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Assessing Informatics in Canadian Schools of Nursing

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Abstract

The provision of informatics content in the basic education programs for Canadian nurses has been limited to date. In previous years, efforts to engage nurse educators in discussions regarding the significance of informatics for tomorrow's nurses had been met with limited interest and understanding. There was an obvious need to heighten the awareness and active participation of nurse leaders in the development of strategies to attend to the informatics education needs of Canadian nurses. This paper describes the findings of a national study to understand the current state of informatics integration within basic nursing curricula.

Keywords:

Nursing informatics, education, curriculum.

Background

There has been rapid growth and an increased expectation that health professionals will utilize information systems and technology in the delivery of health services. As the largest contingent of the healthcare workforce, nurses, in particular are beginning to experience a demand from their employers that they have informatics competencies (knowledge, skills, attitudes and decision making) to effectively meet their responsibilities and standards for nursing practice. This includes the use of information and technology in the direct provision of care, in establishing effective administrative systems, in managing and delivering educational experiences, in supporting lifelong learning, and in supporting nursing research [1].

This study built upon the 1999 National Nursing Informatics Project. It was also influenced the Canadian Nurses Association national Health Information: Nursing Components (HI:NC) policy initiative and Health Canada's Office of Health and the Information Highway (OHIH) work in conjunction with the Canadian Nurses Association (Vision 2020 – ICT in Nursing) and with the 2002 University of Victoria Summit on health informatics competencies.

Purpose of the Study

The overall goal of this national study was to promote the development of nursing informatics (NI) competencies required now and in the future for clinical nursing practice and education. The national study aimed to describe the current situation of undergraduate nursing informatics education in Canada. Specifically it assessed and described:

- The nursing informatics education opportunities currently available to undergraduate students in schools of nursing across the country;
- The level of preparedness and expertise of nursing faculty to provide necessary education opportunities in nursing informatics for undergraduate nursing students;
- The information and communication technology infrastructure and support for providing the education opportunities; and
- Opportunities and needs, including policy, for enhancing nursing curricula, faculty preparedness and Information and Communication Technology (ICT) infrastructure and support in Canadian schools of nursing.

Methods

The national study used survey questionnaire methods and referent group discussions. The survey component used web-based technology – SurveyTracker® survey software. The three survey questionnaires constructed for this project were 1) *Undergraduate Education Opportunity Questionnaire*; 2) *Infrastructure Assessment Questionnaire;* and 3) *Faculty Preparedness and Expertise Questionnaire*. These were implemented in the fall of 2002. Methodological issues in web-based research were addressed [2]. Descriptive statistics were used to analyze survey data and correlation analysis to determine differences between program types. Qualitative data entered as text in the questionnaires were saved as MS Word documents and subjected to content analysis for themes and explanations of the quantitative data.

Sample

All Canadian Schools of Nursing with undergraduate education programs comprised the target audience for the survey component, for a potential number of schools participating being 81. Four schools declined to participate (N=77). Within the remaining target audience were sub-audiences: 1) school of nursing infrastructure to support integration of nursing informatics in the program; 2) the program curriculum – learning opportunities for students; and 3) faculty members with responsibility for some aspect of nursing information, as per the definition provided.

Response rates were: Infrastructure 48% (37 schools); curriculum 51% (39 schools); and faculty 130 representing 38% (29) of schools. The respondents had the knowledge and authority to provide credible information. University baccalaureate programs and collaborative college/technical institution programs were equally represented; there were no diploma only programs.

Referent group discussions were held at national and regional nursing conferences, as well as a college and a hospital. The purpose of these discussions was to examine the critical findings with respect to implications, recommendations and dissemination. Feedback in all phases of the project was solicited through the Canadian Nursing Informatics Association (CNIA) website, project Advisory Committee and members of the organizations they represented, Board members of the CNIA, and NI experts. This study component occurred January to March 2003.

Findings

The findings from the survey questionnaires, referent group discussions and other feedback corroborated those of several recent Canadian and American studies examining similar issues. The following were the critical findings from this study.

Infrastructure

Information and Communication Technology (ICT) Access

- Universal access to the Internet, e-mail, library, software programs and computers ~100% for faculty; less to students (~20% less).
- Universal access to research data-bases is available to faculty in ~75% of the schools; less so for students.
- Availability of ICT in classrooms is inadequate.
- Faculty has more access to clinical institution ICT than students. A desirable level of access is available in less than 1/3 of schools.
- There is greatest access to the library (68% faculty; 43% students) and least to clinical information systems (22% faculty; 14% students).
- Limited connectivity between educational and clinical services settings except for e-mail.
- Students' greatest access to clinical applications is in acute care settings and least in home care. Their access is increased if working as RN or with an RN.
- Faculty note access to clinical ICT systems is important, but the systems have been underdeveloped and their access guarded.

Human Resources

- Technical human resources (e.g. computer lab technicians) are more adequate to integration of NI into undergraduate education program than human resources relevant to teaching (e.g. faculty competencies).
- Less than 1/3 of the schools perceive that faculty and new students have adequate NI competencies and computer skills.
- Approximately 1/4 of the schools are likely to have clinical preceptors/staff with adequate competencies.
- Approximately 5% schools are likely to have adequate graduate students to assist with teaching NI and using ICT.

Educational applications of ICT

- WEB-CT or other distance ICT applications are used in approximately 3/4 of the schools.
- There is variability in use of educational ICT, primarily due to limited school resources.

Continuing Education opportunities

- More educational opportunities are available to faculty than to students, except computer labs that are more available to students.
- Basic computer literacy training is more available than the application of ICT to nursing practice.
- Less than1/3 of schools offer NI credit courses.

Organizational Culture and Strategic Plan

- Approximately 3/4 of the schools have a culture that supports using ICT in teaching and learning.
- However, less than1/2 of the schools have a strategic plan or vision with goals and supportive policies for integration of ICT and NI in nursing education – or a nursing committee to examine the role of ICT and NI in nursing education and practice.
- Approximately 1/2 of the schools have a representative on a campus committee that controls financial and personnel resources to develop and maintain technology.
- Less than 1/3 of the schools have an adequate budget specifically allocated for technology.
- Collaboration for integration of ICT and NI into the schools is rare – almost non-existent with the ICT industry.

Curriculum

Characteristics

- Approximately 3/4 of the schools integrate NI throughout undergraduate curriculum, but do not know exactly where or how many hours are devoted to NI.
- Approximately 2/3 of the schools have a curriculum vision or design that includes NI competencies, but do not have explicit outcome objectives.
- NI educators are most likely to be nurse faculty members.

Objectives

- The most consistently addressed outcome objective is computer literacy in applications such as word processing, use of the internet, and presentations software.
- Approximately 3/4 of the schools have outcome objectives that address to some extent:
  - Use of ICTs to support clinical care delivery;
  - Security, confidentiality and privacy of clients in the use of ICT;

- Moral, ethical and legal aspects of informatics with respect to all domains of nursing.

- Fewer schools address outcome objectives related to:
  - Nursing information systems and their potential for enhancing the nursing process;
  - Understanding information flow through a health care agency and application of ICT;
  - Benefits/limitations of health and nursing information systems (e.g. taxonomies);
  - Access, evaluate and use information clinically;
  - Understand historical trends.

Competencies for entry level practitioners

- Suggested competencies are consistent with the categories/areas of outcome objectives.
- Communication competencies are also suggested (e.g. use of ICT to collaborate, publish and interact with faculty and colleagues).

Faculty

Computer Literacy

- The majority of faculty is most skilled in using common software programs, but there is limited integration of these skills into their teaching (<25%);
- There is limited literacy in the use of statistical and educational applications and least literacy with the use of clinical application systems.

Knowledge of NI Requirements for undergraduate nursing education

- Approximately 1/3 of faculty respondents perceive that they have good to very good knowledge of the five areas of NI educational requirements.
- Approximately 1/3 have no or poor knowledge of these five areas.

Faculty NI Competencies

- Greatest competency with respect to the ethical and legal issues and
- computer assisted instructional aids in teaching
- ~1/2 the faculty have some of the necessary competencies for teaching and evaluating NI competencies to support care delivery.
- Faculty have least NI competencies with respect to:
  - Defining new informatics competencies in conjunction with other nurse educators;
  - Using ICT to enter, retrieve and manipulate date;
  - Teaching-evaluating informatics competencies required for nursing administration; and
  - Designing, developing and implementing hardware and software for teaching.
- Some faculty question the relevance of NI and ICT to quality patient care and nursing.

Access and Experience

- There is poor faculty access to health and nursing informatics and instructional development courses.
- There is limited access to databases for research and to clinical information systems.
- 1/3 of the faculty respondents have taken general informatics courses – few have taken health or nursing informatics courses

Attitudes and Values

- Greatest agreement among faculty respondents that:
  - NI and ICT competencies are essential to practicing nurses
  - Undergraduate programs should use ICT to teach about NI and ICT.
- Less agreement that:
  - NI has the potential to significantly improve quality of nursing care;
  - Faculty are comfortable in abilities to incorporate NI & ICT in the nursing program.
- Little agreement that:
  - Web-based instruction and learning is of the same quality as on-site instruction;
  - School culture is one of being well informed about NI and ICT in nursing education.
- Respondents feel comfortable with ICT but perceptions of colleagues is less positive.
- Some faculty noted that their colleagues are beginning to recognize:
  - The need to increase their own competencies in NI and ICT;
  - Educating future leaders in nursing that NI is invaluable.

Program Type

There were few statistically significant differences between university and non-university programs (i.e. community colleges and technical institutes), although a few trends emerged.

- Statistically significant differences were that:
  - University programs more likely to have curriculum objectives related to nursing informatics;
  - Non-university faculty feel more competent to teach nursing informatics and use computer assisted learning and internet technology in teaching.
- Trends were for non-university programs:
  - to provide better access to NI education opportunities;
  - to have a nursing informatics component in the curriculum;
  - to have faculty who feel more competent in teaching NI and using ICT in teaching.

Conclusions

The findings from the survey questionnaires, referent group discussions and other feedback corroborated those of several recent Canadian and American studies examining similar issues. Of particular significance are the following conclusions:

1. The link between nursing informatics and evidence-based practice needs to be made and valued.
2. There is a need to have concurrent education and capacity building of educators, clinicians and students.
3. There is a danger of practice outpacing academia as ICT and Health Information Systems (HIS) become commonplace in health care settings.
4. There is a need to identify where nursing informatics is in the curriculum, identify core objective, competencies and outcomes.
5. There is a lack of supportive infrastructure (human, material and financial) in both educational and clinical settings – for faculty, staff and students.
6. Partnerships are needed within and across settings and with the private sector.
7. There is a need to follow-up this study to:

   - identify what the health care system's expectations are for new graduates; and how to influence NI and ICT development;

   -look for ways of partnering to increase resources in clinical and educational settings;

   - demonstrate to nurses and educators that adding NI to nursing knowledge has significant benefit to patient care and outcomes.

8. Recommendations for action and follow-up need to involve national nursing organizations representing nursing in policy development, practice, administration, education and research.

The findings, conclusions and recommendations from this and other Canadian reports of studies on nursing informatics can be no longer ignored. It is time to take action.

The full project report, including recommendations and appendices, can be accessed at www.cnia.ca.

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