

Hospital Nurses' and Physicians' Use of Information Sources during their Production of Discharge Summaries: A Cross-Sectional Study

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Abstract. Hospital nurses' and physicians' production and exchange of accurate information between levels of care are crucial for ensuring safe and seamless care for patients in transition. We report on a study in which we explored hospital providers' use of information sources when they prepared discharge information for colleges in the community health-care sector. In this cross-sectional study, 510 nurses and 236 physicians responded through a questionnaire. Our findings show that nurses and physicians use different information sources in patient records when they produce their discharge summaries.

Keywords: Electronic patient record, discharge summary, inter-disciplinary information management

Introduction

The expectations of developing patient records that support different health-care provider documentation and information needs have been discussed for many years. The electronic patient record (EPR) is a repository for patient information, and has the advantage of being accessible by multiple users [1]. Having access to relevant and updated information about patients is regarded as crucial for ensuring patient safety and continuity of care [2]. Ensuring safe and efficient communication from hospital nurses and physicians to their colleagues in community-based health care has become imperative for meeting current and future challenges in health care [3]. Previous research has identified gaps in the exchange of accurate and timely information from hospitals to community-based health care providers [4-6]. When information is lacking, nurses have reported that it is time consuming to find the information they need to provide efficient care [6]. When a patient is discharged from a hospital to follow-up care in the community health sector, the use of discharge summaries has been regarded as a feasible tool for informing colleagues in other sectors. In Norway, where the current study took place, nurses and physicians have traditionally produced separate discharge summaries [7]. As a result, home health-care nurses have reported that they do not always receive relevant medical information [8].

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In accordance with the development of a more fragmented and specialised health-care system, an awareness of having inter-disciplinary information systems has become more obvious. While previous studies have addressed nurses' expectations and attitudes toward using EPRs [9], their perceptions of EPR on patient safety [10], user acceptance [11] and physicians' use of EPR during their daily work [12], all of which have been described in the literature, we have not identified studies exploring how nurses and physicians use different information sources to prepare a discharge summary. The structure of the EPR's content can be differentiated between time-oriented-, problem-oriented- and source-oriented structures [1]. The latter means that the content is organised as the information is received, resulting in different information that is useful for producing discharge summaries possibly being stored according to different orders.

The overall objective of the current study was to investigate hospital nurses' and physicians' production and exchange of information when patients are discharged from a hospital to continuing home health care in a municipality. In light of previous studies, which show that nurses and physicians exchange information along discipline-specific patterns, we more specifically addressed which information sources were most often used when these health professionals prepared the information that they sent to colleges in their municipalities. For the purpose of this paper, our hypotheses were twofold: 1) that nurses more often involved patients, their next of kin and other providers in their information production than physicians did and 2) that nurses and physicians used different information sources from the patient's record. We framed our study within the conceptualisation of continuity of care in which information continuity is regarded as essential for connecting and bridging providers [13, 14].

1. Methods

This study was conducted in Norway. The Norwegian health-care system is separated into specialist health-care services located in hospitals and community health care such as primary care services, nursing homes and home health care located in municipalities, which are required to exchange information when necessary for ensuring follow-up care across the levels of care.

We applied a cross-sectional approach in our study, using a questionnaire. Nurses and physicians (and hence providers) at Norwegian hospitals were invited to participate in the study. Hospitals in Norway have various numbers of beds. To ensure a representative sample, we included providers from small, medium and large hospitals. Therefore, all Norwegian hospitals were initially stratified according to the bed size, and we randomly chose 19 small (33-88 beds), four medium (89-218 beds) and four large (219-2,046 beds) hospitals to be included in the sample. Of the 27 hospitals randomly selected, 20 hospitals consented to participate in our study, and all eligible nurses and physicians were identified by a dedicated contact person at each hospital. Each contact person provided us with the number of nurses and physicians who fulfilled the inclusion criteria, and the number of distributed questionnaires corresponded with that number. The inclusion criteria were that each professional had more than six months experience in their department and had a permanent or temporary position. We selected providers in internal medicine, surgical and mixed departments (a combination of medicine and surgical units) because we expected to find the highest proportion of patients who required post-hospital, community-based health care in

these departments. The contact persons identified 1,430 nurses and 548 physicians who met these inclusion criteria, although for various reasons, 10 physicians and 15 nurses who were identified as being eligible did not receive the questionnaire. The questionnaire was distributed by postal mail.

A researcher-developed questionnaire composed for this study was used, and the development of the questionnaire was based on findings from qualitative interviews with 14 hospital nurses and eight physicians [15], as well as previous research regarding interactions between the hospital and home health-care nurses [16, 17]. For the purpose of the current paper, we used a 16-item scale called the "Information production scale (IPS)", in which we asked all the providers, "How often do you use the following information sources when you are writing your discharge physicians' or nurses' summary?" The IPS score contained three different information sources: information from the EPR, from the patient/next of kin, and from other providers, i.e., other nurses or physicians. We used a Likert scale ranging from 1-5, including 1 = never, 2 = often, 3 = half of the time, 4 = often, and 5 = always. In addition, one section with demographic questions was included, and an expert panel consisting of 11 expert nurses evaluated the questionnaire [18]. After revisions were made, the questionnaire was pilot-tested by 39 hospital nurses. The study was approved from the Norwegian Social Science Data Services.

1.1 Analysis

The data were analysed using SPSS, version 20. Descriptive statistics were used to analyse the provider's age and years of experience. We computed and calculated a score for each of the three sources, and applied independent-sample t-tests to investigate differences in the nurses' and physicians' scores on the IPS scale. Moreover, we used chi-square tests to identify differences in the providers' scores on the single information source items.

2. Results

In total, 510 (35.6%) nurses and 236 (44.3%) physicians returned the questionnaire, and the sampling of nurses included 481 women and 28 men (one missing), with a mean age of 37.8 (range, 22-66) years. The nurses had approximately nine years ($SD \pm 8.8$) of experience as nurses and had worked in their current department for 6.5 years ($SD \pm 6.7$). The physicians consisted of 89 women and 145 men (two missing), with a mean age of 40.9 (range, 25-68) years and 14.2 ($SD \pm 12.1$) years of experience as physicians. They had worked in their current unit for an average of 2.4 years ($SD \pm 14.1$), and most of the respondents worked at a small hospital, as shown in Table 1:

Table 1. Hospital size represented

Hospital size	N=746	Percentage
Small	324	43.4
Medium	185	24.8
Large	237	31.8

All the hospitals had implemented EPRs; however, most of them combined EPRs with the use of paper-based systems in their information work. Regarding our first hypothesis, we did not identify any significant differences between nurses and physicians in using the patient/next of kin dyad or other nurse/physician dyads as sources in their information production. Nonetheless, we identified significant differences between nurses and physicians in their use of the sources in the patient journal systems (p -value <0.001), whereas the size of the hospital had no influence on the results. The finding that nurses and physicians use different sources led us to investigate the identity of these sources, i.e., the specific items that the two provider groups used more often or less often when they produced their discharge information. We collapsed the response rates “never/seldom” to “sometimes”, “always/often”, and “frequent” and present the five most used information sources in Tables 2 and 3.

Table 2 shows that the nurses most often used nurses' notes (written during the hospital stay) and the physicians' admission notes when they produced a discharge summary:

Table 2. Nurses' use of information sources in patient records when writing discharge summaries (%)

	Nurses' notes	Physicians' admission note	Nurses' admission note	Nursing plans	Flow sheet
	n=503	n=505	n=503	n=502	n=496
Seldom	13 (2.6)	35 (6.9)	67 (13.3)	91 (18.1)	116 (23.4)
Half of the time	35 (7.0)	57 (11.3)	62 (12.3)	88 (17.5)	71 (14.3)
Often	455 (90.5)	413 (81.8)	374 (74.3)	323 (64.3)	309 (62.3)

The less used information source by nurses was images and x-rays (used by 19%) and previous physicians' discharge notes (used by 11%). In addition, we found that the physicians used other information sources in the patient records to produce discharge information. As shown in Table 3, the physicians most often used laboratory results and physicians' notes.

Table 3. Physicians' use of information sources when writing discharge summaries (%)

	Images and X-rays	Laboratory results	Physicians' notes	Physicians' admission note	Previous discharge summary
	n=235	n=233	n=235	n=235	n=234
Seldom	8 (3.4)	4 (1.7)	3(1.3)	8 (3.4)	52 (22.2)
Half of the time	9 (3.8)	4 (1.7)	11 (4.4)	9 (3.8)	39 (16.7)
Often	218 (92.7)	225 (96.5)	221(93.6)	218 (92.7)	143 (60.6)

The physicians most seldom used nurses' admission notes (7.3%) and nursing care plans (12.2%), but 26.3% reported that they used nurses' notes in their preparation for the discharge summary. There were significant differences (p -values < 0.001) between the two groups for all the items mentioned in the tables.

3. Discussion and conclusion

We will discuss the findings within an informational continuity-of-care framework. The study shows that nurses and physicians use information sources in the patient records within their traditional professional lines when they produce their discharge summaries. Much effort in Norwegian health care has been conducted recently to ensure that providers who are responsible for following up care receive accurate and timely information [7, 19], but this practice is apparently difficult to implement. In a previous study, only 63% of home care nurses reported that they received the physicians' discharge notes often/always, and only 59% reported that they received medication orders often/always at the patient's discharge [8]. The differences in using information sources, as determined in the current study, stress the necessity of involvement by both professions to deliver complete information and thereby ensure optimal follow-up in the municipality, regarding both medical and nursing care requirements. However, multidisciplinary recording does not always guarantee an accurate and comprehensive exchange of information for stroke patients, which is regarded as a risk for these patients after their discharge from the hospital [20]. An effort to develop and implement interdisciplinary discharge summaries that can be exchanged electronically was attempted in a national Norwegian project. The study showed that the introduction was a catalyst for the collaborating participants to address their interactions with a new perspective [7]. Further development using interdisciplinary discharge summaries might be valuable for ensuring a comprehensive information transition, using the perspective and information sources of both nurses and physicians.

Our findings indicate that nurses and physicians produce their information summaries in parallel working processes. It is therefore reasonable to ask whether their information practices might still be understood along traditional professional lines and not by regarding the EPR as an information repository across professional borders. By contrast, the findings might also express the different provider groups' diverse perspectives regarding the patient, as physicians maintain their medical perspectives very strictly. Nurses appear to have a more blended approach, as they use both physicians' and nurses' notes. Whether this practice indicates that hospital nurses compensate for the lack of medical information provided to nurses in the community health care setting was not within the scope of this study. Moreover, the implication that diverse perspectives exert an influence on ensuring safe and seamless care for patients across different levels of care should be explored more in depth in future studies.

A methodological consideration that should be accounted for when interpreting this study's findings is the response rate, which is a well-known and general problem in conducting postal surveys [18]. The nurses' response was surprisingly lower than that of the physicians, but the nurses who responded did not differ with regard to age, compared with another large study conducted at 32 hospitals, in which 5,455 nurses participated [21]. The physicians' response rate was an expectable response rate for our type of study [22]. We believe the response rate could actually be higher because some of the hospitals did not have a proper overview of providers who met the inclusion criteria. Furthermore, during the telephone follow-up procedure, we identified variations in the contact individuals' enthusiasm for

participating in the study. The strength of this study is the size of the sample, which represents providers from a large number of hospitals throughout the entire country.

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