

Lack of Human Resources Leads to Breaches in Information Management Processes

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Abstract. Effective information management promotes safe patient care. Lack of human resources can cause failures when managing patient information. The aim of this study was to analyse the nature of reported patient safety incidents and their location in Choo's information management process model phases when the contributing factor of the incidents was related to human resources and the consequence of the incident was related to harm to the organization's corporate image. Data consisted of the information management related patient safety incident reports (n=475) from 49 health and social care organizations from 2007-2016 in Finland. Deductive analysis and descriptive statistics were used to analyse the data. The results of the study indicated that the shortage of human resources contributed to incomplete documentation, insufficient information sharing between professionals and documenting of information in the wrong place. The majority of the incidents occurred during the information organizing and storage and information distribution phases of the information management process model. Despite the use of electronic health records and electronic patient data, a lack of human resources can lead to breaches in information management processes and harm an organization's corporate image in health and social care contexts.

Keywords. patient safety, information management, human resources

1. Introduction

Health and social care organizations are both information-intensive and information-reliant systems where clinical information collected, recorded, synthesized and shared in different phases of care processes form the core of the information management process [1,2]. In this study, information management is defined according to Choo's information management process model, in which it is formed from a continuous and recurring cycle of six closely related activities: identification of information needs, information acquisition, information organization and storage, development of information products and services, information distribution and information use [3]. In the health and social care context, clinical information needs arise in decision making and care situations [1] requiring the combination of different types of information, such as clinical patient data, personnel expertise, patient's preferences and values and research evidence [4].

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The “Information needs”, part of the Choos’s information management cycle, is tightly related to information gathering, organizing, and storing [3] through adequate documentation, which can take electronic or paper-based forms such as checklists, care instructions, care plans and handover notes. In Finland, all public hospitals and primary healthcare centres have switched to fully electronic documentation and use of patient data [5]. In the next phase of the information management process, organized and stored information is packaged into different levels of information products [3] in health information systems and electronic health records. Finally, in the phase of “information distribution” [3], written or verbal information is distributed face to face from person to person or through various technologies, systems and methods [6].

Previous studies have found that inadequate information management is a risk for patient safety [7,8]. Safe information management requires that the right information is delivered to the right people in the right place, time and format to be used in care situations [3]. Furthermore, previous studies have indicated that healthcare staffing levels, including staff number or quality, workload and time pressure have effects on patient outcomes such as mortality, medication failures, infections and falls [9, 10, 11]. However, there is a lack of evidence concerning how these factors contribute to patient safety from an information management perspective. The aim of this study was to analyse the nature of reported patient safety incidents and their location in Choo’s [3] information management process model phases when the contributing factor of the incidents was related to human resources, and the consequence of the incident was related to harm to a health and social care organization’s corporate image.

2. Methods

The data consisted of 110,594 patient safety incident reports between 2007 and 2016 in Finland. In this study all the reports where 1) the reported type on incidence was information management and 2) the reported contributing factor “workload”, “staffing number or quality”, “shift arrangements and practices” or “time pressure” were included. A total of 475 patient safety incident reports were included. Based on this delineation, research data covered patient safety incident reports from 49 health and social care organizations. Reports were generated via a national, web-based and anonymous patient safety incident reporting system which is used in more than 200 social and health care organizations in Finland. The incident reports included both structured and free-text descriptions of safety events. Deductive analysis based on Choos’s information management process model was used for the content of the narrative descriptions of the incident reports (n=475). An analysis matrix with the main categories and variables was created as the basis for classifying and coding the data. Incident report narrative descriptions (n=475) were coded based on the analysis matrix variables, and the coded values were entered into IBM SPSS version 25 (IBM Corporation, USA). Direct distributions and cross tabulation were used to analyse the data.

3. Results

The majority of the reported information management related incidents occurred during the period of active treatment (n=229, 48.2%) or during the interfacility or intrahospital transfer of patients (n=95, 20.0%). Furthermore, 69.3% (n=329) of the incidents were

reported as adverse events, of which 52.4% (n=249) caused no harm to the patient. In most of the incidents, the type of resource shortage was reported as relating to workload, shift arrangements or practices (n=347, 73.1%). As shown in Table 1, most of the 475 reported incidents were classified as mistakes (n=224, 47.2%) or lapses (n=181, 38.1%) as the type of error. In addition, tasks or functions deliberately omitted were represented in 60 (12.6 %) of all the 475 reported incidents. In the research data, failures in decision-making appeared for example as the sending of non-electronic or electronic patient information to the wrong person or place, and as memory-related lapses, such as when the arrangement of patients' follow-on appointments was forgotten by the personnel.

Table 1. Description of the reported patient safety incidents.

Variable	n/475 (%)
Incident location in the treatment process	
Implementation of the treatment	229 (48.2)
Patient transfer	95 (20.0)
Planning or arranging the treatment	86 (18.1)
Follow-up treatment	63 (13.3)
Not known	2 (0.4)
Reported incident type	
Adverse event	329 (69.3)
Near miss	146 (30.7)
Type of error	
Mistake	224 (47.2)
Lapse	181 (38.1)
Undone task	60 (12.6)
Deviation from procedure or failure to perform a task	6 (1.3)
Reported level of consequences of the incidents	
No harm	249 (52.4)
Mild harm	136 (28.6)
Missing	51 (10.7)
Moderate harm	38 (8)
Severe harm	1 (0.2)
Reported type of contributing resource	
Workload, shift arrangements or practices	347 (73.1)
Staff number and quality	128 (26.9)

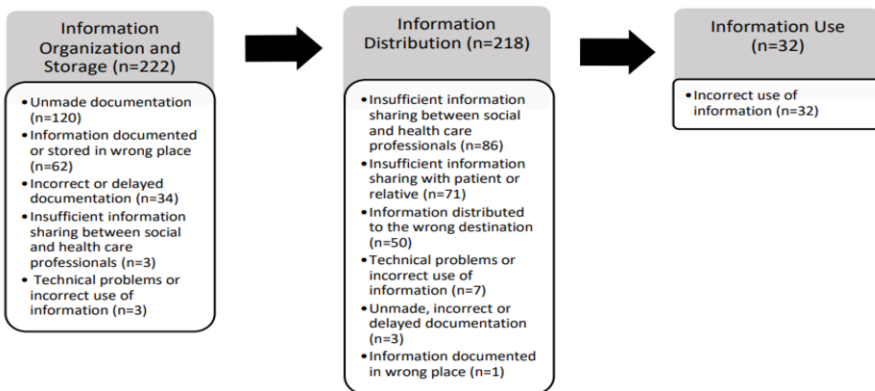


Figure 1. Frequencies of reported patient safety incidents and their position in the modified information management process model [3].

Most of the reported incidents occurred when different types of information were saved or documented (n=222/475, 46.7%), and when verbal or written information was distributed to different locations and to different actors (n=218/475, 45.9%). Hence, the most critical phases in the information management process model [3] for human resource shortage were the information organizing, storage and information distribution phases (Figure 1). Within the information organizing and storage phases, most of the incidents were related to missing documentation (n=120/222) and information documentation or storage in the wrong place (n=62/122). In the information distribution phase, most of the incidents were related to failure in communication between health and social care professionals, or between service users and service providers. Of the 475 reported incidents, 32 took place in the information use phase and were related to incomplete or delayed use or interpretation of information in decision-making and during the patient treatment. A minority (n=3/475, 0.6%) of the reported incidents occurred during the information acquisition and information use phases in the information management process model [3].

4. Discussion

Accurate and intact documenting and distribution of information is a prerequisite for safe and good-quality care processes. This study indicated that a shortage of human resources negatively affects implementation of the treatment, and also patient transfers. Furthermore, the most critical effect of the resource shortage is targeted to failures relating to documentation and communication, occurring particularly as missing documentation, documentation in the wrong place and inadequate or insufficient communication between personnel or between service provider and service user. These findings are supported by the results of previous studies that have highlighted the communication and documentation processes responsible for patient and client safety incidents in various health and social care contexts [6, 7, 8]. The results of this study show similarities with previous research in that from an information management process model perspective [3], information organization and storage and information distribution are the most vulnerable phases for the occurrence of adverse events [7]. The limitations of this study are related to reporting of the patient safety incidents which may be incomplete, and they describe only reporter's perspective of the incident. Further, the criteria on what counts as patient safety incidents may vary at individual and organizational level.

5. Conclusion

Despite the use of electronic health records and electronic patient data, the implementation of information management processes is vulnerable to lack of human resources in health and social care organizations. In particular, documentation and communication in different phases of treatment processes are vulnerable to incidents and therefore the practices related to them need to be critically assessed. Future research should be targeted on other factors, such as IT systems design and usability, contribution to information management related errors in different social and health care settings.

References

- [1] Schlegel CS, Yoder L, Jones TL. Clinical Information Needs: A Concept Analysis. *Advances in Nursing Science* 2020;43(1):E36–45.
- [2] MeSH. Health Information Management. Available at: <http://www.ncbi.nlm.nih.gov/mesh/68063025>. Accessed 22 November 2021.
- [3] Choo CW. Information Management for the Intelligent organization. *The Art of Scanning the Environment*. Third ed. Medford, New Jersey: Information Today, Inc.; 2002. p. 23-42.
- [4] AHRQ. Evidence-Based Decisionmaking. Available at: <https://www.ahrq.gov/prevention/chronic-care/decision/index.html>. Accessed 22 November 2021.
- [5] Hyppönen H, Hämäläinen P, Reponen J. E-health and e-welfare in Finland. Check point 2015. Available at: <https://www.julkari.fi/handle/10024/129709>. Accessed 27 November 2021.
- [6] Vermeir P, Vandijck D, Degroote S, Peleman RA, Verhaeghe R, Mortier EP, Hallaert GG, Van Daele S, Buylaert W, Vogelaers D. Communication in healthcare: a narrative review of the literature and practical recommendations. *International Journal of Clinical Practice* 2015;69(11):1257–67.
- [7] Jylhä V, Bates DW, Saranto K. Critical factors in information management process: the analysis of hospital-based patient safety incident reports. *Finnish Journal of eHealth and eWelfare* 2016;8(4):164-76.
- [8] Kinnunen UM, Kivekäs E, Palojoki S, Saranto K. Register-Based Research of Adverse Events Revealing Incomplete Records Threatening Patient Safety. *Digital Personalized Health and Magazine* 2020;771 – 5.
- [9] Neuraz A, Guérin G, Payet C, Polazzi S, Aubrun F, Dailler F, Lehot J-J, Piriou V, Neidecker J, Rimmelé T, Schott A-M, Duclos A. Patient Mortality is Associated with Staff Resources and Workload. A Multicenter Observational Study. *Critical Care Medicine* 2015;43(8):1587-94.
- [10] Cho E, Chin DL, Kim S, Hong O. The Relationship of Nurse Staffing Level and Work Environment with Patient Adverse Events. *Journal of nursing scholarship* 2016;48(1):74-82.
- [11] Driscoll A, Grant MJ, Carroll D, Dalton S, Deaton C, Jones I, Lehwaldt D, McKee G, Munyombwe T, Astin F. The effect of nurse-to-patient ratios on nurse-sensitive patient outcomes in acute specialist units: a systematic review and meta-analysis. *European journal of cardiovascular nursing* 2018;17(1):6-22.