NURSING EXPECTATIONS OF COMPUTERS IN THE HOSPITAL

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Abstract

This pilot study investigated differences in nursing expectations regarding the use of computers between two groups of nurses. Twenty-six volunteers from two groups identified as pace-setters (Group A) and middle-majority (Group B) completed investigator-constructed questionnaires.

Results indicated that Group A in general had more positive responses than Group B. Differences were seen between the two groups with respect to their willingness to interact with computers in order to accomplish nine common nursing activities. The nature of activities that either group was willing to accomplish by computers suggests needs in nursing education and practice.

Introduction

The purpose of the present study was to investigate the differences in nursing expectations regarding the use of the computers between two groups of nurses (pace-setters and middle-major). A larger study of randomly selected nurses in hospitals at varying levels of computer adoption is in progress. The goal of the larger study is to identify expectations and sources of concern in order to facilitate the implementation of computer use.

Background

Nurses, as a group, are behind in the application of computers in their work settings in comparison with most other professions. It is recognized that in a hospital setting, decisions regarding the institution of computers are made on hospital-wide basis, and for a variety of reasons, nurses are often the last to be considered. This stance is however, changing in part due to nursing's increased awareness of the implications of technological changes.

The conceptual framework for the present study is derived from the works of Houle, Hall and Louckes. The adoption of the use of computers as any other innovation, may be conceptualized according to the typology developed by Houle. In describing adoption of change, Houle indicated that the rate of adoption is correlated with favorable exposure. Within any large group, there will be four categories of adopters. First, there are the innovators who are usually loners, and the first to explore new ways of approaching a specific problem or set of problems. Second, there will be pace-setters who are progressive, but who derive much of their stimulation and gratification from social interactions and from being among the first to adopt innovations. The largest group, the third group, are the middle-majority who follow the pace-setters in accepting new innovations. Finally, there are the laggards who are the last to adopt, if at all. They may be the "die-hards" and "resisters" in a group when innovations are being considered.

The individual is believed to be a target of interventions, and is critical to success or failure of an innovation. Expectations related to several dimensions may be raised when innovation are proposed: personal life, relationship to clients in the work place, relationship to the profession, view of the health care system, and view of cost/health provider time.

In the past, the implementation of computers in hospitals have not included attention to expectations of nurses. Historically, hospital settings have given priority to computerization of payroll, "charge captures" such as drugs and central supply materials. In clinical care, medical technology has made advances in physiological monitoring of patients, laboratory analysis and reports, and in diagnostic procedures. More recently systems used in hospitals such as the Hospital Information System (HIS) and Medical Information System (MIS) and others, include nursing care plans, thereby effecting every nurse in the hospital.

Reports of results of computer use in hospitals have included factors such as job
satisfaction, and quality of patient care. The experience of El Camino Hospital in Mountain View, California, has become legendary. The system was automated for processing doctors' orders, information to place in patients' charts, nursing care plans, requisitions, bills and other documents. Despite problems during implementation, the experience has been gratifying for the nurses.14 The nurses found that the implementation of hospital computer use was associated with higher job satisfaction, quality of patient care, and personal professional development. Experiences of NIH clinical center, Texas Institute for Rehabilitation and Research, Houston, and Johns Hopkins Hospital, and several hospitals in North Carolina and others reported in Werley and Grier provide us with an overview of experiences in hospitals in the use of computers.6 However, few reports focus on expectations and concerns of nurses. Nursing leaders in computer applications recommend that nurses reassess their needs and further their knowledge and expectations in computer computer use.7,8

A decade ago, with the exception of a few individuals, nurses for the most part were not involved in computer applications. Research in the 1970's showed that nurses held a relatively negative attitude in comparison to medical students, medical record librarians, students, house staff, and medical faculty. This attitude was thought to be related to educational level and lack of experience with computers. Today it is hoped that continuing education, and national and international conferences on computer applications in nursing are in part remedying the situation. Special interest groups for nurses are being organized for computer applications in nursing. Newsletters are, as well, emerging to maintain networks for nurses. However, to what extent nurses are positively inclined toward working with computers today is unknown.

Specific questions for the present study are:

1. What are the differences in expectations between the pace-setters and middle-majority in their expectations with respect to their personal life, relationship to the profession, their view of health care system and cost?

2. What are the differences between the two groups in their willingness to interact with the computer to accomplish specific nursing activities (e.g., charting nurses notes, medications, lab work, etc.).

Method

Instruments:

Semi-structured questions addressed the extent to which nurses expected the use of the computer to influence their personal lives, relationship with clients, their profession, the health care system, and health cost or provider time. Examples are: What are your expectations/concerns regarding changes (if any) brought about by the use of computers? a) in relation to my personal life? b) in relation to my clients. The questionnaire also asked whether they were "very willing", "somewhat willing", or "not willing" to interact with computers to perform a list of 9 nursing activities. The activities were those known by the investigators to be commonly available on computers, as well as those cited in research and commercial literature (e.g., chart medications, order supplies, general individualized care plans, etc.). Demographic information were obtained on the nurses' age-groups, sex, previous experience in the use of computer, and the type of nursing in which they are currently engaged. Validity was determined by five expert judges (nurses and non-nurses experienced in the use of computers). Reliability will be obtained as part of the study.

Subjects

The 26 subjects for this study were volunteers from two groups identified apriori as pace-setters (Group A) and middle-majority (Group B). Group A consisted of 14 volunteers from a 3-day computer conference in nursing workshops where many hospital and school administrators sent their nursing personnel, many of whom were the designated computer liaison persons in the hospitals, or faculty asked to provide leadership in computer education in their schools. For this reason, the group from the conference were designated the pace-setter group.

The modal age for Group A was 41-45 (older than Group B's 31-40). Group A had more educators, administrators (6 out of 14), and they were experienced in using home computers and work processing machines; two of the members used computers on a daily basis and others irregularly or never. Twelve of the 14 were able to program or perform data entry, word processing or data management on the computer.

The middle-majority group (Group B) consisted of 12 members of a more general workshop dealing with psychological aspects of patient care, with a model age of 31-40 years, and working in acute care, critical care, psychiatric, and the type of nursing in which they are currently engaged. Only 3 of 12 in Group B used a computer daily or weekly; they either used computers irregularly or never. Only 3 of 12 in Group B recorded data entry or word processing as functions they could perform.

Procedure

Subjects at the conferences were approached individually and asked if they
wished to participate in a pilot survey. Participation was voluntary, and anonymous.

Results

Results regarding positive expectations and potential concerns of Groups A and B can be seen in Table 1. Group A had more people respond positively in each area of life (personal, relationship with clients, professional life, the health care system, and in terms of health cost/provider time) than did Group B. With respect to the impact of computers on personal life, it can be seen that the majority of Group A (11 of 14, or 78%) expected the use of computers to provide more information, save time, and to be generally helpful. In contrast only 4 out of 12 (33%) in Group B indicated positive expectations, and 3 in this group mentioned potential concerns in the areas of loss identity, loss of privacy, and loss of control. Two in Group A and five in Group B had no comments.

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<tr>
<th>AREAS OF LIFE</th>
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* Examples of positive expectations: more information, time-saving, efficient, generally helpful, cost effective, more time at bedside.
** Potential concerns: no comment (group A responses), increase in load, computer malfunction, loss of identity, loss of privacy, loss of control, loss of interpersonal relationships, loss of program in the event of a crash, error hard to remove.
† More than one comment from respondent.

In terms of relationship to clients, and health providers' time, the majority of Group A responded that the computer would be generally helpful, cost effective, and provide more time at the bedside. In Group B only 3-4 respondents responded positively to each area.

Most notably, it can be seen in the area of health cost/provider time, that the 14 respondents in Group A mentioned 15 positive points, and one potential concern, while 4 respondents in Group B mentioned 4 positive points, and one expressed a source of concern (errors are difficult to remove). It is of interest to note that a maximum of 7 (of 12) respondents in Group B answered the questions in this section at all; 5 or 42% did not answer.

Differences were seen between the two groups with respect to their willingness to interact with computers to accomplish the 9 nursing activities. The mean percentage of people who checked "very willing" in Group A was 86% compared with 52% in Group B. Group A showed that 14% checked "somewhat willing," while a mean of 10% of the respondents in Group B did so.

A closer inspection of responses from Group A indicated that the majority (12 of 14) were very willing to interact with computers to chart medicines, graph vital signs, order medicines and supplies, enter Dr.'s orders, generate individualized care plans, staffing schedule, and for reference purposes. This group was less willing (somewhat willing) to use computers to teach students/patients.

Respondents in Group B were more willing to use the computer as a reference and to order supplies (8 of 12), and were only somewhat willing to use the computer to enter Dr.'s orders, generate individualized care plans, elicit patient history, and teach patients/students (5-8 respondents out of 12).

Discussion and Recommendations

The pace-setters in Group A responded more positively to expectations in each area of life than did the Middle-major in Group B. Group A members were more readily able to see the time-saving effects, the ease in the retrieval of information and increased time to be spent at the bedside which may result from adoption of the use of computers. Their perceptions further expanded to the larger health system, and cost-effectiveness.

On the other hand, Group B mentioned concerns related to the loss of identity, loss of control and loss of privacy. These concerns are a reflection of their current understanding of what the computer can do. It is an idea advanced by popular media as well as by reports of experienced computer users in business and blue-collar positions.12,13 Means of controlling or programming the computer are evidently unavailable to these workers. Additionally, the feeling of loss of contact with the data may be a result of a lack of conceptual
knowledge of computer usage. In like manner,
the issue of privacy was not resolved in minds
of some of the respondents in Group B.

Personal and role concerns were reflected in
respondents' willingness to interact with
computers. Group A was very willing to inter-
act with computers with regard to hospital
activities currently on-line in fourth genera-
tion systems. The use of computers for
patient teaching falls under a somewhat
different area. It is conceivable that
respondents were reluctant to "give-away"
patient teaching as part of their nursing
role. It is also a reflection of their lack
of contact with imaginative teaching material
which would supplement teaching by the nurse.

Group B was much more limited in the
activities in which they were willing to use
the computer. Their willingness to order
supplies and to use computers as a reference
indicates again that the activities more
closely associated with nursing were not
included: generating individualized care
plans, eliciting patient history, and teaching
patients/students, and entering the doctor's
orders.

Recommendations for continuing education
of nurses regarding expectations and concerns
can be derived from this study. It is
important to stress points which would clarify
nurses' thinking regarding ways in which they
may safeguard their data, provide for a sense
of control, and retain a sense of personal
interaction in the work setting. For example,
most systems already have passwords for
assessing specialized information for a large
system. Another means of maintaining privacy
is to use multiple modules and multiple soft-
ware for different departments. The latter
proposal proposes other issues of machine-
machine interaction which must be well-thought
out.

It is imperative that the systems provide
for means of program change in an effective
and efficient manner. Hospitals should have
mechanisms whereby desired changes by nurses
can be acknowledged and improved in order for
changes to take place. Computer committees
often neglect the caregiver level in the
hospital and, thus, ignore his/her concerns
and needs with respect to patient care
programming.

Education programs can also be instituted
to demonstrate the use of computers in patient/
teaching. In hospital situations at the
present time, patient education is often a
neglect aspect of patient care. With the use of
varied media (videotapes, computers, video-
discs, etc.) much routine information can be
presented, while the nurse can be present for
counseling and answering questions.

In summary, we have described a study
which identified expectations and concerns of
two groups of nurses. We have also discussed
some implications of nursing and continuing
education. We feel that nursing has a
challenge to meet with respect to computer
application...and nursing has begun to rise
to the occasion.

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