Information on Specialized Intensive Care Procedures through the Internet
by
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Abstract

There are many complex procedures in an Intensive Care Unit (ICU). The objective of this study was to develop an informative website about specialized procedures in ICU, utilizing photos and descriptive text. In order to evaluate the use of the website, 300 nurses from 16 Brazilian states took part in an evaluation that provided 600 answers. The results of the interviews presented 86.6 per cent satisfaction, concluding that the objectives of this study were reached.

Keywords:

Internet; nursing care, Intensive Care Unit

Introduction

Nursing professionals who work in Intensive Care Units (ICU) should have a common goal, which is the constant search for more knowledge to enhance their skills. With the great technological evolution that is presently taking place, they should incorporate new therapeutic methods of treatment in the area of technical procedures.

The role of nursing in the ICU becomes clearer when nurses choose to care for the patient and utilize technology to their advantage without forgetting their principles, so that the patient's well-being is improved without just depending on technology in patient care (Malta, & Nishide, 2007). The nurse, therefore, should be constantly aware of new information, participate in training practices and always update and recycle knowledge.

There are several barriers to achieving knowledge growth. Geographically Brazil is a large country and as a result many professionals are situated far from the larger educational centers. As well, there are only a small number of qualified professionals. Publications of foreign language articles with restrictive access to only a few were another difficulty encountered.

Despite these difficulties, knowledge has grown exponentially over the last decades. The computer has become a valuable resource along with the Internet in providing dissemination of information and interaction of individuals by removing all geographical restrictions (Marques & Marin, 2002). There are various websites that deal with health-related issues and one of them is the Brazilian Virtual Hospital (BVH), which has a free multidisciplinary data bank (Lopes et al.,. 1996). Education in the nursing area is strongly linked to informatics due to new information that

is always accumulating, the need for specialized skills and knowledge as well as the growing utilization of technology (Marin, 1995).

We propose to use this resource of transmitting information using the computer and Internet to set up a website consisting of specialized ICU procedures that can serve as education material to enhance learning and dynamically stimulate professionals and students in the health area.

Objectives

The general objective was to create *"Hyper Text Mark Language"* (HTML) pages with nursing-related ICU procedures. More specifically the objective was to provide both guidelines on hemodynamic monitoring using the Swan-Ganz catheter and a check-up of the Central Venous Pressure (CVP). This material was made available through the nursing area on the Brazilian Virtual Hospital Internet site at (http://www.hospvirt.org.br/enfermagem/).

Materials and Methods

Creating the website

A Pentium® 166 MHz computer was used, equipped with the Microsoft Front Page® 3.0 web page development software, along with a ZENIT® camera that had an adjustable lens focus to create the HTML pages. Images were digitalized into gif and jpg formats, and the Adobe® Photoshop® 5.0 image manipulation software was used for image treatment.

Publication and Dissemination

The WWW pages were hosted by a non-commercial provider at the Nucleus of Biomedical Informatics, State University of Campinas, UNICAMP, under the Brazilian Virtual Hospital domain (http://www.hospvirt.org.br) for the years 2002 to 2006. The information was made available through a list of free on-line services as well as on nursing discussion lists.

Website Assessment

An HTML questionnaire was created to be answered on-line by visitors to the site. There were six criteria to be evaluated: loading velocity; the design presented; organization of available information, general website navigation; existing contents and their suitability regarding information updating and recycling. The scoring scale ranged from 05 for best performance to 01 for the worst, with a maximum score of 30 and minimum of 06. The questionnaire also made it possible to characterize the user profile with regard to sex, age, location and occupation.

Results and Discussion

Website Structure

The "ICU Procedures" website was composed of 18 HTML pages stored in the BVH domain (http://www.hospvirt.org.br/enfermagem/port/). There were four pages on Central Venous Pressure and nine pages on the Swan-Ganz Catheter. The website had 98 pictures and figure graphics (icons).

User Profile

There were 600 answers to the on-line questionnaire. The users' ages ranged from 18 to 46 years, which meant that the participants included technical students as well as academics and highly qualified professionals. The largest age group cluster was between 23 to 27 years (25.9 per cent) (see *Table 1*).

Table 1: Frequency of website assessors according to the age group

Age	Frequency	Percentage (%)
18 - 22 years	130	21.6%
23 - 27 years	155	25.9%
28 - 32 years	125	20.9%
33 - 37 years	60	10.0%
38 - 42 years	90	15.0%
43+ years	40	6.6%
Total	**600**	**100%**

Regarding sex, the female website assessors (81.7 %) predominated over the male assessors (18.3 %) (see *Table 2*), following the existing predominance of the female gender in nursing.

Table 2: Frequency of website assessors according to gender.

Gender	Frequency	Percentage (%)
Male	110	18.3%
Female	490	81.7%
Total	**600**	**100%**

With relation to the occupation of the website assessors, it was observed that the professional nurse predominated (50.0 %), followed by nursing academics (26.6 %). Nursing technicians / assistants also participated and nine evaluators did not belong to the nursing area (see *Table 3*).

Table 3: Frequency of website assessors according to occupation.

Occupation	Frequency	Percentage (%)
Practicing Nurse	300	50.0%
Nursing academics	160	26.7%
Nursing tech/assist	95	15.8%
Another occupation	45	7.5%
Total	**600**	**100%**

An analysis of where the website assessors resided was a small demonstration of how information is easily disseminated through the Internet. The 600 site assessors were from 16 Brazilian States and Sao Paulo was in the forefront with 39.1 % of the participants, followed by Rio de Janeiro (13.3 %), Rio Grande do Sul (7.5 %), Minas Gerais (6.6 %) and Parana (5.8 %). There were also ten responses from residents in Portugal (see *Table 4*).

Table 4: Report on the residence of the website assessors according to the State.

Brazilian State	Frequency	Percentage(%)
Bahia	10	1.7%
Ceará	10	1.7%
Distrito Federal	25	4.2%
Espirito Santo	10	1.7%
Goiás	10	1.7%
Maranhao	5	0.8%
Mato Grosso do Sul	15	2.5%
Minas Gerais	40	6.6%
Pará	10	1.7%
Paraná	35	5.8%
Pernambuco	25	4.2%
Rio de Janeiro	80	13.3%
Rio Grande do Norte	10	1.7%
Rio Grande do Sul	45	7.5%
Santa Catarina	25	4.1%
São Paulo	235	39.1%
Another Country		
Portugal	10	1.7%

Total	**600**	**100%**

Results of the Questionnaire

The assessment data compiled by the 600 users was related to connection velocity, design, organization, navigation, content and learning, which amounted to 26.6, representing 88.6 % of the total score (30).The calculation used when analyzing the score for each criterion in the questionnaire was the same as that applied to obtain the mean score. The complete report of the mean scores is shown in *Table 5*.

With regard to the velocity criterion, it was possible to observe that the assessment diverged greatly as this criterion received the least mean score (4.23). This was expected in view of the changes that Internet status in Brazil is still undergoing and the various methods of connecting that greatly differ in relation to velocity and quality. Another factor is the extensive use of computers with slower systems because of the high cost of more advanced computers.

Table 5: Total and mean score obtained for each criterion in the website assessment

Criterion	Question	Total score	Mean score
Velocity	#1	2540	4.23
Design	#2	2685	4.47
Organization	#3	2710	4.51
Navigation	#4	2625	4.37
Content	#5	2695	4.49
Learning	#6	2735	4.55
			*26.6

#1:How do you arrange the loading velocity?
#2:How do you arrange the design presented?
#3:How do you evaluate the organization of available information?
#4:How do you arrange the general website navigation?
#5:How do you arrange the existing contents?
#6:How do you evaluate the learning, recycling or the information updating about the content?

An observation of the mean assessment scores shows that the item navigation obtained a mean score that was a little inferior to the other criteria (4.37). This criterion depends on connection velocity (Internet limitations) but was also affected by some individual barriers that have been cited by Marques (2000) such as a lack of knowledge or skill in using the Internet or even the computer.

Criteria related to learning, organization, content and design received the highest score and were considered quality indicators of the Website, both aesthetically and with regard to the available information. As previously cited, the mean score result of 26.6 classified the Website as well elaborated and successful in attaining the proposed objectives.

Although the Website achieved its objectives, project continuity that includes updated content with new issues and a future proposal of including more interactive resources such as on-line sections for clarifying doubts or chat sites is extremely important as it will improve the quality of education and/or update nursing care.

Final Considerations

After creating, implementing and assessing the research results of the Website "ICU Procedures" we reached several conclusions. They were that the project was easily implemented, was financially accessible and required only basic computer and Internet knowledge. There was a lot of software available to create this (and similar) websites that are easy to understand and if well utilized bring numerous advantages in providing valuable knowledge.

This experience was highly valid because of the constructive criticism as well as the compliments received from health professionals reflecting the success of this site. A common complaint was that very few sites exist in Portuguese, particularly in the intensive care area.

Various messages were received during the assessment process requesting continuity of the project, the inclusion of new issues and amplification of the site so that it could be more interactive and receive more visitors. The objectives of this project were achieved and received the approval of the participants who suggested further stimulating proposals.

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