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Nurses' perceptions of their documentation experiences in a computerized nursing care planning system

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Nurses' perceptions of their documentation experiences in a computerized nursing care planning system

Aim. To explore how the content design of a computerized nursing care plan affects nurses' perceptions of their documentation experience, specifically in making care plans.

Background. Nurses' attitudes towards and experiences of computer use in daily practice have been studied. However, no studies have examined how using a computerized nursing care planning system affects nurses' perceptions of the documentation process.

Methods. A descriptive, exploratory qualitative approach was used to conduct one-on-one, in-depth interviews with 20 nurses. The major interview question was, 'What do you think the content of the computerized care plan provided in making care plans?' Data analysis was based on Miles and Huberman's data reduction, data display, and a conclusion verification process.

Findings. Nurses generally viewed the content of the computerized nursing care planning system as a reference to aid memory, a learning tool for patient care, and a vehicle for applying judgement to modify care plan content.

Conclusions. Although computer technology is designed to streamline nurses' work, using a computerized care plan system can also enhance their knowledge, experience and judgement of descriptions of patient problems and care strategies. Thus, the effects of using technology on documentation behaviours or patterns may deserve further exploration.

Relevance to clinical practice. While computerized documentation systems have been used widely in patient care, little attention has been given to how the design of care plan content affects the documentation process. Electronic documentation systems can introduce nurses to new skills and knowledge that may improve care quality.

Key words: computerized nursing care plan, information technology, nurses, nursing, nursing diagnosis, qualitative study

Introduction

The use of computer technology in nursing documentation has been reported since the 1960s (Romano 1982). In the early 1980s, Romano proposed a model in which the content of computerized nursing documentation would provide medical orders, nursing interventions and patients' responses towards these treatment and caring processes. While technology has been comprehensively used in daily nursing practice, researchers have cautioned for the need to explore nurses' perceptions of the effects of technology on patient care and to explore nurses' motivation to apply the

technology for improving their professional image and skills (Romano 1990a,b, Rinard 1996, Barnard 1997, 2000).

Computerized nursing care plan (CNCP) systems are nursing information systems (NISs) designed to construct care plans by providing a selection of nursing diagnoses, defining characteristics, related factors, expected outcome goals, related nursing interventions and outcome evaluations. These systems have become popular in recent years and are increasingly recommended for describing patient conditions (Getty *et al.* 1999, Lee *et al.* 2002). The importance of computerized documentation has been noted as a legal record to ensure appropriate care, patient safety and for third-party reimbursement (Chase 1997); to provide immediate access to information and automated referrals (Morrow 2002); and to provide direction for care and communicate information (Daly *et al.* 2002). Furthermore, CNCP systems not only offer nurses skills in using new technology for patient care, but also add to their knowledge and experience (Rinard 1996).

Researchers have generally viewed nursing documentation such as care plans as a requisite for quality patient outcomes (Romano 1982, Festa *et al.* 1996, Daly *et al.* 2002), but most studies on computerized nursing documentation have focused on nurses' attitudes towards computers and seldom specifically explored the influence of this technology on nurses' perceptions of the documentation process (Stronge & Brodt 1985, Harris 1990, Simpson & Kenrick 1997, Wilson & Fulmer 1998, Stricklin *et al.* 2003, Darbyshire 2004).

As nurses are the major care providers in the healthcare institutions, and CNCP systems have been designed specifically to reflect nurses' patient care efforts, understanding how nurses view their documentation process certainly affects the development of this technology and the design of educational programmes for using care plans. Therefore, this study was conducted to explore further how the content of a CNCP system influences nurses' perceptions of this documentation process in making care plans.

Literature review

'A nursing care plan is a written guide to the individual patient's nursing needs, purposefully stated so that appropriate nursing actions are specific or implied' (Aidroos 1991, p. 1). Therefore, care plans have been viewed as guidelines for care and incorporated into clinical practice to assess and document evidence of dedication to patient care (Shea 1986, Hildman & Ferguson 1992). However, some researchers question whether this documentation process reveals the effects of nursing care or professionalism (Moloney & Maggs 1999, Mason 1999, Kerr & Lewis 2000).

The general benefits of adopting a computerized charting system have been viewed as time saving (Korst *et al.* 2003), effective and efficient (Allan & Englebright 2000), identifying more patient problems and implementing more interventions (Daly *et al.* 2002), and providing care guidelines (Lee *et al.* 2002, Lee & Chang 2004). However, disadvantages of standardized or computerized care plans have been cited, such as losing nursing expertise (Harris 1990), paperwork requirement (Mason 1999, Lee *et al.* 2002) and de-individualized content (Harris 1990, Lee *et al.* 2002). Darbyshire (2000, 2004) found that computerized patient information systems lacked the sensitivity for nurses to record the essence of caring. Thus, the technology was simply an electronic way of doing what had previously been done using pen and paper.

Applying computer technology to nursing documentation has often required a standardized format for the nursing diagnoses used in making care plans. Nurses who use nursing diagnoses need to identify the related factors, to define the characteristics (signs and symptoms) of patient problems, to provide the appropriate interventions and, finally, to observe patients' responses to the care process (Carpenito 2000). However, nurses' use of nursing diagnoses has been affected by time constraints (Higuchi *et al.* 1999), lack of knowledge and experiences (Thomas & Newsome 1992, Higuchi *et al.* 1999), and incomplete patient data (Higuchi *et al.* 1999). Similarly, studies have revealed that nurses' knowledge base and experience could affect their assessment process (Woolley 1990, Carnevali & Thomas 1993, Taylor 1995). Thus, constructing care plans requires that nurses integrate their knowledge base, long-term memory and problem-solving strategies to strengthen the diagnostic reasoning process.

Although paper forms of care plans are being replaced by computerized care plan systems, their effects on quality of nursing care and on professional growth are still under investigation. In a previous qualitative study, Lee *et al.* (2002) explored nurses' experiences using the same CNCP system described here. Interview data from that study indicated that while nurses valued making computerized care plans quickly and minimizing paper printouts, they felt that using the CNCP system compromised nurses' thinking process and professional judgement of patient problems. Understanding nurses' perceptions of this computerized documentation process could not only enhance their adaptation to using this technology, but also improve the quality of patient care resulting from better designed care plan content and training programmes. Therefore, this study was conducted to explore further how the content of the CNCP system influences nurses' perceptions of this documentation process in making care plans.

Methods

Setting

The research reported here was conducted on three respiratory care units (including one intensive care unit) at a medical centre in Taiwan. These units were selected because they had been involved in pilot tests of different NISs such as the CNCP, nursing records, and a variety of assessment forms in the institutions. The nurses in these units had been encouraged to express their opinions about the strengths and weaknesses of using these NISs. This hospital implemented the CNCP in 1998 and the system has been used since then in all inpatient nursing units. Nurses are required to devise care plans by selecting nursing diagnoses, goals and interventions for every newly admitted patient and then obtaining printouts in the nursing stations. Nurses are supposed to terminate online charting when patients are transferred out of the units.

Research design

To identify and describe nurses' perceptions of how the content design of the CNCP system influenced their documentation process, a descriptive, exploratory, qualitative research design was used to interview nurses in-depth. The criterion for participating in the study was having worked on the unit for at least six months, by which time nurses would have learned the unit routine and computerized charting system. Data were collected and analysed simultaneously. Recruitment of participants ceased when data analysis indicated that similar or repeated topics appeared.

Participants

Twenty nurses were purposively recruited for this study based on their willingness to discuss their perceptions of the CNCP system. Two nurses had less than one year nursing experience, seven had one to three years, three had four to five years, and the rest had worked six to 10 years. Eight nurses were between 20 and 25 years old, 11 were between 26 and 30, and only one was between 31 and 35. Half of them were college graduates and the rest had associate nursing degrees. Eleven reported first-time use of computers for electronic documentation.

Ethical consideration

Potential participants signed informed consent forms, which indicated the study purpose, method of data collection and guaranteed the participants' anonymity. Anonymity was assured by using code numbers to identify data (interview transcripts). These data and code numbers were accessed only by the researcher. The consent form also assured nurses that participating or dropping out of the study would not influence the evaluation of their job performance. To increase the incentive to participate, each nurse was given a gift with a $20 dollar value.

Data collection

After the hospital's Institutional Review Board approved the study, a letter of introduction was sent to all nurses on the three units asking for volunteers to participate from May to July of 2002. The letter explained the study purpose and the procedure involving one-on-one, tape-recorded interviews. Each interview started by asking a general question such as, 'What kind of information do you need (such as defined characteristics, related factors, signs and symptoms) in making care plans?' and then a more probing question such as, 'What is your opinion of the CNCP content in providing these data for making care plans?' Finally, the nurse participant would be asked, 'Would you please give an example of how you used the CNCP content in your charting process?' Each interview lasted 30–45 minutes and was conducted in a private room on the unit, at a convenient time for participants.

Data analysis

Each interview was transcribed verbatim and the accuracy of its content was verified by the participant (member check). Transcripts were examined and coded by content analysis. First, each transcript was analysed to identify terms or incidents that were similar and appeared frequently. This coding and analysis process was reviewed by nursing experts in chart audit and in qualitative researcher (peer debriefing). Next, the identified incidents or terms were compared with those of other transcripts. Finally, similar or different incidents or terms were then grouped into categories to become concepts or themes from which to draw conclusions for this study (Miles & Huberman 1994).

Findings

Content analysis of the interview transcripts revealed three major concepts regarding nurses' perceptions of how the CNCP content influenced their documentation process: as a reference list to aid memory, as a learning tool for patient care and as a vehicle for applying judgment to modify care

plan content. Excerpts from participant interviews are given below to support these major themes.

Reference list – gleaning available items and confirming diagnoses and care

Some nurses drew on their knowledge or experience to search the CNCP content for items representing patient conditions. It was much easier to glean the list and select items than to generate the items from memory. Nurses generally said that they could not remember every likely nursing diagnosis for a care plan. Thus, the CNCP was viewed as an aid that provided a convenient list when they had trouble making nursing diagnoses. One nurse said:

If the patient has no fever, no respiratory problems and is not in a fall prevention programme, I can glean the list to pick up a nursing diagnosis instead of squeezing out something to write (#N5).

Although the reference list was used as memory aid, some participants emphasized that they used the list to confirm their thoughts of patient problems. One said:

I might check the content for confirmation, but that doesn't mean that I don't know how to care for patients (#N8).

However, if they found no apparent match with a patient condition, 'knowledge deficit' would be used to indicate a need for health education about care procedures.

Learning tool – applying the obtained information to care and charting step by step

Some nurses used the CNCP as a learning tool to increase their knowledge or experience. They learned how to care for patients based on the information provided by the CNCP content. One said:

When I click on certain nursing diagnoses, many interventions and goals will pop up. If I learn that there are two more goals listed for a particular problem than I used to know, I may apply these two to a patient if the condition calls for it. (#N5)

Another nurse said:

For pain control, I used to ask the doctor for pain relievers. After learning from the care plan about other pain interventions, I will apply one next time before asking for medication. (#N17)

Another said:

I might not have found this problem when I assessed the patient, but it was on the care plan. So, I will go back to reassess the patient and find out whether I missed something or the problem no longer exists. (#N6)

In this learning process, some participants admitted that they first followed other nurses' diagnoses, and then developed their own. For example, one participant said:

Most nurses used 'risk for trauma' on patients with bloody sputum, but I checked the textbook and learned that it was inappropriate. After that, I didn't use it as every one did. (#N8)

In addition, some participants realized the importance of documenting care plans. One said:

I used to do what I was supposed to do for the patient, and didn't realize that it could be documented in such a formal way, with related factors, defined characteristics, diagnosis, goals and intervention. I never realized that these everyday routines could be stated as important documentation. (#N9)

Using judgement in charting – revising the CNCP content and prioritizing problems

Some nurses applied their existing knowledge or experience to modify the CNCP content. They either revised inappropriate item descriptions on the reference list or set their own priority for patient problems. One nurse said:

Some related factors for fever are due to the disease, not environmental factors, but the computer can't distinguish the difference. You need to correct or revise it. (#N3)

Another said:

If an ice pack is suggested for fever, but the patient doesn't want it, I won't follow that instruction (#N3).

Some said that corrections could only be made when they had available time. For example, one participant said:

I found that a patient still had a problem with airway clearance, but that diagnosis had been replaced by another one, so I put it back, but not until the night shift when I had some spare time (#N2).

Prioritizing diagnoses also depended on the nurse's experience. One said:

If a patient's problem is not documented, I will review the care plan first, then decide whether to make another nursing diagnosis or just to make a note of it. Problems may not appear every day, but they do not go away either. If a patient is diagnosed with pneumonia, even though he/she doesn't have a fever now, I won't delete the problem. (#N8)

Another said:

Suppose the care plan lists two problems, 'pain' and 'ineffective breathing pattern', with no priority for which one should be solved

immediately, but the patient is concerned about his constipation. Which one do you think should be listed first on the care plan?' (#N10)

Discussion

The findings of this study show that this sample of nurses generally viewed the content of the CNCP system as a reference for charting and care, as a learning tool and as a vehicle for applying judgment to modify care plan content. In a previous study (Lee *et al.* 2002), nurses using the same CNCP system generally thought that it did save time and paper, but the tradeoff was losing desired content to describe patient conditions. A similar scenario emerged from the current study: nurses applied their judgment or experience to revise and even correct unsatisfactory content. However, some participants viewed the CNCP content as helpful for diagnostic thinking, learning and constructing care plans.

In regard to the CNCP list of diagnoses, nurses used the CNCP content as a memory aid to choose items describing patient condition. This finding is consistent with information processing theory, which proposes that human beings have limited capacities for processing information in long-term memory (Carnevali & Thomas 1993, Van Wynen 1997). Similarly, it has been reported that lists of detailed care guidelines save nurses from too much memorizing (Lee & Chang 2004). Therefore, computer-based patient record systems are designed to respond to the user's contextual needs by allowing thoughtful browsing without adding to cognitive overload (Chamorro 2001, Dowding 2001).

However, on some occasions nurses could not find the diagnosis they wanted so they used 'knowledge deficit' as a common nursing diagnosis. Nonetheless, this diagnosis has been proposed to be removed from the NANDA (North American Nursing Diagnosis Association) list as it does not meet the required criteria for defining nursing diagnoses (Powers 2002). Nurses probably had to pick up at least one diagnosis to complete a care plan requirement. A more versatile choice of items may be necessary to meet an individual nurse's needs (Lee & Chang 2004).

Another finding of this study was that nurses viewed the CNCP content as a learning tool for nursing diagnoses and implementing interventions. Some even corrected errors in previous diagnoses and learned the importance of documenting their patient care efforts. This finding is similar to that of a previous study, in which novice nurses generally viewed the care plan as offering helpful guidelines (Lee *et al.* 2002). However, nurses in the current study also used learning resources other than the CNCP. They checked textbooks regarding CNCP diagnoses and realized that other indicators should have been given more attention. Researchers have recommended that nurses be encouraged to use computers for more than just performing daily routines (Curran-Smith & Best 2004). For example, the time nurses save by making a computerized care plan can be used to reflect on improving patient care or to construct new knowledge (Lee *et al.* 2002).

The last major finding of this study was that nurses with experience in patient care and nursing diagnoses did not follow the care plan's direction and even revised incorrect/outdated content. Likewise, other researchers have found that experienced nurses seldom used care plans because their knowledge, experience, and critical thinking guide their day-to-day care activities (Smith & Smith 2002). Chase (1997) proposed that standard problem lists are useful tools for beginning nurses, but they can limit the contributions of expert nurses if the list represents nursing efforts. Although nurses in the current study complained about having to make their own care priority and update the care plan in the night shift, researchers have suggested that a nurse cannot realistically address all or most nursing diagnoses and nursing care plans should be made early enough to be used during the clinical day, not after the shift (Carpenito 2000, Schuster 2000). Therefore, nurses' routine tasks may have to be redesigned to incorporate this new documentation process.

The content of the CNCP was perceived by the nurses as affecting their documentation process in three stages. Firstly, they used the content as a reference list to select items that described patient condition. Secondly, they used the content as care guidelines to perform nursing activities. Finally, when they had accumulated certain knowledge and experiences from the CNCP content, they applied their judgement to revise whatever they thought was inappropriate to describe patient condition or care.

Conclusion and suggestions

This study explored nurses' perceptions of how the content design of a CNCP system affected the making of care plans. The findings indicate that nurses felt that using the CNCP system affected their charting patterns in three ways: they used the content as a reference, a learning tool, and a vehicle to apply their own judgement to modify care plans. The results suggest different stages of incorporating this computer application into the documentation process. Other researchers have stressed that nurses could learn new skills and knowledge introduced by technology, but any effects on nursing practice, such as care experiences, may deserve further attention (Rinard 1996, Alexander & Kroposki 2001).

The author recommends future studies. Firstly, to measure changes in documentation patterns accurately using CNCP

systems, a longitudinal study is needed that takes nurses' experiences and knowledge into consideration. Such changes would affect decisions about care which, in turn, could affect patient outcomes (Alexander & Kroposki 2001). Secondly, charting quality and patient outcomes as a result of using computerized documentation should be measured (Romano 1982). Nurses who are used to charting in a narrative form may not adjust to using electronic documentation to represent the complexities of their care, thus compromising the quality of the data in revealing care efforts. Finally, the effect of computers on documentation and charting behaviour may need to be examined using the diagnostic reasoning process (Taylor 1995, Chartier 2001, Dowding 2001). Further studies are needed to examine the effect of CNCP content design on patient data collected and hence on nurses' diagnostic reasoning process.

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Contributions

Study design: TL; data analysis: TL; manuscript preparation: TL.

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