

# RIASE

REVISTA IBERO-AMERICANA DE SAÚDE E ENVELHECIMENTO  
REVISTA IBERO-AMERICANA DE SALUD Y ENVEJECIMIENTO

## **HEALTH CARE RATIONING IN QUALITY OF NURSING CARE: SYSTEMATIC REVIEW**

Ana Filipa Poeira - PhD Nursing Sciences. Invited Adjunct Professor, Nursing Department, School of Health, Polytechnic Institute of Setúbal, Researcher in NURSE'IN Nursing Research Unit for South and Islands

Lucília Nunes - PhD Philosophy, Coordinator Professor, Nursing Department, School of Health, Polytechnic Institute of Setúbal, Researcher in NURSE'IN Nursing Research Unit for South and Islands

Andreia Ferreri Cerqueira - PhD Nursing. Adjunct Professor, Nursing Department, School of Health, Polytechnic Institute of Setúbal, Researcher in NURSE'IN Nursing Research Unit for South and Islands

Adriana Silva - Student, 16th Nursing Course, School of Health, Polytechnic Institute of Setúbal

Nélida Lopes - Student, 16th Nursing Course, School of Health, Polytechnic Institute of Setúbal

## ABSTRACT

---

The adequate allocation of nurses ensures the quality of nursing care, thus enabling the health care security for the client and the achievement of the organizational goals.

**Objectives:** To identify and synthesize evidence about the impact of health care rationing in quality of nursing care.

**Review Methodology:** A systematic review of the literatures was carried out following the PICO strategy in the formulation of the research question and the methodology of *Joanna Briggs Institute*. There were five databases consulted: Medline, CINAHL, Scielo, Academic Search Complete and Web of Science. Applied inclusion criteria: studies that include nurses and/or clients, the influence of nurses' endowments on the safety and quality of care; qualitative and quantitative studies, available in full-text, in Portuguese or English and between 2007 and 2017.

**Results:** Six articles of a quantitative nature were selected that relate the effect of adequate appropriations to the safety and quality of nursing care, also having an influence on the satisfaction of nurses and clients.

**Conclusion:** Ensuring safe nursing care is paramount since it improves working conditions with an impact on productivity and performance and consequently on the results of care provided to patients.

**Descriptors:** Nurses; quality of health care; health care rationing.

## INTRODUCTION

---

Safe staffing allocation is a crucial subject in the nursing area since it is essential to adjust the existent nursing resources to the clients' real needs. The necessary resources, either in quantity, or in techno-scientific skills, enable both quality and security<sup>(1)</sup>.

The International Council of Nurses<sup>(2)</sup> determines allocations as quantity and the needful type of staff for the customers care; and safe allocations as the availability, at any time, of an appropriate combination of levels of ability, to fill the need a of the customer care, reducing the risk to the minimum in terms of working conditions.

The implementation of safe allocations in health care has a direct impact in the organizational excellence and efficiency, encompassing: the proper management of the financial and human resources, the clients' safety, the occurrence and notification of adverse effects, the health promotion, the reinstatement fee, the establishment of high levels of

performance and expectations for the clients' safety implying as well the professionals well-being and satisfaction<sup>(2)</sup>.

In fact, increasing the labor and the workload hours has negative implications in the professional satisfaction turnover levels, sign of a unfavorable organizational climate<sup>(3)</sup>.

The implementation of safe allocations in nursing, besides being important to the quality of the nursing care and the clients' safety, is also associated to the satisfaction, of both clients and professionals<sup>(1)</sup>.

The professional satisfaction has influence on the individual level of each professional as on the collective one influence the organization productivity. Therefore, satisfied professionals within an organization is a synonymous of success for the organization, since the productivity increases, the costs decrease as consequently the organization gains competitiveness<sup>(4)</sup>.

Studies conducted in several countries reveal that adverse events are related to the time increase of internment and mortality<sup>(5-7)</sup>. According to Sousa et al. "the incidence rates of adverse events in hospitals reach values that vary between 3,7% and 16,6% (with a consequent clinic, economical and social impact), being the larger section (40% to 70%) considered preventable or avoidable"<sup>(7)</sup>.

Still in the same study in three public hospitals in the Lisbon area, the conclusion is that due to the adverse event the internment is protracted, on average, 10,7 days<sup>(7)</sup>.

A consensual methodology of support to the operationalization of the safe staff allocation in nursing is still a strong aim of study and investigation<sup>(1)</sup>. Furthermore, according to the Portuguese Nursing Order<sup>(9)</sup>, the proper allocations of nurses, their qualifications level and skills profile, are fundamental aspects to achieve better rates of security and quality of health care to the target population and to organizations too.

Taking into account the theme relevance the following question has been elaborated: "*In what way do the safe allocations influence the quality of the nursing care?*".

This question has been done based on the method PICO<sup>(10)</sup>: P (Population) - nurses, I (Intervention) - safe allocations in nursing, C (Comparison) - X; O (Outcome) - quality of nursing care.

This Systematic Review of Literature main goal is to understand to which point safe allocations of nurses influence the quality of nursing care.

## METHOD OF SYSTEMATIC REVIEW

After formulating the investigation question according to PICO strategy and attending to the methodology of Joanna Briggs Institute, there have been defined inclusion and exclusion criteria to the studies research.

### *Inclusion Criteria*

**Type of participants:** all studies that include nurses in the direct care delivery to clients.

**Type of interventions/interest phenomena:** all studies that have observed the influence of nursing allocations in the quality of nursing care.

**Type of results:** all studies that have evaluated and/or proved the influence of safe allocations in the quality of nursing care.

**Type of studies:** all primary studies of qualitative and/or quantitative nature.

### *Research and Identification Strategy of Studies*

The research has been conducted through five databases: MEDLINE, CINAHL with Full Text, Scielo, Academic Search Complete e Web of Science, using as markers: 1) articles published between 2007 and 2017; 2) peer review; 3) articles published in academic journals with full text available in Portuguese and/or English.

The research conducted in each database had into account the indexed vocabulary, having proceeded to descriptors combinations with boolean operators outlined in table 1.

**Table 1 – Combination of descriptors and boolean operators in different data bases.**

Data base	Combination of key-words and boolean operators
MEDLINE	“nursing” AND “quality of health care” AND “health care rationing”
CINAHL with Full Text; Academic Search Complete; Scielo	“nurse” AND “quality health care” AND “nurse patient ratio”
Web of Science	“nurse” AND “health care quality” AND “health care rationing”

From the conducted research, 337 articles were gathered. After removing the duplicate ones, the number has reduced to 289 articles. The articles that focused the interest phenomena or did not serve the proper methodology were further excluded, so it was reduced to 7 articles. Of these, after its evaluation, 1 article was excluded because it did not present relevant conclusions in order to answer the question of investigation, reason why only 6 were included in the present systematic review of literature.

In the following flow diagram (Image 1) is possible to see the process of selection of studies throughout this revision.

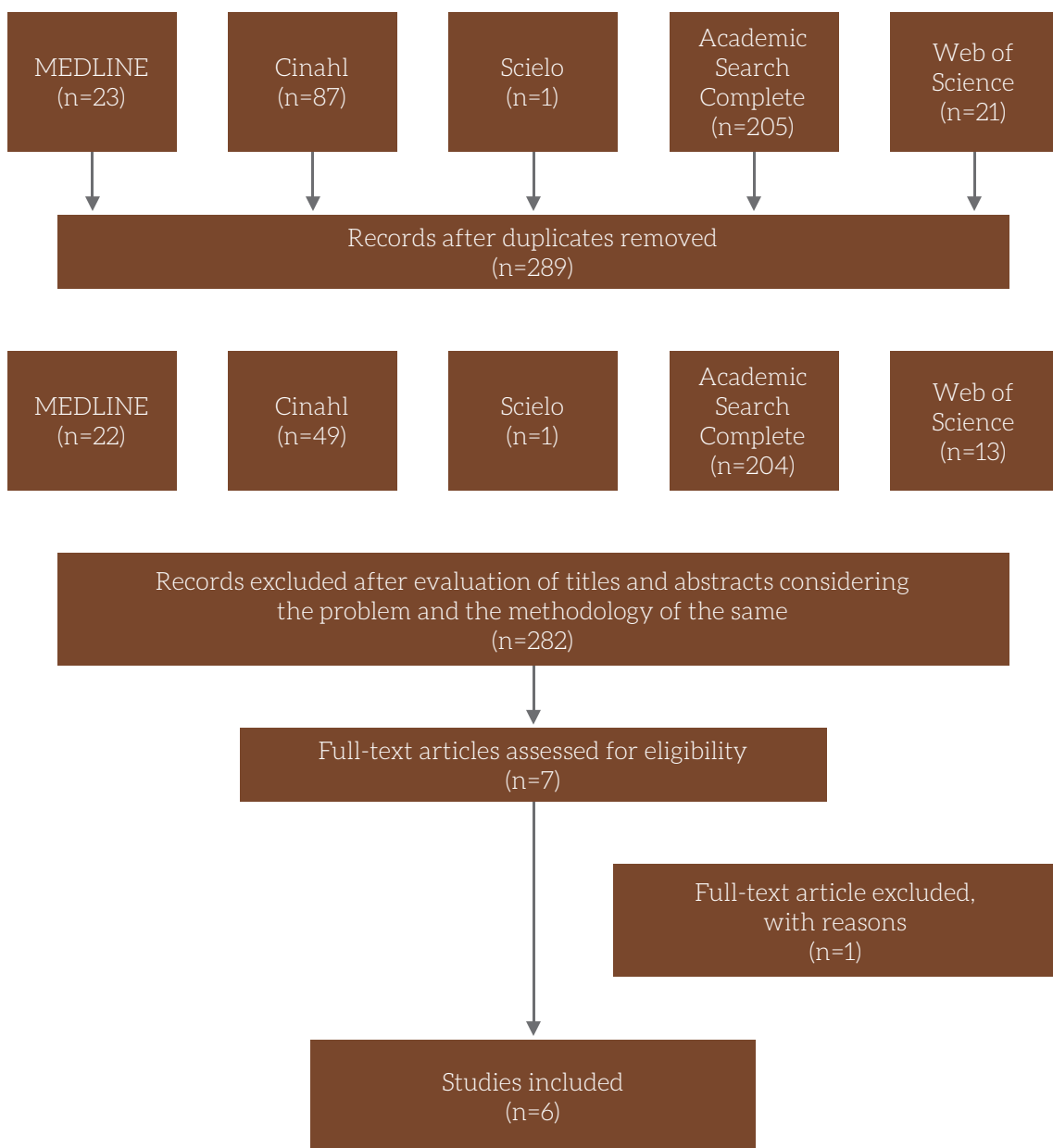


Figure 1 - Flow Diagram<sup>(9)</sup>.

*Evaluation of the Methodological Quality*

The instruments of critical evaluation of the *Joanna Briggs Institute - Critical Appraisal Checklist for Analytical Cross Sectional Studies* were applied to evaluate the methodological quality of the seven selected articles. Two independent reviewers assured the critical evaluation. A study has been excluded by this evaluation.

*Data extraction*

Two independent reviewers achieved data extraction and using the data extraction instruments of the Joanna Briggs Institute, namely the *JBI Data Extraction Form for Experimental/Observational Studies*. Thus, the information related to each article presents itself outlined on table 2 and organized in general information (header of the article, periodical, author, year), article features (goal, type of participants, period of time) and its conclusions. Concomitantly, we present the level of evidence of the scientific articles, based on the hierarchy of evidence of Melnyk & Fineout-Overholt<sup>(10)</sup>.

Table 2 – Data Extraction.

Header of the article/ Periodical	Author(s)/Year	Goal(s)	Type of Participants/ Period of Time	Conclusions	Hierarchy Level
<b>Association between workload of the nursing staff and patient safety outcomes.</b> Revista da Escola de Enfermagem da USP	Ana Maria Müller de Magalhães; Diovane Ghignatti da Costa; Caren de Oliveira Riboldi; Thiane Mergen; Amanda da Silveira Barbosa; Gisela Maria Schebella Souto de Moura. 2017	Describe the workload of the nursing team and relate it with the results that ensure the safety of the hospitalized client in a clinical or surgical unit of a university hospital.	157.481 clients; 126 nurses; 376 nursing technicians; 264 observations which ensured the safety. October 2013 – September 2015.	There was the existence of significant association between the workload and the internment period, urinary infection and the clients' satisfaction with the nursing care. The increase of nursing team's workload had a negative impact in the quality of the care and clients' safety. The safe allocations promote an environment of more secure care.	Level IV
<b>A tale of two systems—Nurses practice environment, well being, perceived quality of care and patient safety in private and public hospitals in South Africa: A questionnaire survey.</b> International Journal of Nursing Studies	Siedine K. Coetzee; Hester C. Klopper; Suria M. Ellis; Linda H. Aiken. 2013	To verify if there is a connection between the variables that can be modified, such as the working environment and the workload with the quality and safety of the nursing care in clinical and surgical units of public and private hospitals in South Africa.	1187 nurses (716 nurses from private hospitals and 471 nurses from public hospitals).	Improve the working environment, including the client/nurse ratio, is fundamental to maintain a competent team, benefiting the clients on terms of higher quality care.	Level IV
<b>Impact of Nurse Work Environment and Staffing on Hospital Nurse and Quality of Care in Thailand</b> Journal of Nursing Scholarship	Aiken, L.; Aunguroch, Y.; Kunaviktikul, W.; Nantsupawat, A.; Srisuphan, W.; Wichaikhum, O. 2011	To determine the impact of the working environment and the client/nurse ratio in the professional satisfaction, the burnout and the quality of the nursing care.	5247 nurses.	Promote the working environment in the Thai hospitals reduces the nurses' burnout and consequently their retention in the organization, as well as to optimize the quality of the cares provided.	Level IV

Table 2 – Data Extraction.

Header of the article/ Periodical	Author(s)/Year	Goal(s)	Type of Participants/ Period of Time	Conclusions	Hierarchy Level
<b>Exploring the Association Between Nurse Workload and Nurse-Sensitive Patient Safety Outcome Indicators</b> The Journal of Nursing Research	Li-Fang Liu; Sheuan Lee; Pei-Fang Chia; Shu-Ching Chi; Yu-Chun Yin 2012	To understand the workload of nurses. To determine the relation between the nurses' workload and markers of the nursing results related to the clients' safety.	1358 nurses December 1, 2008 to february 28, 2009.	Taskforce of nurses is positively correlated with the results achieved by clients.	Level IV
<b>Nurse burnout in China: a questionnaire survey on staffing, job satisfaction and quality of care</b> Journal of Nursing Management	Minmin Lu; Hui Ruan; Weijie Xing; Yan Hu. 2015	To determine what extend the lack of nurses affects the professional satisfaction and the quality of the provided nursing care.	873 nurses 2009.	The nurses' allocation is related with the professional satisfaction and with the quality of the nursing care. The nursing leaders should, therefore, maintain client/nurse ratios, as well as, adopt strategies to increase the professional satisfaction and evaluate its effects.	Level IV
<b>Nurse Staffing Levels Make a Difference on Patient Outcomes: A Multisite Study in Chinese Hospitals</b> Journal of Nursing Scholarship	Xiao-wen Zhu BSN; Li-ming You; Jing Zheng; Ke Liu; Jin-bo Fang; Shu-xiao Hou; Min-min Lu; Ai-li Lv; Wei-guang Ma; Hong-hong Wang; Zi-jing Wu & Li-feng Zhang 2012	To determine the relation between the nurses' allocations and the clients' results.	7,802 nurses and 5,430 clients.	The results reveal that inappropriate allocations in nursing can result in unaccomplished needed nursing care and negative and harmful results to clients.	Level IV



After the data extraction from the articles (Table 2) we can find in all a relation between the nursing allocations and the quality of the care provided, with IV evidence level. Although it is not always possible to evaluate the quality of the care from the clients' perspective (2 studies), this has been evaluated from the nurses' perspective (6 studies), through questionnaires or daily records.

#### *Data summary*

All the extracted information is systematically presented and was collected by two independent reviewers. A narrative summary for quantitative data was used to the synthesis of studies.

## RESULTS PRESENTATION

---

The studies included in the systematic review of literature were conducted between 2011 and 2017 and determine clearly and closely the investigation issue, its goals, the sample and the data collection method, leaving no reasons of a doubt of its inclusion, pitching in, this way, to the collection of fundamental evidence to the understanding of the concerned topic.

Magalhães et al.<sup>(11)</sup> in his quantitative study that evaluates the nurses' workload based on the relation between the average number of clients and professionals in the day shifts (morning and afternoon) and the ratio clients/nurses and nursing technician, based on the number of professional who have worked from Monday to Friday, with a sample of 157.481 clients, 126 nurses and 376 nursing technician, noticed a significant relation between the workload and the increase of the interment time as well as the adverse events.

Similarly, in the study of Liu et al.<sup>(12)</sup> there is a significant association between the nurses workload and the clients' interment time, meaning that the increase of nursing teams' workload has an impact in the quality of the clients care and safety and a proper number of nurses per team promotes a safe care environment.

On the other hand, the study conducted by Siedine et al.<sup>(13)</sup> emphasizes the importance of the working environment in the nursing care provided and the earnings in health for clients. In fact, a favorable working environment, which is only possible with an up qualified nurses benefiting clients as far as nursing care goes.

These results meet the results of a study conducted in Thailand, which intended to determine the impact of the working environment and the nursing team on themselves. Aiken et al.<sup>(14)</sup> realized a decrease on the nurse's wear out and an improvement in the quality of the treatment when there was an uplift of the working environment. In terms of clinical relevance, this study states that nurses should work together with other professionals to establish measurements in order to achieve a safe level of human resources and favorable working environment for the nursing practice.

In another study, conducted in Taiwan, aiming to determine the relation between the nurses' workload and the nursing markers related with the clients' safety, the authors achieved as a result a significant association between the extra working hours and episodes of fall, medication error among others<sup>(15)</sup>. They have also verified that there is a correlation between the proper number of nurses' team and the clients' results markers.

A study in China, with the purpose of examine how the nursing team affects the job satisfaction and the quality of care, presented, as results, high levels of burnout related with work and dissatisfaction with it<sup>(16)</sup>. These authors refer that the decrease in the number of clients per nurses would be auspicious to the improvement in the health care.

Another study also conducted in China, verified positive effects in the quality of the provided nursing care to customers when the numbers of professionals increased<sup>(12)</sup>. To conclude, the authors state that an inappropriate nursing team can end up in insufficient nursing care and, consequently, in negative results to the clients' health.

Therefore, we can ascertain that the analyzed studies, in a general way, suggest that a higher ratio client/nurse increases the number of internment days, the adverse events, meaning an increase on the nurses' workload, which diminishes the quality of nursing care.

## CONCLUSION

---

None of these studies has been conducted in the European continent, which means that there is still urgent to develop investigation studies that approach this phenomenon, contributing to the clients' safety and the quality of the nursing care provided both in a hospital and community context.

In fact, there are several studies among to evaluate the occurrence of adverse events and their impact in the internment time and clients' mortality. However, it is still important to include variables that relate the occurrence of those adverse events with the client/nurse ratio.

Future studies should contemplate on the evaluation of the nursing care quality on both the nurse as well as the client perspective, using for that an objective method of data collection. Thereby, we face the need to operationalize the safe allocation concept to universal level.

It is yet to clarify the importance given and the way human resources directors in nursing assure a competent team to accomplish successful results, once the safe allocation implies a proper number but also the proper level of qualification and profile.

In conclusion, the studies included in the present systematic review of literature answer the initial question enhancing the importance to assure safe allocations in nursing, once they promote a healthy working environment, assure the quality of the nursing care provided, improve the clients' safety and allows the customization and individualization of the nursing cares, as well as the willing to promote health and nursing teaching.

## BIBLIOGRAPHIC REFERENCES

---

1. Freitas MJ. Dotação segura para a prática de enfermagem: um contributo para a gestão de unidades de saúde. Lisboa. Tese [Doutorada em Enfermagem] - Universidade Católica Portuguesa; 2015.
2. Conselho Internacional de Enfermeiros. Dotações seguras salvam vidas - Instrumento de informação e ação [Internet]. 2006 [Cited on 15 Sep, 2018]. Available from: [http://www.ordemenfermeiros.pt/publicacoes/documents/kit\\_die\\_2006.pdf](http://www.ordemenfermeiros.pt/publicacoes/documents/kit_die_2006.pdf)
3. Poeira AF. Rotatividade externa dos enfermeiros em Portugal. Porto. Tese [Doutorada em Ciências de Enfermagem] - Instituto de Ciências Biomédicas Abel Salazar da Universidade do Porto; 2017.
4. Mezomo JC. Gestão da qualidade na saúde: princípios básicos. São Paulo: Manole; 2001. 301 p.

5. Roque KE, Tonini T, Melo ECP. Eventos adversos na unidade de terapia intensiva: impacto na mortalidade e no tempo de internação em um estudo prospectivo. *Cad. Saúde Pública*. 2016; 32(10):1-15.
6. Forster AJ, Worthington JR, Hawken S, Bourke M, Rubens F, Shojanian K, *et al*. Using prospective clinical surveillance to identify adverse events in hospital. *BMJ Qual Saf* 2011; 20:756-63.
7. Sousa P, Uva AS, Serranheira F, Leite E, Nunes C. Segurança do doente: eventos adversos em hospitais portugueses: estudo piloto de incidência, impacto e evitabilidade. Lisboa: Escola Nacional de Saúde Pública, Universidade de Lisboa; 2011.
8. Ordem dos Enfermeiros. Norma para o cálculo de dotações seguras dos cuidados de enfermagem [Internet]. 2014 [Cited on 15 Sep, 2018]. Available from: [http://www.ordemenfermeiros.pt/legislacao/Documents/LegislacaoOE/PontoQuatro\\_Norma\\_de\\_DotacoesSeguras\\_dos\\_Cuidados\\_de\\_Enfermagem\\_AG\\_30\\_05\\_2014\\_aprovado\\_por\\_maioria\\_proteg.pdf](http://www.ordemenfermeiros.pt/legislacao/Documents/LegislacaoOE/PontoQuatro_Norma_de_DotacoesSeguras_dos_Cuidados_de_Enfermagem_AG_30_05_2014_aprovado_por_maioria_proteg.pdf)
9. Joanna Briggs Institute. Systematic Review Resource Package [Internet]. 2015 [Cited on 15 Sep, 2018]. Available from: [https://joannabriggs.org/assets/docs/jbc/operations/can-synthesise/CAN\\_SYNTHSISE\\_Resource-V4.pdf](https://joannabriggs.org/assets/docs/jbc/operations/can-synthesise/CAN_SYNTHSISE_Resource-V4.pdf)
10. Melnyk BM, Fineout-Overholt E. Evidence-Based Practice in Nursing & Healthcare: A Guide to best Practice'. Second edition. Philadelphia: Wolters Kluwer Health; 2011.
11. Magalhães AMM, Costa DG, Riboldi CO, Mergen T, Barbosa AS, Moura GMSS. Association between workload of the nursing staff and patient safety outcomes. *Rev Esc Enferm USP*. 2018; 51: e03255. Doi: <http://dx.doi.org/10.1590/S1980-220X2016021203255>
12. Liu LF, Lee S, Chia PF, Chi SC, Yin YC. Exploring the association between nurse Workload and nurse-Sensitive patient safety Outcome Indicators. *Journal of Nursing Research*. 2012; 20(4):300-309. Doi: 10.1097/jnr.0b013e3182736363
13. Coetzee SK, Klopper HC, Ellis SM, Aiken LH. A tale of two systems—Nurses practice environment, well being, perceived quality of care and patient safety in private and public hospitals in South Africa: A questionnaire survey. *International Journal of Nursing Studies*. 2013; 50(2): 162-173. Doi: <https://doi.org/10.1016/J.IJNURSTU.2012.11.002>
14. Aiken L, Aunguroch Y, Kunaviktikul W, Nantsupawat A, Srisuphan W, Wichaikhum O. Impact of Nurse Work Environment and Staffing on Hospital Nurse and Quality of Care in Thailand. *Journal of Nursing Scholarship*. 2011; 43(4):426-433. Doi: <https://doi.org/10.1111/j.1547-5069.2011.01419.x>

15. Zhu X , You L , Zheng J, Liu K, Fang J, Hou S, Lu M, Lv A, Ma W, Wan H, Wu Z., Zhang L. Nurse Staffing Levels Make a Difference on Patient Outcomes: A Multisite Study in Chinese Hospitals. *Journal of Nursing Scholarship* 2012; 44:266-273. doi: 10.1111/j.1547-5069.2012.01454.x
16. Lu M, Ruan H, Xing W, Hu Y. Nurse burnout in China: a questionnaire survey on staffing, job satisfaction, and quality of care. *Journal of Nursing Management*. 2015; 23:440-447. Doi: <https://doi.org/10.1111/jonm.12150>

Correspondence: [lucilia.nunes@ess.ips.pt](mailto:lucilia.nunes@ess.ips.pt)