



DOCENCIA - INVESTIGACIÓN

Is information literacy learning effective for nursing students?

¿Es efectivo el aprendizaje sobre alfabetización en información para estudiantes de enfermería?

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ABSTRACT

Objective: The structured development on informatics and long term information literacy skills are urgently required for undergraduate nurses. Therefore, the improvement in the skills of information literacy of nursing students and evaluation of the learning process were proposed.

Methods: A teaching-learning process on information literacy was developed with 80 students, who had to submit a report for evaluation of the learning process. A quasi-experimental design was used with a group for the evaluation of acquired knowledge, to which a pretest and post-test was applied.

Results: 82.5% of students passed the report. Almost all participants were satisfied with the learning process. In the self-assessment of knowledge acquired, the means obtained were significantly higher in the post-test, while the effect size was very high.

Conclusions: There is evidence that the teaching-learning process to improve information literacy has been effective. The main contribution has been to incorporate information literacy into the students' curriculum.

RESUMEN

Objetivo: Es urgente realizar programas dirigidos a las enfermeras de pregrado para desarrollar destrezas informáticas y sobre alfabetización de la información a largo plazo. Por ello se propuso

mejorar las destrezas en alfabetización en información de los/as estudiantes de Enfermería y evaluar el proceso de aprendizaje.

Metodología: Se ha desarrollado un proceso enseñanza-aprendizaje para la alfabetización informacional de 80 estudiantes, que debían presentar para la evaluación un informe del proceso de aprendizaje. Se ha utilizado un diseño cuasi experimental con un grupo para la evaluación de conocimientos adquiridos, al que se le aplicó un pretest y un postest.

Resultados: El 82.5% de los/as estudiantes ha superado el informe. Casi todos los participantes se han mostrado satisfechos/as con el proceso de aprendizaje. En la autovaloración de los conocimientos adquiridos, las medias obtenidas fueron significativamente mayores en el postest, siendo el tamaño de efecto muy grande.

Conclusiones: Existen evidencias de que el proceso enseñanza-aprendizaje para mejorar la alfabetización en información ha sido efectivo. La principal contribución ha sido incorporar la alfabetización de la información en el currículum de los/as estudiantes.

INTRODUCTION

Programs for undergraduate nurses to develop computer and long term information literacy ⁽¹⁾ skills are urgently needed. The new information and communication technologies (ICT) allow permanent access to increasing volumes of information available to everybody. Open access is an increasingly rapid and immediate way to ensure the availability of information and assist the visibility, use and impact of research by promoting a greater amount of available scientific information on a particular subject area, especially located in the most relevant data bases in the field ⁽¹⁻⁴⁾.

The use of ICT is also essential to ensure independent learning by providing digital resources: virtual campus, tele-learning through virtual teaching managers, use of virtual and/or remote laboratories, etc. In this framework, students face new pedagogical challenges, more practice-oriented, based on their own initiative, and the acquisition of skills for searching, processing and organizing the available scientific information. In these cases the teaching should allow students and future professionals to develop skills and strategies to access, process and manage the wealth of information available as well as knowing which tools are available, so that they can be proficient in the management of scientific literature on a particular subject area ^(1, 4, 5).

Teachers have to face a teaching-learning process with a pedagogical relationship based on tutoring, using more learning resources, and acquiring more skills of "virtualization" ^(1, 4, 5). Training in the use of information involves the development of an expert use of library services, and thus optimizes results in the education system ⁽⁶⁾. The students are active participants in their learning and have to acquire a range of skills that enables them to meet the specific skills in their areas of expertise, as they need to be able to handle the knowledge, update it, select and know the sources of information and to understand what they have learned, so as to be able to integrate it into their knowledge base and adapt it to new situations ^(1, 7, 8).

As an incipient learning process, information literacy is proposed where information technology and communication and e-learning are included, all of which is focused on digital literacy. Information literacy is defined as knowing when and why information is needed, where to find it, how to evaluate it, how to use it and how to communicate it ethically to others ⁽⁷⁾.

Obtaining skills in information literacy multiplies the possibilities of students' individual study, committing them to using a variety of information resources to expand their knowledge, ask knowledgeable questions and improve their critical thinking and the basis for their lifetime learning ^(1, 2, 9, 10). University libraries assume a constitutive function in their role of providing information skills. Therefore, to incorporate information literacy into curricular projects requires the joint efforts of teachers, librarians and administrators ^(9, 11).

There is little research on literacy skills in nursing students ⁽¹²⁾. In a research carried out in the United States of America (USA), only 33% of the coordinators of undergraduate nursing programs were identified as including computer skills, such as knowledge about the use of e-mail, word processing, bibliographic retrieval and Internet ⁽¹³⁾, in their curriculum. On the other hand, while previous authors claim that university students consider that their skills on the use of ICT are quite high, and are fairly satisfied with the teaching conditions in the subjects in which work is being supported by new technologies ⁽¹⁴⁾, in others, undergraduates students have inadequate knowledge about the resources that informatics has, or literature searches, which prevents them using ICT in different dimensions in which Nursing is related, i.e., teaching, research, management and support ^(3, 15).

Considering all this, a group of teachers of Nursing Degree at the University of Seville in the subject of Nursing Services Management set out to develop an experience to enhance students' skills in information literacy during the 2009 / 2010 year. In this work the experience, as well as the results obtained from the evaluation from the latter are presented.

MATERIAL AND METHODS

Development of the teaching-learning process

Nursing Services Management course belonged to the undergraduate nursing program, 93 students were enrolled in this course, of which 80 students participated in this educational experience, constituting 86% of the total.

The teaching-learning process on information literacy was conducted in five four-hour sessions, giving a total of 20 hours. The first two sessions were held in the computer labs in small groups; the third sessions was conducted individually or in pairs, while the fourth and fifth were for independent or self-managed student learning, thus encouraging their active learning. All the sessions were supervised by a tutor.

The planning and organization of the content and evaluation of the teaching-learning process were included in the course syllabus. The following organization was followed, taking into account the importance of informing the students about the main databases of interest in nursing ⁽¹⁶⁾:

Session I: 1 Designing a search strategy; 2 Practices in databases from the Spanish Superior Council of Scientific Research (Consejo Superior de Investigaciones Científicas, CSIC); 3 Presentation of bibliographies (APA, Vancouver, etc.) by using RefWorks; 4 Practice in location of journals in the library catalog "FAMA" and electronic resources of the University of Seville; 5 Management of interlibrary loan requests.

Session II: 1 Practice on use of MESH database to guide the search in PUBMED; 2 Practices in PubMed database; 3 Practices in SCOPUS database, including locating citations from journals and authors; 4 Practices in Journal Citation Report (JCR) for the impact factor and quartiles of the journals; 5 Practices in translations into Spanish of the abstracts.

These sessions were supported by tutorials available through the Virtual Learning platform of the course, which included multiple-choice questions for self-testing the acquired knowledge

Session III: In this session, first the students selected a topic of their interest related to the contents of the course syllabus, on which they had to perform a literature search (individually or in pairs) and hand in the title of the chosen topic and keywords to the tutor, so that he/she approved its adequacy prior to initiating the search. Second, the students learned about the characteristics of the presentation and requirements of the report on work process of information literacy, i.e., the bibliographic search. Third, individual control on the acquired knowledge in the teaching-learning process in the computer lab was performed.

Sessions IV and V: The purpose of these tutorial sessions was to promote students' independent learning in handling the management of scientific information with the tutor's support. These are conducted by face-to-face and/or not presential tutorials (e-learning and online tools).

The report on the working process of information literacy, which the students presented, had to contain the following elements: 1) search histories of two databases (PubMed and its analogous Spanish "index medicus español" [IME]); 2) the selected records of a search-history of each database used, together with summaries and translations of titles and abstracts in the case of PUBMED; 3) the bibliography in APA or Vancouver style using Refworks; 4) procedures performed in the SCOPUS database to acquire data of the citations from journals and the authors; 5) the factor impact and quartile of a journal in the JCR database; and 6) a full paper selected as being the most consistent with the proposed research topic, chosen from the records of the IME and PUBMED databases.

Evaluation of the experience

For the assessment the report prepared by students during independent work, the qualification criteria listed in Table 1 were followed. The following ranges were established: less than 0.7 points was considered as failed; 0.8 to 1 point was regarded as passed; 1.1 to 1.3 points was considered good; and from 1.4 to 1.6 points was considered outstanding.

Table 1. Qualification criteria of the reports.

Qualification criteria
<ul style="list-style-type: none"> - Presentation and adequacy of the selected records of a search-history of IME and PUBMED together with abstracts of articles in the most appropriate search-history related to the topic of interest - Translations into Spanish of "abstracts" from PUBMED - Presentation and adequacy of procedures for searches in SCOPUS database and journal and author's citations - Presentation of the bibliography according to Vancouver or APA using RefWorks - Presentation of the ISI Impact Factor and quartile of the selected journal -Presentation of the most appropriate article regarding to the topic of the interest selected

To evaluate the teaching-learning process, a pretest-post-test design was used with an only one experimental group, to which an anonymous, self-administered questionnaire was applied before and after the teaching-learning process. Age and sex/gender were collected as demographic variables. A scale of self-assessed knowledge, Likert-type, consisting of six items with five response options (1-strongly agree, 2-agree, 3-indifferent, 4-disagree and 5-strongly disagree) was applied. This scale obtained optimum Cronbach's alpha values in the pretest $\alpha = 0.76$ and 0.78 in the post-test. In the post-test two questions about the adequacy of learning and satisfaction of students with this (Table 2) were introduced.

Table 2. Items that constitute the pretest y post-test administered to nursing students.

Pretest Items	Post-test Items
1. I have enough knowledge to search in the IME (CSIC) database	1. I have enough knowledge to search in the IME (CSIC) database
2. 2. I have enough knowledge to search in the PUBMED database	2. I have enough knowledge to search in the PUBMED database
3. 3. I have enough knowledge to search in the SCOPUS database	3. I have enough knowledge to search in the SCOPUS database
4. 4.I have enough knowledge to find the scientific journal and author's citations in the SCOPUS database	4. I have enough knowledge to find the scientific journal and author's citations in the SCOPUS database
5. 5. I have enough knowledge to find the impact factor of scientific journals in the JCR database	5. I have enough knowledge to find the impact factor of scientific journals in the JCR database
6. I have enough knowledge to find scientific information in general	6. I have enough knowledge to find scientific information in general
	7. The theoretical and practical learning in small groups in the computer lab has been adequate
	8.Overall I am satisfied with the information literacy practices

A descriptive analysis of the study variables was performed. Given that the questionnaire items were measured on an ordinal scale, and showed a different distribution to normal in the dependent variables in the sample, i.e., in the different

questionnaire items in the pretest and post-test, as well as the full scale of self-assessed knowledge, the non-parametric Wilcoxon W test was applied to contrast the hypothesis of the existence of differences between the means of the responses to the scale of knowledge between the pre-post-test with a confidence interval of 95% ($p < .05$). Verification of whether the sample followed a normal distribution was performed by applying the Z Kolmogorov-Smirnov (K-S) test, accepting the alternative hypothesis, i.e., the distribution is different to normal, in the case that it was significant with a confidence interval of 95% ($p < .05$) (Table 3). Effect size was measured by calculating the standardized mean difference (d) for the following values: low = 0.2, medium = 0.5, high = 0.8. The SPSS 18.0 statistical program was used.

Table 3. Application of Kolmogorov-Smirnov test to the full scale of self-assessed knowledge in pre and post-test exposition.

	Item 1		Item 2		Item 3		Item 4		Item 5		Item 6		Self-assessed knowledge Scale	
	Pre	Post	Pre	Post										
N	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Mean	1.99	4.38	1.95	4.41	1.31	4.29	1.66	4.24	1.21	4.24	1.93	4.61	10.05	26.16
Typical Des.	0.86	0.58	0.86	0.59	0.57	0.51	0.78	0.58	0.44	0.64	0.76	0.88	2.93	2.64
Extreme Differences														
Absolute	0.31	0.33	0.29	0.31	0.45	0.40	0.28	0.35	0.46	0.31	0.34	0.40	0.13	0.17
Positive	0.31	0.33	0.29	0.31	0.45	0.40	0.28	0.35	0.46	0.31	0.34	0.33	0.13	0.17
Negative	-0.22	-0.27	-0.21	-0.29	-0.29	-0.26	-0.20	-0.27	0.31	-0.27	-0.28	-0.40	-0.09	-0.11
Z K-S test	2.74	2.93	2.59	2.76	4.00	3.59	2.48	3.10	4.11	2.75	3.00	3.54	1.18	1.52
P-value	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.124	.020

The study was approved by the Ethical Committee for Experimentation of the University of Seville, which requested the informed consent of the participating students was requested.

RESULTS

Students' ages ranged between 20 and 37 years, with an mean of 22.5 (21.8-23.3). 73.70% of students were female and 34 (26.30%) men.

Results regarding the reports on the working process of information literacy

49 reports were performed, 32 of them in pairs, and the others individually. Most students obtained a pass score in the report (35%), followed by those who scored a good mark (32.5%), fails (17.5%), and outstanding (15%)

Results regarding the evaluation of the teaching-learning process.

Statistically significant differences between the means obtained in the pretest and post-test were found, with respect to the students' degree of agreement with each item

as well as the full scale of self-assessment of knowledge and being able to affirm that said scores improved significantly after the implementation of the teaching-learning process with a confidence interval of 99%, while the effect size was very high in all cases. Likewise, the mean scores on questions about the adequacy of learning and students' satisfaction with these were very high (Table 4).

Table 4. Differences obtained in the complete scale of self-assessed knowledge, pre and post-test exposure to the teaching-learning process.

Items	Pretest	Post-test	<i>Wilcoxon W</i>	<i>P</i>	<i>D</i>
	M (SD)	M (SD)			
1. I have enough knowledge to search in the IME (CSIC) database	1.99 (0.86)	4.38 (0.58)	-7.61	.000	3.26
2. I have enough knowledge to search in the PUBMED database	1.95 (0.86)	4.41 (0.59)	-7.66	.000	3.34
3. I have enough knowledge to search in the SCOPUS database	1.31 (0.56)	4.29 (0.51)	-7.91	.000	5.56
4. I have enough knowledge to find the scientific journals and author's citations in the SCOPUS database	1.66 (0.78)	4.24 (0.58)	-7,71	.000	3.75
5. I have enough knowledge to find the factor impact of scientific journals in the JCR database	1.21 (0.44)	4.24 (0.64)	-7.85	.000	5.52
6. I have enough knowledge to search for scientific information in general	1.93 (0.76)	4.61 (0.88)	-7.62	.000	3.26
Total score in the self-assessed knowledge scale in literacy information	10.05 (2.93)	26.16 (2.64)	-7,78	.000	5.78
7. The theoretical and practical learning in small groups in the computer lab has been adequate	---	4.68 (0.47)	---	---	---
8. Overall I am satisfied with the information literacy practices	---	4.6(0.52)	---	---	---

In the pretest most students disagreed with having knowledge about the tools proposed (IME, PUBMED, and SCOPUS) as well as the literature search in general. In the post-test most students agreed to having knowledge about these aspects. Practically the totality of the students agreed with the adequacy and satisfaction with the learning process (Table 5).

Table 5. Results of the responses to pretest-posttest items. Percentages and total frequencies.

Items	Pretest			Post-test		
	Disagree -ment	Indiffe -rent	Agree- ment	Disagree -ment	Indiffe -rent	Agree- ment
1. I have enough knowledge to search in IME (CSIC)	81.3% (65)	10% (8)	8.8% (7)	1.3 (1)	1.3 (1)	97.6% (78)
2. I have enough knowledge to search in PUBMED database	81.3% (65)	11.3% (9)	7.5% (6)	1.3 (1)	1.3 (1)	97.6% (78)
4. I have enough knowledge to find scientific journals and author's citations in SCOPUS database	91.3% (73)	3.8% (3)	5% (4)	0	7.5% (6)	92.5% (74)
5. I have enough knowledge to find the impact factor of scientific journals in the JCR database	98.8% (79)	0	0	1.3 (1)	7.5% (6)	92.5% (74)
6. I have enough knowledge to search for scientific information in general	87.6% (70)	6.3% (5)	6.3% (5)	0	1.3 (1)	98.8% (79)
7. The theoretical and practical learning in small groups in the computer lab has been adequate				0	0	100% (80)
8. Overall I am satisfied with the information literacy practices				0	1.3 (1)	98.8% (79)

DISCUSSION

Most students (82.5%) passed the test related to the final report on the working process of information literacy. In addition, 47.5% of students scored high marks (good and outstanding) in the report performed; these results are consistent with those obtained in studies where student independent learning^(10, 15) is promoted.

In the pretest administered to nursing students, these showed a high degree of agreement on the limited knowledge for searching for scientific information. Previous studies state that Nursing students self-assessed their knowledge about search information as being deficient^(3, 12, 17).

The self-assessment of knowledge in information literacy by students improved greatly from pretest to post-test in all items. After performing the teaching-learning process, self-assessment in each of the items of the proposed scale, as well as its overall combination, increases by two to three points with significance levels $p < 0.01$. The effect size with values $d > 3.0$ was very high, if we consider the reference values.

Previous research conducted to assess literacy information courses for nursing students showed significant differences pre and post-program in knowledge and skills regarding this topic. Thus, higher levels of self-confidence have been found in the use of tools for finding information by nursing students who performed an information literacy program when compared to a control group⁽¹⁸⁾ or important improvements in the proposed objectives for self-assessment of skills in information search, and in comparison to a control group⁽¹⁹⁾. An information literacy program aimed at post-graduate nurses led to an increase of 50% on self-assessment in skills on information literacy skills, who identified the use of electronic databases as the most useful skill learned in the program⁽²⁰⁾. In another cohort study to evaluate an information literacy program in postgraduate nurses, statistical differences in self-assessment of skills were found in the cohort that the program received, with a high effect size⁽¹²⁾.

The search for scientific information is an important component of information literacy. The improvements obtained in the post-test in self-assessed knowledge, together with the skills shown in the reports regarding to search, evaluation and use of information can be signs of the acquisition of skills in information literacy by students after completing the teaching-learning process^(7, 10).

This intervention has therefore contributed to the management of digital tools and content such as scientific information databases, through the acquisition of appropriate skills which are the relevant in people's lifelong learning^(3, 6, 10, 12, 19). In addition, nursing students' exposure to these tools can have a great impact on health care, by facilitating that once they are graduated they can develop a evidence-based practice with clinical security and a decision-making based on scientific research^(9, 18, 19).

Moreover, the way in which training was conducted may have facilitated independent learning in students, since, by using a wide variety of information sources they expand their knowledge, learn skills to develop research questions and increase their capacity for critical thinking in future learning^(7, 10). This leads to information literacy representing an important skill for an effective teaching-learning process⁽²⁾.

The process of reflective learning, self-directed by the student, in agreement with the topics taught in the course and supported by person-to-person and virtual tutoring, has helped to strengthen and self-check the acquired knowledge, which, in contrast to isolated teaching of information search techniques was able to favor the acquisition of competences and skills in information literacy, and students' satisfaction with the methodology used^(2, 4, 9, 10, 21).

Previous research has indicated that most Nursing Faculties do not have adequate programs on information literacy in their syllabus^(12, 13, 19), posing to other authors the need to conduct research that responds to this problem so that by incorporating information literacy learning into the curriculum of the nursing degree, it can ensure that all the students complete their studies with high levels in these skills^(1, 10, 13, 16).

This study has some limitations. First, a quasi-experimental design was used with only one group, also called study before and after, so that the absence of a control group does not allow us to ensure that the observed response is due solely to the study intervention, as other uncontrolled factors may have influenced this ⁽²²⁾. However, it was considered ethically wrong to stop administering the intervention to part of the students enrolled in the course. Secondly, the scale used performs self-assessed knowledge by the student, but does not check the actual knowledge or other aspects related to skills, such as attitudes or abilities. It is possible that although students self-assess their knowledge on information searches as high, there are variations with their real skills. Another potential problem of self-assessment by students is that the low assessment of knowledge shown in the pretest may indicate a lack of confidence in the use of these tools ⁽¹³⁾. However, the use of strategies such as the final report on information literacy allows us to validate the results of the scale, and can help demonstrate student skill in information literacy.

CONCLUSIONS

So that nursing students can carry out a good information management, it is necessary to obtain information literacy skills using an approach based on independent and self-directed learning, and including planning, organization and evaluation of the contents in program syllabus of the courses. All this encourages a meaningful and reflective learning and is a feed-back mechanism for the process of student learning.

It is essential to encourage active and collaborative learning by students, support for new technologies such as virtual campus and the interest in updating knowledge throughout the training period and the subsequent future professional development based on research and in scientific evidence.

REFERENCES

1. Button D, Harrington A, Belan I. E-learning & information communication technology (ICT) in nursing education: A review of the literature. *Nurse Educ Today*. In press [acceso 10 Septiembre 2013]. pii: S0260-6917(13)00165-2. doi: 10.1016/j.nedt.2013.05.002.
2. Veiga J; Martín-Rodero, H. Acceso Abierto: nuevos modelos de edición científica en entornos web 2.0. *Salud Colectiva*. 2011; 7(1), S19-S27.
3. Huamani-Navarro M, Alegría-Delgado D, López-Sánchez M, Tarqui-Mamani CB., Ormeño-Caisafana L. Conocimientos, practicas y habilidades sobre la búsqueda bibliográfica y percepción estudiantil sobre la capacitación universitaria en investigación, en estudiantes de obstetricia. *Educ Med*. 2011; 14 (4): 235-2402.
4. López-Morales M, Celma-Vicente M, Cano-Caballero M. Dolores, Quero-Rufián A, Rodríguez-López MA. Docencia universitaria semipresencial. Experiencia en el uso de la plataforma virtual SWAD. *Educ Med* 2011; 14 (4): 229-234
5. San Miguel B. Las tecnologías de la información y la comunicación en el Espacio Europeo de Educación Superior [Editorial]. *Salud Colectiva*. 2011; 7(1), S5-S7.
6. Caridad M, Marzal MA. Políticas de información y alfabetización en información como medios de la inclusión social desde la óptica europea. *Inclusão Social*. 2006; 1(2): 31-43.
7. Pinto M. Habilidades y competencias de gestión de información para aprender a aprender en el Marco del Espacio Europeo de Enseñanza Superior [internet].

- PORTAL ALFIN- EEES 2005 [acceso 10 Septiembre 2013]. Disponible en: <http://www.mariapinto.es/alfineees>
8. Daniele V, Rino MM. Currículo por competencia y metodología activa: percepción de estudiantes de enfermería. *Rev. Latino-Am de Enfermagem*, 2010 [acceso 10 Septiembre 2013]; 18(1). Disponible en: http://www.scielo.br/pdf/rlae/v18n1/es_17.pdf
 9. Duquesne A. La alfabetización en información en los Policlínicos Universitarios. *Educación Médica Superior* 2011; 25(2):157-63.
 10. Barnard A, Nash R, O'Brien M. Information Literacy: Developing lifelong skills thought Nursing Education. *J Nurs Educ*. 2005; 44 (11), 505-510.
 11. Uribe-Tirado A, Girlesa A. La alfabetización informacional en las universidades españolas. Niveles de incorporación a partir de la información publicada en los sitios web de sus bibliotecas-CRAI. *Rev Esp Doc Cient*. 2012; 35 (2): 325-345.
 12. Tarrant M, Dodgson JE, Law BVKK. A curricular approach to improve the information literacy and academic writing skills of part-time post-registration nursing students in Hong Kong. *Nurse Educ Today*. 2008; 28: 458–68.
 13. Mcneil BJ, Elfrink VL, Bickford CJ, Pierce ST, Beyea SC, Averill C, et al. Nursing information technology knowledge, skills, and preparation of student nurses, nursing faculty, and clinicians: a U.S. Survey. *J Nurs Educ*. 2003; 42(8): 341-349.
 14. Silva ISA, Marques IR. Conhecimento e barreiras na utilização dos recursos da Tecnologia da Informação e Comunicação por docentes de enfermagem. *J Health Inform*. 2011; 3(1): 3-8.
 15. García-Valcárcel A.; Tejedor-Tejedor F. Variables TIC vinculadas a la generación de nuevos escenarios de aprendizaje en la enseñanza universitaria. Aportes de las curvas ROC para el análisis de diferencias. *Educación XX1*. 2011; 14: 43-78.
 16. Jiménez JA, Guillén JF, Murillo R. Fuentes de documentación para enfermería. *Enfermería Global*. 2006 [acceso 10 Septiembre 2013]; 5(1). Disponible en: <http://revistas.um.es/eglobal/issue/view/63>
 17. Jacobsen HE, Andanaes R. Third year nursing students' understanding of how to find and evaluate information from bibliographic databases and Internet sites. *Nurse Educ Today*. 2011; 31: 898-903.
 18. Shorten A, Wallace MC, Crookes PA. Developing information literacy: a key to evidence-based nursing. *Int Nurs Rev*. 2001; 48(2): 86-92.
 19. Wallace MC, Shorten A, Crookes PA. Teaching information literacy skills: an evaluation. *Nurse Educ Today*. 2000; 20: 485-489.
 20. Jacobs SK, Rosenfeld PH. Information literacy as the foundation for evidence-based practice in graduate nursing education: a curriculum-integrated approach. *J Prof Nurs*. 2003; 19(5): 320-328.
 21. Schutt MA, Hightower B. Enhancing RN-to-BSN students' information literacy skills through the use of instructional technology. *J Nurs Educ*. 2009; 48(2): 101-105.
 22. Argimon JM, Jiménez J. *Métodos de investigación clínica y epidemiológica*. 3ª Ed. Barcelona: Elsevier; 2000.

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