





The Race to Retain Healthcare Workers: A Systematic Review on Factors that Impact Retention of Nurses and Physicians in Hospitals

INQUIRY: The Journal of Health Care Organization, Provision, and Financing
Volume 60: 1–21
© The Author(s) 2023
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/00469580231159318
journals.sagepub.com/home/inq



Neeltje de Vries, RN, MSc^{1,2}, Anke Boone, MSc³, Lode Godderis, MD, PhD^{3,4}, José Bouman, BEd², Szymon Szemik, PhD⁵, Domenica Matranga, PhD⁶, and Peter de Winter, MD, PhD^{2,7,8}

Abstract

The shortage of healthcare workers is a growing problem across the globe. Nurses and physicians, in particular, are vulnerable as a result of the COVID-19 pandemic. Understanding why they might leave is imperative for improving retention. This systematic review explores both the prevalence of nurses and physicians who are intent on leaving their position at hospitals in European countries and the main determinants influencing job retention among nurses and physicians of their respective position in a hospital setting in both European and non-European countries. A comprehensive search was fulfilled within 3 electronic databases on June 3rd 2021. In total 345 articles met the inclusion criteria. The determinants were categorized into 6 themes: personal characteristics, job demands, employment services, working conditions, work relationships, and organizational culture. The main determinants for job retention were job satisfaction, career development and work-life balance. European and non-European countries showed similarities and differences in determinants influencing retention. Identifying these factors supports the development of multifactorial interventions, which can aid the formulation of medical strategies and help to maximize retention.

Keywords

physicians, nurses, determinants, systematic review, PRISMA, Job Demand-Resources model, retention, turnover

What do we already know about this topic?

The shortage of nurses and physicians is a growing and worrying problem across the globe due to the aging population, increasing incidence of chronic diseases and aging healthcare workforce.

How does your research contribute to the field?

This systematic review investigated push and pull factors that determine why nurses and physicians want to stay or leave their position; the main determinants were job satisfaction, career development and work-life balance.

What are your research's implications toward theory, practice, or policy?

Identifying these factors supports development of multifactorial interventions, which can aid the formulation of human resource strategies and help to maximize retention of nurses and physicians.

Introduction

Healthcare personnel shortages are a problem across the globe. With a lack of 4.3 million doctors in 2016¹ and 5.9 million nurses in 2020² globally, the shortage was already critical. The World Health Organization (WHO) reports that by 2030, there will be a global shortage of almost 14 million healthcare workers, in terms of nurses, physicians, midwives and other cadres.³ These challenges constitute a multifaceted

phenomenon. Among other things, extant literature shows that personnel shortages in healthcare are primarily driven by demographic changes in the population, increasing demand for healthcare, and a growing number of chronically ill patients.⁴ Life expectancy has consistently increased and is expected to continue to increase, which, in turn, increases morbidity because people are experiencing more age-related diseases.⁵ At the same time, the workforce is aging.⁴ The expected retirement rate of nurses within the next 10 years is



17% in the American and European regions.² Regarding physicians, half of them who were practicing in 2021 will be retired by 2030 due to age and early retirement.^{6,7} The cumulative effect of these trends is that there are insufficient recruits to replace retiring personnel.⁸

These high turnover rates are dysfunctional in multiple respects. Firstly, they lead to financial losses related to recruitment. Secondly, high turnover rates have a deleterious impact on the quality of care provided, for example, higher mortality rates⁹⁻¹¹ and an increase in medical errors.^{10,12} loss of care continuity^{13,14} and patient dissatisfaction,¹⁵ which, in turn, can result in lost revenues and higher patient care costs. Finally, high turnover rates reduce staff productivity for the simple reason that there is less staff to complete the tasks¹⁶ which can be lowering the morale of the remaining staff.^{17,18} This may lead to additional turnover among the remaining nurses and physicians.¹⁹

EU hospitals, in particular, are suffering from high staff turnover rates, while simultaneously being faced with austerity measures.⁴ This has resulted in less recruitment, replacement and retention investment to meet their saving targets.²⁰ During the COVID-19 crisis, hospitals were under additional pressure due to acute stress, frustration, isolation and the high risk of infection. Many studies show an increasing desire among medical staff to quit their jobs and leave the healthcare sector. In the long term, we can expect additional dropouts as a result of long-term mental health problems among medical staff due to COVID-19.²¹ Nashwan et al reported that turnover intentions of nurses were higher during COVID-19 in comparison before the crisis.²² Overall, the healthcare workforce is vulnerable to the growing job demands in the sector witnessed both during and after the COVID-19 pandemic.²³

Literature shows that turnover intentions are critical predictors when it comes to nurses and physicians leaving the workforce.^{13,24} The intention to leave is considered to be one of several stages in a complex decision-making process that leads to turnover behavior.²⁵ The reasons that trigger nurses' and physicians' intention to leave are complex and influenced by multiple individual and organizational factors. A recent systematic review of the determinants influencing turnover among nursing staff indicates that job satisfaction, stress and burnout are crucial individual determinants

among this working population.²⁶ Although the determinants influencing medical doctors' intention to leave have been less systematically studied, the available evidence indicates that psychosocial determinants (eg. job satisfaction, burnout) substantially influence these particular nurses' and physicians' intention to leave.^{26,27} This conclusion is supported by the Job Demands-Resources (JD-R) model.²⁸ The JD-R model was developed in the context of employee wellbeing and work-related stress. The central idea is that every occupation has its specific job demands and job resources. Job demands comprise all aspects of the job that require continuous physical or mental effort and are associated with a specific cost. On the other hand, job resources stimulate personal growth, lead to the achievement of one's goals and reduce the costs of job demands.²⁹ Job satisfaction, burnout and turnover intentions are thus the results of complex interactions between job demands and job resources. The associations between job demands, job resources, job satisfaction, burnout and turnover are illustrated in Figure 1, based on the findings of extant literature.²⁹

Hence, focusing on workers' intention to leave is strongly recommended, whereas, attitudes, subjective norms and perceived behavioral control are what underpin someone's intentions and actual behaviors.³⁰ Both policymakers and managers can potentially still influence these intentions in order to prevent workers from actually leaving the workforce.³¹ Although a lot of research has been conducted on this topic, multiple research gaps remain. Prior systematic reviews either solely focused on nurses^{24,32} or physicians,³³ or carried out in a non-EU setting^{34,35} or primary care setting.³⁶ In addition, they were conducted prior to the COVID-19 pandemic. As both demographic changes and the COVID-19 pandemic may result in new outcomes, this systematic review is desirable.

To the best of the author's knowledge, no systematic review is conducted yet examining the nurses' and physicians' intentions to leave their position in the hospital. The first aim of this systematic review is to explore the prevalence of nurses and physicians who intend to leave their position in a hospital in EU countries. Second, this systematic review aimed to explore the main determinants influencing job retention among nurses and physicians in their respective position in a hospital setting. The outcomes of this study will enhance our current knowledge of the prevalence and the

¹Department of Internal Medicine, Spaarne Gasthuis, Hoofddorp, The Netherlands

²Department of Science, Spaarne Gasthuis, Haarlem and Hoofddorp, The Netherlands

³Centre for Environment and Health, KU Leuven, Leuven, Belgium

⁴IDEWE, External Service for Prevention and Protection at Work, Leuven, Belgium

⁵Department of Epidemiology, School of Medicine in Katowice, Medical University of Silesia, Katowice, Poland

⁶University of Palermo, Department of Health Promotion, Mother and Child Care, Internal Medicine and Medical Specialties, Palermo, Italy

⁷Leuven Child and Health Institute, KU Leuven, Leuven, Belgium

⁸Department of Development and Regeneration, KU Leuven, Leuven, Belgium

Received 23 August 2022; revised 29 January 2023; revised manuscript accepted 6 February 2023

Corresponding Author:

Peter de Winter, Spaarne Gasthuis, PO Box 417, 2000 AK Haarlem, The Netherlands.

Email: pdewinter@spaarnegasthuis.nl

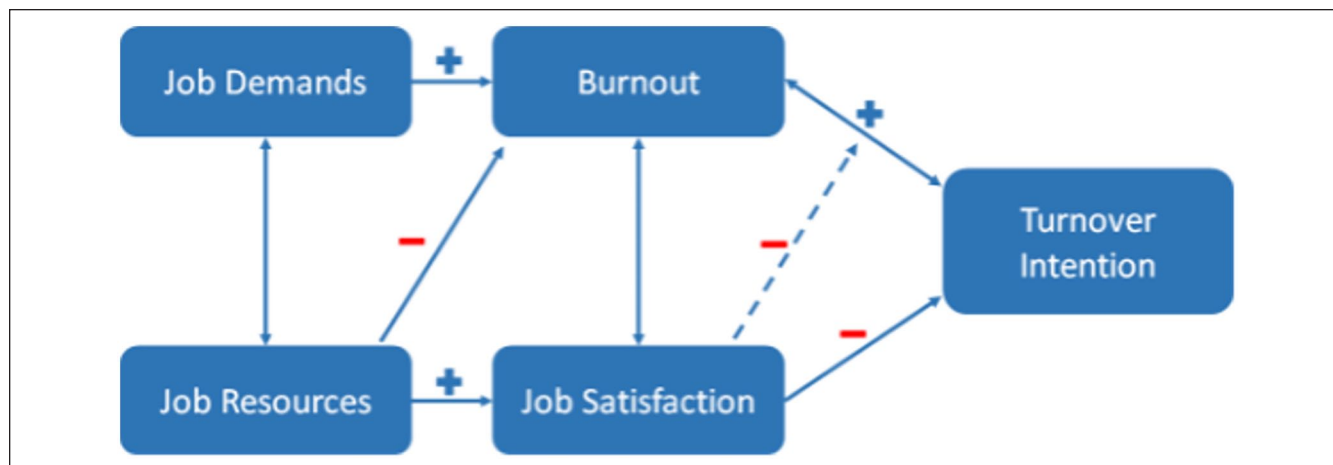


Figure 1. Job Demands-Resources Model adapted to turnover intentions.²⁹

determinants influencing job retention as well as diversity in magnitude of determinants and potential new determinants. Knowing these determinants of intention to leave, will aid the development of retention interventions in a hospital setting and inform policymakers related to human resources. These interventions may prevent nurses and physicians from actually leaving the workforce, which, among other things, positively impacts the quality of care, financial costs and morale of the remaining staff.

Methods

This systematic review constitutes the starting point of a large European Union-funded project called MenTal hEalth: focus on Retention of healthcare workers (METEOR). Further information about the project can be found on the website.³⁷

Design and Population

The systematic review was conducted with multiple quantitative and qualitative studies, and was carried out in accordance with the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) statement.³⁸

The systematic review is registered at the International prospective register of systematic reviews (PROSPERO), CRD4202159007. The population studied in this review included nurses and physicians, namely nurses and physicians, who either worked or are currently working in a hospital setting.

Data Sources and Searches

We developed an extensive search string to be used in scientific literature databases, namely PubMed, Embase, and CINAHL. The study search was fulfilled on June 3, 2021. The search was framed using the domain (healthcare professionals), determinant (determinants/interventions), and

outcome (job retention/turnover) within the last 10 years. The timeframe of the last 10 years was chosen because the healthcare sector is changing a lot in recent years and, this systematic review aimed to include recent articles so outcomes are still sufficiently relevant for today's healthcare sector. In this study, we used the term turnover to refer to nurses and physicians who no longer work as nurses and physicians in their respective position in a hospital setting, which included former nurses and physicians who either moved to a different unit, different hospital, moved on to work in non-patient roles or left the system entirely.³⁹

For healthcare professionals, the following synonyms were used: "health personnel [Mesh]," "health personnel," "healthcare workers," "healthcare providers," "healthcare professionals," "health workforce," and "health workers." Because of the population, the domain was extended with "nurses [Mesh]," "nurse," "nursing personnel," "physicians [Mesh]," "physician" or "doctor." The search for determinants contained "determinants," "factors," "predictors" and "interventions." Synonyms for the outcome that were used were: "personnel turnover [Mesh]," "personnel turnover," "retaining personnel," "job retention," "retention rates," "turnover intention," "intention to leave," "intention to quit," "intention to stay." Supplemental Appendix 1 can be consulted for the complete search string.

Study Selection

Articles were included in the review if they studied nurses and/or physicians, and contained determinants of job retention or turnover intention. Furthermore, the study needed to have been published between 2011 and August 2021. If a study was not carried out in a hospital setting or if the manuscript was not in English, then the study was excluded. Further exclusion criteria were as follows: systematic review, study protocol and thesis, and full text not available. Moreover, studies that contained interventions seeking to reduce the intention to leave were also excluded from this

systematic review. All the participants in the studies also needed to be of working age. There were no restrictions on gender, ethnicity or healthcare status. Data extraction began with evaluating the abstracts of the studies following the formulated inclusion criteria; one reviewer conducted this evaluation. Furthermore, a selection was made of those studies that were conducted in countries of the European continent (EU) or non-European continent (non-EU). This distinction was drawn because of the participating countries in the ***-project, which led us to focus on EU studies.³⁷ After the first screening, full texts of EU studies carried out over the last 5-year period were examined by 2 pairs of 2 reviewers (JB, SS, NdV, PdW). The studies carried out during this period give the strongest insight into the determinants in the EU. Furthermore, we did this to create an overview of the information about the pre-COVID period in the EU with a minimal degree of bias.

In order to facilitate the comparison of EU outcomes with non-EU studies, the abstracts of studies conducted in non-EU countries over the last 10-year period, rather than the last 5 years, were analyzed. This global overview of non-EU outcomes can be used to supplement details in the EU outcomes.

A quality assessment of the EU studies in our search was conducted by using the Mixed Methods Appraisal Tool (MMAT) version 2018. This tool was selected because it is applicable for mixed methods studies. To reduce bias, 2 researchers independently carried out the quality assessment (NdV, PdW). Non-EU studies were not included in this quality assessment as the outcomes of the heterogeneous non-EU countries were indicated as a global overview and supplemental in the EU outcomes.

Any disagreements over the eligibility of certain studies were resolved through either engaging in consensus-based decision-making or by including the views of an additional author. The other authors reviewed the validity of the data extraction.

Data Extraction

The data from the EU studies were extracted into multiple characteristics: the author, the country where the study was conducted, the population and push and pull factors influencing job retention. Push factors were defined as those factors which increase the intention of nurses or physicians to leave the hospital setting. Conversely, pull factors were defined as those factors which increase the intention to stay in the hospital setting.

Prevalence of Nurses and Physicians Who Intended on Leaving Their Position at Hospitals in EU Studies Where Described Using Percentages

The determinants identified in the EU and non-EU studies were organized into one of the following subthemes:

personal characteristics, job demands, employment services, working conditions, work relationships and organizational culture. The determinants identified in the EU studies were described in text. The data from the non-EU studies were extracted into one of the subthemes a table.

Results

The literature search, including determinants and interventions, resulted in 3521 studies over the last 10-year period. After excluding all studies that met the exclusion criteria and removing any duplicates, 345 studies fulfilled the inclusion criteria: 37 EU studies and 308 non-EU studies (Figure 2).

The EU studies comprised 2 qualitative studies and 35 (semi)quantitative studies. Most of the studies were conducted in Turkey (19%), followed by Germany (8%), Norway (8%) and Sweden (8%), respectively (Table 1).

Of the studies included, 78.4% were concerned exclusively with nurses,^{15,40-67} 8.1% only looked at physicians,⁶⁸⁻⁷⁰ 10.8% included nurses and physicians,⁷¹⁻⁷⁴ while 2.7% studied healthcare professionals.⁷⁵ The studies of healthcare professionals also included nurses and physicians, therefore, these were included.

The literature showed that between 12% and 64% of nurses intend to leave their current job (Figure 3). Turkey in particular has a high number of nurses who intend to leave, with studies finding 60.9%⁵⁷ and 64.4%,⁴² respectively. The countries with the lowest percentages of nurses intending to leave were Italy (11.7%),⁶³ Germany (14%),⁶⁷ and Switzerland (16.7%).⁷¹

With respect to physicians, the percentage of them that intend to leave their current job ranged from 16.7% to 29% (Figure 4). Switzerland had the lowest number of physicians who intend to leave, namely 14.2%,⁷¹ followed by Norway (21%),⁷⁰ Poland (22.7%)⁶⁸ and Germany (28.2%).⁷² Van den Bulcke et al studied multiple countries and revealed that 36.1% of the participating physicians intended to leave their job.⁷³

Determinants in the EU Studies

The results related to the determinants were categorized into push and pull factors. Table 2 provides an overview of the selected EU studies, along with all the push and pull factors for each study.

Two reviewers (NdV, PdW) discussed these push and pull factors to categorize them into “personal characteristics,” “job demands,” “employment services,” “working conditions,” “work relations,” and “organizational culture.”

Personal Characteristics

The studies showed that older nurses were more likely to remain in the workplace,⁵⁷ while younger nurses were more inclined to leave their hospital.^{41,44,57,73} The outcome related

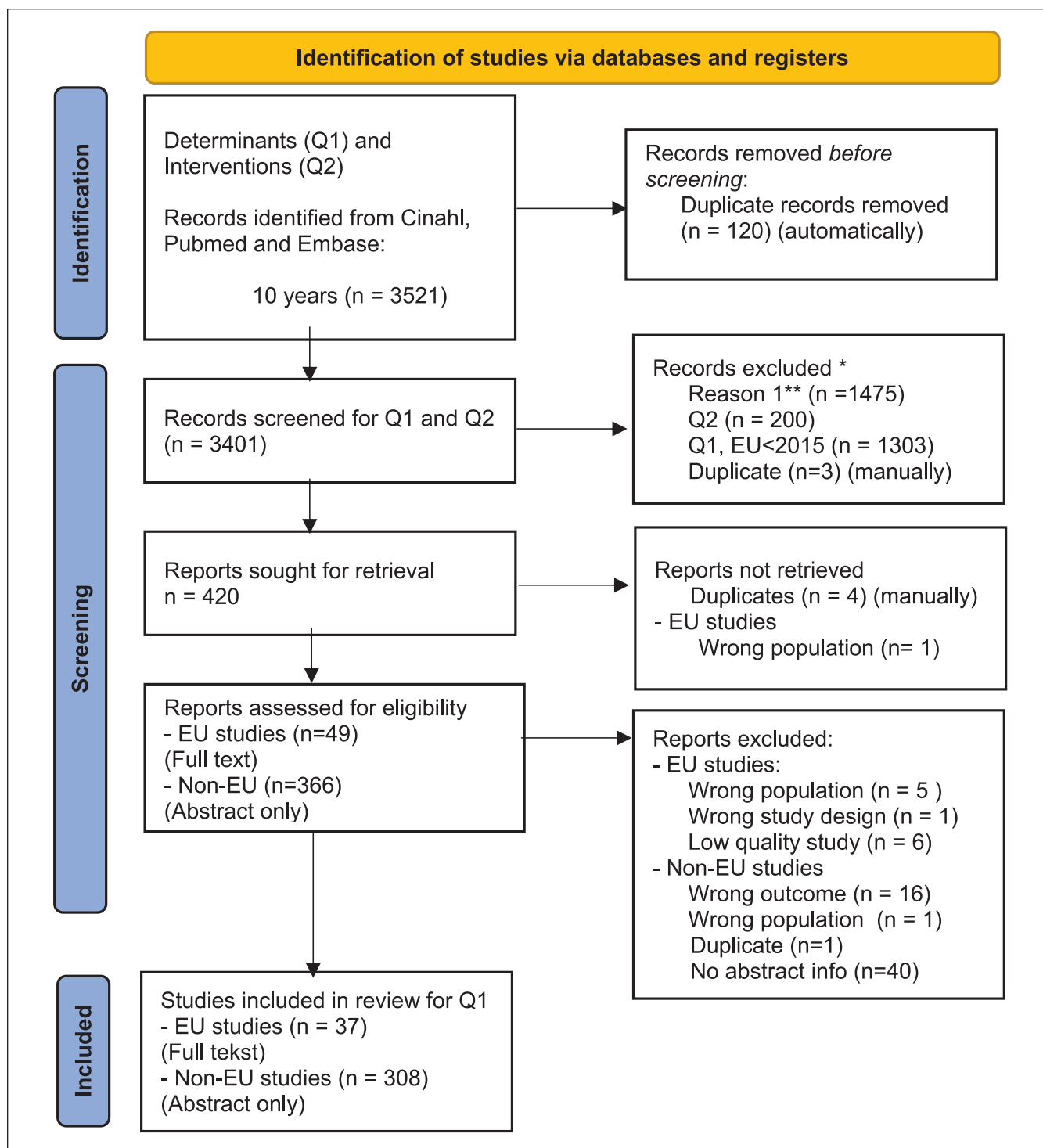


Figure 2. PRISMA flow diagram.

*This part was always reviewed by 2 reviewers.

**Excluded due to wrong population, wrong outcome, wrong publication type, wrong determinant, wrong study design, or foreign language.

to the impact of gender was inconsistent. Specifically, the literature revealed male gender was both a pull factor⁵⁵ and a push factor.⁶³ The female gender decreased the intention to

stay.⁴³ Furthermore, one's household structure (number of children) was also found to impact upon one's intention to leave.⁴⁰

Table 1. Study Characteristics of the Included EU Studies.

Study characteristics	Included studies, n (%)
Type of study	
Qualitative	2 (5)
Quantitative	35 (95)
Study country	
10 European countries	1 (3)
Belgium	2 (5)
Czech Republic	1 (3)
Denmark	1 (3)
EU and USA	1 (3)
Finland	1 (3)
France	1 (3)
Germany	3 (8)
Ireland	1 (3)
Italy	2 (5)
Italy, Turkey and Iceland	1 (3)
Lithuania	1 (3)
Norway	3 (8)
Poland	2 (5)
Sweden	3 (8)
Switzerland	2 (5)
The Netherlands	2 (5)
Turkey	7 (19)
UK	2 (5)
Publication year	
2016	7 (19)
2017	5 (14)
2018	3 (8)
2019	8 (22)
2020	8 (22)
2021	6 (16)

Furthermore, higher educated nurses (Master's degree) were more likely to leave their current employment.⁵⁷ Moreover, a higher Big Mac index in the healthcare worker's region increased their intention to leave.⁷³ Good personal health⁴⁰ and being single⁵⁷ were found to potentially increase retention, moreover, self-efficacy (indicating one's beliefs about one's personal ability to implement the necessary actions to achieve specific goals) reduced turnover intention.¹⁵ A lack of passion for patient care⁵³ and high interpersonal conflict⁴⁷ were also found to result in an intention to leave.

Job Demands

Overall, job demands and (adequate) resources were found to play a positive role in the intention to stay.^{42,48} More specifically, job satisfaction was found to be an important pull factor in multiple studies,^{15,40,41,43,44,46,49,57,60,63,72} whereas a lack of job satisfaction was found to be a push factor.^{42,53}

Other push factors were burnout symptoms,⁶⁵ which can be defined as depersonalization, emotional exhaustion and

reduced personal accomplishment.⁷⁶ Several studies highlighted symptoms like emotional exhaustion^{42,43,47,58,63} and depersonalization^{42,74} as push factors. Similarly, nurses and physicians were found to be more likely to intend to leave when they experienced dissatisfaction,⁴² were unsatisfied with individual expectations,⁴⁵ had low energy,⁴⁷ encountered ethical dilemmas in the workplace,⁵¹ experienced mental job stress⁷¹ or high moral distress.⁵⁴

Other studies pointed toward quantitative workload,^{47,67} high quantitative demands,⁶⁷ temporal, physical, emotional and mental workload,⁷¹ rest break disturbances,⁶⁷ stressful work⁴¹ and performing non-nursing care activities (for nurses) as push factors.⁶³ Conversely, performing core nursing activities was found to be a pull factor.⁶³ Moreover, the work engagement of the staff,^{15,58} agentic capacity,¹⁵ the meaning that nurses and physicians attached to their work^{51,65,75} and low job stress⁴⁹ were found to be essential. More specifically, high work engagement was found to be a pull factor, while low work engagement was a push factor.⁶¹ Similarly, pull factors were described in terms of having less stressful work and carrying out less monotonous tasks.⁴¹ Finally, the literature showed that autonomy was an essential factor that positively impacted upon nurses' intention to stay.⁴¹

Employment Services

Financial items like a good salary^{40,66,68} and positive changes in salary⁵² appeared to also positively impact upon the intention to stay. Furthermore, rewards were found to be a pull factor,⁷⁵ whereas effort-reward imbalance impacted upon the intention to leave.⁷¹ The absence of social benefits at work, such as, for example, social perks provided by the employer (personal accounts, vitamins, meal tickets, etc.) led nurses to intend to leave their employer.⁶⁶

Moreover, development opportunities in nurses' and physicians' careers were found to positively impact upon retention in several studies,^{43,56,75} including opportunities for education,⁴⁴ a chance for renewal⁵² and positive career experiences.⁵⁵ Conversely, it is important to note that a lack of challenge⁵³ and limited opportunities for career development were found to increase the intention to leave,^{43,46} along with a lack of perceived competence.⁵³ In addition, temporary positions were also found to negatively impact upon job retention.⁴¹

The work schedule was also found to impact upon job retention. For example, schedule flexibility was found to positively impact upon retention,⁵⁵ whereas irregular working hours⁴¹ and on-call duties⁶⁹ can operate as push factors. The effect of the number of contracted working hours was ambiguous in the studies; both part-time⁴⁰ and full-time work⁵⁵ were found to affect job retention positively.

Finally, both more working years^{42,43} and high levels of experience^{44,55,56} were found to increase the chance of retention.

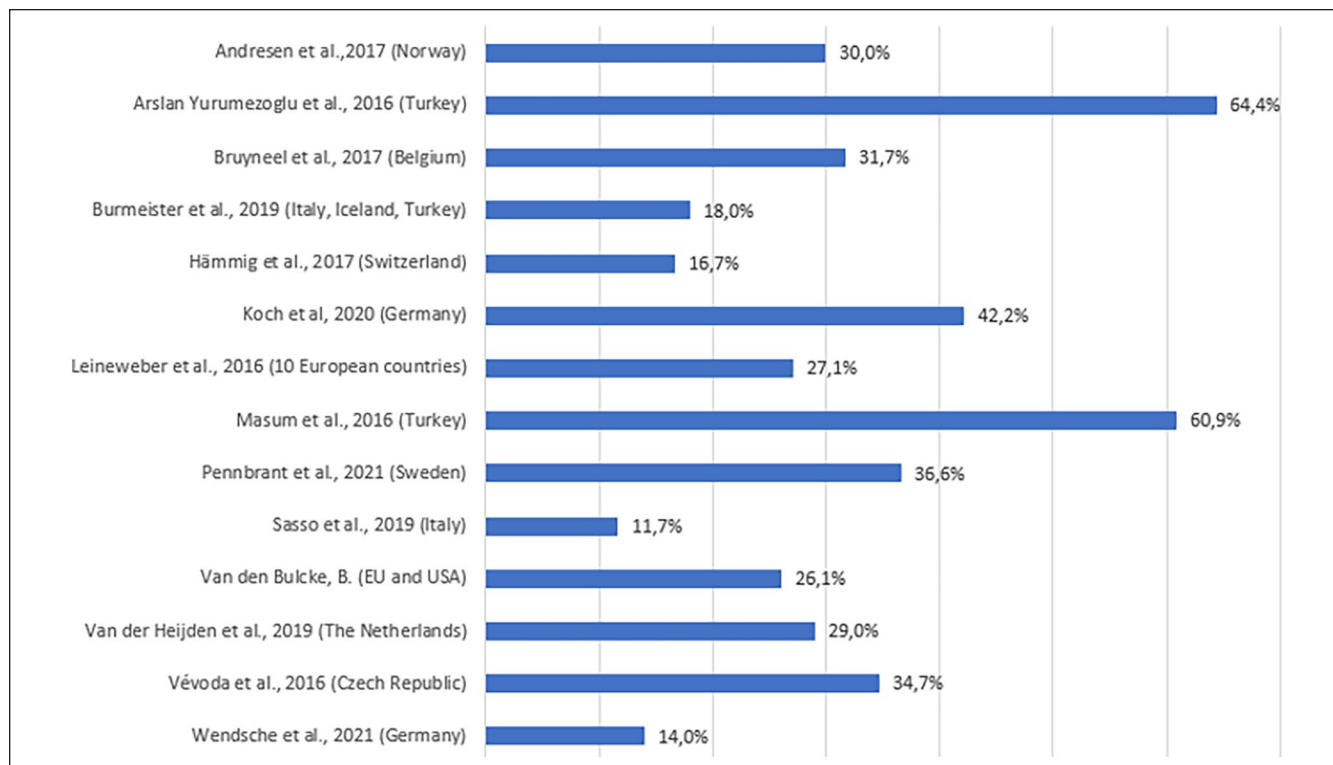


Figure 3. Intention to leave: registered nurses.

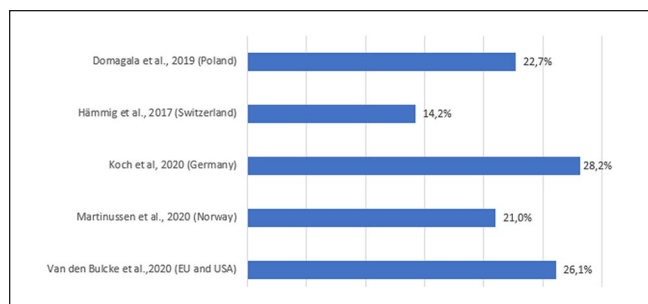


Figure 4. Intention to leave: physicians.

Working Conditions

Several working conditions positively impact upon retention, such as, for example, reducing the administrative burden and improving infrastructure.^{52,68} Nurses working in hospitals in the countryside were found to have a greater intention to leave than those working in hospitals in large cities.⁶⁸ Moreover, patient care impacts upon the intention to stay. Poor patient safety⁶³ and higher mortality rates contribute to nurses and physicians leaving their hospital.⁷³ Similarly, both patient satisfaction¹⁵ and perceived high quality of care^{63,72} were also found to have a positive impact on job retention.

Adequate staffing was found to have a positive impact on retention.⁴²⁻⁴⁴ Conversely, inadequate staffing,^{43,45,63,72} and a

high level of job strain (high demands, low control)⁶⁹ were found to be push factors.

Finally, moderate work pace⁴⁸ and positive unit-level variables were found to positively influence retention,⁵⁵ while a low level of job strain (low demand and high control) were identified as being pull factors.⁶⁹

Furthermore, social support,^{48,65} and a good work-life balance were found to play an important role in the intention to stay.^{56,68} Therefore, work-family conflict^{47,61} defined as “a form of inter-role conflict in which the general demands of, time devote to, and strain created by the job interfere with performing family-related responsibilities”⁷⁷ or family work conflicts,^{47,65} defined by Netemeyer et al as: “a form of inter-role conflict in which the general demands of, time devoted to, and strain created by the family interfere with performing work-related responsibilities.”⁷⁷ Lastly, work-life imbalance^{71,75} negatively impact the intention to stay.

Work Relationships

Nurses and physicians benefit from social colleagues,⁵⁶ good communication on the work floor,⁵⁹ affective commitment,^{46,62} appreciation from their superior⁴¹ and mutual respect.⁷³ However, nagging colleagues,⁴¹ unfair behavior⁷⁵ and many social conflicts on the work floor negatively impact upon leaving an organization.⁶⁷

Table 2. Details of Studies With Push and Pull Factors Related to Nurses and Physicians' Intention to Leave Their Hospital: EU Countries.

Author	Country	Type of health care worker	Sample size	Pull factors	Push factors
Alameddine et al ⁴⁰	Germany	Nurses	1000	Job satisfaction, part-time factor, good wages, good personal health	Household structure (number of children)
Andresen et al ⁴¹	Norway	Nurses	478	Satisfaction with job, autonomy, less stressful work, less monotonous tasks, appreciative leader	Low age, nagging colleagues, temporary position, stressful work, irregular working hours, less appreciation, fewer years in current job
Arslan Yurumezoglu and Kocaman ⁴²	Turkey	Nurses	799	More working years in the organization, positive perception of staffing, adequacy of staffing and resources, collegial nurse-physician relationship	Dissatisfaction, emotional exhaustion, depersonalization
Bruyneel et al ⁴³	Belgium	Nurses	294	Adequate staffing, career development, job satisfaction, enough social support supervisor, decision authority, a long career	Female gender, inadequate nurse staffing, bad career development and opportunities, low decision authority, low social support supervisor, low skill discretion, emotional exhaustion
Burmeister et al ⁴⁴	USA, Turkey, Iceland, Australia, Lebanon, South Korea, Italy ^a	Nurses	6212	Perceived staffing adequacy, job satisfaction, possibilities for education, enough experience	Younger age
Çamveren et al ⁴⁵	Turkey	Nurses	15		Negative work environment, nurse shortages, unsatisfied with their individual expectations
Çamveren and Kocaman ⁴⁶	Turkey	Nurses	335	Job satisfaction, affective commitment to the organization	
Dåderman and Basinska ⁴⁷	Poland	Nurses	188		Work-family conflict and family-work conflict, high interpersonal conflicts at work, high quantitative workload, low energy
De Simone et al ⁴⁵	Italy	Nurses	194	Job satisfaction, work engagement, self-efficacy, agentic capacities, patient satisfaction	
Domagala and Dubas-Jakóbczyk ⁴⁸	Poland	Physicians	1003	Salary, working conditions, better work-life balance, hospital located in city	Country hospital
Eriksson et al ⁴⁸	Sweden	Nurses	516	Job demands and resources, social support, vertical trust, humanity, moderate work pace	
Fasbender et al ⁴⁹	United Kingdom	Nurses	361	Sufficient satisfaction, low job stress, on the job embeddedness	
Gillet et al ⁵⁰	France	Nurses	81	Enough job satisfaction	
Hämmig ⁷¹	Switzerland	Physicians/nurses	1840		Temporal, physical, emotional and mental workload, effort-reward, work-life imbalance, job stress
Heponiemi et al ⁶⁹	Finland	Physicians	3324	Low job strain (low demand and high control)	On-call duties, high level of job strain (high demands, low control)
Hognestad Haaland et al ⁵¹	Norway	Nurses	2946	Social support from supervisor, the meaning of work	Ethical dilemmas
Karlsson et al ⁵²	Sweden	Nurses	25	Positive changes in salary, working environment, chance for renewal, nursing leadership	
Koch et al ⁷²	Germany	Physicians/nurses	1060	High perceived quality of care, high job satisfaction	

(continued)

Table 2. (continued)

Author	Country	Type of health care worker	Sample size	Pull factors	Push factors
Kox et al ⁵³	The Netherlands	Nurses	17		Lack of challenge, lack of passion, lack of perceived competence, lack of job satisfaction, lack of work capacity, lack of feeling of belonging
Lauris et al ⁵⁴	Lithuania	Nurses	612	Low moral distress level	High moral distress level
Leineweber et al ⁵⁵	Europe, 10 countries	Nurses	2,3076	Positive unit-level variables, personal characteristics nurse, full-time job, male, positive career experience, full-time working, schedule flexibilities	
Loft and Jensen ⁵⁶	Denmark	Nurses	28	Experience in important specialties, positive management, development possibilities, social colleagues, good home-work balance, positive changes in the organization	
Martinussen et al ⁷⁰	Norway	Physicians	971	Upbeat leadership style, positive organizational context, professional-supportive leader	
Masum et al ⁵⁷	Turkey	Nurses	417	Job satisfaction, positive supervisor support, more experience, older age	Female gender, Master's degree, single, younger age
McKenna and Jeske ⁵⁸	Ireland	Nurses	89	Ethical leadership, decision authority, positive work engagement	Emotional exhaustion
Özer et al ⁵⁹	Turkey	Nurses	175	Positive work environment, communication satisfaction, good leadership	
Özer et al ⁶⁰	Turkey	Nurses	189	Authentic leadership	
Pennbrant and Döderman ⁶¹	Sweden	Nurses	807	High work engagement	Work-family conflict, low work engagement
Peter et al ⁷⁵	Switzerland	Health professionals	3398	Opportunities for development, quality of leadership, rewards	Work-private life conflict, unfair behavior of colleagues, low level meaning of work
Robson and Robson ⁶²	United Kingdom	Nurses	433	Organization support, affective commitment, leader-member exchange	
Sasso et al ⁶³	Italy	Nurses	3667	Positive perception of quality and safety of care, performing core nursing activities, job satisfaction, good relation with medical staff	Understaffing, emotional exhaustion, poor patient safety, performing non-nursing care, male
Sungur et al ⁶⁴	Turkey	Nurses	215		Paternalistic leadership, organizational cynicism
Van den Bulcke et al ⁷³	EU and USA ^a	Physicians/nurses	2992	Mutual respect, open interdisciplinary reflection, not avoiding end of life decisions	Younger age, higher Big Mac index, ICUs mortalities
Van der Heijden et al ⁶⁵	The Netherlands	Nurses	1187		Burnout symptoms, the impact of perceived effort and meaning of work, family-work conflict, social support
Vandenbroeck et al ⁷⁴	Belgium	Physicians/nurses	1169/ 4531		Depersonalization, emotional exhaustion
Vévoda et al ⁶⁶	Czech republic	Nurses	1992	Salary, social benefits, management, healthy work environment	
Wendsche et al ⁶⁷	Germany	Nurses	167		Rest break disturbances, high quantitative demands, high social conflicts at work

^aBecause of the many included EU countries (besides non-EU), this was chosen to be included in the study.

Table 3. Determinants Influencing Nurses and Physicians' Retention in Hospitals: Non-EU Countries.

Theme	Determinants, ^a n(%)
Personal characteristics.	Ethnicity (2 (0.6)), Age (38 (12.3)), Marital status (16 (5.2)), Gender (10 (3.2)), Health status (11 (3.6)), Motivation (5 (1.6)), Self-esteem (11 (3.6)), Lifestyle and coping behaviour (4 (1.3))
Job demands	Job satisfaction (71 (23.1)), Altruistic desire (1 (0.3)), Emotional stability (4 (1.3)), Compassion fatigue (8 (2.6)), Workload (23 (7.5)), Emotional demands (2 (0.7)), Challenges (2 (0.7)), Valuation (15 (4.9)), Working values (5 (1.6)).
Employment services	Clinical experience (18 (5.8)), Need for income (1 (0.3)), Work-life balance (22 (7.1)), Ambition (3 (1.0)), Salary and rewards (27 (8.8)), Distance and housing (3 (1.0)), Job security (9 (2.9)), Employment (4 (1.3)), Professional title (6 (1.9)), Lifelong learning (3 (1.0)), Education, career and budget for development (25 (8.1)), Job orientation (3 (1.0)), Mentorship (2 (0.7)), Internship (1 (0.3)), Magnet hospital (2 (0.7)), Teaching hospital (12 (3.9)), Work shifts (9 (2.9)), Leadership position (12 (3.9)).
Working conditions	Environment (34 (11)), Scale, number of bed and region (6 (1.9)), Physicians per bed (2 (0.7)), Environment, equipment (4 (1.3)), Shortage of staffing (6 (1.9)), Quality of work (12 (3.9))
Work relations	Soft skills (3 (1.0)), (social) support (9 (2.9)), Bullying (13 (4.2)), Collaboration with doctors (5 (1.6)), Support from work (28 (9.1)), Organizational commitment (45 (14.6)), Role models (3 (1.0)), Teamwork (5 (1.6)), Team climate (6 (1.9)), discrimination (5 (1.6)).
Organizational culture	Hierarchy and leadership styles (21 (6.8)), Professional vision towards nursing (4 (1.3)), Magnet philosophy (10 (3.2)), Ethics with speak-up, open culture, self-efficacy and autonomy (34 (11.0))

^aThe font size used for the determinants signals the frequency with which the determinant appeared in one of the included non-EU studies; the larger the font size, the more frequently the determinant was described in the literature.

Regarding teamwork, nurses and physicians were found to benefit from open interdisciplinary reflection and not avoiding end of life decisions.⁷³ Furthermore, a collegial nurse-physician relationship was emphasized in earlier studies.^{42,63} Conversely, a lack of appreciation for the operational activities⁴¹ and the absence of a feeling of belonging⁵³ increased the intention to leave.

Organizational Culture

Nurses were found to benefit from positive organizational changes in terms of job retention.^{56,70} Moreover, with regard to cultivating a workplace culture characterized by respect and reciprocity, humanity is an essential factor to focus on if a healthcare organization is to positively enhance retention.⁴⁸ A positive work environment positively affects retention,⁵⁹ whereas a negative work environment (lack of professional solidarity, lack of support from management, horizontal violence and inadequacy of preceptorship process) makes nurses leave their organization.⁴⁵

The literature also underscored that good leadership,⁵⁹ leadership quality,^{59,75} and leadership styles make a key difference. Productive leadership styles identified in the research were authentic leadership,⁶⁰ upbeat leadership⁷⁰ and ethical leadership,⁵⁸ while, alternatively, paternalistic leadership was found to be a push factor.⁶⁴ Moreover, sufficient social support from one's supervisor^{43,51,57,62,70} and vertical trust⁴⁸ were found to be important determinants of remaining in the workplace. Multiple studies outlined the importance of positive management for successful retention.^{56,66} Alongside this, exchanges between supervisors and nurses were also shown to impact upon retention positively.⁶² Furthermore, decision authority^{43,58} and nursing leadership⁵² were important pull factors in the literature. Conversely, low decision

authority⁴³ and organizational cynicism⁶⁴ negatively impact upon the intention to stay and, hence, should be avoided.

Determinants Non-EU Studies

The determinants influencing nurses' and physicians' intention to leave outlined in the non-EU studies afford a global overview of similarities and differences between non-EU and EU studies. The determinants identified in the abstracts of the non-EU studies were also categorized into themes by 2 reviewers (NdV, PdW). Table 3 presents an overview of all the determinants identified in the studies in non-EU countries.

The literature of the determinants influencing nurses' and physicians' intention to leave in non-EU countries presented some similarities and differences with the studies in EU countries.

One of the similarities was the impact of job satisfaction upon the intention to leave.⁷⁸⁻¹⁴⁷ A study conducted in Australia by Doleman et al noted that "Job satisfaction was found to have a significant negative inverse relationship with intention to leave."⁹⁷ Similar to the situation in EU countries, education and career development appeared to play an important role in non-EU countries with regard to the retention of nurses and physicians.^{87,131,135,148-167} A study conducted in the United States found that career development was positively correlated with retention.¹³⁵ Moreover, like in the EU studies, work-life balance^{112,113,115,118,134,143,157,168-181} and organizational commitment^{78,82,83,87,91,92,100,103,109,116,118,122,123,128,134,140,157,171,172,178,182-203} were also found to be determinants influencing the intention to leave in non-EU studies.

Notable differences highlighted in the non-EU studies pertained to the impact of race/ethnicity²⁰⁴⁻²⁰⁶ or discrimination^{183,207-210} upon the intention to leave. For example,

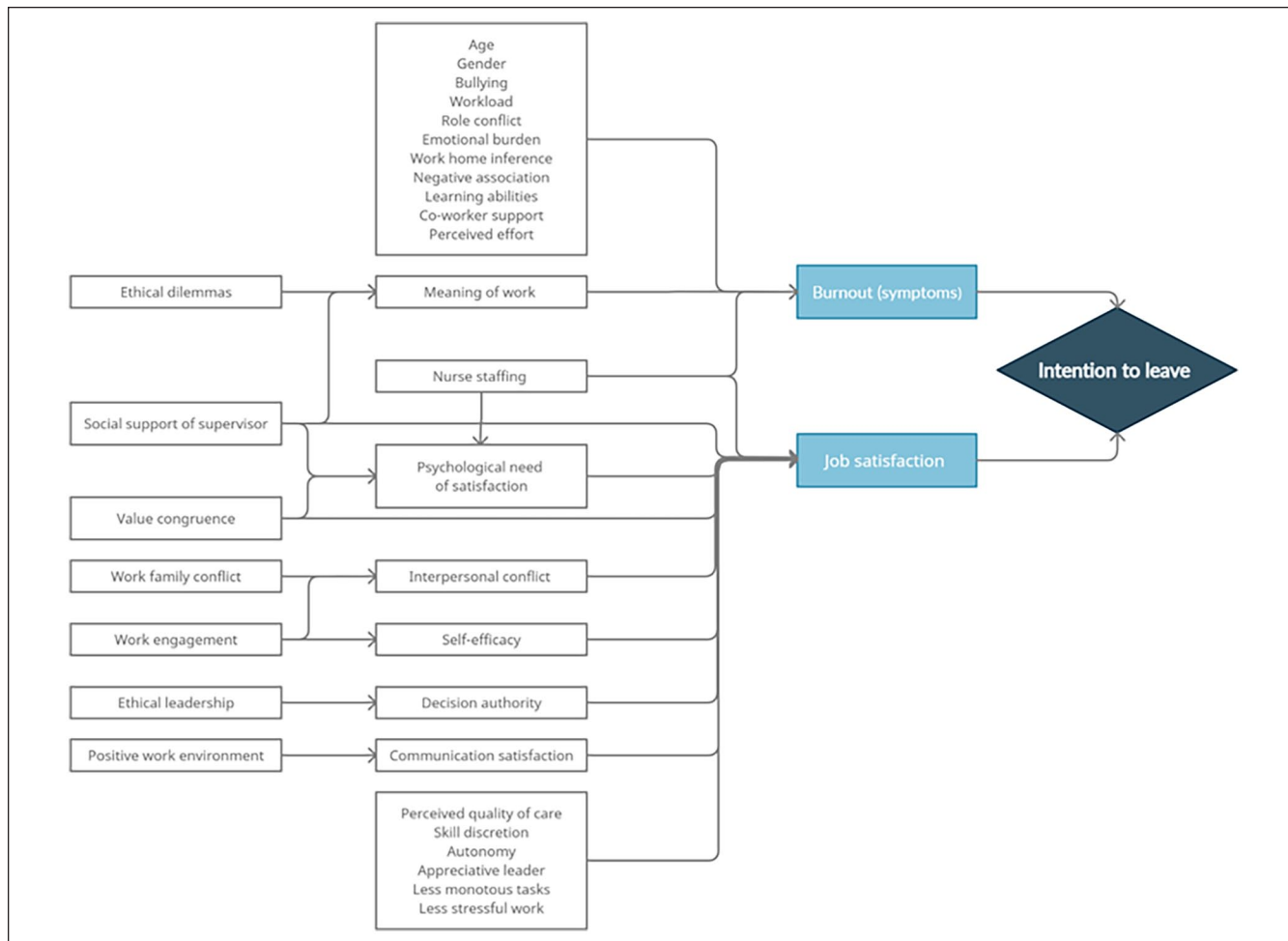


Figure 5. Inter-correlation figure adapted for turnover intention.

Alshareef et al described that in Saudi Arabia, Filipino nurses were more intent to leave their current position due to discrimination.¹⁸³ Furthermore, Hispanic^{204,205} and black²⁰⁴ nurses and physicians were more inclined to leave compare to white or Asian nurses and physicians,²⁰⁴ which could be influenced by discrimination. Furthermore, bullying was frequently noted in the non-EU studies.^{84,120,211-221} Favaro et al found that those who had recently graduated, particularly male graduates, reported significantly higher workplace bullying.²¹³

Finally, hospitals with a Magnet designation were associated with lower turnover rates in the United States.^{222,223} The Magnet program “will continually elevate patient care around the work in an environment where nurses, in collaboration with the interprofessional team, flourish by setting the standard for excellence through leadership, scientific discovery and dissemination and implementation of new knowledge”.²²⁴

Multifactorial Determinants

This review has thus far focused on single factor determinants that impact upon the intention to leave or stay. However, these

outcomes are multifactorial rather than being based on a single factor. The review began with the JD-R model that was adapted to address turnover intention, which showed the inter-correlation between job demand, job resources, burnout, job satisfaction and intention to leave (Figure 1). Figure 5 provides an overview of the extended JD-R model with more specific inter-correlations from the considered literature on EU countries.^{15,41,43,49-51,58,59,61,72,74,225}

As shown in Figure 5, burnout (symptoms) and job satisfaction are correlated with the determinants, which also impact upon the intention to leave by single factor determinants. It should be noted that the direct correlation between the intention to leave and those determinants was dropped in Figure 5, in order to provide a more precise picture. For example, work-family conflict and work engagement impact upon interpersonal conflict, which, in turn, impacts job satisfaction and subsequently the intention to leave. As was the case for simultaneous work-family conflict, work engagement and interpersonal conflict directly impact upon the intention to leave. Furthermore, social support of the supervisor impacts upon job satisfaction. Moreover, social support impacts upon the meaning of work and subsequently burnout (symptoms), which impacts upon the

intention to leave. Nevertheless, social support of the supervisor also directly impacts upon the intention to leave.

Discussion

This systematic review aimed to explore both how prevalent the intention to leave is among physicians and nurses in EU countries and the main determinants of job retention among nurses and physicians in their respective position in a hospital setting.

The results showed notable differences with respect to nurses' and physicians' intentions to leave their position. The determinants that impact upon job retention varied and were divided into 6 themes: personal characteristics, job demands, employment services, working conditions, work relationships and organizational culture. These outcomes are in line with previous systematic research in different population^{32,33,226} and setting.³⁴⁻³⁶

The similar determinants identified in studies in EU and non-EU countries were job satisfaction, education and career development, work-life balance and organizational commitment. Non-EU countries were characterized by different determinants that impact upon the intention, namely ethnicity and discrimination, bullying and whether a hospital had a Magnet designation. Nevertheless, a comparison of these outcomes should be handled with care due to the heterogeneity variation in countries in the non-EU setting and EU setting. Future research is required to fulfill knowledge of these gaps regarding the determinants in non-EU countries.

The JD-R framework (Figure 1) illustrated the association between job demands, job resources, job satisfaction, burnout and turnover.²⁹ The outcomes of this current systematic review confirmed that these determinants impact upon the intention to leave. Nevertheless, the factors job demands, job resources, job satisfaction and burnout can be further specified by drawing upon the outcomes from this study. Furthermore, the JD-R framework of Demerouti et al illustrated that the determinants were multifactorial.²⁹ The results of this study confirmed the multifactorial impact of determinants, illustrated in Figure 5.

The percentages of the prevalence of intention to leave displayed wide variance across the studies. The intention to leave in Turkey displayed the highest prevalence of all the EU studies, with 61-64% of the nurses declaring their intention to leave.^{42,57} This could be explained by how intention to leave was defined in different studies. Prevalence was measured in terms of intention to leave their organization,^{42,43,66} intention to leave their current position^{41,44,55,57,61,63,70,73} or intention to leave their profession.^{65,71,72} Furthermore, there was also variance in the timeline of the prevalence; some studies measured the prevalence in a longitudinal design (eg, within a 12-month period), whereas others applied a cross-sectional design, which may have impacted the prevalence outcomes.

In terms of personal characteristics, the literature is not clear about the effect of gender on job retention. Leineweber et al found that males were more inclined to leave their profession, but not to leave their workplace.⁵⁵ Sasso et al also noted that being male influenced the intention to leave their current job,⁶³ which was confirmed by the systematic review of Chan et al.²²⁷ However, other studies included in the present systematic review showed that females were more likely to leave their current workplace.^{43,57} This difference is difficult to explain because the outcomes are so varied. It is possible that there are gender differences related to how nurses and physicians perceive their job.

Moreover, self-efficacy seemed to reduce turnover intentions. A systematic review conducted in 2018 showed self-efficacy is positively related to nursing resilience.²²⁸ Both outcomes assume that implementing an intervention enlarging one's beliefs about one's personal ability, could positively impact the retention rates. Supervisors should support healthcare workers by identifying their strengths and enlarging their self-efficacy. Recent research showed that job-crafting can positively impact building on strength, self-efficacy and less turnover intention.²²⁹ Self-efficacy is an interesting theme in turnover intention and more research toward the outcomes and impacting this determinant is desirable to reduce turnover.

Furthermore, this review showed more working years^{42,43}, a high level of experience^{44,55,56} and being older⁵⁷ increased the chances of retention. These outcomes related to experience are in accordance with Chan et al's systematic review, which studied nurses' intention to leave their employment or profession.²²⁷ However, they noted that the multifactorial impact of age along with the determinant of experience impacted on the intention to leave; that is to say, the younger the nurses and physicians were and the less experience they had, the greater their intention to leave, whereas nurses above the age of 45 who had less experience were found to be more likely to stay,²²⁷ which should be noted in the outcomes of the present systematic review.

Part-time work was a pull factor in terms of job retention for nurses and physicians.⁴⁰ Conversely, full-time work was found to be a push factor in terms of leaving the workplace and a pull factor for nurses and physicians intending to remain in the profession.⁵⁵ This could be explained by the fact that nurses and physicians who work full-time instead of part-time are more exposed to working conditions that negatively impact upon job satisfaction and result in them leaving the workplace. Similarly, full-time work can create greater difficulties in combining one's work and private life, due to more working hours, which negatively impacts upon work-life balance, work-family conflicts, job satisfaction and turnover intention.^{46,56,61,68,71,75}

Furthermore, career and learning abilities were found to be important determinants of intention to leave.^{43,44,56,75} The ability to further develop as a nurse or physician or the chance of renewal may help reduce the turnover of nurses

and physicians. For example, the Magnet philosophy focuses additional attention on education and career development across every career stage, which was indeed found to be a pull factor in hospitals in the United States.²²² Annual interviews can be helpful for both evaluating and reviewing future expectations, such as, for example, one's career development or learning opportunities.

Leadership is a hot topic at the moment. This review has underscored the positive effect of nursing leadership and autonomy on the intention to stay.^{41,52} An integrative review by Kiwanuka et al noted that nursing leadership influences the productivity and morale of nursing staff, which can have a positive effect on the general mood on the work floor and, in turn, increase the intention to stay.²³⁰

Social support appeared to be an important psychosocial theme in terms of job retention. Indeed, during the COVID pandemic, many front-line nurses and physicians suffered from mental health problems and benefited from social and organizational support.²³¹ There is mounting evidence indicating that such support can lead to higher job satisfaction and, ultimately, successful job retention.

It is important to note that the current search string employed in this systematic review did not result in articles specifically related to COVID-19, likely because the studies focused on COVID-19 and the dropouts or determinants impacting upon the intention to leave were not published yet at the moment the search string was enrolled. Further systematic research would be advisable to create an evident clarification of the impact of COVID-19 on the intention to leave of nurses and physicians.

Limitations

This systematic review studied extant literature on physicians and nurses which constitutes a key strength of this study. Other systematic reviews on this topic focused on turnover among solely nursing staff or physicians.^{24,33} To the best of our knowledge, there is no systematic review available exploring both nurses' and physicians' intentions to leave the hospital setting, which makes this systematic review unique.

The limitations of this study should also be considered. We conducted a quality assessment and full-text screening of studies carried out in EU countries for this review. However, no quality assessment was conducted for the studies carried out in non-EU countries; rather, only the abstracts were studied for determinants. In light of the simplified screening of non-EU studies, there is the possibility of bias, and, as such, the outcomes should be considered with caution.²³² Nevertheless, the extensive literature search can be seen as a strength of this review. Furthermore, the *** project mainly focused on EU outcomes. In this respect, the non-EU determinants were merely supplementary and should be considered as such. Further systematic research is recommended

that more closely examines the determinants influencing the intention to leave hospitals in non-EU countries.

The included studies defined intention to leave in various ways; intent to leave their current position,^{44,46,47,69} intent to leave their organization,^{15,42,45,46,55,58,66-68} intent to leave their profession,^{42,46,47,49,53-55,61,64,66,69,71,72} intent to leave the job,^{40,41,60,69,70,73} intent to leave the workplace,^{50,57,61} intent to leave (not specified)^{43,48,49,51,60,62,63,74,75} or intent to stay.^{52,56} This systematic review aimed to search for determinants impacting the intention to leave their respective position of nurses and physicians in a hospital setting. The multiple definitions of intention to leave in this systematic review are a limitation of this study. Nevertheless, leaving their position in the hospital could also implicate nurses or physicians to change their work organization or even leave their profession. Hence, intent to leave the respective position is the overarching term for intent leaving the organization or intent leaving the profession. Moreover, the inclusion of this broad definition of intent to leave resulted in a complete overview of determinants impacting the retention of nurses and physicians. Therefore, the bias in this systematic review due to the definition of intention to leave is minimal.

Moreover, most of the participants in the studies reviewed were female (nurses). Because there is a lack of research on this subject for male nurses and physicians, it could potentially generate gender bias and the presented results should be handled with care. Nevertheless, research showed in 2019 that only 14% of the proportion of nurses in Europe were male and consequently, consequently the majority of nurses are female.²³³ Furthermore, this review only included studies written in English, which may have led to the exclusion of other valuable study findings.

Conclusion

Our findings have shown that the determinants identified in this systematic review, namely personal characteristics, job demands, employment services, working conditions, work relationships and organizational culture, impact, the job retention of nurses and physicians. Assessing the outcomes of this systemic review, management should take job satisfaction, career development and the work-life balance of their personnel seriously into account as 3 crucial factors in terms of job retention. Currently, the determinants identified in this systematic review can be used to design interventions or policies dedicated to increasing job retention and improving healthcare quality. The impact of the determinants could differ per hospital which should be taken into account designing the interventions. Therefore, it is desirable to fulfill future research to check which determinants are crucial in a specific hospital. Finally, an overview of interventions impacting the determinants described in this systematic review would be desirable expanding the adapted knowledge to stabilize the workforce of nursing and physicians in a hospital setting in the future.

Author's Note

We confirm that the listed authors have authorized the submission of their manuscript via third party and approved any statements or declarations, for example, conflicting interests, funding, etc.

Acknowledgments

The authors greatly acknowledge all partners and collaborators of METEOR: www.meteorproject.eu

Author Contributions

All authors contributed substantially to the concept and design, acquisition of the data or analysis and interpretation of the data, drafted the article or revised it critically for important intellectual content, and approved the final version to be published.

Disclaimer and Funding Source

The views expressed in the submitted article are those of the authors alone and may not reflect the official position of their respective institutions.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: External funding was received for the development of this study: European Union, Chafea – 3rd Health Programme, Multi-beneficiary Project Grant (HP-PJ, HP-JA), Topic: PJ-01-2020-1, Type of action: HP-PJ, SEP-210693712: Project called METEOR (MEnTal hEalth: fOCUS on Retention of healthcare workers).

The funding source did not influence the study design, the collection, analysis and interpretation of the data, the manuscript writing or the decision to submit the manuscript for publication. Both the views that are expressed and any errors or omissions are the sole responsibility of the authors.

Presence of Declarations, and Ethics and Consent Statements


For this systematic review no ethical/consent concerns were needed because no humans were involved. We only checked the available literature in three databases.

ORCID iDs

Neeltje de Vries  <https://orcid.org/0000-0001-9779-9055>

Lode Godderis  <https://orcid.org/0000-0003-4764-8835>

Domenica Matranga  <https://orcid.org/0000-0002-2466-937X>

Peter de Winter  <https://orcid.org/0000-0002-8476-5312>

Supplemental Material

Supplemental material for this article is available online.

References

1. World Health Organization. *Working Together for Health; the World Health Report 2006*. World Health organization; 2006.
2. World Health Organization. International Council of Nurses. *Nursing Now. State of the World's Nursing 2020; Investing in Education, Jobs and Leadership*. World Health Organization; 2020.
3. World Health Organization. *Global Strategy on Human Resources for Health: Workforce 2030*. World Health Organization; 2016.
4. Kroezen M, Dussault G, Craveiro I, et al. Recruitment and retention of health professionals across Europe: A literature review and multiple case study research. *Health Policy*. 2015;119(21):1517-1528.
5. Brown GC. Living too long: the current focus of medical research on increasing the quantity, rather than the quality, of life is damaging our health and harming the economy. *EMBO Rep*. 2015;16(2):137-141. doi:10.15252/embr.201439518
6. AAMC. Physician Specialty Data Report. Published 2019. Accessed August 3, 2022. <https://www.aamc.org/data-reports/workforce/interactive-data/active-physicians-age-and-specialty-2019>
7. Petterson SM, Rayburn WF, Liaw WR. When do Primary Care Physicians Retire? Implications for workforce projections. *Ann Fam Med*. 2016;14(4):344-349. doi:10.1370/afm.1936
8. Commission of the European Communities. Green paper on the European workforce for health. Published 2008. (accessed 11 August 2022) https://ec.europa.eu/health/ph_systems/docs/workforce_gp_en.pdf
9. Aiken LH, Sloane DM, Bruyneel L, et al. Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *Lancet*. 2014;383(9931):1824-1830.
10. Buchan J. Evidence of nursing shortages or a shortage of evidence? *J Adv Nurs*. 2006;56(5):457-458.
11. Rafferty AM, Clarke SP, Coles J, et al. Outcomes of variation in hospital nurse staffing in English hospitals: cross-sectional analysis of survey data and discharge records. *Int J Nurs Stud*. 2007;44(2):175-182.
12. O'Brien-Pallas L, Murphy GT, Shamian J, Li X, Hayes LJ. Impact and determinants of nurse turnover: a pan-Canadian study. *J Nurs Manag*. 2010;18(8):1073-1086.
13. Hayes LJ, O'Brien-Pallas L, Duffield C, et al. Nurse turnover: a literature review. *Int J Nurs Stud*. 2006;43(2):237-263.
14. Wagner CM. Predicting nursing turnover with catastrophe theory. *J Adv Nurs*. 2010;66(9):2071-2084. doi:10.1111/j.1365-2648.2010.05388.x
15. De Simone S, Planta A, Cicotto G. The role of job satisfaction, work engagement, self-efficacy and agentic capacities on nurses' turnover intention and patient satisfaction. *Appl Nurs Res*. 2018;39:130-140.
16. Jones TL, Hamilton P, Murry N. Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. *Int J Nurs Stud*. 2015;52(6):1121-1137.
17. Cavanagh SJ, Coffin DA. Staff turnover among hospital nurses. *J Adv Nurs*. 1992;17(11):1369-1376.

18. Ghandour S, Elzohairy M, Elsayed N. Relationship between staff morale and intention to leave among professional nurses at Damanshour National Medical Institute. *Port Said Sci J Nurs*. 2019;6:178-194.
19. Misra-Hebert AD, Kay R, Stoller JK. A review of physician turnover: rates, causes, and consequences. *Am J Med Qual*. 2004;19(2):56-66.
20. Buchan J, Twigg D, Dussault G, Duffield C, Stone PW. Policies to sustain the nursing workforce: an international perspective. *Int Nurs Rev*. 2015;62(2):162-170.
21. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-analysis. *Psychiatry Res*. 2020;291:113190.
22. Nashwan AJ, Abujaber AA, Villar RC, Nazarene A, Al-Jabry MM, Fradelos EC. Comparing the impact of COVID-19 on Nurses' turnover intentions before and during the pandemic in Qatar. *J Pers Med*. 2021;11(6):456. doi:10.3390/jpm11060456
23. Godderis L, Boone A, Bakusic J. COVID-19: a new work-related disease threatening healthcare workers. *Occup Med*. 2020;70(5):315-316.
24. Halter M, Boiko O, Pelone F, et al. The determinants and consequences of adult nursing staff turnover: a systematic review of systematic reviews. *BMC Health Serv Res*. 2017;17(1):824.
25. Mobley WH, Griffeth R, Hand HH, Meglino BM. A review and conceptual analysis of the employee turnover process. *Psychol Bull*. 1979;86(3):493-522.
26. Windover AK, Martinez K, Mercer MB, Neuendorf K, Boissy A, Rothberg MB. Correlates and outcomes of physician burnout within a large academic medical center. *JAMA Intern Med*. 2018;178(6):856-858.
27. Pathman DE, Konrad TR, Williams ES, Scheckler WE, Linzer M, Douglas J. Physician job satisfaction, dissatisfaction, and turnover. *J Fam Pract*. 2002;51(7):593.
28. Bakker A, Demerouti E, Schaufeli W. Dual processes at work in a call centre: an application of the job demands-resources model. *Eur J Work Organ Psychol*. 2003;12(4):393-417. doi:10.1080/13594320344000165
29. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. *J Appl Psychol*. 2001;86(3):499-512.
30. Ajzen I. The theory of planned behaviour: Reactions and reflections. *Psychol Health*. 2011;26:1113-1127.
31. Heinen MM, van Achterberg T, Schwendimann R, et al. Nurses' intention to leave their profession: A cross sectional observational study in 10 European countries. *Int J Nurs Stud*. 2013;50(2):174-184. doi:10.1016/j.ijnurstu.2012.09.019
32. Al Yahyaie A, Hewison A, Efstathiou N, Carrick-Sen D. Nurses' intention to stay in the work environment in acute healthcare: a systematic review. *J Res Nurs*. 2022;27(4):374-397. doi:10.1177/17449871221080731
33. Degen C, Li J, Angerer P. Physicians' intention to leave direct patient care: an integrative review. *Hum Resour Health*. 2015;13:74.
34. He R, Liu J, Zhang WH, Zhu B, Zhang N, Mao Y. Turnover intention among primary health workers in China: a systematic review and meta-analysis. *BMJ Open*. 2020;10(10):e037117.
35. Kim H, Kim EG. A meta-analysis on predictors of turnover intention of hospital nurses in South Korea (2000-2020). *Nurs Open*. 2021;8(5):2406-2418.
36. Shen X, Jiang H, Xu H, et al. The global prevalence of turnover intention among general practitioners: a systematic review and meta-analysis. *BMC Fam Pract*. 2020;21(1):246. doi:10.1186/s12875-020-01309-4
37. Meteor. Mental Health: a focus on retention of healthcare workers. Published 2022 [cited 2022 Aug 11]. <http://www.meteorproject.eu>
38. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Int J Surg*. 2010;8(5):336-341.
39. Willard-Grace R, Knox M, Huang B, Hammer H, Kivlahan C, Grumbach K. Burnout and Health Care Workforce turnover. *Ann Fam Med*. 2019;17(1):36-41.
40. Alameddine M, Bauer JM, Richter M, SousaPoza A. The paradox of falling job satisfaction with rising job stickiness in the German nursing workforce between 1990 and 2013. *Hum Resour Health*. 2017;15(1):55.
41. Andresen IH, Hansen T, Grov EK. Norwegian nurses' quality of life, job satisfaction, as well as intention to change jobs. *Nord J Nurs Res*. 2017;37(2):90-99.
42. Arslan Yurumezoglu H, Kocaman G. Predictors of nurses' intentions to leave the organisation and the profession in Turkey. *J Nurs Manag*. 2016;24(2):235-243.
43. Bruyneel L, Thoelen T, Adriaenssens J, Sermeus W. Emergency room nurses' pathway to turnover intention: a moderated serial mediation analysis. *J Adv Nurs*. 2017;73(4):930-942.
44. Burmeister EA, Kalisch BJ, Xie B, et al. Determinants of nurse absenteeism and intent to leave: an international study. *J Nurs Manag*. 2019;27(1):143-153.
45. Çamveren H, Arslan Yürümezoğlu H, Kocaman G. Why do young nurses leave their organization? A qualitative descriptive study. *Int Nurs Rev*. 2020;67(4):519-528.
46. Çamveren H, Kocaman G. Factors influencing a university hospital nurses' intentions to leave the unit, Organisation and Profession: A cross-sectional study. *J Health Manag*. 2021;23(2):240-250.
47. Dąderman AM, Basinska BA. Job demands, engagement, and turnover intentions in Polish nurses: the role of Work-Family Interface. *Front Psychol*. 2016;7:1621.
48. Eriksson A, Jutengren G, Dellve L. Job demands and functional resources moderating assistant and registered nurses' intention to leave. *Nurs Open*. 2021;8(2):870-881.
49. Fasbender U, Van der Heijden BIJM, Grimshaw S. Job satisfaction, job stress and nurses' turnover intentions: the moderating roles of on-the-job and off-the-job embeddedness. *J Adv Nurs*. 2019;75(2):327-337.
50. Gillet N, Fouquereau E, Coillot H, et al. The effects of work factors on nurses' job satisfaction, quality of care and turnover intentions in oncology. *J Adv Nurs*. 2018;74(5):1208-1219.
51. Hognestad Haaland G, Olsen E, Mikkelsen A. The association between supervisor support and ethical dilemmas on Nurses' intention to leave: the mediating role of the meaning of work. *J Nurs Manag*. 2021;29(2):286-293.
52. Karlsson A, Gunningberg L, Bäckström J, Pöder U. Registered nurses' perspectives of work satisfaction, patient safety and intention to stay – A double-edged sword. *J Nurs Manag*. 2019;27(7):1359-1365.
53. Kox JHAM, Groenewoud JH, Bakker EJM, et al. Reasons why Dutch novice nurses leave nursing: A qualitative approach.

- Nurse Educ Pract.* 2020;47:102848. <https://pubmed.ncbi.nlm.nih.gov/32781415/>
54. Laurs L, Blaževičienė A, Capezuti E, Milonas D. Moral distress and intention to leave the profession: Lithuanian nurses in Municipal Hospitals. *J Nurs Scholarsh.* 2020;52(2):201-209.
 55. Leineweber C, Chungkham HS, Lindqvist R, et al. Nurses' practice environment and satisfaction with schedule flexibility is related to intention to leave due to dissatisfaction: A multi-country, multilevel study. *Int J Nurs Stud.* 2016;58:47-58.
 56. Loft MI, Jensen CS. What makes experienced nurses stay in their position? A qualitative interview study. *J Nurs Manag.* 2020;28(6):1305-1316.
 57. Masum AK, Azad MA, Hoque KE, Beh LS, Wanke P, Arslan . Job satisfaction and intention to quit: an empirical analysis of nurses in Turkey. *PeerJ.* 2016;4:e1896.
 58. McKenna J, Jeske D. Ethical leadership and decision authority effects on nurses' engagement, exhaustion, and turnover intention. *J Adv Nurs.* 2021;77(1):198-206.
 59. Özer Ö, Şantaş F, Şantaş G, Şahin DS. Impact of nurses' perceptions of work environment and communication satisfaction on their intention to quit. *Int J Nurs Pract.* 2017;23(6):23.
 60. Özer Ö, Uğurluoğlu Ö, Sungur C, Çiraklı Ü. The relationship between authentic leadership, performance and intention to quit the job of nurses. *Hosp Top.* 2019;97(3):73-79. <https://pubmed.ncbi.nlm.nih.gov/31116689/>
 61. Pennbrant S, Dåderman A. Job demands, work engagement and job turnover intentions among registered nurses: explained by work-family private life inference. *Work.* 2021;68(4):1157-1169.
 62. Robson A, Robson F. Investigation of nurses' intention to leave: a study of a sample of UK nurses. *J Health Organ Manag.* 2016;30(1):154-173.
 63. Sasso L, Bagnasco A, Catania G, Zanini M, Aleo G, Watson R. Push and pull factors of nurses' intention to leave. *J Nurs Manag.* 2019;27(5):946-954.
 64. Sungur C, Özer Saygili M, Uğurluoğlu . Paternalistic leadership, organizational cynicism, and intention to quit one's job in nursing. *Hosp Top.* 2019;97(4):139-147.
 65. Van der Heijden B, Mahoney CB, Xu Y. Impact of Job Demands and Resources on Nurses' Burnout and Occupational Turnover Intention Towards an Age-Moderated Mediation Model for the Nursing Profession. *Int J Environ Res Public Health.* 2019;16(11):2011.
 66. Vévoda J, Vévodová Š, Bubeníková Š, Kisvetrová H, Ivanová K. Datamining techniques - decision tree: New view on nurses' intention to leave. *Cent Eur J Nurs Midwifery.* 2016;7(4):518-526.
 67. Wendsche J, Paridon H, Blasche G. Nurses' rest breaks and organizational leaving intentions. *Psychol Health Med.* 2022;27:1782-1792.
 68. Domagała A, Dubas-Jakóbczyk K. Migration intentions among physicians working in Polish hospitals - insights from survey research. *Health Policy.* 2019;123(8):782-789.
 69. Heponiemi T, Presseau J, Elovainio M. On-call work and physicians' turnover intention: the moderating effect of job strain. *Psychol Health Med.* 2016;21(1):74-80.
 70. Martinussen PE, Magnussen J, Vrangbæk K, Frich JC. Should I stay or should I go? The role of leadership and organisational context for hospital physicians' intention to leave their current job. *BMC Health Serv Res.* 2020;20(1):400.
 71. Hämmig O. Explaining burnout and the intention to leave the profession among health professionals – a cross-sectional study in a hospital setting in Switzerland. *BMC Health Serv Res.* 2018;18(1):785.
 72. Koch P, Zilezinski M, Schulte K, Strametz R, Nienhaus A, Raspe M. How perceived quality of care and job satisfaction are associated with intention to leave the profession in young nurses and physicians. *Int J Environ Res Public Health.* 2020;17(8):2714.
 73. Van den Bulcke B, Metaxa V, Reyners AK, et al. Ethical climate and intention to leave among critical care clinicians: an observational study in 68 intensive care units across Europe and the United States. *Intensive Care Med.* 2020;46(1):46-56.
 74. Vandebroecck S, Van Gerven E, De Witte H, Vanhaecht K, Godderis L. Burnout in Belgian physicians and nurses. *Occup Med.* 2017;67(7):546-554. doi:10.1093/occmed/kqx126
 75. Peter KA, Hahn S, Schols JMGA, Halfens RJG. Work-related stress among health professionals in Swiss acute care and rehabilitation hospitals-A cross-sectional study. *J Clin Nurs.* 2020;29(15-16):3064-3081.
 76. Maslach C, Jackson SE. The measurement of experienced burnout. *J Organ Behav.* 1981;2(2):99-113.
 77. Netemeyer RG, Boles JS, McMurrian R. Development and validation of work-family conflict and family-work conflict scales. *J Appl Psychol.* 1996;81:400-410.
 78. Abou Hashish EA. Relationship between ethical work climate and nurses' perception of organizational support, commitment, job satisfaction and turnover intent. *Nurs Ethics.* 2017;24(2):151-166.
 79. AbuAlRub R, El-Jardali F, Jamal D, Abu Al-Rub N. Exploring the relationship between work environment, job satisfaction, and intent to stay of Jordanian nurses in underserved areas. *Appl Nurs Res.* 2016;31:19-23.
 80. AbuAlRub RF, Alghamdi MG. The impact of leadership styles on nurses' satisfaction and intention to stay among Saudi nurses. *J Nurs Manag.* 2012;20(5):668-678.
 81. Ada HM, Dehom S, D'Errico E, Boyd K, Taylor EJ. Sanctification of work and hospital nurse employment outcomes: an observational study. *J Nurs Manag.* 2021;29(3):442-450.
 82. Alfuqaha OA, Al-Hairy SS, Al-Hemsi HA, Sabbah AA, Faraj KN, Assaf EM. Job rotation approach in nursing profession. *Scand J Caring Sci.* 2021;35(2):659-667.
 83. Alharbi AA, Dahinten VS, MacPhee M. The relationships between nurses' work environments and emotional exhaustion, job satisfaction, and intent to leave among nurses in Saudi Arabia. *J Adv Nurs.* 2020;76(11):3026-3038.
 84. Ali Jadoo SA, Aljunid SM, Dastan I, et al. Job satisfaction and turnover intention among Iraqi doctors—a descriptive cross-sectional multicentre study. *Hum Resour Health.* 2015; 13:21.
 85. Ambani Z, Kutney-Lee A, Lake ET. The nursing practice environment and nurse job outcomes: A path analysis of survey data. *J Clin Nurs.* 2020;29(13-14):2602-2614.
 86. Ayalew E, Workineh Y. Nurses' intention to leave their job and associated factors in Bahir dar, Amhara Region, Ethiopia, 2017. *BMC Nurs.* 2020;19:46.

87. Bonenberger M, Aikins M, Akweongo P, Wyss K. The effects of health worker motivation and job satisfaction on turnover intention in Ghana: a cross-sectional study. *Hum Resour Health*. 2014;12:43.
88. Bontrager S, Hart PL, Mareno N. The role of Preceptorship and group cohesion on newly licensed registered nurses' satisfaction and intent to stay. *J Contin Educ Nurs*. 2016;47(3):132-139.
89. Bordignon M, Monteiro MI. Predictors of nursing workers' intention to leave the work unit, health institution and profession. *Rev Lat Am Enfermagem*. 2019;27:e3219.
90. Bratt MM, Felzer HM. Predictors of new graduate nurses' organizational commitment during a nurse residency program. *J Nurses Staff Dev*. 2012;28(3):108-119.
91. Brewer CS, Kovner CT, Greene W, Tukov-Shuser M, Djukic M. Predictors of actual turnover in a national sample of newly licensed registered nurses employed in hospitals. *J Adv Nurs*. 2012;68(3):521-538.
92. Brewer CS, Chao YY, Colder CR, Kovner CT, Chacko TP. A structural equation model of turnover for a longitudinal survey among early career registered nurses. *Int J Nurs Stud*. 2015;52(11):1735-1745.
93. Buffington A, Zwink J, Fink R, DeVine D, Sanders C. Factors affecting nurse retention at an Academic Magnet® Hospital. *JONA J Nurs Adm*. 2012;42(5):273-281.
94. Cho SH, Lee JY, Mark BA, Yun SC. Turnover of new graduate nurses in their first job using survival analysis. *J Nurs Scholarsh*. 2012;44(1):63-70.
95. Dekeyser Ganz F, Toren O. Israeli nurse practice environment characteristics, retention, and job satisfaction. *Isr J Health Policy Res*. 2014;3(1):7.
96. Deng W, Feng Z, Yao X, et al. Occupational identity, job satisfaction and their effects on turnover intention among Chinese paediatricians: a cross-sectional study. *BMC Health Serv Res*. 2021;21(1):6.
97. Doleman G, Twigg D, Bayes S, Chivers P. Paediatric nurses' satisfaction with organisational communication, job satisfaction, and intention to stay: A structural equation modelling analysis. *Collegian*. 2021;28(4):376-384.
98. Dorigan GH, Mingato DFP, Guirardello EDB. Nursing safety attitudes: relationship with time of experience and intention to leave the job. *Rev Gaucha Enferm*. 2020;41:e20190274.
99. Feng D, Su S, Yang Y, Xia J, Su Y. Job satisfaction mediates subjective social status and turnover intention among Chinese nurses. *Nurs Health Sci*. 2017;19(3):388-392.
100. Fernet C, Trépanier SG, Demers M, Austin S. Motivational pathways of occupational and organizational turnover intention among newly registered nurses in Canada. *Nurs Outlook*. 2017;65(4):444-454.
101. Gebregziabher D, Berhanie E, Berihu H, Belstie A, Teklay G. The relationship between job satisfaction and turnover intention among nurses in Axum comprehensive and specialized hospital Tigray, Ethiopia. *BMC Nurs*. 2020;19:79.
102. Hatamizadeh M, Hosseini M, Bernstein C, Ranjbar H. Health care reform in Iran: Implications for nurses' moral distress, patient rights, satisfaction and turnover intention. *J Nurs Manag*. 2019;27(2):396-403.
103. Ishihara I, Ishibashi Y, Takahashi K, Nakashima M. Effect of organizational factors and work environments on newly graduated nurses' intention to leave. *Jpn J Nurs Sci*. 2014;11(3):200-210.
104. Jeong IY, Kim JS. The relationship between intention to leave the hospital and coping methods of emergency nurses after workplace violence. *J Clin Nurs*. 2018;27(7-8):1692-1701.
105. Jiang H, Ma L, Gao C, Li T, Huang L, Huang W. Satisfaction, burnout and intention to stay of emergency nurses in Shanghai. *Emerg Med J*. 2017;34(7):448-453.
106. Johnson A. Relationship between job satisfaction and voluntary registered nurse turnover intentions (Doctoral dissertation of Master's thesis). Retrieved from ProQuest. 2020.
107. Kuo HT, Lin KC, Li IC. The mediating effects of job satisfaction on turnover intention for long-term care nurses in Taiwan. *J Nurs Manag*. 2014;22(2):225-233.
108. Labrague LJ, Gloe DS, McEnroe-Petitte D, Tsaras K, Colet PC. Factors influencing turnover intention among registered nurses in Samar Philippines. *Appl Nurs Res*. 2018;39:200-206.
109. Li N, Zhang L, Xiao G, Chen ZJ, Lu Q. Effects of organizational commitment, job satisfaction and workplace violence on turnover intention of emergency nurses: A cross-sectional study. *Int J Nurs Pract*. 2020;26(6):e12854.
110. Li X, Guo Y, Zhao T, Zhang S, Yue X, Liu Y. Cluster analysis of self-concept and job satisfaction in Chinese nurses with master's degree to identify their turnover intention: A cross-sectional study. *J Clin Nurs*. 2021;30(13-14):2057-2067.
111. Lo WY, Chien LY, Hwang FM, Huang N, Chiou ST. From job stress to intention to leave among hospital nurses: A structural equation modelling approach. *J Adv Nurs*. 2018;74(3):677-688.
112. Lu Y, Hu XM, Huang XL, et al. The relationship between job satisfaction, work stress, work-family conflict, and turnover intention among physicians in Guangdong, China: a cross-sectional study. *BMJ Open*. 2017;7(5):e014894.
113. Matsuo M, Suzuki E, Takayama Y. Factors related to hospital nurse intention to leave: does striving for work-life balance and sense of coherence affect wishes to stay in the organization? *GSTF J Nurs Health Care*. 2019;4(1):1-10.
114. Varcoe McLaughlin K-A. *Factors Associated With Intentions to Leave Bedside Nursing During Early Nursing Career Development*. PhD thesis. DeSales University ProQuest Dissertations Publishing; 2015.
115. Modaresnezhad M, Andrews MC, Mesmer-Magnus J, Viswesvaran C, Deshpande S. Anxiety, job satisfaction, supervisor support and turnover intentions of mid-career nurses: A structural equation model analysis. *J Nurs Manag*. 2021;29(5):931-942.
116. Park SA, Ahn SH. Relation of compassionate competence to burnout, Job Stress, turnover intention, job satisfaction and organizational commitment for Oncology Nurses in Korea. *Asian Pac J Cancer Prev*. 2015;16(13):5463-5469.
117. Perry L, Gallagher R, Duffield C, Sibbritt D, Bichel-Findlay J, Nicholls R. Does nurses' health affect their intention to remain in their current position? *J Nurs Manag*. 2016;24(8):1088-1097.
118. Phuekphan P, Aunguroch Y, Yunibhand J. A model of factors influencing intention to leave nursing in Thailand. *Pacific Rim Int J Nurs Res*. 2021;25(3):407-420.
119. Proctor S. Strategies to improve job satisfaction and reduce voluntary employee turnover of nurses. *Walden Dissertations and Doctoral Studies*. 2018;79:4166.
120. Rodwell J, Brunetto Y, Demir D, Shacklock K, Farr-Wharton R. Abusive supervision and links to nurse intentions to quit. *J Nurs Scholarsh*. 2014;46(5):357-365.

121. Rutledge DN, Douville S, Winokur E, Drake D, Niedziela D. Impact of engagement factors on nurses' intention to leave hospital employment. *J Nurs Manag.* 2021;29(6):1554-1564.
122. Satoh M, Watanabe I, Asakura K. Occupational commitment and job satisfaction mediate effort-reward imbalance and the intention to continue nursing. *Japan J Nurs Sci.* 2017;14(1):49-60.
123. Shacklock K, Brunetto Y, Teo S, Farr-Wharton R. The role of support antecedents in nurses' intentions to quit: the case of Australia. *J Adv Nurs.* 2014;70(4):811-822.
124. Toren O, Zelker R, Lipschuetz M, Riba S, Reicher S, Nirel N. Turnover of registered nurses in Israel: characteristics and predictors. *Health Policy.* 2012;105(2-3):203-213.
125. Tuckett A, Winters-Chang P, Bogossian F, Wood M. "Why nurses are leaving the profession . . . lack of support from managers": What nurses from an e-cohort study said. *Int J Nurs Pract.* 2015;21(4):359-366.
126. Unruh LY, Zhang NJ. Newly licensed registered nurse job turnover and turnover intent. *J Nurses Prof Dev.* 2014;30(5):220-229.
127. Halpern LW. Five variables predict whether newly licensed nurses stay on a unit or transfer. *Am J Nurs.* 2016;116(10):15.
128. Wang L, Tao H, Ellenbecker CH, Liu X. Job satisfaction, occupational commitment and intent to stay among Chinese nurses: a cross-sectional questionnaire survey. *J Adv Nurs.* 2012;68(3):539-549.
129. Wang Y, Yuan H. What is behind high turnover: a questionnaire survey of hospital nursing care workers in Shanghai, China. *BMC Health Serv Res.* 2018;18(1):485.
130. Williams NJ, Beidas RS. Navigating the storm: How proficient organizational culture promotes clinician retention in the shift to evidence-based practice. *PLoS One.* 2018;13(12):e0209745.
131. Wilson NA. Factors that affect job satisfaction and intention to leave of allied health professionals in a metropolitan hospital. *Aust Health Rev.* 2015;39(3):290-294.
132. Wolf L. How safe staffing can improve emergency nursing: time to cut the Gordian knot. *Emerg Nurse.* 2020;28(1):28-32.
133. Xu S, Tao L, Huang H, Little J, Huang L. Pediatric Nurses' turnover intention and its association with calling in China's tertiary hospitals. *J Pediatr Nurs.* 2020;52:e51-e56.
134. Yang Y, Chen J. Related factors of turnover intention among pediatric nurses in mainland China: A structural equation modeling analysis. *J Pediatr Nurs.* 2020;53:e217-e223.
135. Yarbrough S, Martin P, Alfred D, McNeill C. Professional values, job satisfaction, career development, and intent to stay. *Nurs Ethics.* 2017;24(6):675-685.
136. Yang YH, Kim JK. Factors influencing turnover intention in clinical nurses: Compassion Fatigue, Coping, social support, and Job Satisfaction. *J Korean Acad Nurs Adm.* 2016;22(5):562-569.
137. Zahednezhad H, Hoseini MA, Ebadi A, Farokhnezhad Afshar P, Ghanei Gheshlagh R. Investigating the relationship between organizational justice, job satisfaction, and intention to leave the nursing profession: A cross-sectional study. *J Adv Nurs.* 2021;77(4):1741-1750.
138. Zhang Y, Wu X, Wan X, et al. Relationship between burnout and intention to leave amongst clinical nurses: the role of spiritual climate. *J Nurs Manag.* 2019;27(6):1285-1293.
139. Zhang Y, Feng X. The relationship between job satisfaction, burnout, and turnover intention among physicians from urban state-owned medical institutions in Hubei, China: a cross-sectional study. *BMC Health Serv Res.* 2011;11:235.
140. Zhang Y, Zhang X, Xu N, Yun E. Nurses' turnover intention in secondary hospitals in China: A structural equation modeling approach. *J Nurs Manag.* 2021;29(7):2216-2224.
141. Zhao Y, Wang H, Sun D, et al. Job satisfaction, resilience and social support in relation to nurses' turnover intention based on the theory of planned behaviour: A structural equation modelling approach. *Int J Nurs Pract.* 2021;27(6):e12941.
142. Chen MF, Ho CH, Lin CF, et al. Organisation-based self-esteem mediates the effects of social support and job satisfaction on intention to stay in nurses. *J Nurs Manag.* 2016;24(1):88-96.
143. Chen IH, Brown R, Bowers BJ, Chang WY. Work-to-family conflict as a mediator of the relationship between job satisfaction and turnover intention. *J Adv Nurs.* 2015;71(10):2350-2363.
144. ElJardali F, Murray SF, Dimassi H, et al. Intention to stay of nurses in current posts in difficult-to-staff areas of Yemen, Jordan, Lebanon and Qatar: A cross-sectional study. *Int J Nurs Stud.* 2013;50(11):1481-1494.
145. Lee E. Why newly graduated nurses in South Korea leave their first job in a short time? A survival analysis. *Hum Resour Health.* 2019;17(1):61.
146. Liu W, Zhao S, Shi L, et al. Workplace violence, job satisfaction, burnout, perceived organisational support and their effects on turnover intention among Chinese nurses in tertiary hospitals: a cross-sectional study. *BMJ Open.* 2018;8(6):e019525.
147. Mahoney CB, Lea J, Schumann PL, Jillson IA. Turnover, Burnout, and job satisfaction of Certified Registered Nurse Anesthetists in the United States: role of Job Characteristics and personality. *AANA J.* 2020;88(1):39-48.
148. Ayalew F, Kols A, Kim YM, et al. Factors affecting turnover intention among nurses in Ethiopia. *World Health Popul.* 2015;16(2):62-74.
149. Chiao LH, Wu CF, Tzeng IS, et al. Exploring factors influencing the retention of nurses in a religious hospital in Taiwan: a cross-sectional quantitative study. *BMC Nurs.* 2021;20(1):42.
150. Dawson AJ, Stasa H, Roche MA, Homer CS, Duffield C. Nursing churn and turnover in Australian hospitals: nurses perceptions and suggestions for supportive strategies. *BMC Nurs.* 2014;13(1):11-20.
151. El-Jardali F, Alameddine M, Dumit N, Dimassi H, Jamal D, Maalouf S. Nurses' work environment and intent to leave in lebanese hospitals: implications for policy and practice. *Int J Nurs Stud.* 2011;48(2):204-214.
152. Faraji O, Salehnejad G, Gahramani S, Valiee S. The relation between nurses' quality of work life with intention to leave their job. *Nurs Pract Today.* 2017;4(2):103-111.
153. Goldsworthy S. The influence of professional development on intent to stay among critical care Nurses. . Dynamics of Critical Care 2016 in Charlottetown, PE, September 25-27, 2016. *Can J Crit Care Nurs.* 2016;27(2):23.
154. Havaei F, MacPhee M, Dahinten VS. RNs and LPNs: emotional exhaustion and intention to leave. *J Nurs Manag.* 2016;24(3):393-399.

155. Hung MSY, Lam SKK. Antecedents and contextual factors affecting occupational turnover among registered nurses in public hospitals in Hong Kong: A qualitative descriptive study. *Int J Environ Res Public Health*. 2020;17(11):3834.
156. Kols A, Kibwana S, Molla Y, et al. Factors predicting Ethiopian anesthetists' intention to leave their job. *World J Surg*. 2018;42(5):1262-1269.
157. Moloney W, Boxall P, Parsons M, Cheung G. Factors predicting registered nurses' intentions to leave their organization and profession: A job demands-resources framework. *J Adv Nurs*. 2018;74(4):864-875.
158. Mosadeghrad AM. Occupational stress and turnover intention: implications for nursing management. *Int J Health Policy Manag*. 2013;1(2):169-176.
159. Nowrouzi B, Rukholm E, Lariviere M, et al. An examination of retention factors among registered nurses in Northeastern Ontario, Canada: Nurses intent to stay in their current position. *Work*. 2016;54(1):51-58.
160. Osuji J, Uzoka FM, Aladi F, El-Hussein M. Understanding the factors that determine registered nurses' turnover intentions. *Res Theory Nurs Pract*. 2014;28(2):140-161.
161. Palmer SP. Nurse retention and satisfaction in Ecuador: Implications for nursing administration. *J Nurs Manag*. 2014;22(1):89-96.
162. Panati SR. Factors affecting job satisfaction, intention to stay and retention among health workers who provide emergency obstetric and neonatal care in Kalomo district, Zambia. 2016;76:No Pagnaton Sefed.
163. Pham TTL, Teng CI, Friesner D, et al. The impact of mentoree rapport on nurses' professional turnover intention: Perspectives of social capital theory and social cognitive career theory. *J Clin Nurs*. 2019;28(13-14):2669-2680.
164. Takase M, Teraoka S, Yabase K. Retaining the nursing workforce: factors contributing to the reduction of nurses' turnover intention in Japan. *J Nurs Manag*. 2016;24(1):21-29.
165. Yu M, Kang KJ. Factors affecting turnover intention for new graduate nurses in three transition periods for job and work environment satisfaction. *J Contin Educ Nurs*. 2016;47(3):120-131.
166. Alilu L, Valizadeh L, Zamanzadeh V, Habibzadeh H, Gillespie M. A qualitative exploration of facilitators and inhibitors influencing nurses' intention to leave clinical nursing. *Rev Esc Enferm USP*. 2016;50(6):982-989.
167. Fitzpatrick JJ, Campo TM, Lavandero R. Critical care staff nurses: empowerment, certification, and intent to leave. *Crit Care Nurse*. 2011;31(6):e12-e17.
168. Alonazi NA, Omar MA. Factors affecting the retention of nurses. A survival analysis. *Saudi Med J*. 2013;34(3):288-294.
169. Boamah SA, Laschinger H. The influence of areas of worklife fit and work-life interference on burnout and turnover intentions among new graduate nurses. *J Nurs Manag*. 2016;24(2):E164-E174.
170. Dousin O, Collins N, Bartram T, Stanton P. The relationship between work-life balance, the need for achievement, and intention to leave: Mixed-method study. *J Adv Nurs*. 2021;77(3):1478-1489.
171. Hatam N, Jalali MT, Askarian M, Kharazmi E. Relationship between family-work and work-family conflict with organizational commitment and desertion intention among nurses and paramedical staff at hospitals. *Int J Community Based Nurs Midwifery*. 2016;4(2):107-118.
172. Ibrahim Alzamel LG, Abdullah KL, Chong MC, Chua YP. The quality of work life and turnover intentions among Malaysian nurses: the mediating role of organizational commitment. *J Egypt Public Health Assoc*. 2020;95(1):20.
173. Lee YW, Dai YT, Park CG, McCreary LL. Predicting quality of work life on nurses' intention to leave. *J Nurs Scholarsh*. 2013;45(2):160-168.
174. Levine RB, Lin F, Kern DE, Wright SM, Carrese J. Stories from early-career women physicians who have left academic medicine: a qualitative study at a single institution. *Acad Med*. 2011;86(6):752-758.
175. Matsuo M, Suzuki E, Takayama Y, Shibata S, Sato K. Influence of striving for work-life balance and sense of coherence on intention to leave among nurses: A 6-Month Prospective Survey. *Inquiry*. 2021;58:469580211005192.
176. Rajkonwar B, Rastogi M. The impact of work-family issues on turnover intentions among nurses? A study from north-eastern India. *J Health Manag*. 2018;20(2):164-177.
177. Satoh M, Watanabe I, Asakura K. Determinants strengthening Japanese nurses' intention to stay at their current hospital. *Tohoku J Exp Med*. 2018;246(3):175-182.
178. Shacklock K, Brunetto Y. The intention to continue nursing: work variables affecting three nurse generations in Australia. *J Adv Nurs*. 2012;68(1):36-46.
179. Wu YF, Wang PC, Chen YC. Gender differences and work-family conflicts among emergency physicians with intention to leave. *Emerg Med Int*. 2018;2018:3919147.
180. Zhou L, Kachie Tetgoum AD, Quansah PE, Owusu-Marfo J. Assessing the effect of nursing stress factors on turnover intention among newly recruited nurses in hospitals in China. *Nurs Open*. 2022;9:2697-2709. doi:10.1002/nop2.969
181. Cao J, Jia Z, Zhu C, et al. Nurses' turnover intention and associated factors in general hospitals in China: A cross-sectional study. *J Nurs Manag*. 2021;29:1613-1622.
182. Al-Hussami M, Darawad M, Saleh A, Hayajneh FA. Predicting nurses' turnover intentions by demographic characteristics, perception of health, quality of work attitudes. *Int J Nurs Pract*. 2014;20(1):79-88.
183. Alshareef AG, Wraith D, Dingle K, Mays J. Identifying the factors influencing Saudi Arabian nurses' turnover. *J Nurs Manag*. 2020;28(5):1030-1040.
184. Asakura K, Asakura T, Satoh M, Watanabe I, Hara Y. Health indicators as moderators of occupational commitment and nurses' intention to leave. *Jpn J Nurs Sci*. 2020;17(1):e12277.
185. Boakye KG, Apenteng BA, Hanna MD, et al. The impact of interpersonal support, supervisory support, and employee engagement on employee turnover intentions: differences between financially distressed and highly financially distressed hospitals. *Health Care Manage Rev*. 2021;46(2):135-144.
186. Cao T, Huang X, Wang L, et al. Effects of organisational justice, work engagement and nurses' perception of care quality on turnover intention among newly licensed registered nurses: A structural equation modelling approach. *J Clin Nurs*. 2020;29(13-14):2626-2637.
187. Chang HY, Chu TL, Liao YN, Chang YT, Teng CI. How do career barriers and supports impact nurse professional commitment and professional turnover intention? *J Nurs Manag*. 2019;27(2):347-356.
188. Chang YP, Lee DC, Chang SC, Lee YH, Wang HH. Influence of work excitement and workplace violence on professional

- commitment and turnover intention among hospital nurses. *J Clin Nurs*. 2019;28(11-12):2171-2180.
189. Chen H, Li G, Li M, Lyu L, Zhang T. A cross-sectional study on nurse turnover intention and influencing factors in Jiangsu Province, China. *Int J Nurs Sci*. 2018;5(4):396-402.
 190. Chênevert D, Jourdain G, Vandenberghe C. The role of high-involvement work practices and professional self-image in nursing recruits' turnover: A three-year prospective study. *Int J Nurs Stud*. 2016;53:73-84.
 191. de Oliveira DR, Griep RH, Portela LF, Rotenberg L. Intention to leave profession, psychosocial environment and self-rated health among registered nurses from large hospitals in Brazil: a cross-sectional study. *BMC Health Serv Res*. 2017;17(1):21.
 192. Gellatly IR, Cowden TL, Cummings GG. Staff nurse commitment, work relationships, and turnover intentions: a latent profile analysis. *Nurs Res*. 2014;63(3):170-181.
 193. Hauck A, Quinn Griffin MT, Fitzpatrick JJ. Structural empowerment and anticipated turnover among critical care nurses. *J Nurs Manag*. 2011;19(2):269-276.
 194. Laschinger HK. Job and career satisfaction and turnover intentions of newly graduated nurses. *J Nurs Manag*. 2012;20(4):472-484.
 195. Lee H, Kim MS, Yoon JA. Role of internal marketing, organizational commitment, and job stress in discerning the turnover intention of Korean nurses. *Jpn J Nurs Sci*. 2011;8(1):87-94.
 196. Reinhardt AC, León TG, Amatya A. Why nurses stay: Analysis of the registered nurse workforce and the relationship to work environments. *Appl Nurs Res*. 2020;55:151316.
 197. Sawatzky JA, Enns CL, Legare C. Identifying the key predictors for retention in critical care nurses. *J Adv Nurs*. 2015;71(10):2315-2325. <https://pubmed.ncbi.nlm.nih.gov/26037809/>
 198. Takase M, Teraoka S, Kousuke Y. Investigating the adequacy of the competence-turnover intention model: how does nursing competence affect nurses' turnover intention? *J Clin Nurs*. 2015;24(5-6):805-816.
 199. Worku N, Feleke A, Debie A, Nigusie A. Magnitude of intention to leave and associated factors among health workers working at primary hospitals of North Gondar Zone, Northwest Ethiopia: Mixed Methods. *Biomed Res Int*. 2019;2019:7092964.
 200. Yu H, Huang C, Chin Y, et al. The mediating effects of nursing professional commitment on the relationship between social support, resilience, and intention to stay among newly graduated male nurses: A cross-sectional questionnaire survey. *Int J Environ Res Public Health*. 2021;18(14):7546.
 201. Yufang Q, Hui Y, Sha C. Correlations between organizational commitment and turnover intention of clinical nurses. *Chin Nurs Res*. 2017;31(28):3534-3538.
 202. Han SS, Han JW, An YS, Lim SH. Effects of role stress on nurses' turnover intentions: the mediating effects of organizational commitment and burnout. *Jpn J Nurs Sci*. 2015;12(4):287-296.
 203. Lee M, Ju Y, Lim S. A study on the intent to leave and stay among hospital nurses in Korea: A cross-sectional survey. *J Nurs Manag*. 2020;28(2):332-341.
 204. Doede M. Race as a predictor of job satisfaction and turnover in US nurses. *J Nurs Manag*. 2017;25(3):207-214.
 205. Dyo M, Kalowes P, Devries J. Moral distress and intention to leave: A comparison of adult and paediatric nurses by hospital setting. *Intensive Crit Care Nurs*. 2016;36:42-48.
 206. Jacobs S, Chrysler-Fox P, Van Wyk R. Psychological contract breach and its influence on the job embeddedness of professional nurses. *Africa J Nurs Midwifery*. 2020;22(2):1-18.
 207. Aljohani KA, Alomari O. Turnover among Filipino nurses in Ministry of Health hospitals in Saudi Arabia: causes and recommendations for improvement. *Ann Saudi Med*. 2018;38(2):140-142.
 208. Rajacich D, Kane D, Lafreniere K, Freeman M, Cameron S, Daabous J. Male RNs: Work Factors influencing job satisfaction and intention to stay in the profession. *J Nurs Res*. 2014;46(3):94-109.
 209. Valizadeh L, Zamanzadeh V, Habibzadeh H, Alilu L, Gillespie M, Shakibi A. Experiences of Iranian nurses that intent to leave the clinical nursing: a Content Analysis. *J Caring Sci*. 2016;5(2):169-178.
 210. Chang HY, Huang TL, Wong AM, et al. How career facilitators and barriers influence nurses' professional turnover intention. *J Adv Nurs*. 2019;75(12):3577-3587.
 211. Blackstock S, Harlos K, Macleod ML, Hardy CL. The impact of organisational factors on horizontal bullying and turnover intentions in the nursing workplace. *J Nurs Manag*. 2015;23(8):1106-1114.
 212. Chachula KM, Myrick F, Yonge O. Letting go: How newly graduated registered nurses in Western Canada decide to exit the nursing profession. *Nurse Educ Today*. 2015;35(7):912-918.
 213. Favaro A, Wong C, Oudshoorn A. Relationships among sex, empowerment, workplace bullying and job turnover intention of new graduate nurses. *J Clin Nurs*. 2021;30(9-10):1273-1284.
 214. Gou L, Ma S, Wang G, Wen X, Zhang Y. Relationship between workplace ostracism and turnover intention among nurses: the sequential mediating effects of emotional labor and nurse-patient relationship. *Psychol Health Med*. 2022;27:1596-1601.
 215. Hsieh YH, Wang HH, Ma SC. The mediating role of self-efficacy in the relationship between workplace bullying, mental health and an intention to leave among nurses in Taiwan. *Int J Occup Med Environ Health*. 2019;32(2):245-254.
 216. Park M, Choi JS. Effects of workplace cyberbullying on nurses' symptom experience and turnover intention. *J Nurs Manag*. 2019;27(6):1108-1115.
 217. Roh YH, Yoo YS. Workplace violence, stress, and turnover intention among perioperative nurses. *Korean J Adult Nurs*. 2012;24(5):489-498. doi:10.7475/kjan.2012.24.5.489
 218. Tsai ST, Han CH, Chen LF, Chou FH. Nursing workplace bullying and turnover intention: an exploration of associated factors at a medical center in Southern Taiwan. *J Nurs*. 2014;61(3):58-68.
 219. Wilson BL, Diedrich A, Phelps CL, Choi M. Bullies at work: the impact of horizontal hostility in the hospital setting and intent to leave. *J Nurs Adm*. 2011;41(11):453-458.
 220. Liaqat M, Liaqat I, Awan RL, Bibi R. Exploring workplace bullying and turnover intention among registered nurses in tertiary hospitals, Lahore, Pakistan. *Int J Nurs Educ*. 2021;13(2):70-77.

221. Kim Y, Lee E, Lee H. Association between workplace bullying and burnout, professional quality of life, and turnover intention among clinical nurses. *PLoS One*. 2019;14(12):e0226506.
222. Blegen MA, Spector N, Lynn MR, Barnsteiner J, Ulrich BT. Newly licensed RN retention: hospital and nurse characteristics. *J Nurs Adm*. 2017;47(10):508-514.
223. Staggs VS, Dunton N. Hospital and unit characteristics associated with nursing turnover include skill mix but not staffing level: an observational cross-sectional study. *Int J Nurs Stud*. 2012;49(9):1138-1145.
224. American Nurses Credentialing Center. About Magnet; New 2020 Magnet Mission and Vision Statement. Published 2020 [cited 2022 Aug 11]. <https://www.nursingworld.org/organizational-programs/magnet/about-magnet/>
225. Søbstad JH, Pallesen S, Bjorvatn B, Costa G, Hystad SW. Predictors of turnover intention among Norwegian nurses: A cohort study. *Health Care Manage Rev*. 2021;46(4):367-374.
226. Drennan VM, Halter M, Gale J, Harris R. Retaining nurses in metropolitan areas: insights from senior nurse and human resource managers. *J Nurs Manag*. 2016;24(8):1041-1048.
227. Chan ZC, Tam WS, Lung MK, Wong WY, Chau CW. A systematic literature review of nurse shortage and the intention to leave. *J Nurs Manag*. 2013;21(4):605-613.
228. Yu F, Raphael D, Mackay L, Smith M, King A. Personal and work-related factors associated with nurse resilience: A systematic review. *Int J Nurs Stud*. 2019;93:129-140. doi:10.1016/j.ijnurstu.2019.02.014
229. Chu X, Zhang L, Li M. Nurses' strengths use and turnover intention: the roles of job crafting and self-efficacy. *J Adv Nurs*. 2022;78(7):2075-2084. doi:10.1111/jan.15124
230. Kiwanuka F, Nanyonga RC, Sak-Dankosky N, Muwanguzi PA, Kvist T. Nursing leadership styles and their impact on intensive care unit quality measures: an integrative review. *J Nurs Manag*. 2021;29(2):133-142.
231. Labrague LJ, De Los Santos JAA. COVID-19 anxiety among front-line nurses: predictive role of organisational support, personal resilience and social support. *J Nurs Manag*. 2020;28(7):1653-1661.
232. Duyx B, Swaen GMH, Urlings MJE, Bouter LM, Zeegers MP. The strong focus on positive results in abstracts may cause bias in systematic reviews: a case study on abstract reporting bias. *Syst Rev*. 2019;8(1):174.
233. Boniol M, McIsaac M, Xu L, Wuliji T, Diallo K, Campbell J. *Gender Equity in the Health Workforce: Analysis of 104 Countries*. World Health Organization; 2019.