ORIGINAL

Assessment of nurses' medication problems in relation to their pharmacological competencies in an Intensive Care Unit of a public hospital in the city of Rosario in September 2021

Valoración de la problemática medicamentosa de los enfermeros en relación a sus competencias farmacológicas en una Unidad de Terapia Intensiva de un hospital público de la ciudad de Rosario en setiembre de 2021

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ABSTRACT

Introduction: Pharmacological competence in Nursing is fundamental to guarantee patient safety and prevent errors related to medication administration, especially in Intensive Care Units (ICU), where patient conditions demand precise pharmacological management. This study aimed to describe the assessment of nurses' medication problems in relation to their pharmacological competencies in an ICU of a public hospital in the city of Rosario in September 2021.
Methods: A non-experimental, descriptive, cross-sectional and quantitative approach study was conducted. The population consisted of 27 nurses who met the inclusion and exclusion criteria. For data collection, a self-administered survey was used, composed of 31 closed questions and one open question. The instrument was validated by means of a pilot test applied to four nursing supervisors with experience in ICUs. The results were analyzed exclusively for this specific population.
Results: The nurses surveyed showed a predominance of technical training and expressed dissatisfaction with the pharmacological training received during their academic stage. Although they showed interest in continuing education, they pointed out that many of the previous training courses lacked specific content in pharmacology. Knowledge of general pharmacology reached a level of correct answers above 75%, while in therapeutic pharmacology the results were favorable for drugs frequently used in the ICU and regular for those less frequently used. The most relevant problems identified included pharmacological learning limited to the work environment, individual decisions in drug preparation and administration, and uncritical execution of medical prescriptions.

Conclusions: The study evidences the need to strengthen the pharmacological training of nurses, both in the academic stage and in continuous training, in order to improve safety in the administration of medications in the UTI. The results underline the importance of integrating educational strategies that include specific pharmacology content and that encourage a critical and reflective approach in professional practice. These actions will contribute to prevent errors, optimize the quality of care and consolidate pharmacological competencies in the nursing team.

Keywords: Nursing; medication problems; pharmacological competencies.

RESUMEN

Introducción: La competencia farmacológica en Enfermería es fundamental para garantizar la seguridad del paciente y prevenir errores relacionados con la administración de medicamentos, especialmente en Unidades de Terapia Intensiva (UTI), donde las condiciones de los pacientes exigen un manejo farmacológico preciso. Este estudio tuvo como objetivo describir la valoración de la problemática medicamentosa de los enfermeros en relación con sus competencias farmacológicas en una UTI de un hospital público de la ciudad de Rosario en septiembre de 2021.
Métodos: Se realizó un estudio no experimental, descriptivo, transversal y de enfoque cuantitativo. La población estuvo constituida por 27 enfermeros que cumplían con los criterios de inclusión y exclusión. Para la recolección de datos, se utilizó una encuesta autoadministrada de elaboración propia, compuesta por 31 preguntas cerradas y una abierta. El instrumento fue validado mediante una prueba piloto aplicada a cuatro supervisoras de enfermería con experiencia en UTI. Los resultados se analizaron exclusivamente para esta población específica.
Resultados: Los enfermeros encuestados presentaron un predominio de formación técnica y expresaron inconformidad con la formación farmacológica recibida durante su etapa académica. Aunque mostraron interés en la formación continua, señalaron que muchas de las capacitaciones previas carecieron de contenidos específicos en farmacología. Los conocimientos en farmacología general alcanzaron un nivel de respuestas correctas superior al 75%, mientras que en farmacología terapéutica los resultados fueron favorables para los fármacos de uso frecuente en la UTI y regulares para aquellos menos utilizados. Las problemáticas más relevantes identificadas incluyeron el aprendizaje farmacológico limitado al ámbito laboral, las decisiones individuales en la preparación y administración de medicamentos y la ejecución acrítica de las prescripciones médicas.
Conclusiones: El estudio evidencia la necesidad de fortalecer la formación farmacológica de los enfermeros, tanto en la etapa académica como en la capacitación continua, para mejorar la seguridad en la administración de medicamentos en la UTI. Los resultados subrayan la importancia de integrar estrategias educativas que incluyan contenidos específicos de farmacología y que fomenten un abordaje crítico y reflexivo en la práctica profesional. Estas acciones contribuirán a prevenir errores, optimizar la calidad del cuidado y consolidar las competencias farmacológicas en el equipo de enfermería.

Palabras clave: Enfermería; problemática medicamentosa; competencias farmacológicas.

INTRODUCTION

The use of medication is an essential component of healthcare, especially in critical care units such as Intensive Care Units (ICUs), where pharmacological management has a direct impact on the patient's recovery and safety. Nursing, as a fundamental discipline in the administration of medication, plays a key role in the prevention of medication errors. Although these errors may have various multifactorial causes, such as failures in prescription, preparation, or administration, they usually position the nurse as the last

line of defense before the error affects the patient. This responsibility underlines the need for solid pharmacological competencies among nursing professionals.

Previous studies have documented the inadequacy of pharmacological training during nurses' academic training, which influences the occurrence of errors and adverse events. According to Montero Vizcaíno et al. (2017), more than 60% of nurses surveyed in a neonatal unit were unable to identify adverse drug reactions despite handling commonly used drugs. Similarly, research like that of Vaca Aúz et al. (2016) identified that the most frequent errors in critical care units stem from inadequate administration techniques and failure to comply with schedules and medical instructions. These findings demonstrate the direct relationship between the lack of pharmacological knowledge and the occurrence of errors in professional practice.

The present study aims to analyze the pharmacological competencies of the nurses in an ICU in a public hospital in the city of Rosario to identify areas of strength and weakness in managing medications and assess the medication-related problems they face in their daily practice. In a context where medication administration is a critical task, the nurse's ability to correctly manage therapeutic pharmacology improves patient safety, strengthens professional practice, and reduces the incidence of adverse events.

The evaluation is framed within a rigorous ethical and methodological context, guaranteeing the participants' confidentiality and the results' validity. This approach allows for a comprehensive approach to understanding the impact of academic and continuing education on clinical practice and proposes strategies to improve pharmacological competencies in nursing. This work seeks to contribute to the debate on the need to strengthen pharmacological training at the academic and institutional levels to guarantee safe and quality care in highly complex sectors such as ICUs.

What is the assessment of the medication-related problems of nurses in an Intensive Care Unit about their pharmacological skills?

General objective

To describe the assessment of medication-related problems of nurses about their pharmacological skills in an Intensive Care Unit of a public hospital in the city of Rosario in September 2021.

METHODS

Design

In September 2021, a non-experimental, descriptive, cross-sectional, quantitative study was conducted in the ICU of a public hospital in the city of Rosario.

The study was conducted in an ICU with 13 beds, modern facilities, and furniture. Fifty-four nurses report to a Head, a Deputy Head, and a Coordinator. The service has internet access, a bibliographic archive, and authorization for nurses to consult. The medication in the two emergency trolleys has the containers labeled with the expiration dates.

Participants

The number of nurses in the ICU selected for the study was 54. The inclusion criterion applied to this group was that they had to have worked there for at least a year, reducing the number of nurses to 47. Applying the exclusion criteria, eight nurses who had been absent for long periods during the last year, four who were absent during the instrument application, and eight who did not agree to participate were excluded. Finally, the study population of 27 nurses who met the criteria was addressed; therefore, the results can be applied to this population exclusively.

Techniques and instruments

It was decided to use the survey technique using a self-administered questionnaire of our design with 31 closed questions and one open question. The first 24 items made it possible to determine the pharmacological competencies of the nurses; the initial eight items include the demographic categories of age and gender and inquire about academic qualifications, updates carried out, and professional

seniority; and include an open question. The following 16 items reveal the participants' pharmacological knowledge using statements with multiple choice answers or a selection of true or false. Finally, eight statements measure the assessment of medication-related problems of nurses using a Likert-type scale with three options (frequent, infrequent, and does not happen).

Pilot test

The instrument was tested on four nursing supervisors from the same institution who had worked as expert nurses assigned to the ICU. Criteria such as understanding the items and the answer options, the instrument's complexity, the participants' motivation when answering, and the time taken to complete the survey were reviewed. It was concluded that the instrument is understandable, easy to apply, and motivating for those who agree to complete it. This pilot test made it possible to improve the internal validity of the study. Throughout September 2021, the researcher went to the healthcare center and interviewed each unit of analysis, explaining the project, inviting them to participate, and explaining the corresponding ethical considerations. If they accepted, this interview ended with signing the informed consent and completing the survey on paper.

Ethical considerations

The study was conducted entirely within an ethical context. Its purpose was to fulfill an academic requirement that was sufficiently explained to the nurses who agreed to take part in it.

Furthermore, permission was obtained from the hospital authorities to collect the data necessary to meet the proposed objectives.

The participating nurses met the selection and exclusion criteria and were informed of the study's nature and objective. Before inclusion, they were informed of their right to accept or refuse to participate and of the possibility of withdrawing from the study if they wished.

The researcher presented the survey to them individually and clarified any doubts they may have had. Once they had agreed to participate, they signed an informed consent form. The identity of the nurses and the information they revealed was kept safe by the researcher, who guaranteed anonymity and confidentiality.
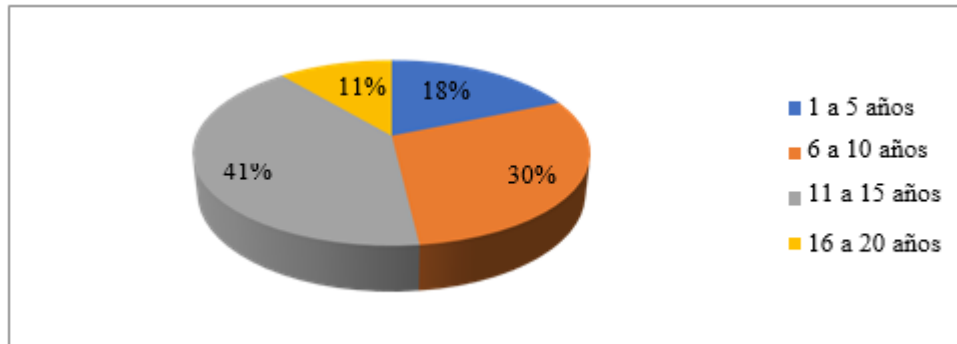
RESULTS

The study population consisted of 27 nurses, the majority of whom were women (71.42%) and had a homogeneous age distribution.

Twenty-three undergraduate nurses (85.18%) and four nursing graduates represented the level of academic training. With regard to continuous training, all expressed an interest in training in the problem and having attended courses, talks, symposia, conferences, or other types of refresher training, but 40.74% of these proposals did not include pharmacological skills.

About professional/work seniority as an adult ICU nurse, 82% of the population has more than 6 years of experience.

Graph 1. Professional/work experience as an adult ICU nurse of nurses surveyed in the ICU, September 2021.

Source: data collected in the survey.

The nursing team survey reveals a high percentage of seniority in adult ICUs. The results showed a clear predominance of technical qualifications and training, but only just over half of the training activities they selected included training in pharmacological skills. The open question in the survey made explicit the dissatisfaction of nurses about pharmacological training during their respective study programs: 11 said that what was taught in the training stages was not of a sufficient level; 6 believed that it is necessary to learn pharmacological skills during the 5 years of the degree course, six thought that the training is helpful when a nurse teacher leads it. Four said that they had graduated without having mastered it.

Graph 2. Opinion regarding the learning of Pharmacology during the degree program. Nurses surveyed in the ICU, September 2021.
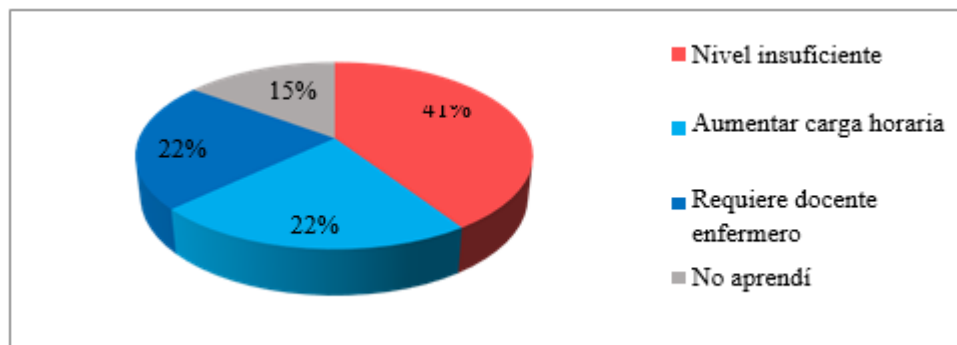
Source: data collected in the survey.

It is worth remembering that Machado de Azevedo et al. (2012) determined in urgent and emergency units of the East Health District of Goiânia - Goiás, Brazil - that, out of 37 nurses surveyed, 79.2% reported that the knowledge of pharmacology acquired during graduation was insufficient for professional practice; 81.1% considered that the content provided and the number of hours dedicated to the subject was inadequate and 96.2% that the relationship between pharmacology theory and practice was unsatisfactory. Montero Vizcaíno et al. (2017) state that the initial training of health professionals should be complemented by continuous training during professional practice because training deficits can "affect knowledge of procedures that should be mandatory in services" and propose that this ongoing training be implemented institutionally to improve the quality of patient care.

When knowledge of general pharmacology and therapeutics was evaluated, the following results were obtained:

Table 1. Absolute frequencies of correct and incorrect answers on general pharmacology and therapeutics knowledge of nurses surveyed in the ICU, September 2021.

Items	Correct	Incorrect	% Correct
a) Pharmacodynamics and pharmacokinetics (13 questions)	268	82	76,35
b) Inotropics (5 questions)	108	27	80,00
c) Sympathomimetics (4 questions)	95	13	87,96
d) Neuromuscular blockers (4 questions)	85	23	78,70
e) Alpha-2 receptor antagonists (3 questions)	63	15	81,48
f) Antiarrhythmics (1 question)	22	5	81,48
g) Vasodilators (3 questions)	43	38	53,08
h) Corticosteroids (3 questions)	65	16	80,24
i) Neuroleptics (1 question)	12	15	44,44
j) Sedatives and opioids (3 questions)	63	18	77,77
Total/average number of correct answers	824	252	69,41

Source: Author's own creation.

The answers to general pharmacology (pharmacodynamics and pharmacokinetics) are more than 75% accurate. About therapeutic pharmacology, the results show a high average of correct answers in the field of sympathomimetic drugs compared to other types of drugs, such as vasodilators and neuroleptics. It can be interpreted that the higher average of correct answers about the group of medicines commonly used in the service - particularly adrenaline - is because the management of cardiorespiratory arrest is one of the most frequent activities in this area; in contrast, the drugs with the highest number of incorrect answers are not commonly used.

Graph 3. Percentage relationship of correct and incorrect answers on general and specific pharmacology knowledge of nurses surveyed in the ICU, September 2021.
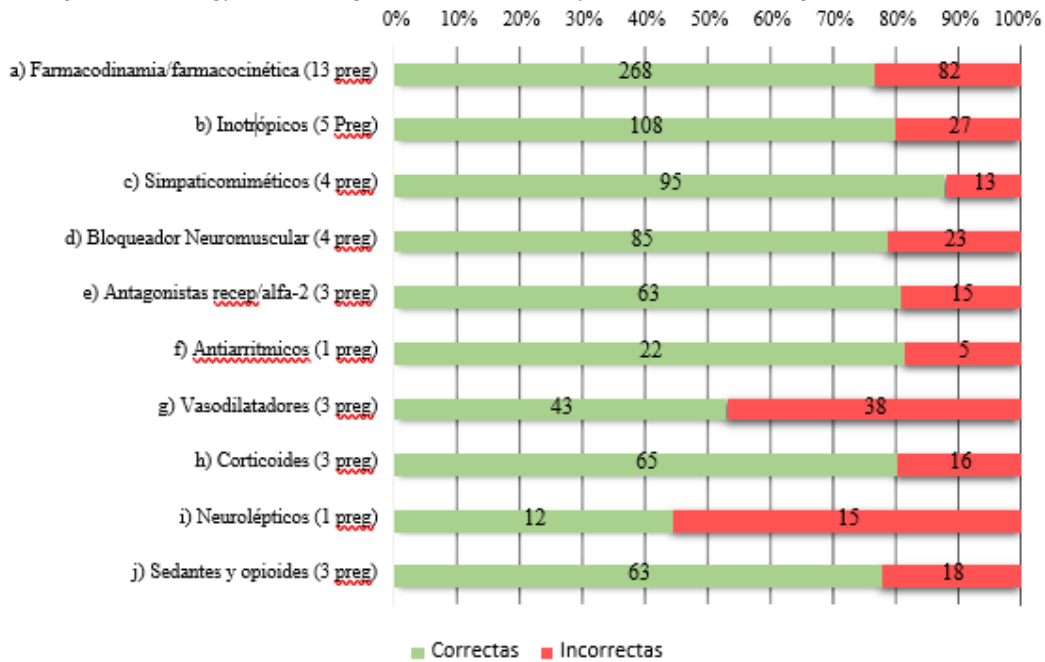
Source: Author's own creation.

In the assessment of drug-related problems in the ICU, the respondents indicated the frequency of occurrence according to 8 proposed items.

Table 2. Absolute frequencies of assessment of drug-related problems in the ICU. Nurses surveyed, September 2021.

	Frequent	Infrequent	It doesn't happen
1. Combines without knowledge of interaction	5	13	9
2. Contaminates preparation and administration	0	18	9
3. Ignores adverse/side effects	9	17	1
4. Does not seek information when in doubt	1	17	9
5. Limited information is used	8	15	4
6. Limited to medical indication	11	11	5
7. Individual competence of the nurse	19	6	2
8. Obtaining knowledge on the job	23	4	0
Totales	76	101	39

Regarding the occurrence of problems without discrimination, a minority could be observed in the "do not happen" category.

Graph 4. Percentage occurrence of assessment of drug-related problems in the ICU. Nurses surveyed, September 2021.
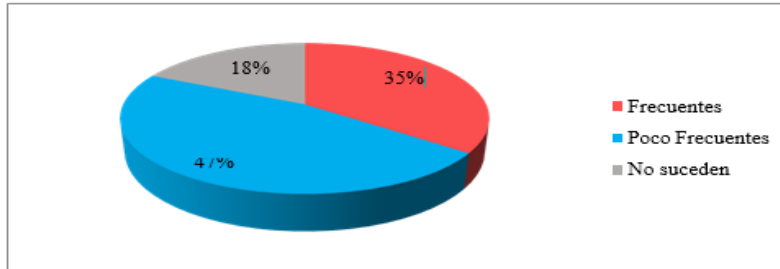
Source: Author's own creation.

The percentage of responses from the nurses surveyed regarding the assessment of medication-related problems in the ICU clearly shows the predominance of frequent occurrence about the individual decisions made by professionals in the preparation and administration of medication (70.37%) and in obtaining knowledge about pharmacology exclusively in the workplace (85.18%). No less important is the frequent problem of nurses uncritically limiting themselves to medical indications (40.74%). Learning pharmacological management in the workplace can leave out specific information on adverse effects and drug interactions. Montero Vizcaíno et al. (2017) determined that most nurses in a Neonatology department knew the medications they commonly used, but 62.5% could not identify adverse reactions. Vaca Aúz et al. (2016) determined that, out of 26 adverse events detected over 30 days, all the events were potentially preventable, and the majority were the result of poor technique when administering the medication and failure to comply with the schedule and medical indications. Molina Gómez et al. (2019) affirm that consolidating pharmacological competencies in nursing would prevent adverse events caused by errors in medical prescription.

Graph 5. Detailed percentage breakdown of assessment of medication-related problems in the ICU. Nurses surveyed, September 2021.
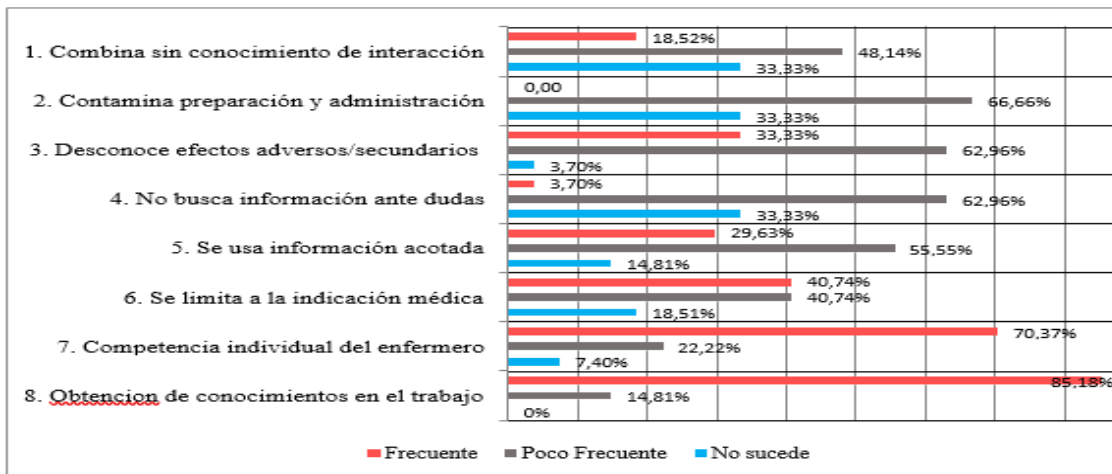
Source: Author's own creation.

CONCLUSIONS

The nurses surveyed showed a predominance of technical training and good work/professional seniority in the adult ICU. They expressed broad dissatisfaction with the skills built up during their academic training. They called for a more significant workload and a more significant presence of nursing issues in the teaching orientation of the courses. Although they expressed an interest in training in pharmacological issues and having attended courses, talks, symposia, conferences, or other forms of updating and continuing education, many of these proposals did not include pharmacological competencies.

The general pharmacology assessment had a good level of correct answers. The therapeutic pharmacology test had a good level of correct answers in the group of sympathomimetic active ingredients, in the group of alpha-2 receptor antagonists, in the group of antiarrhythmics, in the management of corticoids, in the group of inotropic drugs, in the group of neuromuscular blockers and the group of sedatives and opioids. In contrast, the average number of correct answers was low for the group of vasodilators and neuroleptics. This performance correlates with the medication used most and least frequently in the service. In assessing medication-related problems in the ICU, according to 8 proposed items, only 35% of the opinions rated them as frequent; the rest thought that they did not happen or were infrequent. The individual decisions made by professionals in the preparation and administration of medication were considered the most frequent medication-related problem, followed by the habit of obtaining knowledge about pharmacology exclusively in the workplace.

A suggestion for the present experience can be drawn from the opinion of the professionals regarding the level of training obtained during the degree course and the need to update, deepen, and extend the pharmacological subject matter of the curriculum until the end of the degree course, including the scheduling of specific institutional training in the health effectors. One finding that emerges is the proposal to construct an interdisciplinary medication use system to improve patient safety and support the healthcare team in the personal and professional exposure resulting from professional practice in these critical sectors.

REFERENCES

1. Administración Nacional de Medicamentos, Alimentos y Tecnología Médica (10 de mayo de 2022). Formulario de comunicación de eventos adversos. https://www.argentina.gob.ar/anmat

2. Aimacaña Guayta, E. (2019). Aplicación de los 10 correctos en la administración de medicación por parte del personal de enfermería en el Hospital Provincial General Docente Ambato. Universidad Técnica de Ambato, Ecuador. Facultad Ciencias de la Salud. Carrera de Enfermería. https://repositorio.uta.edu.ec/bitstream/123456789/29444/2/

3. Aldana de Becerra, G. y Ruiz, J.R. (2010). La formación por competencias y la calidad de la educación. Entrevista a Sergio Tobón Tobón. Dialnet-LaFormacionPorCompetenciasYLaCalidadDeLaEducacionR-3701429Argentina Presidencia/Boletín Oficial (8 de junio de 2022). Legislación y avisos oficiales. Resolución 2721/2015. https://www.boletinoficial.gob.ar/detalleAviso/primera/135700/20151109

4. Bunk, G. (1994). La transmisión de las competencias en la formación y perfeccionamiento profesionales de la RFA. G - Revista europea de formación profesional, 1994 - dialnet.unirioja.es

https://scholar.google.com.ar/scholar?q=bunk+1994+competencias+profesionale
s&hl=es&as_sdt=0&as_vis=1&oi=scholart

5. Calderón Mediavilla, N. (2021). Farmacovigilancia: Implicación Del Profesional De Enfermería. Tesis de grado. Facultad de Enfermería, Universidad de Cantabria. https://repositorio.unican.es/xmlui/bitstream/handle/10902/22155/CALDERON%20MEDIAVI
LLA,%20NOELIA.pdf?sequence=1

6. Encina Contreras, P. y Rodríguez Galán, M.A. (2016). Errores de Medicación. Subdepartamento Farmacovigilancia, Instituto de Salud Pública, Ministerio de Salud, Gobierno de Chile
https://www.ispch.cl/newsfarmacovigilancia/07/images/parte04.pdf

7. Escrivá Gracia, J. (2017). Riesgo de errores de medicación y conocimientos de farmacología del profesional de enfermería en una unidad de cuidados críticos. Tesis doctoral. Facultat D'infermeria I Podologia, Departament D'infermeria, Universitat de Valencia. https://core.ac.uk/download/pdf/84750116.pdf

8. Gobierno de Catalunya (2008). Boletín de Prevención de errores de medicación de Cataluña. Vol. 6, núm. 2 • mayo - septiembre 2008. Departamento de Salud. https://scientiasalut.gencat.cat/bitstream/handle/11351/2520/butll_prev_errors_
medicacio_catalunya%20_2008_06_02_cas.pdf?sequence=2&isAllowed=y

9. Honorable Congreso de la Nación (6 de junio de 2022). Normativa Ley 24004/1991. Enfermería, Ejercicio profesional. Fecha de sanción 26-09-1991, Publicada en el   Boletín Nacional del 28-Oct-1991.
https://www.argentina.gob.ar/normativa/nacional/ley-24004-403/texto

10. Institute for Safe Medication Practices [ISMP] (14 de junio de 2022). Inicio página institucional. https://www.ismp.org/about.

11. Instituto para el Uso Seguro de los Medicamentos (15 de junio de 2022). Inicio página institucional. https://www.ismp-espana.org/

12. Instituto para el Uso Seguro de los Medicamentos (15 de junio de 2022). Boletín n° 51. Errores de medicación de mayor riesgo para los pacientes notificados en 2021. https://www.ismp-espana.org/noticias/view/173

13. Machado de Azevedo Filho, F., Soares Martins, I.M., Rodrigues Silva Soares, C.S., Gomes Fazendeiro, P., Tanferri de Brito Paranaguá, T., y Queiroz Bezerra, A.L. (2012). Administración de medicamentos: conocimiento de los enfermeros del sector de urgencia y emergencia. Enferm. glob. vol.11 n.26 Murcia Apr. 2012.

14. Enfermería Global 11(26), 54-69 On-line   version   ISSN   1695-6141. https://dx.doi.org/10.4321/S1695-61412012000200005.

15. Macías Vázquez, A. (2014). Criterios que emplea el personal de Enfermería para la dilución de medicamentos intravenosos en el adulto.   Tesis   para   obtener   el   postgrado   de   especialista.   Universidad   Veracruzana   Campus Xalapa,   Especialización de   Enfermería   en   Cuidados   Intensivos   del   Adulto   en   Estado   Crítico. https://cdigital.uv.mx/bitstream/handle/123456789/46451/MaciasVazquezAngel.
pdf?sequence=2&isAllowed=y

16. Molina Gómez, L., Quintero Rendón, K., Vallejo Gómez, M. y Velásquez Pérez, K. (2019). Conocimiento farmacológico en estudiantes de último año de enfermería de la Corporación Universitaria Adventista. Repositorio Institucional. Facultad de   Ciencias   de   la   Salud,   Medellín,   Colombia.
http://repository.unac.edu.co/bitstream/handle/11254/916/Proyecto%20de%20Gr
ado.pdf?sequence=1&isAllowed=y

17. Ministerio de Salud de Argentina (10 de mayo de 2022). ANMAT. https://www.argentina.gob.ar/anmat

18. Montero Vizcaíno, Y., Izquierdo Santa Cruz, M., Vizcaíno Alonso, M.C. y Montero Vizcaíno, Y.Y. (2017). Conocimiento del manejo práctico de fármacos en Enfermería. Servicio de reanimación neonatal. Hospital Ginecobstétrico Guanabacoa. Revista Habanera de Ciencias Médicas, vol. 16, núm. 5, pp. 822- 831. Universidad de Ciencias Médicas de La Habana. Ciudad de La Habana, Cuba   versión On-line ISSN 1729-519X

19. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1729- 519X2017000500014

20. Morón Rodríguez, F. y Levy Rodríguez, M. (2002). Farmacología General. La Habana: Editorial Ciencias Médicas; 2002. ISBN:959-212-070-6.

21. National Coordinating Council for Medication Error Reporting and Prevention [NCC MERP]- (14 de junio de 2022). Página institucional. https://www.nccmerp.org/leadership-member-organizations

22. Organización Mundial de la Salud [OMS] (2017). El tercer reto mundial por la seguridad del paciente: reducir los daños causados por los medicamentos. Boletín de la Organización Mundial de la Salud, Agosto (2017); p.95. https://argentina.campusvirtualsp.org/el-tercer-reto-mundial-por-la-seguridad-   del-paciente-reducir-los-danos-causados-por-los-medicamentos

23. Organización   Mundialde   la   Salud [OMS] (2019). Seguridad   del paciente.https://www.who.int/es/news-room/fact-sheets/detail/patient-safety

24. Osinachi, Ch. (2004) Farmacología para la enfermería. Librería Arkadia. Bs. As., Argentina. Pp1   y   2. https://alumnosenfermeriauac2014.files.wordpress.com/2016/09/farmacologogia-para-la-enfermeria_-edicion-2004.pdf

25. Otero, M.J. (2003). Errores de medicación y gestión de riesgos. Revista Española de Salud Pública,   77(5),527-540. ISSN:11355727.https://www.redalyc.org/articulo.oa?id=17077503.

26. Otero, M.J., Martín, R., Robles, M. y Codina, C. (2002). Errores de Medicación. Farmacia Hospitalaria. España: Fundación Española de Farmacia Hospitalaria; 2002. p. 713-47.

27. Parra, D.I., Camargo-Figuera, F.A. y Rey Gómez, R. (2012). Eventos adversos derivados del cuidado de enfermería: flebitis, úlceras por presión y caídas. Enfermería Global versión On-line ISSN 1695-6141.   Enferm.   glob.   vol.11   no.28   Murcia   oct.   2012. cielo.isciii.es/scielo.php?script=sci_arttext&pid=S169561412012000400010#:~:text=Un%20Evento%20adverso%20(EA)%20son,dem ora%20del%20alta%2C%20a%20la

28. Páez Arellano, T.G., Meneses Dávila, M.S., Hidrobo Guzmán, J.F., Jaramillo, D. y Álvarez Moreno, M. (2016). Enfermería Investiga. Investigación, Vinculación, Docencia y Gestión-Vol. 1 No. 3 2016 (Jul-Sep). https://dialnet.unirioja.es/servlet/articulo?codigo=6194255

29. Romero Viamonte, K. (2018). El conocimiento de la Farmacología en el profesional de enfermería. Enfermería Investiga, Investigación, Vinculación, Docencia y Gestión-Vol. 3 N° 2 p.   95-104.   DOI: http://dx.doi.org/10.29033/ei.v3n2.2018.07. https://dialnet.unirioja.es/descarga/articulo/6494657.pdf.

30. Sistema Nacional de Farmacovigilancia (22 de mayo de 2022). Eventos adversos. https://www.argentina.gob.ar/anmat/farmacovigilancia/notificanos/eventosadver sos

31. Vaca Aúz, J., Muñoz Navarro, P., Flores Grijalba, M.C., Altamirano Zabala, G.N., Meneses Dávila, M.S., Barahona Cisneros, M.E. y Ortega López, C.E. (2016). Eventos adversos relacionados con los cuidados de enfermería en el Hospital de Ibarra, provincia de Imbabura. Enfermería Investiga: Investigación, Vinculación, Docencia y Gestión, ISSN 2477-9172, ISSN-e

2550-6692, Vol. 1, Nº.   3,   2016,   págs.   102-106. https://dialnet.unirioja.es/servlet/articulo?codigo=6194257

32. Vera Carrasco, O. (2014). Enseñanza de la farmacología basada en competencias. Educación Medica Continua.   Cuadernos   Hospital   de   Clínicas versión impresa ISSN   1562-6776   Cuad.   -   Hosp.   Clín.   vol.55   no.4   La   Paz   2014. http://www.scielo.org.bo/scielo.php?script=sci_arttext&pid=S1652- 67762014000100006

33. Vergel Rivera, G.M., Tasé Martínez, M.J. y Groning Roque, E. (2009) Farmacología. Proceso de atención en enfermería. Editorial Ciencias Médicas. La Habana, Cuba.