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A Preliminary Study: Capturing Perceived Accuracy and Confidentiality of Traditional and Computerized Patient Records

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Introduction

A recent survey of health care organizations found that almost 30 percent have automated the documentation process with a computer-based patient record (Perreault and Wiederhold, 1990). Research is needed to determine the impact of computerized information systems on quality of care and the nurses' perceptions on the security (accuracy and confidentiality) of data. The Nurse's Perception of Charting Accuracy and Confidentiality instrument (NPCAC) is being developed to identify these variables.

The purpose of this study is to identify the pertinent literature, develop the initial questions, and to begin to validate this instrument.

Review of Literature

Technology Assessment (TA) is a framework for the systematic study of a technology for the purpose of assisting decision-makers to establish policies on the development, acquisition, and utilization of health care technologies (Menon, 1993). The TA framework can be used to assess any health care technology. Health care technology encompasses "drugs, devices, and procedures used in health care as well as the organizational and support systems within which such care is delivered" (Pillar, Jacox and Redman, 1990, p. 16). There are four components of a comprehensive TA: safety, efficacy/ effectiveness, social impact and cost/benefits (Happ, 1991a, Pillar et al., 1990). Since health care technology deals with the well being and life of consumers, safety is of primary concern. The safety component of TA, the focus of this study, deals with (1) accuracy and timeliness of data input, and (2) confidentiality of data.

Accuracy and Timeliness. It has been stated that automated data is "more complete, accurate, and legible than data in manual records" (General Accounting Office, 1991, p.13). The legibility issue is undebatable, but the completeness and accuracy issues lack empirical substantiation. Accuracy and timeliness of data can be effected at several areas during the processing of data. Errors can involve the actual human-computer interaction, such as omissions or input of incorrect data, the processing of data, such software malfunction, and the output of data, such as distribution to unintended users (Minard, 1991).

Hinson et al. (1994) in a study of the impact of a clinical nursing information system on one nursing unit, utilized a chart audit form to assess completeness of documentation by nurses. Preliminary findings suggested that system implementation resulted in the identification of a greater number of problems in the nursing charting.

Dennis, Sweeney, Macdonald and Morse (1993) studied the impact of a bedside information system on nursing care including the completeness of documentation. Charts were monitored using the documentation standards disseminated by the Joint Commission of Accreditation of Health care Organizations (JCAHO). Results showed that there was "significant improvement in compliance to 34% of the JCAHO standards for nursing documentation that were monitored". Analysis of qualitative data identified timeliness, comprehensiveness, and accuracy as advantages of the system.

Confidentiality. Confidentiality of data must be guaranteed to all clients while at the same time the data must be easily available to health care workers providing care (Priest, 1989). Neither manual nor automated medical records are totally secure from loss or unauthorized use, but problems of this nature can be anticipated and minimized. In the safety area of TA confidentiality deals with the actual security of the medical record. Data security or confidentiality is required by law.

Curran and Curran (1991) explored privacy and confidentiality issues in electronic information systems. They reported that 76% of the nurses admitted that they used the computer to obtain patient information that was not in their assigned duty areas (Rittman and Gorman, 1992).

Brodt and Stronge's Nurses' Attitudes Toward Computers Questionnaire, includes two items that possibly measure nurses' attitude toward security (Stockton and Verhey, 1995). Five previously identified subscales of this instrument included a subscale

of "legal ramifications of computer use" (Scarpa, Smeltzer and Jasion, 1992). In a recent psychometric examination of this instrument, factor analysis revealed only three factors (Stockton and Verhey, 1995). One of these factors, labeled "Computers and personal security" included two items dealing with confidentiality or security issues (Stockton and Verhey, 1995).

Concerns about security were summarized in the General Accounting Office's report to the Committee on Governmental Affairs, United States Senate, on automated medical records, (General Accounting Office, January, 1991): "(Because) Automated records . . . tend to be accessible to many users in many locations and these users could potentially search thousands of files with relative ease, problems with security and privacy are magnified. One of the chief advantages of automated records, easy and widespread access, also can make them vulnerable to easy and widespread abuse (p.22)."

An additional concern regarding confidentiality of patient records arises when data from hundreds of health care organizations is transmitted outside the organization, and aggregated for outcomes research or other purposes.

Method

Instrument Development. The NPCAC instrument began with fifteen forced choice items that were based on the literature review and the output from a seminar of nursing informatics graduate students. All had a wide range of experience with hospital information systems. Statements were rated on a five point Likert scale from strongly agree to strongly disagree.

For content validation these items were reviewed by eight nurses working in a critical care area of a regional medical center that had implemented a computer-based health care information system with a computerized patient record in the last twelve months. Nurses were asked to review item content for appropriateness in evaluating nurses' perception of accuracy and confidentiality of the patient's medical record. In addition, the information systems nurse at the same medical center was asked to review the statements.

Recommendations from these nine nurses were incorporated into the twenty one items found in Appendix A. This instrument included eleven items designed to assess accuracy descriptors: descriptiveness, timeliness, and completeness. In addition, five pairs of items (one item in each pair pertains to the traditional paper record and one item in the pair pertains to the computerized patient record) were designed to assess confidentiality of the two systems.

These 21 items were randomly inserted into a questionnaire including an additional 45 items pertaining to computer-based health care information systems. This study was the initial use of these items and acted as the pilot study.

Sampling. Eight-five half-time and full-time registered or licensed practical nurses were asked to participate in the study. Each worked in the critical care area (ICU or CCU) of a regional medical center that recently implemented a bedside computerized patient record. Since this was the initial testing of these items it was felt that this sample size was adequate.

Each nurse was given a packet (i.e., cover letter, survey, and return envelop) via unit mail boxes. The cover letter assured confidentiality and anonymity. To enhance participation, the questionnaire packet also contain an entry for eligibility in a drawing for a \$50 gift certificate. Estimated survey completion time was fifteen minutes. The completed instrument and entry form were returned to a well-labeled box located in the nursing lounge. Envelopes were collected daily.

Plan for Data Analysis. Since this is the initial testing of the NPCAC instrument, an exploratory factor analysis approach to construct identification will be employed. It is hoped that a three factor structure would emerge identifying the three expected outcomes for the safety component: accuracy, security of the computerized record and security of the traditional record.

Principal axis factoring (PAF) will be carried out on the data using a statistical software package (SPSS-X). Factors will be retained if they have an Eigenvalue >1.0. This criterion is known to be quite accurate when the number of variables (items) is small (<30) and the communalities is high (>.70) (Stevens, 1992).

Factor loadings will be evaluated. Items that load on more than one factor will need to be evaluated to see where they might "fit" best theoretically. If an item does not load on any one factor, it may need to be eliminated from the scale. It is hoped that three factors emerge that could be named (1) Accuracy descriptors, (2) Paper Record Security descriptors and (3) Computerized Record Security descriptors. If another factor structure emerges other names may be more appropriate.

The reliability or internal consistency of the items in each factor will then be calculated. Alpha reliability values of .90 or above are desired. If the alpha value is not at the desired level, the item discrimination index scores may identify items that do not correlate well. Items with low item discrimination index correlations may need to be modified or omitted from the measure.

Summary

The Nurses' Perception of Charting Accuracy and Confidentiality (NPCAC) instrument is being developed as a result of a dearth of measures in the area. Before this instrument can be used validity and reliability assessments must be made using recognized statistical procedures. This study has presented a review of literature, presented the development of an initial instrument, and discussed the statistical validation (i.e., construct validity by exploratory factor analysis and internal consistency reliability). Results will be forthcoming.

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Appendix A

NURSE'S PERCEPTION OF CHARTING ACCURACY AND CONFIDENTIALITY OF TRADITIONAL PAPER AND COMPUTERIZED PATIENT RECORD INSTRUMENT

Please rate the following items as to whether you Strongly Agree(1), Agree(2), No Opinion (3), Disagree(4) or Strongly Disagree(5) by circling the appropriate number beside the item.

Accuracy Items	SA	A	NO	D	SD
1. The computerized patient record allows me to chart as descriptively as I need to.	1	2	3	4	5
2. The computerized patient record allows me to chart in a timely manner.	1	2	3	4	5
3. Documentation in the patients' charts seem to be more complete than with a paper documentation system.	1	2	3	4	5
4. Sometimes I am forced to make a choice from a menu that does not totally agree with what I want to document.	1	2	3	4	5
5. In reviewing computerized charting I did previously, the documentation is always what I had intended to write.	1	2	3	4	5

6. I have noticed that the overall quality of documentation by others has improved since system implementation.	1	2	3	4	5
7. Care planning done using this system is less individualized and/or accurate for the patient.	1	2	3	4	5
8. It is easy to make data entry errors (keyboard, mouse, etc.) when using this system.	1	2	3	4	5
9. I do not chart as descriptively now as I did prior to implementation of the computerized patient record.	1	2	3	4	5
10. The information system prompts me to chart pertinent assessments that are required by JCAHO or other facility policy.	1	2	3	4	5
11. The system allows me to easily correct errors I make while charting.	1	2	3	4	5
Confidentiality Items	SA	A	NO	D	SD
12. If I was the patient, I would feel my traditional paper patient record was protected or secure from unauthorized use.	1	2	3	4	5
13. If I was the patient, I would feel my computerized patient record was protected or secure from unauthorized use.	1	2	3	4	5
14. Printouts of data from the Computerized Patient Record that have a patient's name or number on them, but are not part of the patient record, do not need to be considered confidential information.	1	2	3	4	5
15. Copies of pages from a patient's paper record are not considered confidential material	1	2	3	4	5
16. With the Traditional Paper Patient Record it is difficult for me to read information on patients that I am not currently caring for.	1	2	3	4	5
17. With the Computerized Patient Record it is difficult for me to retrieve information on patients that I am not currently caring for.	1	2	3	4	5
18. I feel that it is not a breach of confidentiality if I read the chart of a patient I am not caring for.	1	2	3	4	5
19. I feel that it is not a breach of confidentiality if I look up computerized data about a patient that I am not caring for.	1	2	3	4	5
20. Visitors or patient's families can easily read confidential patient information written on various patient records.	1	2	3	4	5
21. Visitors or patient's families can easily view confidential patient information on the computer screen.	1	2	3	4	5