2 (0.244)	29.1	Fixed
		Organizational socialization	3 (386)	−0.384	−0.480 to −0.279	−0.673 (<0.001)	0.005	1.85	2 (0.396)	0.0	Fixed
		Ethical dilemma	3 (1,555)	0.165	0.061 to 0.265	3.10 (0.002)	0.006	7.30	2 (0.026)	72.6	Random
		Customer orientation	3 (1,176)	−0.071	−0.128 to −0.014	−2.43 (0.015)	0.001	1.64	2 (0.440)	0.0	Fixed
	External organization	Work–family conflict	8 (2,564)	0.387	0.354 to 0.420	20.60 (<0.001)	0.002	6.00	7 (0.540)	0.0	Fixed
		Awareness of accreditation	6 (1,191)	−0.421	−0.527 to −0.301	−6.39 (<0.001)	0.024	29.43	5 (<0.001)	83.0	Random
		Parenting stress	5 (1,195)	0.273	0.164 to 0.376	4.76 (<0.001)	0.013	16.40	4 (0.003)	75.6	Random
		Gender role conflict	3 (527)	0.216	0.138 to 0.296	4.99 (<0.001)	0.006	3.97	2 (0.137)	49.6	Fixed
		Job opportunity	3 (915)	0.134	−0.023 to 0.285	1.67 (0.095)	0.016	12.13	2 (0.002)	83.5	Random

Abbreviations: LMX, leader–member exchange; OCB, organizational citizenship behaviour.

Han & Jekel, 2011; Hayes et al., 2006; Oyeleye et al., 2013; Özkan et al., 2020; Simone et al., 2018; Yin & Yang, 2002).

Important factors that promoted turnover intention related to the personal characteristics and occupational perceptions of hospital nurses were emotional exhaustion, depression, job stress, fatigue and emotional labour. In contrast, factors that prevented nurses' turnover intention were work engagement, job satisfaction and professional self-concept. The finding that individual-level predictors affect nurses' turnover intention was consistent with findings in studies conducted in other countries (Chiang & Chang, 2012; Deery et al., 2011; Fasbender et al., 2019; Özkan et al., 2020; Simone et al., 2018; Zhao et al., 2018). In particular, job stress was shown to be prevalent in nursing positions and highly related to emotional exhaustion, depression, fatigue and burnout (Chiang & Chang, 2012; Trybou et al., 2014). However, previous studies have reported that increasing nurses' positive occupational perceptions through interventions such as education, training and lectures, as well as increasing nurses' self-esteem, self-efficacy, resilience, psychological capital, motivation, grit, empowerment, emotional intelligence and professional identity, are effective for retaining nurses (Foster et al., 2020; Guo et al., 2018; Niskala et al., 2020; Simone et al., 2018; Wang et al., 2017). Accordingly, hospital administrators and nursing managers should conduct regular empowerment programmes, control job stressors and develop support measures to increase work engagement, so that nurses' can continue to experience passion for their work and professional pride (Sellers et al., 2019; Oyeleye et al., 2013; Simone et al., 2018).

The present study examined the predictors that affect turnover intention and the nursing unit level by classifying them into work conditions, interpersonal relationships and unit culture. Nursing unit managers, in their position as leaders, can improve organizational performance not only by playing a pivotal role in effective human resources management but also by affecting the job performance attitudes and behaviours of unit members (Gollan, 2012). In particular, through transformational leadership, authentic leadership, emotional leadership and supportive relationships with nurses, nursing unit managers can help to lower the turnover intention of nurses by increasing mutual trust and followership (Alatawi, 2017; Fallatah et al., 2017). In their work environment, hospital nurses face high workloads, time pressures and high physical demands (Mark & Smith, 2012). Such a work environment causes nurses to experience job stress, role ambiguity and role conflict with other healthcare professionals, which can also increase turnover (Suresh et al., 2013). Accordingly, nursing unit managers should exercise leadership that can provide support for unit members, improve negative work conditions and prevent conflict among healthcare staff by forming trusting relationships and fostering close communication with unit members (Cowden et al., 2011). However, in the past decade, workplace violence or bullying have been emerged as the main predictors of nurses' turnover, reflecting the negative situation often present in clinical sites (Kim et al., 2019). Bullying also includes being ignored or excluded, and workplace violence can be committed not only

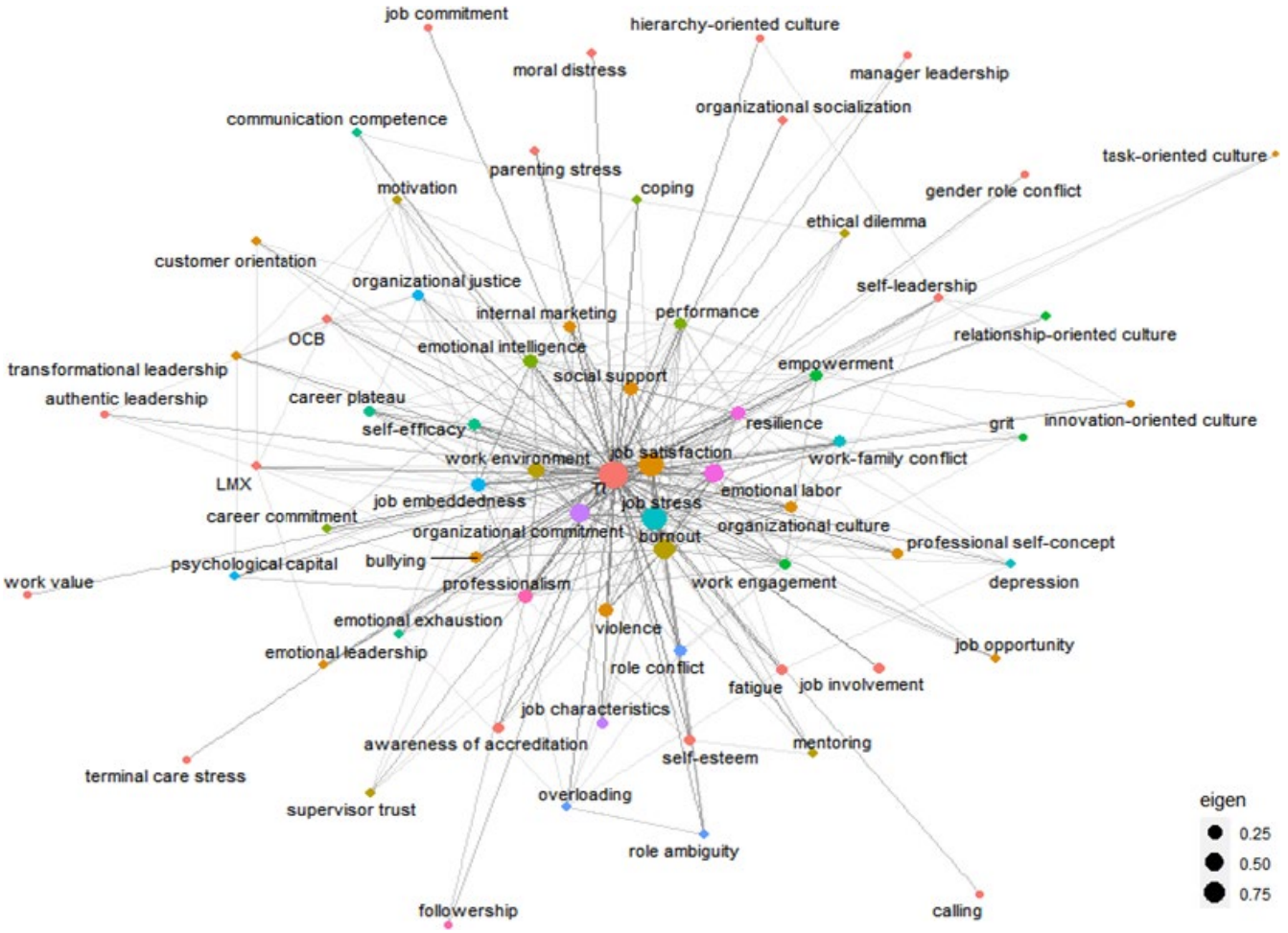

FIGURE 1 Network graph between turnover intention and predictors

by patients, patient's family members and doctors but also by fellow nurses (Kim et al., 2019). Ultimately, violence or bullying increases nurses' burnout and pushes them to leave their jobs (Deery et al., 2011; Kim et al., 2019; Zhao et al., 2018). Bullying or violence at work is also related to the culture of the organization and nursing unit, highlighting the necessity of managers to provide strong leadership.

The major predictors of turnover intention at the organizational level included organizational commitment, person–organization fit, job embeddedness, organizational justice, organizational socialization and internal marketing of the organization. Organizational commitment and job embeddedness require policy efforts through internal marketing such as improving the environment and working conditions for nurses, providing pay raises and increasing opportunities to develop expertize at the organizational level (Chang & Chang, 2009). Nurses who experience limited promotion opportunities and discrepancies between their competence and job in the organization will generally reach a career plateau (Edwards & Shipp, 2007; Park et al., 2006). Nurses who reach a career plateau will feel they have a lack of appropriate responsibilities and challenges in their work, thereby negatively affecting career commitment and satisfaction and increasing turnover intention (Xie & Long, 2008; Xie et al., 2016). Various career development programmes that fit the situation of the hospital organization and prevent career plateaus for nurses have been reported to have a positive impact on organizational effectiveness by solving nurses' desire for promotions and increasing professional growth, motivation and job satisfaction (Park et al., 2006). Accordingly, organizations should support the establishment and achievement of realistic goals that fit nurses' values, capabilities and lifestyles, with a focus on career management and development, to overcome nurses' career plateaus.

As for predictors of turnover intention outside the organization, it was found that the more positively nurses perceive the healthcare accreditation, the lower their turnover intention. In 2011, South Korea implemented an autonomous accreditation programme for acute hospitals, based on medical law, with the goal of managing patient safety and improving healthcare services. However, a large part of medical institution accreditation standards leads to increasing the work burden of nurses, thus also increasing turnover intention (Mun et al., 2018). Accordingly, promotion of and education on the purpose of the accreditation programme and systematic support are necessary, and a review of the standards of the relevant institutions is required so that the accreditation programme does not become

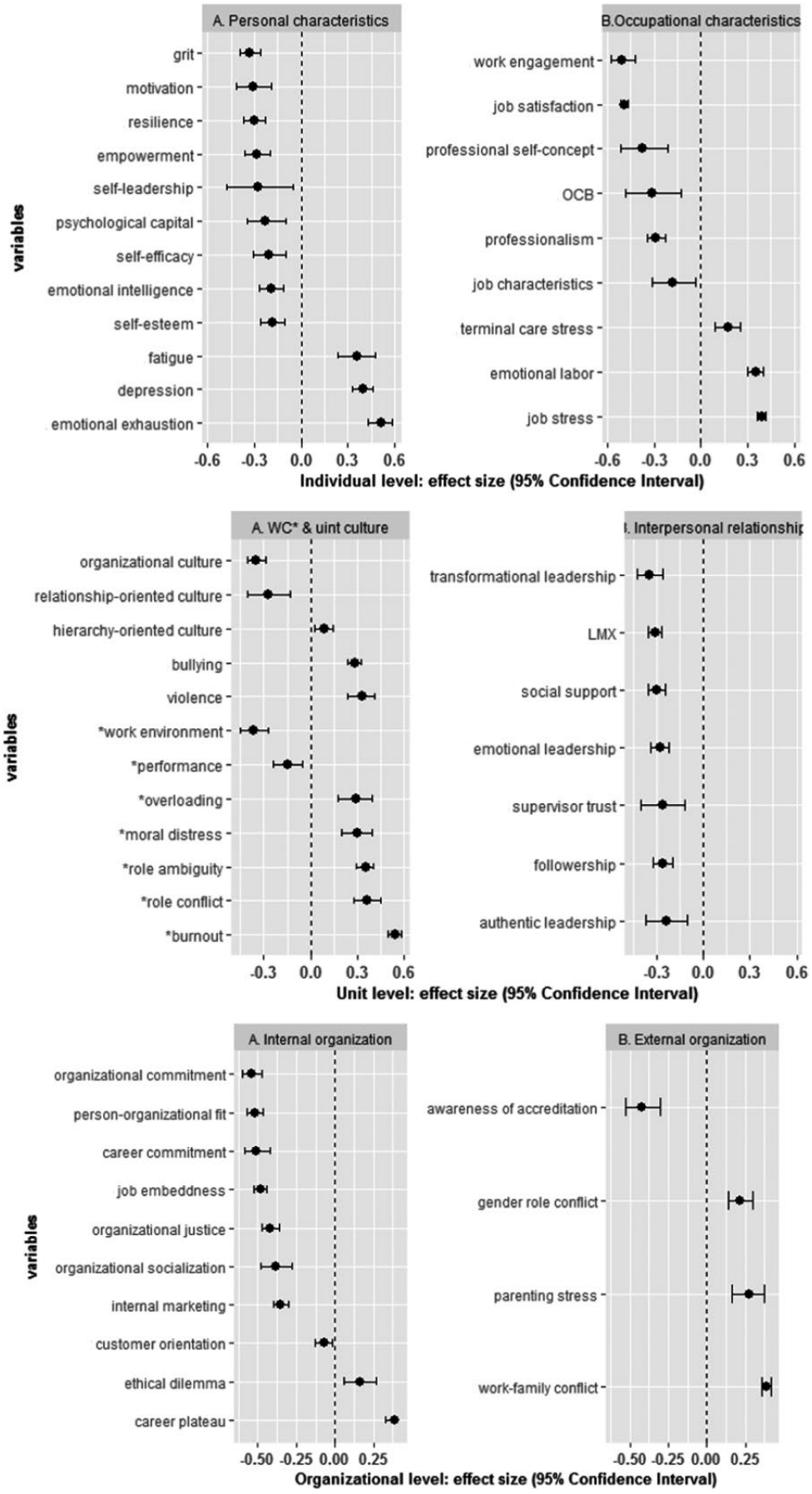

FIGURE 2 Effect size of related factors for turnover intention of hospital nurses. *LMX, leader–member exchange; OCB, organizational citizenship behavior; WC, work conditions

a burden to nurses. Additionally, 95% of South Korean nurses are women, and it has been shown that for married nurses, higher levels of conflict between work and family life and parenting stress lead to higher turnover intention (Galletta et al., 2019; Kim & Park, 2017). Accordingly, expanded childcare leave at the institutional level, flexible work arrangements and childcare support policies at the governmental level are needed.

Over the past 20 years, South Korea's efforts to solve the problem of turnover in hospital nurses have mostly focused on problems related to the nurses themselves, such as their characteristics or professionalism. However, the effect sizes of these individual-level factors have been relatively small in relation to lowering the turnover rates for hospital nurses, compared to factors at the organizational or social levels (Lee & Kang, 2018). To address the problem of nurses' turnover, it is essential to respond sensitively to the needs and interests of nurses with high turnover intention at the organizational level and establish strategies and policies to retain them (Oyeleye et al., 2013). Furthermore, medical institutions and the government should actively cooperate to solve nurses' work–family conflicts and parenting stress.

6 | CONCLUSIONS AND IMPLICATIONS FOR NURSING MANAGEMENT

As a result of this study, the authors found that the main positive predictors on turnover intention at the individual level of nurses were emotional exhaustion, depression, job stress, emotional labour, fatigue, and negative predictors were work engagement, job satisfaction, professional self-concept, grit, OCB, motivation and resilience. At the unit level, the positive predictors were burnout, role conflict, role ambiguity, violence and bullying, and negative predictors were organizational culture, work environment, transformational leadership, leader–member exchange (LMX) and social support. At the organizational and governmental level, positive predictors were work–family conflict, career plateau and parenting stress, and negative predictors were organizational commitment, person-organization fit, career commitment, job embeddedness and organizational justice.

The factors identified in the present study that are highly influential in hospital nurses' turnover intention are also the main factors that predict nurses' turnover intention in most other countries. Therefore, identifying the predictors of turnover intention in South Korean nurses is also related to the global shortage of nurses; this study will contribute to finding organizational, institutional, and governmental solutions and strategies to reduce turnover rates for hospital nurses.

Since the purpose of this study was to comprehensively review the predictors of turnover intention in hospital nurses and suggest intervention measures for clinical practice, there are some limitations. First, the authors arbitrarily classified the factors as being individual, nursing unit and organizational level, considering the main body of problem-solving efforts of nurses' turnover intention. The way the predictors of turnover intention are classified may differ depending on the researcher, due to close correlation and causality. Second, the present study included research that used instruments with multiple items measured using continuous variables and had proven reliability in the analysis, without limiting turnover intention scales. However, most previous meta-analysis studies did not limit turnover intention scales either (Özkan et al., 2020; Yin & Yang, 2002). In fact, a random-effects model was used because the effect sizes of most predictors were heterogeneous, regardless of whether a specific scale was used (Lee & Kang, 2018) or the scales used were not limited (Özkan et al., 2020). The range of the confidence interval for the random-effects model increases because the model reflected heterogeneity among studies, and weights for differences in the number of samples in each study are relaxed. Accordingly, more realistic situations can be reflected if a greater number of studies and samples are reflected (Jackson & Turner, 2017). Therefore, the factors for which the random-effects model was used in the present study are considered to have modelled actual differences due to the inclusion of a large number of studies and samples.

As a future study, we propose a large-scale study that comprehensively analyses the effect size on predictors of turnover intentions of nurses around the world, including its analysis according to the work environment and workforce of each country.

ETHICAL CONSIDERATION

This study is a reanalysis of the results of the published research paper and is not subject to IRB.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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