Evaluation of a *website* on nursing care in the post anesthesia recovery room*

Avaliação de website sobre assistência de enfermagem na sala de recuperação pós-anestésica

Evaluación de un website sobre la asistencia de enfermería en la sala de recuperación post-anestésica

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ABSTRACT

Objectives: To develop a website on the nursing care in the post-anesthesia recovery room, and evaluate the content, presentation and updating of information. **Methods:** We used the methodology of Clement Mok, DADI, comprised by definition, architecture, design and implementation. The evaluation of the website was done by nurses using a questionnaire containing items about authority, general content, presentation and reliability of information. For data analysis, we used descriptive statistics. **Results:** The results were satisfactory, with the approval of 99.67% of participants. We found that the construction and provision of information about the referenced theme on this website was reliable and valid. **Conclusion:** The importance and relevance of the World Wide Web for information transmission, in particular, for nursing, provides a method to obtain practical scientific knowledge and an exchange of experiences, regardless of geographic location.
Keywords: Internet; Nursing care; Postanesthesia nursing; Nursing informatics

RESUMO

Objetivos: Desenvolver um *website* sobre a assistência de enfermagem em sala de recuperação pós-anestésica e avaliar o conteúdo, apresentação e atualização das informações. **Métodos:** Foi utilizada metodologia de Clement Mok, DADI, composta por definição, arquitetura, design e implementação. A avaliação do *website* foi realizada por enfermeiros por meio de um questionário contendo itens sobre autoridade, conteúdo geral, apresentação e confiabilidade das informações. Para a análise dos dados, foi utilizada a estatística descritiva. **Resultados:** Os resultados foram satisfatórios, tendo como aprovação de 99,67%. Comprovou-se que a construção e disponibilização de informações sobre a temática referida no *website* são confiáveis e válidas. **Conclusão:** A importância e a relevância da *World Wide Web* para a transmissão de informações, em especial, para a enfermagem permitem uma aproximação do conhecimento científico à prática de atualização e de troca de experiências, independente da localização geográfica.
Descritores: Internet; Cuidados de enfermagem; Enfermagem em pós-anestésico; Informática em enfermagem

RESUMEN

Objetivos: Desarrollar un *website* sobre la asistencia de enfermería en una sala de recuperación post-anestésica y evaluar el contenido, presentación y actualización de las informaciones. **Métodos:** Se utilizó la metodología de Clement Mok, DADI, compuesta por definición, arquitectura, design e implementación. La evaluación del *website* fue realizada por enfermeros por medio de un cuestionario que contenía items sobre autoridad, contenido general, presentación y confiabilidad de las informaciones. Para el análisis de los datos, se utilizó la estadística descriptiva. **Resultados:** Los resultados fueron satisfactorios, teniendo una aprobación del 99,67%. Se comprobó que la construcción y disponibilidad de informaciones sobre la temática referida en el *website* son confiables y válidas. **Conclusión:** La importancia y la relevancia de la *World Wide Web* para la transmisión de informaciones, en especial, para la enfermería permiten una aproximación del conocimiento científico a la práctica de actualización y de intercambio de experiencias, independiente de la ubicación geográfica.
Descriptores: Internet; Atención de enfermería; Enfermería postanestésica; Informática aplicada a la Enfermería

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INTRODUCTION

In Brazil, nursing informatics began around 1985, by providing advances in care, administration, research and teaching. It can be considered an area of knowledge related to the access and use of data, information and knowledge to standardize documentation, improve communication, develop and disseminate new knowledge, enhance quality, effectiveness and efficiency of care as well as to provide advancement in nursing. [1-2]

For this, the nurse should be able to make use of informatics resources. Actions for training personnel, updating knowledge and developing specific technical skills are activities that promote an improved quality of nursing care. Thus, informatics education can be used in activities for improvement of staff and continuing education.[3]

Nursing, like many other professions, is dependent on information. The volume of data used by nurses has increasingly grown and one manner of providing information, either in the academic environment for research or in the hospital environment, is through the use of the world wide web (www), which is where *websites* are available.

For research, in all areas, some features available on the www such as search engines and e-mail have become indispensable and fundamental [4]. Because of its importance, nursing researchers developed and evaluated *websites*, with an emphasis on two distinct studies on the use of a Swan-Ganz catheter [5] and another study that added to a protocol for intra-hospital transport of critically ill patients. [6]

Given the importance of the internet, and especially the search engines, to promote the education of nursing professionals, we developed a *website* providing information on the Post-Anesthesia Care Unit (PACU), which is a highly specialized and important service. The purpose of the study was to promote nursing learning via the web, that is, available on the internet.

The PACU is the destination for those patients who are post-anesthesia from a surgical procedure. It has as objectives and advantages, the prevention and early detection of complications after anesthesia and surgery, specialized nursing care, patient safety, the medical and nursing team, streamlining of staff, human resource efficiency and utilization of therapeutic expertise, and the field of learning for health. [7-8]

Thus, the post anesthetic nursing care begins in the operating room and continues until the time of discharge from the PACU. For patient care in the postoperative period to be efficient and of quality, the nurse must be updated in the theoretical and practical realms, using among other resources, the internet, which is a vehicle for transmitting information.

This study had as its premise the rate of 90% approval rating of the *website* about nursing care in the PACU. According to the results found in the study by Alves, Cunha and Marin (2000), in which a *website* was designed for nurses about the feet of diabetics, specialists in the areas of informatics, diabetes mellitus and distance learning considered the 90% result as excellent, very good or good. [7]

It is worth noting that, in Brazil, there are 54 million internet users, and in 2008, we observed a rate of 72% of individuals who used the internet for education [9]. This proves the importance and relevance of using the resources of the www for the transmission of information. Therefore, it is expected that a *website* for nurses in the PACU could allow an approach to scientific knowledge for everyday practices, as well as providing updates and exchange of experiences, independent of geographic location of the nurse, thus contributing to teaching, research, management and nursing care.

Thus, the objective of this study was to develop a *website* about nursing care in the recovery room after anesthesia, and to evaluate the content, presentation and timeliness of information.

METHODS

This was applied research of the descriptive type, inserted in the line of research of Fundamentals, Methods, Processes and Technologies in Nursing and Health of the Center for Nursing Informatics at the Federal University of São Paulo (UNIFESP). The project was approved by the Committee on Ethics in Research of the State University of Health Sciences in the state of Alagoas and UNIFESP, under Protocol nº. 2.176/08, and all subjects were informed and signed the Term of Free and Informed Consent, conforming to Resolution CNS 196/96. The research was based on the construction and evaluation of a *website* in order to provide safe and reliable information about nursing care in the PACU, and was intended for nurses and nursing students.

The sample consisted of nurses working in the PACU for a minimum of five years, and for graduate nursing faculty.

The data collection instrument used was adapted from that developed and validated by Marques and Marin (2002) [10]. Before its use, a pre-test was conducted on the relevance, pertinence, adequacy and appropriateness of the questions. The instrument consisted of two parts: (a) data to characterize the evaluator: age, gender, marital status, length of employment, length of experience in PACU, weekly working hours and number of hours used to evaluate the *website* content, (b) assessment of the *website* containing a question for which the nurses can provide feedback and make

suggestions or comments with respect to the *website*, and 17 questions related to authority, general content, presentation and reliability of information. For each question of each criterion, the evaluator gives one of the responses: excellent (5), good (4), good (3), fair (2) bad (1) or poor (0).

To construct the *website*, the DADI methodology was used: an acronym which stands for **D**efinition / **A**rchitecture / **D**esign / **I**mplementation, and was created by the American designer, Clement Mok, featuring four steps that allows for better organization of the division of work, gathering of information, the choice of layout and implementation of programming. [11]

We performed a systematic search in the databases of PubMed (National Library of Medicine), CINAHL® (Cumulative Index to Nursing and Allied Health Literature), BIREME (Latin American and Caribbean Center on Health Sciences), including BDENF (Database of Nursing), Medline (Medical Literature Analysis and Retrieval System Online), SciELO (Scientific Electronic Library Online), and Lilacs (Latin American and Caribbean Health Sciences). The procurement of scientific articles on the subject used the descriptors: Internet, Post-anaesthesia nursing - Postanesthesia nursing and recovery room - recovery room, in addition to consulting text books.

For the quality of information available, we used the code of conduct for medical and health *websites*, the *Health On The Net Foundation* (*HONcode*) [13] which establishes criteria for authority, comprehensiveness, confidentiality, attribution, justification, transparency in ownership and sponsorship, honesty in advertising and editorial policy.

The following applications were used: *Word* 2007 as a text editor, *Dreamweaver* CS3® for the construction of pages, *Photoshop* CS3 and *Flash* ® CS3 for image editing, creation and animation of the logo at the top of the *website*. The language used to generate the source code was HTML.

For data analysis descriptive statistics were used, both for data to characterize the evaluators and the evaluation of the *website*.

RESULTS

For better understanding, the results are presented conforming to the definition of the objectives of this study: *website* development and evaluation process.

Website development

The construction of the *website* lasted around six months and resulted in a large document consisting of 26 pages with 31 images: nine at the top and 22 within the site. All pages of the *website* followed the same standards in relation to color, the symbol of UNIFESP, site logo, top, text size and font color as its *layout*.

The *website* was directed to the nurses who provide care in the recovery room and the nursing students to serve as consulting or academic use, such as textbooks, providing reliable and secure information.

The *website* "Post-anesthesia nursing" can be accessed via the intranet of UNIFESP, directly connected to the Center for Informatics Research in Nursing - NIEn at the electronic address: http://www.unifesp.br/denf/NIEn/enfermagemposanestesica/index.html.

The initial page referred to as index.htm is designed to facilitate navigation on the website, which consists of three parts:

● Top: refers to the upper part of the *website* containing the personalized banner, incorporating the logo of the *website* built in photoshop, with nine working images using photoshop and flash for animation.

● Menu: this is on the left of the page, containing 15 menu options and 15 submenu options created in photoshop and flash in an HTML page. It also has the logo of UNIFESP, with the option of a link.

● Central: contains content or links on the menu in the text used for loading pages. Contains information about the intended audience of the website, who developed it, and a brief concept regarding PACU.

From this page, the user has access to other pages of the *website* which provide all of the information and images within each page. On all pages, the e-mail is available to contact the author.

The home page contains a welcome message, describes the PACU setting and purpose of the *website*, presents the logo of the *website* and of UNIFESP, serving as a link, the menus, the date of most recent content update, and contact information. (Figure 1).

The menu options are in didactic order to facilitate understanding of the information prepared for the user about the PACU, organized as follows: home page, concept / legislation; physical structure; equipment and materials; anesthesia procedure that is subdivided into pre-anesthesia evaluation, anesthesia, postoperative analgesia and post-anesthetic complications; human resources; admission and discharge from the PACU; perioperative period, and the perioperative nursing process. In turn, the perioperative nursing process is also divided into conceptual steps (history of nursing, nursing diagnosis, nursing plan of care, nursing intervention, nursing evaluation) and examples; references consulted; credits; partners; links; contact and sitemap .

The user can communicate with the *website* author via the "contact" menu, simply by filling out the form and pressing the "request" button so that the message is sent directly by email to the author.

Figure 1. Home page of the website "Post-anesthesia nursing"

Website evaluation

The *website* was evaluated by 17 nurses during a period of 10 days in the month of September, 2009, in Maceió-AL. The objective of the evaluation was to analyze the available content to enable its publication on the internet.

The time used by nurses to evaluate the *website* averaged 78.24 minutes, with a minimum of 30 minutes to a maximum of 130 minutes, with a standard deviation of 32.83. The age ranged from 29 to 51 years, with an average of 42.71 years and a standard deviation of 7.01. Regarding marital status, 76.5% of the evaluators were married; 47.1% had more than 10 years of experience in the PACU, and 52.9% worked between 40 to 60 hours per week.

The data in Table 1 present the distributions of ratings given by the nurses. In general, all evaluated the items with responses of "very good" and "excellent."

Considering that the goal of the research was to obtain an evaluation of the *website* in which more than 90% evaluated it as excellent, very good or good, it was observed that all the questions of the data collection instrument obtained an evaluation over 90%, achieving an average of 99.67%. Therefore, this met the initial premise of the research of 90%.

In the analysis of the evaluation items, the critical point indicated by the evaluators referred to the item "the information does not present grammatical errors", corresponding to 94.20% as excellent, very good or good and 5.90% as average. Therefore, the measures adopted were to revise and correct typographical and grammatical errors.

Regarding the question of suggestions, in general, the evaluators affirmed that the *website* was very well developed, up-to-date, with great presentation, easy access and assessment, it was important to the relevance of nurses' performance and represented a major initiative with useful information.

Table 1. Evaluation of the *website* by question and score

Question	Regular		Good		Very Good		Excellent	
	n	%	n	%	n	%	n	%
1a. Author is indicated					2	11.80	15	88.20
1b. Contact information of the author							17	100.00
2a. Adequacy of information					4	23.50	13	76.50
2b. Organization and identification of the information					2	11.80	15	88.20
2c. Links are adequate			1	5.90	4	23.50	12	70.60
2d. The quality of the information is guaranteed by the consulted references			1	5.90	6	35.30	10	58.80
3a. Graphic design of the website					7	41.20	10	58.80
3b. Graphics add knowledge to the text					14	82.40	3	17.60
3c. Graphics are consistent with the text					8	47.10	9	52.90
3d. Site naviation			1	5.90	2	11.80	14	82.40
3e. Maintains the user's attention			1	5.90	4	23.50	12	70.60
3f. Organization of the information					2	11.80	15	88.20
3g. Quantity of information covers the subject well					8	47.10	9	52.90
4a- Reliable information and knowledge for the user					3	17.60	14	82.40
4b. Updated information					3	17.60	14	82.40
4c. Research sources are credible					3	17.60	14	82.40
4d. The information does not present grammatical errors	1	5.90	2	11.80	6	35.30	8	47.10

DISCUSSION

The *website* followed the same *layout* throughout its structure. *Websites* should facilitate the comprehension and understanding of the content they cover, since they are resources with educational purposes. Is worth remembering that there were four criteria for building a *website*: high quality content, regularly updated, minimum download time, and ease of use.[12]

Websites and e-mail facilitate users in finding, connecting and collaborating with each other. The ability to attach files and receive e-mail facilitated the preparation of grants, data sharing, analysis and writing collaboratively across research teams. Therefore, it is possible to obtain knowledge by means of *websites*. [13]

Thus, a *website* can support students' general information in relationship to a theme, facilitate access to updated content, and can be a dynamic resource, enriching the teaching - learning process and access to other interested parties [14]. This justifies the adoption of this technology to facilitate teaching and information dissemination.

There are several educational *websites* that provide information to health professionals and the lay public, just by the user having a computer with internet access. This facilitates the search for information, independent of geographic location of the user, allowing the exchange of experiences and knowledge.

In this study, HTML (Hypertext Markup Language) was used to facilitate the construction of the *web* page and to permit the creation of documents. Hypertext allows a reading that is full of connections, rather than having to read a text in a linear fashion as occurs in readings made in print. By means of links, the reader is able to develop his own strategy for reading, taking whatever path he finds most convenient. [15]

The *website* content was divided into parts to facilitate understanding of information by the user, maintaining

clarity, awakening interest and objectivity and making navigation easier. Through the menu option "site map", it was possible to view all content, while highlighting the user's current location.

Navigating the *website* is one of the most important steps, because the user must achieve her objectives of finding information while browsing as little as possible to avoid accessing unnecessary pages, and reducing the interest in it. On the contrary, it is hoped that, by means of an adequate navigation feature, the user's interest is maintained to review the entire content.

Besides the ease of navigation on the *website*, the content offered should be direct, clear, updated and in a language accessible to the user. We sought to, in this case, disclose updated information and practices, to enable nurses to identify with the text and, at the same time, to update them on topics of interest. To have a *website* of excellent quality, it must have relevant content tailored to the needs of users and the tasks they want to accomplish. [12]

The norms of the Healthcare Code of Conduct for *websites* were used in order to improve the quality of information available on the *internet*. These standards, from the Agency for Healthcare Research and Quality demonstrate concern with the content quality and reliability of information found on the *web*, with links established for accessibility and navigation, the arrangement of colors, font usage for text, as well as the use of images.[6]

The methodology facilitated the construction with respect to the structural organization of the pages, and the development of the information. In the evaluation performed by nurses, feedback was given with respect to language and content. It was an important step to ensure better quality and usability of information resources.

The time spent by nurses for the navigation and *website* assessment contradicted that in other studies. For example, the time for evaluating a *website* on in-hospital transport for nurses was 21 minutes, corresponding to one third of the time of this study [6]. This may have occurred because of the higher amount of content available on this *website*.

The utilization of a questionnaire for evaluation was useful because it allowed an interaction between user and interface, collecting information about quality and content. The use of criteria established in the HONcode proved to be effective and satisfactory.

The evaluation of the *website* at 99.67% approval confirmed the hypothesis of the research and user satisfaction on the information available, situations that have also been shown in other studies.[5-7,10-11]

The use of *websites* is a strategy for behavior change necessary for education and health, permitting users and experts to take better advantage [6]. Its use allows for greater openness in the pursuit of knowledge and sharing of such information, allowing the exchange of experiences, personal and professional satisfaction. Using a *website* for the PACU is important, given the scarcity of scientific articles on the subject this becomes one resource that will facilitate access to reliable and timely information, regardless of the location of the professional.[6]

A *website* about the PACU is a means of communication that is easily accessible, globalized and rapid because it permits centralization of information facilitating the research for any healthcare professional and academician due to the difficulty of finding references on the subject. It also allows one to obtain precise information, updated in real time, clarification of doubts with adequate assistance, permitting the exchange of experiences and continuing education. [16]

Thus, the nurse can take advantage of informatics resources in professional activities, whether in teaching, research, management or care, promoting ways to insert the use of technological resources in a constructive manner and as a vehicle for dissemination of knowledge in everyday life. [14]

The use of technological resources can not be neglected, since the various roles nurses play in their daily lives, both in care and education of team members, management of nursing services in the construction of manuals, and also printed matter in formulating and implementing the nursing process, supervision of service and formulation of work schedules. When using informatics associated with nursing, the nurse will be seeking solutions to the tasks to be completed in the best manner possible, and comprehensively, being a facilitator for the performance of activities.

The majority of the evaluators' suggestions were incorporated, such as grammatical changes, visualization of tables, links to the Aldrete and Kroulik indexes, adding graphics of anesthesia items, and adding captions to graphics of equipment and materials. However, some suggestions were not accepted to prevent compromise of the quality of the *website*, such as for example, the suggestion of using stronger colors and providing the phone number of the author.

CONCLUSION

The available information on nursing care in the PACU was reliable and valid. The methodology was adequate to support the development and evaluation of the *website*. It is also considered that in providing information to nurses in different regions of the country, one can contribute to improving the care that nurses provide to patients. Further studies will conduct analyses to evaluate the use of the *website* in daily practice.

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