

## Structural and Procedural Risk Factors Correlated to Missed Nursing Care in Hospitals

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### Review Article

Received date: 27/06/2020;

Accepted date: 04/08/2020;

Published date: 11/08/2020;

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Keywords: Patient safety, Missed care, Risk factors, Nursing, Hospitals.

### ABSTRACT

**Objective:** To identify, based on the scientific literature, the structural and procedural risk factors correlated to missed nursing care in hospitals.

**Materials and Methods:** This is an integrative literature review, which was conducted in May 2020, through empirical articles indexed in the Medical Literature and Retrieval System Online, Cumulative Index to Nursing and Allied Health Literature, Web of Science and Scopus databases. The studies were independently selected by two reviewers. Quality appraisal was based on the Quality Assessment Tool. Data were abstracted from the study design and the measures of the factors correlated to missed nursing care. Data were descriptively analysed by means of conceptual frameworks.

**Results:** Fifteen risk factors for missed nursing care were investigated. The conceptual framework of the study was composed of thirteen variables: ten structural factors (teamwork, nurses' perceptions of the impact of healthcare information technology on practice, personal accountability, nurse work environment, patient safety culture, ethical climate, collective efficacy, personality traits, workload and work alienation) and three procedural factors (frequency of nursing care reminders, errors of commission and ward accountability).

**Conclusion:** Confidence in delegation and professional quality of life showed no significant correlation to missed nursing care, while workload still requires inferential statistical evidence.

### INTRODUCTION

The global reality of hospital systems is to cope with constraints, such as, for example, reduced staffing levels and lack of time and resources, generating a high degree of care commitment. Missed nursing care is a relevant problem because it can generate negative outcomes for the patient and reduce the effectiveness of teamwork, which can result in harm <sup>[1]</sup>.

The Missed Nursing Care Model, formulated in 2006, is based on Donabedian three-dimensional structure on healthcare quality (structure, process and outcomes). The model introduced the concept of missed nursing care, defined as necessary nursing care that is partially or totally omitted by the nurse or that is significantly delayed. The reasons for this omission reported by nurses were distributed into three categories: antecedents that catalyse the need for a decision on priorities, elements of the nursing process and perceptions and internal values of the nurse [2].

Nevertheless, multiple environmental factors intrinsic to nursing professionals influence the provision of the necessary care, indicating the need to deepen investigations of more complex factors. For this reason, researchers intensified the development of validation studies of the Missed Nursing Care Survey (MISSCARE Survey), in order to measure the omission of nursing care and check the reasons for the omission of this care in other countries, such as Brazil [3], Italy [4] and Germany [5], which expanded the assessment of complex aspects related to this phenomenon.

The key factor for global interest is focused on clinical outcomes associated with missed nursing care, such as increased hospital infections, falls, pressure injuries, critical incidents, medication errors, adverse events, readmission rate and mortality. Missed nursing care is also related to significant decrease in patient satisfaction, prolonged hospital stays and increased healthcare costs [6,7].

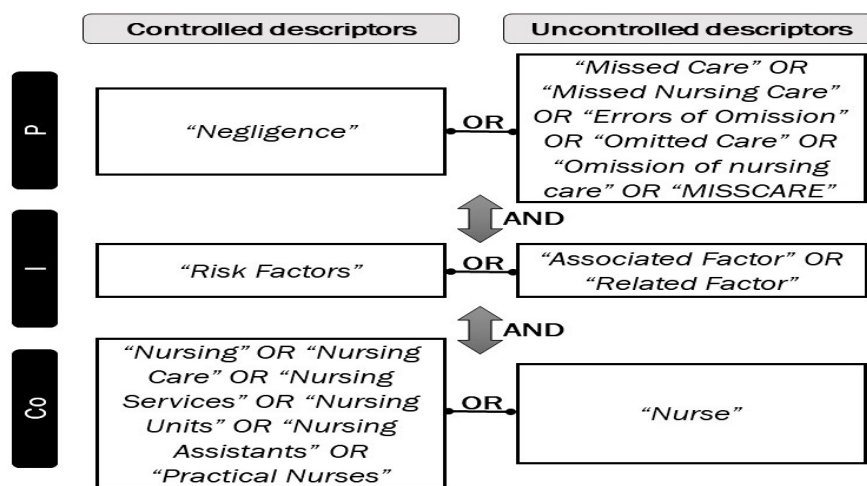
In this context, the assessment of factors related to missed nursing care may contribute to the planning of more effective managerial actions for its handling. Most studies investigate the association between the missed care and the characteristics of the hospital, unit and nursing team, focusing on human and material resources as well as tension or communication breaks in the nursing team [8,9].

In general, environmental conditions, the effects of changing nursing workflows, the performance of the nursing team and the use of technological resources may be contributing or mitigating factors to missed nursing care [10]. The way of gathering more reliable data on how much these more complex factors may be associated to missed nursing care is to assess each factor using validated scales, due to the precision of measurement and ability to investigate aspects that cannot be directly checked, such as the characteristics and resources, for example.

Therefore, the objective of this review is to identify, based on the scientific literature, the structural and procedural risk factors correlated to missed nursing care in hospitals.

**LITERATURE REVIEW**

This review was undertaken in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [11]. The research question was: What structural and procedural risk factors measured by scales are correlated to missed nursing care in the scientific literature? **Figure 1** shows the technique held in the investigation.



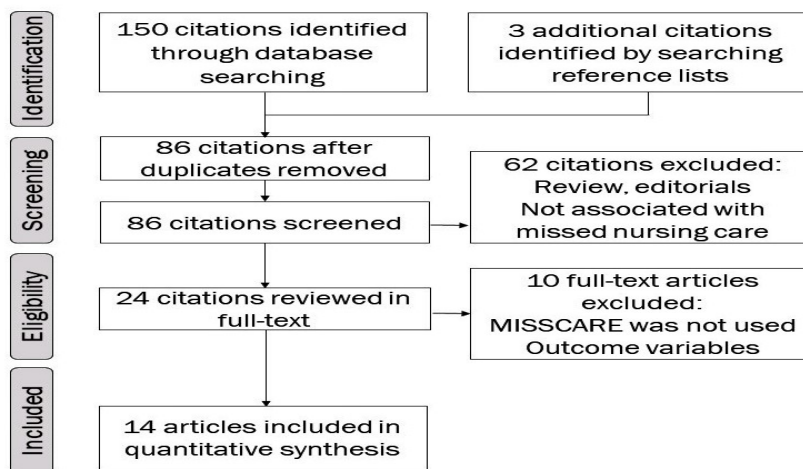
Source: Medical Subject Headings (MeSH) and CINAHL Headings

**Figure 1.** Controlled and uncontrolled descriptors of database research. Teresina, Piauí, Brazil, 2020.

The PICo technique was used to conduct the research, where P refers to the problem (missed care), I indicates the aspect of interest (related factors) and Co corresponds to the context of the investigation (nursing care). Combinations between controlled descriptors and uncontrolled descriptors using the OR operator were performed in the advanced research forms. P, I and Co research results were combined with the AND operator, as shown in **Figure 1**.

The selected databases were: Medical Literature and Retrieval System Online (MEDLINE/PubMed®), via National Library of Medicine, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science Core Collection and Scopus.

The databases were accessed in May 2020. The research of the studies followed the criteria and manuals of each database and there was no restriction of the publication period. The study selection flow and the steps followed according to PRISMA recommendations are shown in **Figure 2**.



**Figure 2.** Flowchart of database research - PRISMA recommendation. Teresina, Piauí, Brazil, 2020.

According to these predefined criteria, 153 articles were found: 23 from MEDLINE/PubMed, 57 from CINAHL, 23 from Web of Science and 50 from Scopus. The inclusion criteria were: the study was an empirical article, published in a peer review journal, developed in a hospital environment, focused on missed nursing care measured by the MISSCARE Survey, in order to standardize correlation measures, and involved a risk factor to missed care (explanatory or mediator variable) measured by a scale. The exclusion criteria were: the study was an editorial, review and included factors related to patient and staff outcomes.

Two reviewers analysed the articles. After the removal of duplicates, a total of 86 citations were analysed using titles, abstracts and inclusion criteria. The value of Cohen’s kappa <sup>[12]</sup> was moderate (0.78). In the second phase, a total of 24 records were screened by reading full texts, where a strong agreement was achieved (0.98). The total number of studies included in the final analysis was 14.

The Quality Assessment Tool was used to guide the extraction of data and to measure the quality of the selected studies. The instrument assesses nine criteria: abstract and title, introduction and objectives, method and date, sampling, data analysis, ethics and bias, results/outcomes, transferability/generalisability, and implications and usefulness. Each criterion is measured by an ordinal scale of four points, which are good (four points), fair (three points), poor (two points) or very poor (one point), thus allowing a maximum score of 36 points <sup>[13]</sup>. The studies were classified as high (30-36 points), medium (24-29 points) and low quality (9-23 points). Data were abstracted from the study design and the measures of the factors correlated to missed nursing care. Results were descriptively analysed by means of conceptual frameworks.

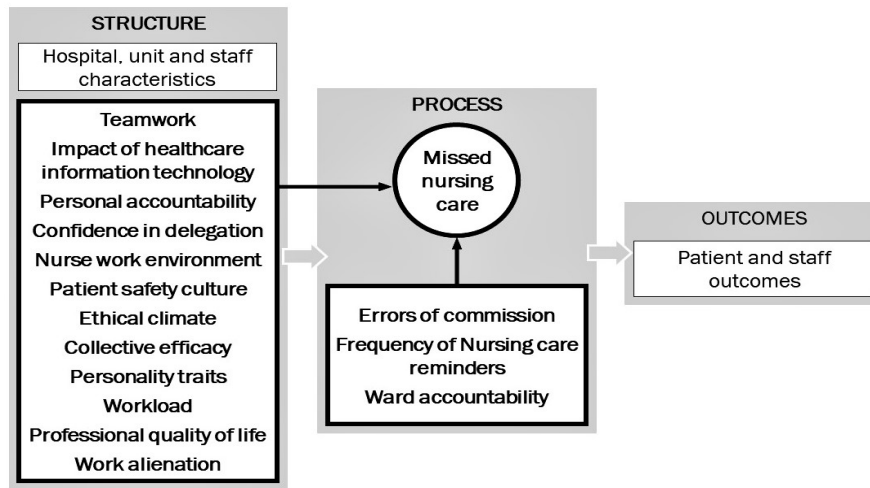
The information corresponding to the Quality Assessment Tool criteria was reorganised in the following data: quality level of the study, citation, year of publication, country, design and sample, measured risk factors, correlation to missed nursing care and characteristics, validity and psychometric analysis of the scale used to measure the factor.

The factors measured by scales were organised based on the Donabedian conceptual framework of Structure, Process, and Outcomes Model of Healthcare Quality <sup>[14]</sup>. Based on the results of the studies, the structural and procedural risk factors were organised into the three categories of Kalisch’s Missed Nursing Care Model: *Antecedents, Nursing Process and Nurses’ Internal Processes* <sup>[2]</sup>.

There was no funding or conflict of interest to develop this study. There was also no need for an assessment by an Ethics Committee, since it is an integrative review.

## **RESULTS**

The sample studies checked the relationship between one or two risk factors at structural and/or procedural level and the frequency of missed nursing care. **Figure 3** shows the conceptual framework of this review based on the healthcare quality model (structure, process and outcomes) from the factors that were initially identified in the citations.



**Figure 3.** Conceptual framework of the structural and procedural risk factors possibly correlated to missed nursing care (note: the variables included in the review model are indicated in bold lines). Teresina, Piauí, Brazil, 2020.

The total number of risk factors measured by scales in the scientific literature and included in the review was 15. Twelve factors represented the investigation of the influence of the structure in cases of missed nursing care, being added to the characteristics of the hospital, unit and team previously present in the framework of the model of missed nursing care. Three factors represented the assessment of the influence of elements at procedural level, according to **Figure 3**.

**Table 1** shows the characteristics of the studies according to the assessed risk factors, as well as the correlations found and the respective quality level of the study.

**Table 1.** Summary and correlations of studies included in the review. Teresina, Piauí, Brazil, 2020.

Citation/Year/Country	Design/sample	Factors	Correlation to missed nursing care (r = correlation coefficient)	Quality level
Bacaksiz et al. (2020) Turkey [15]	Correlational and cross-sectional/897 nurses	Professional quality of life and Work alienation	Professional quality of life subscales or total score: non-significant correlations. Work alienation subscales: only Powerlessness (r = 0.104).	36
Silva et al. (2020) Brazil [16]	Cross-sectional/29 intensive care nurses	Nurse Environment Work and Workload	The professional practice environment and workload may constitute predictive factors (descriptive only).	34
Drach-Zahavy and Srulovici (2019) Israel [17]	Cross-sectional/ 290 registered nurses	Personal accountability and Personality traits	Personal accountability: negative and low (r = -0.280). Personality traits: Conscientiousness (r = -0.217), Agreeableness (r = -0.225) and Neuroticism (r = 0.115).	30
Smith et al. (2018) USA [18]	Cross-sectional/ 233 registered nurses	Nurse Environment Work and Collective Efficacy	Nurse Work Environment: nurse staffing and resource adequacy (r = -0.17) and nursing foundations for quality of care (r = -0.22). Collective efficacy: negative and weak (r = -0.17).	35
Vryonides et al. (2018) Cyprus [19]	Correlational/ 157 registered nurses	Ethical climate	Ethical climates: instrumental (r = 0.612), independence (r = 0.461), caring (r = -0.695), rules (r = -0.367), and law-and-code (r = -0.487) types.	31
Kim, Yoo and Seo (2018) Korea [20]	Cross-sectional/ 186 registered and practical nurses	Nurse Environment Work and Patient Safety Culture	Nurse Work Environment: nurse staffing and resource adequacy (r = -0.44), nursing foundations for quality of care (r = -0.40), nurse manager ability, leadership and support of nurses (r = -0.38) and collegial nurse-physician	32

			relations ( $r = -0.32$ ). Patient Safety Culture: within unit ( $r = -0.41$ ).		
Park, Hanchett and Ma (2018) USA [21]	Correlational/ 31,650 registered nurses	Nurse Environment	Work	The increase of the staffing and resource adequacy and collegial nurse-physician relations reduced missed nursing care in 81.5% and 21.9%, respectively, but a higher nurse participation in hospital affairs can double the level of missed nursing care. Good environment units had 63.3% lower odds of having miss care activities (comparative only).	29
Saqer and AbuAIRub (2018) Jordan [22]	Cross-sectional/ 362 registered nurses	Confidence delegation	in	Non-significant correlation.	27
Srulovici and Drach-Zahavy (2017) Israel [23]	Cross-sectional/ 172 focal and 123 incoming nurses	Personal accountability and Ward accountability	and	Personal accountability: focal ( $r = -0.401$ ) and incoming ( $r = -0.239$ ) nurse. Ward accountability: only the focal nurse ( $r = -0.248$ ).	31
Chapman et al. (2016) Australia [24]	Descriptive exploratory/ 334 registered and enrolled nurses	Teamwork		Teamwork ( $r = -0.34$ ) alone explained 8.9% of missed nursing care, controlling for occupation of the staff member and staff characteristics.	34
Bragadyttir, Kalisch and Tryggvadottir (2016) Iceland [25]	Cross-sectional/ 864 registered and practical nurses	Teamwork		Teamwork ( $r = -0.436$ ) explained 14% of the variance of missed nursing care, controlling for unit type, role, age and staffing adequacy.	32
Piscotty, Kalisch and Gracey-Thomas (2015) USA [26]	Descriptive/165 registered nurses	Impact of healthcare information technology (IHIT) and Nursing care reminder usage (NCRU)		IHIT negatively affected missed nursing care and explained 9.8% of variance. NCRU was positively associated with missed nursing care and explained 3.4% of the variance, however, when there is IHIT the NCRU is no longer significant (comparative only).	29
Castner et al. (2015) USA [27]	Cross-sectional/ 553 registered nurses	Errors of commission	of	The increase of two or more reported errors of commission raises the level of missed nursing care by 22% (comparative only).	27
Kalish and Lee (2010) USA [28]	Cross-sectional/ 2216 nursing staff members	Teamwork		Teamwork ( $r = -0.37$ ) alone explained 10.9% of missed nursing care.	34

The articles were published between 2010 and May 2020, with a predominance of North American research (5; 35.7%) and focused on registered nurses (10; 66.7%). Most studies were classified as high quality (10; 71.4%), while the others as moderate quality (4; 28.6%). Among the assessed risk factors, workload was found only with descriptive statistics. All other factors were analysed with correlations, comparisons and/or regression analyses. The correlation coefficients shown in the studies indicated relationships with missed nursing care characterized as weak or moderate, as shown in **Table 1**.

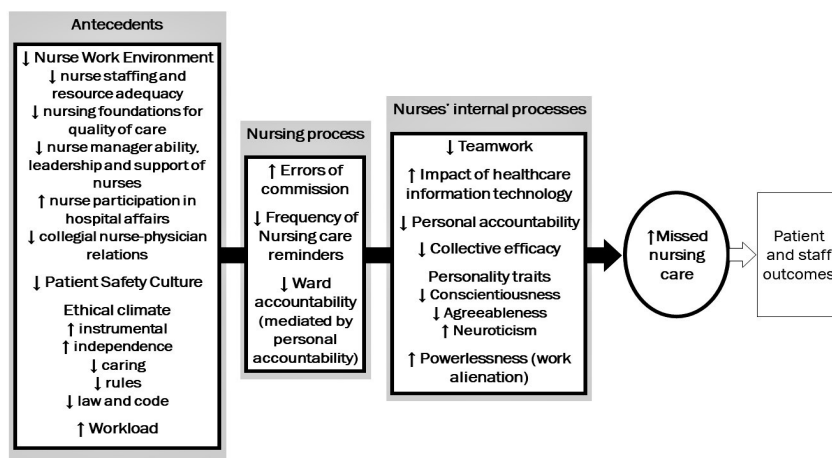
**Table 2** shows the psychometric quality of the scales used as reported in the studies, from the oldest to the most current.

**Table 2.** Characteristics of the scales used to measure the structural and procedural factors. Teresina, Piaui, Brazil, 2020.

Factor	Scale	Psychometric analysis reported
Teamwork [24-25,28]	Nursing Teamwork Survey (NTS)	High acceptability, validity and reliability
Errors of commission [27]	Practice and Professional Issues Survey	Adequate validity and acceptable reliability
Impact of healthcare information technology [26]	Impact of Healthcare Information Technology (I-HIT) Scale	High validity and reliability

Nursing care reminders [26]	Nursing Care Reminder Usage Survey (NCRS)	Adequate validity and reliability
Personal accountability [17,23]	Personal Accountability Scale	Acceptable validity and high reliability
Ward accountability [23]	Ward Accountability Scale	Acceptable validity and high reliability
Confidence in delegation [22]	Confidence and Intent to Delegate Scale	Adequate validity and reliability
Nurse work environment [16,18,20-21]	Practice Environment Scale of the Nurse Work Index (PES-NWI)	High acceptability, validity and reliability
Patient Safety Culture [20]	Perception of Patient Safety Culture Scale	Acceptable validity and reliability
Ethical climate [19]	Ethical Climate Questionnaire (ECQ-26)	High acceptability, validity and reliability
Collective efficacy [18]	Collective Efficacy Beliefs Scale (CEBS)	High validity and reliability
Personality traits [17]	Big Five Inventory	Acceptable validity and reliability
Workload [16]	Nursing Activities Score (NAS)	Adequate validity and reliability
Professional quality of life [15]	Professional Quality of Life (ProQOL)	Adequate validity and reliability
Work alienation [15]	Work Alienation Scale (WAS)	Adequate validity and reliability

Each of the assessed structural and procedural risk factors were measured by the same instrument. The greatest predominance in the investigations was as follows: nurse work environment (4; 28.6%), teamwork (3; 21.4%) and personal accountability (2; 14.3%). The studies reported, at least, acceptable validity and reliability of the scales used, according to **Table 2**. **Figure 4** shows the final conceptual table of the review.



**Figure 4.** Conceptual framework of the review results according to the Missed Nursing Care Model (note: the variables included in this review model are indicated in bold lines; heavy lines refer to the current study; arrows in the same direction indicate positive correlations; and arrows in opposite direction indicate negative correlations). Teresina, Piaui, Brazil, 2020.

Confidence in delegation and professional quality of life did not correlate significantly with missed nursing care, and therefore were not included in the model. The final conceptual framework consisted of 13 risk factors for the increased level of missed nursing care, according to **Figure 4**.

## DISCUSSION

Data showed the predominance of investigations on structural risk factors, mainly regarding perceptions and internal values of the nurse. The interest in background and organisational factors arose recently, more precisely in 2018, focusing on nurse work environment, patient safety culture and ethical climate, thus initiating the use of scales that measure antecedents that catalyse the decision process in the hospital context.

This advance also highlights the recognition on the part of literature with respect to the influence exerted by the environment where the nursing team works on the omission of care. In fact, the multidimensionality of errors by omission



requires institutional measures for its confrontation from the adequacy of work conditions. The commitment to improve the quality of hospital care due to administrative bias has been strengthened. Accordingly, hospitals that have experienced substantial changes in the work environment have shown more significant decrease in negative outcomes for patients, better participation of the nursing team and increased ability to manage conflicts [17,22,24,29].

The investigated structural risk factors for missed nursing care were: teamwork, nurses' perceptions of IHIT on practice, personal accountability, confidence in delegation, nurse work environment, patient safety culture, ethical climate, collective efficacy, personality traits, workload, professional quality of life and work alienation. The procedural factors were: errors of commission, frequency of nursing care reminders and ward accountability. It was noted the importance that researchers have placed on aspects regarding the health professionals' beliefs, values, perceptions and communication networks, as well as shared behavioural expectations within health organisations.

The understanding of aspects of the work environment and also intrinsic to nurses is a crucial element in the current health systems because it expresses the professionals' perceptions or feelings in relation to the culture and safety climate of the institution. Therefore, the information generated by these studies may support actions that go beyond theoretical and methodological approaches and foster affective commitment, with a focus on activities and normative commitment of the nursing team, thus avoiding a cause and effect network that limits the provision of quality services [16,18,20,21].

The concentration of studies developed in the United States combines with the production environment of the MISSCARE Survey, which may characterize an advantage over countries that need to first go through the process of validating the instrument and checking its adequacy to meet local cultures, in order to, subsequently, initiate the assessments of missed care. In addition, investigations of a new object usually begin with basic research to generate data for applied research, thus also contributing to longer processes in other countries.

Although the studies were classified as high or moderate quality, it is important to highlight that all designs were cross-sectional or correlational. There seems to be a gap concerning the production of quasi-experimental and experimental studies involving structural and procedural factors in the context of missed care.

Among the assessed risk factors, workload was found only with descriptive statistics in a study performed in Brazil, where it was suggested that nurse work environment and workload seem to constitute predictors of missed nursing care [16], and therefore this factor was included in the conceptual framework. The other factors were analysed with correlations, comparisons and/or regression analyses in other studies, including nurse work environment, whose correlation with missed care was found in two studies performed in the United States [18,21] and one study in Korea [20].

Studies that calculated correlation coefficients indicated relationships with missed nursing care that ranged from weak to moderate. The highest types were: caring, instrumental, law-and-code and independence of the ethical climate, assessed in Cyprus [19]; teamwork, assessed in Iceland [25]; patient safety culture within unit, assessed in Korea [20]; and personal accountability by the focal nurse, assessed in Israel [23], in samples ranging from 157 to 864 nurses.

The most investigated risk factors were: nurse work environment, teamwork and personal accountability, thus reinforcing the concern with antecedent factors and that are internal processes of nurses. The pertinent literature recognizes that intensification of work affects the provision of quality care and that it is necessary to develop strategies for controlling complex healthcare environments where nurses are inserted [20,21]. Teamwork levels explained 9% to 14% of the nurses' perception of missed nursing care [25,28]. Both interpersonal and structural aspects influence the care processes and represent a small amount of the variation of missed nursing care [17,23].

All the instruments used showed construct validity, nine of which have subscales [15-17,19-21,24,25,28] and the other six were assessed based on the global score [17,18,22,23,26,27], and the studies reported, at least, acceptable validity and reliability. These psychometric characteristics may be related to the choice of the same instrument by researchers from different countries to measure a certain risk factor for missed nursing care.

However, two factors had discarded correlation with missed nursing care and were not included in the final model. Confidence in delegation did not show a significant correlation, and the authors explained the possible interference of the characteristics of the sample, which was mainly composed of professionals with a very low level of nursing experience [22]. A previous study indicated that low delegation ability was one of the reasons reported by nurses for the omission of care [2], but without statistical assessment.

Missed nursing care also had no relationship with compassion satisfaction, burnout and compassion fatigue, which are the components of professional quality of life. The version adapted to the Turkish context of MISSCARE has evidence of validity and reliability. Despite this, the authors attributed the outcomes contrary to the hypothesis of the study to the structure of a single factor that this version of the instrument presents, thus suggesting the organisation of subscales for new applications in Turkey [15].

Thus, based on the three components of the Missed Nursing Care Model, four factors were antecedents that catalyse the decision on priorities: a negative nurse work environment (for all subscales, except nurse participation in hospital affairs,

where the correlation was positive), a weak patient safety culture (in general), less presence of caring, rules, and law-and-code ethical climate (except instrumental and independence ethical climate, which had a positive correlation), and a high workload (found only descriptively). Three factors represented the influence of elements of the nursing process: a high frequency of errors of commission, a low frequency of nursing care reminders, and a low ward accountability. Finally, six factors corresponded to the nurses' internal perceptions and values: less teamwork, nurses' negative perceptions of IHIT on practice, low personal accountability, low perception of collective efficacy, personality traits (low conscientiousness, low agreeableness and high neuroticism), and high perception of work alienation (in the powerlessness dimension) [2,20-29].

In this context, the understanding of structural and procedural risk factors related to the omission of nursing care may guide the formulation of a specific set of strategies for strengthening values and organisational environment that are favourable to the improvement of the patient safety culture. Thus, it improves the path whose final objective is the quality of care and the improvement of results for both the patient and the nursing team.

As a limitation of this review study, it is highlighted the small sample size of studies recovered in databases assessing risk factors whose measurement is more complex and requires the use of validated scales. In addition, the results that underpinned the conceptual framework of this review were obtained from studies that used convenience samples in cross-sectional or correlational designs, thus limiting the generalisation of results. Despite this, it did not prevent the objective of identifying the structural and procedural factors correlated to missed nursing care in the pertinent literature.

### CONCLUSION

The final conceptual framework of this review consisted of 13 risk factors for the increased frequency of missed nursing care. Ten factors were structural (less teamwork, nurses' negative perceptions of IHIT on practice, low personal accountability, negative nurse work environment, weak patient safety culture, negatives ethical climates, low perception of collective efficacy, negative personality traits, high workload and negative work alienation) and three were procedural (high frequency of errors of commission, low frequency of nursing care reminders and low ward accountability).

Confidence in delegation and professional quality of life showed non-significant correlation to missed nursing care and workload still requires inferential statistical evidence. These risk factors need further examination and analysis in future studies. Correlation measures between workload and missed nursing care have not yet been established. There seems to be a gap concerning the production of studies assessing the influence of structural and procedural factors in the context of missed nursing care with a higher level of evidence.

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