FinJeHeW Finnish Journal of eHealth and eWelfare

SCIENTIFIC PAPERS
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Information system support for medical secretaries' work in patient administration tasks in different phases of the care process

Jenni Santavirta[1,2], Anne Kuusisto[2], Kaija Saranto[1], Tarja Suominen[3], Paula Asikainen[2,3]

[1] University of Eastern Finland, Kuopio, Finland; [2] Satakunta Hospital District, Pori, Finland; [3] Tampere University, Tampere, Finland.

Jenni Santavirta, PhD candidate, MHSc, RN, Satakunta Hospital District, Satasairaala, Sairaalantie 3, FI-28500 Pori, FINLAND. Email: jenni.santavirta@satasairaala.fi

Abstract

Medical secretaries may have several separate electronic nursing information systems in use, but regardless of the systems, their task is to make sure that the patient information is correct and usable.

The purpose of this study is to describe the support provided by the hospital information systems for the work of medical secretaries in patient administration tasks in different phases of the care process. The data were collected in a central hospital where medical secretaries had long been using partly electronic information systems. The data were collected using an abridged version of the Hospital Information System Monitor (HIS-monitor).

The majority of the secretaries (N=60) gave a positive assessment for the support provided by the information system for their work at patient admission, when ordering diagnostic or therapeutic examinations or procedures, and at patient discharge. In the planning and organization of care, most thought that the systems provided poor support for informing all those involved in patient care. At patient admission, nearly half considered that the support for ensuring data protection (46%) and the systems' compliance with legal obligations (44%) was poor. In connection with ordering diagnostic and therapeutic examinations and procedures, nearly half (43%) thought that information on the availability in ancillary units was not readily and easily available. At patient discharge, 40% considered that the systems did not support the identification of missing or incorrect information.

The hospital information system provides partial support for medical secretaries' work. The implementation of fully electronic systems and their functions may improve the support.

Keywords: medical secretaries, hospital information systems, information systems, organization and administration, patient care

Introduction

A medical secretary (unit secretary/ward clerk) – hereafter referred to as secretary – is a health care unit employee responsible for tasks such as appointment scheduling and write journal entries [1]. When working on administrative tasks as part of the care team, the secretaries enable nurses to spend more time on direct patient care [2]. Ensuring the quality of documentation is part of the secretaries' work [3]. The main task of the secretary is to make sure that patient documents are correct, and that all relevant information is recorded and in correct format. [4] The job descriptions of secretaries vary to some extent between countries. In Finland, the main task of secretaries is to schedule appointments and record follow-up documentation. [1] In paper-based offices, secretaries have mainly ensured the data security of patient information during their working hours by returning patient files to their proper places and by encouraging others to do the same [5]. The use of electronic information systems requires equal compliance with data security and protection from everyone.

The implementation of an electronic information system may impact secretaries' job description. It has been observed that collaboration between different professional groups became closer and some tasks were moved to other groups while others disappeared altogether. [4,6] New tasks also emerged, such as checking and correcting entries made by other professionals. Some tasks also became more difficult because entering data into the new information system did not work smoothly, for example. [4]

If the technology used does not support the work tasks, it has a negative impact on its usefulness [7]. Secretaries are more satisfied with the use of electronic hospital information systems than physicians or nurses. The reason for this may be that different groups use different parts of the information systems and their tasks differ as well. [8] On the other hand, in the 2013 study by Bossen et al., secretaries considered the structure of the new, only recently implemented electronic patient information system to be confusing and its interface difficult and slow [9].

Secretaries may use separate electronic applications designed for specific tasks, such as a transcription system for transcribing dictations or a patient administration IT system used for recording information such as diagnoses or whether the patient is in hospital or has been discharged. The systems used by the secretaries may also be part of the patient information system. In parallel with these, paper charts may also still be used. [4.] The degree of maturity of the digitalization and functionality of a patient information system can be described with the aid of the Electronic Medical Record Adoption Model (EMRAM) scale (0–7). At EMRAM Stage 0, electronic information systems have been only partly installed in the key ancillary departments (Laboratory, Radiology, Pharmacy), while at Stage 7, a complete electronic information system is in use with seamless exchange of information and advisory capacity. [10]

The speed at which information systems have been adopted differs between countries [11]. The assumption is that information systems support secretaries' work. Secretaries have perceived the patient administration information system to be complicated, even though observation revealed that their work was facilitated, e.g. in that they no longer had to search for patients' paper documents. [9.] If the electronic patient information system does not support the work tasks, it leads to workarounds, i.e. tasks being carried out different-

ly than they should. Workarounds may impact patient safety or efficiency. [12] If the user does not trust the electronic system, the data may also be recorded on paper to make sure that the patient information is available when needed [13].

When the technology and tools used for information processing support the tasks of patient care, the quality of the information system is good [14]. The usefulness of the technology used to process information has an impact on secretaries' intentions of using it. Usefulness is increased by data security. [7] Finland has a separate law on the status and rights of patients. According to the law, patients have the right to confidentiality of patient information. [15]

There has been little research focusing on secretaries. There is some previous research information on secretaries' training [2], their importance for health care [1] and their tasks [3]. In addition, the impact of a new electronic tool on secretaries' work has been studied [4,6,16]. The work tasks were partly altered, partly eliminated, or remained partly the same [4,6]. Secretaries have been included as one group in studies comparing the perceived benefit, ease of use and possibility to control own tasks with the hospital information system between different professional groups [8], intentions of using the electronic system and the preceding factors [7], as well as the support for different groups of healthcare professionals provided by a recently adopted electronic patient information system [9].

This study looks at the hospital information system support for medical secretaries' work in patient administration tasks in different phases of the care process. The care process consists four phases in this study: patient admittance, planning and organization of patient care, ordering examinations and procedures, and patient discharge. The study was conducted at a point when electronic information systems had been used for some patient administration tasks in different domains to varying degrees since the 1980s.

Purpose of the study and study questions

The purpose of the study is to describe the hospital information system support for medical secretaries' work in patient administration tasks in different phases of the care process.

The study questions are as follows:

1. How do the systems support secretaries' work at patient admittance?

2. How do the systems support secretaries' work in the planning and organization of patient care?

3. How do the systems support secretaries' work when ordering examinations and procedures?

4. How do the systems support secretaries' work at patient discharge?

Material and methods

Description of the target group and data collection

This study is part of research on the implementation of a patient information system in one Finnish central hospital with 3650 employees (2013), which has long had electronic systems that can be used for patient administration tasks, such as recording information about appointments. In the somatic domain, an electronic patient information system has been in use since the late 1980s, while in psychiatry, a different electronic system has been used since the mid-1990s. In the 2010s, a

national electronic patient data repository was implemented in Finland for storing official patient data. The repository offers safe access to up-to-date patient data during patient care [17]. To join the repository, the patient information system had to meet certain criteria to enable transfer of information to the repository. As a result, the central hospital had to reform its systems, and a new electronic medical record was taken into use in all units in spring 2013. Once it was implemented, the degree of maturity of the patient information system can be described as Stage 2 on the EMRAM scale as it became possible to transfer data to the central repository that could be utilized throughout the country. The material for the study was collected prior to the implementation of the new patient administration module in 2013. At the time, those working in the somatic domain used electronic scheduling and electronic file ordering whereas paper calendars, but not electronic file ordering, were in use in the psychiatric domain.

An abridged version of the Hospital Information System (HIS) Monitor instrument was used in the study. This instrument was developed to evaluate information system quality, i.e. how well the information system supports patient care by providing the necessary information [14,18]. The instrument was translated from German to Finnish in 2012.

The instrument contained 108 questions. The questions in the original instrument are aimed at different groups of healthcare professionals: physicians, nurses, and secretaries. [14.] One researcher picked 42 questions from the instrument that measure the support by the information system for administrative tasks and relate to secretaries' work. Permission to use, abridge, translate, and publish the instrument was obtained from the developer. The abridged instrument was tested by four secretaries who worked on the information system implementation project and had also worked as medical secretaries in research organization. They did not suggest any changes to the instrument. Their answers were included in the data.

The instrument was divided into four segments. 1) Recording patient information at admission: appointment scheduling and patient invitation (6 questions) and recording administrative patient information (7 questions). 2) Planning and organization of care: checking patient-related information (5 questions) and planning resources, appointments and material (3 questions). 3) Ordering examinations and procedures: 14 questions. 4) Discharge: recording clinical information (3 questions) and processing administrative information (4 questions).

The Cronbach alphas of the instrument subcategories were as follows: recording information on admission 0.75, planning and organization of care 0.86, examination and procedure orders 0.87, and discharge 0.97. Cronbach's alpha should be 0.7–0.95; in many cases, using 0.9 as the highest value is recommended; in that case, the questions in the instrument measure the same thing [19].

Nurse managers and nursing directors were informed about the study in advance by email. The study contact person sent a paper questionnaire by internal mail to all secretaries (N=192), excluding those working in the transcription center, occupational health secretaries and patient information system coordination secretaries as they do not use the patient information system in question. Permission for gathering the data was obtained from the organization. The secretaries were reached by domain and unit through Human Resources Management. The questionnaire was accompanied by a cover letter, instructions for com-

pletion and a sealable envelope. Two reminders were sent.

Some researchers worked in the same organization as the respondents, which may have affected the willingness to participate in the study. Voluntary participation was particularly important [20], and this was pointed out in the cover letter.

Respondents' right to privacy was ensured in reporting the study results [20]. Background information was reported without risk of identification. To ensure anonymity, ranges are not given when reporting means in connection with background information. Respondents were asked to give their names for the purposes of possible further study; they were stored separately from the study material. The material was stored and analyzed in anonymized form using SPSS. Only descriptive analysis was used in the study as only a small minority of the respondents only used paper documents, making it irrelevant to compare different tools. Background variables were not used in the comparison due to the small number of participants and the skewed distribution.

Data analysis

The instrument contained 15 background questions: name, age, permanent/temporary employment, mainly working in ward/outpatient clinic, domain, number of years working in the hospital district in question, six questions about technology used for documentation and information processing, and one question about computer use experience and use.

The questions were answered using a four-step Likert scale: poorly/seldom/unreasonable – well/often/reasonable. There was also the option "the question does not apply to me". For each question, the respondents were asked to indicate whether they mainly used paper or a computer for the task in question. The original four-step variables were modified by combining positive variables into one class and negative ones into another. In the question of whether paper or computer was mainly used, the answers where respondents said they used computer and paper to an almost equal degree are reported as "both".

The data were analyzed using IBM SPSS Statistics 25. The analysis used descriptive statistical methods, frequencies, and percentages to describe the proportions of positive and negative assessments of information processing quality.

Results

Background information

A total of 60 secretaries (response rate 30 %) with mean age of 49 years took part in the study. The majority (80%, n=47) were permanent employees. More than half (56%, n=33) worked in the medical domain, about a third (32%, n=19) in the surgical domain, while the rest worked in first response and emergency care or psychiatry. Slightly more than half worked in an outpatient clinic (54%, n=32), slightly more than a third in a ward, (37%, n=22), while one in ten worked in both (9%, n=5). Forty percent (n=24) had worked in this hospital district for 20 years or longer, while slightly more than one in five (22%, n=13) less than five years. On the average 86% (variation from 35 to 100%) of the secretaries' daily work consisted of computer application use.

All respondents (n=59) considered that patient documents that are complete in terms of content, accurate, readable and up to date are important for ensuring the quality of patient care while nearly all (97%, n=55) felt that they were able to utilize them a lot. The majority (95%, n=54) thought that

the amount of working time they spent on recording individual patient-related information was reasonable, and 97% (n=55) considered that the information processing tools (paper/computer) support them with their tasks in patient care. Most of the respondents (73%, n=33) expressed a wish that the computer applications would support tasks related to patient care while slightly more than one in four (27%, n=12) wanted only little or no support from computer applications in these tasks.

The majority (91%, n=53) felt generally confident or fairly confident with computer use. Most used a computer for processing information in all phases of the care process. Paper documents were used by the majority to file information only at patient discharge. Depending on the question, 6-41% responded that they used both paper and computer documentation to an almost equal degree.

Patient information system support at patient admission

More than half of the secretaries expressed a positive assessment for the support from the information system at patient admission. However, nearly half of them felt that the support for compliance with legal obligations by the tools was poor. Nearly half also considered that unauthorized access to administrative patient information was poorly prevented. For most, computer was the primary tool used for processing information. (Table 1.)

In appointment scheduling and patient invitation, the secretaries' assessment was most positive concerning the amount of time spent looking for a previously booked appointment for treatment queue/treatment. The majority (95%) considered that the amount of time spent was reasonable. The possibility to read appointments was given the most negative assessment. Thirty-five percent of the secretaries considered that appointments were often unreadable if the appointment was to an outpatient clinic, while thought so when the appointment was to a ward. (Table 1.)

In recording administrative patient information, the secretaries were most positive in their assessment of their ability to check whether the patient had previously been treated in the hospital in question. Preventing unauthorized access to administrative patient data received the most negative assessment; nearly half thought that it was poorly prevented. (Table 1.)

Table 1. Assessment of information system support at patient admission.

Appointment and scheduling	**Unreasonable / Seldom / Poorly n (%)**	**Reasonable / Often / Well n (%)**	**I mostly use**		
			a computer n (%)	**paper n (%)**	**both n (%)**
Reasonable amount of time spent on					
…searching for a previously booked appointment for treatment queue/treatment?	2 (5)	40 (95)	39 (93)	0 (0)	3 (7)
…searching for a previously booked outpatient clinic appointment?	3 (6)	48 (94)	44 (94)	0 (0)	3 (6)
…searching for and making an appointment for treatment queue/treatment on ward?	5 (15)	29 (85)	25 (74)	0 (0)	9 (27)
…searching for and making an outpatient clinic appointment?	10 (22)	36 (78)	37 (84)	0 (0)	7 (16)
***How often** are appointment entries unreadable when the appointment is*					
…to a ward?	27 (71)	11 (29)	34 (90)	0 (0)	4 (11)
…to an outpatient clinic?	34 (65)	18 (35)	44 (92)	1 (2)	3 (6)
Recording patient's administrative information on admission					
***How well** (easily and quickly)*					
…are you able to see if the patient has previously been treated in this hospital?	4 (7)	53 (93)	52 (93)	0 (0)	4 (7)
… do you think that the tools you use support ensuring that you get the patient's basic information recorded in its entirety?	6 (11)	50 (89)	49 (91)	0 (0)	5 (9)
…are you able to use patient-related administrative information?	11 (26)	32 (74)	39 (93)	0 (0)	3 (7)
…do you think that the tools you use support compliance with legal obligations?	15 (44)	19 (56)	26 (79)	2 (6)	5 (15)
…do you think that unauthorized access to administrative patient is prevented?	20 (46)	24 (55)	33 (81)	1 (2)	7 (17)
***How often** does it happen that you have to enter the patient's basic information several times?*	41 (87)	6 (13)	41 (91)	0 (0)	4 (9)
***Reasonable amount of time** spent on entering administrative patient information at patient admission?*	13 (27)	36 (74)	41 (87)	0 (0)	6 (13)

Information system support in the planning and organization of patient care

Most of the secretaries gave a positive assessment for the support provided by the information system for the planning and organization of patient care in other areas, but the majority (68%) thought that the tools used did not support informing about changes in plans. The majority used a computer as the primary tool in care planning and organization.

In checking recorded patient-related information, the secretaries' assessment was most positive concerning access to up-to-date patient-related scheduled appointments and information on patient's treatment period. The most negative assessment was given concerning access to patient

information in connection with patient transfer. Nearly one in four secretaries considered that they had poor access to patient's treatment period information when the patient was being transferred. (Table 2.)

In resource, appointment and material planning, the secretaries gave the most positive assessment on the possibility to find out whether there is a bed available on the ward; the majority (75 %) thought they were well able to find this out. The most negative assessment was on informing all parties concerned of changes in plans; thought that the support provided by the tools was poor. (Table 2.)

Information system support for ordering examinations and procedures

Most of the secretaries assessed positively the support for ordering examinations and procedures provided by the information system. More than half mainly used a computer to process information.

The most positive assessment concerning the ordering of examinations and procedures was for recording samples; all respondents thought that samples were seldom recorded for the wrong patient. In the most negative assessment, nearly half of the respondents reported that they had poor access to information on the availability of ancillary units that was needed immediately. More than one in three also thought that looking for and scheduling appointments in ancillary units took up an unreasonable amount of time. (Table 3.)

Table 2. Assessment of information system support for planning and organization of patient care.

Looking at patient-specific information recorded	**Poorly n (%)**	**Well n (%)**	**I mostly use a computer n (%)**	**paper n (%)**	**both n (%)**
How well *(easily and quickly) are you able to access*					
…up-to-date patient-related scheduled appointments?	4 (7)	51 (93)	50 (91)	0 (0)	5 (9)
…information about the patient's treatment period?	4 (8)	49 (93)	47 (92)	1 (2)	3 (6)
…patient's information					
- during doctors' rounds?	3 (11)	24 (89)	23 (85)	0 (0)	4 (15)
- in actual treatment situations?	4 (16)	21 (84)	18 (72)	0 (0)	7 (28)
- in connection with patient transfer?	7 (24)	22 (76)	24 (77)	0 (0)	7 (23)
Resource, appointment, and material planning					
How well *(easily and quickly)*					
… are you able to find out if there is a free bed available on the ward?	6 (25)	18 (75)	15 (68)	1 (5)	6 (27)
…are you able to access information about availability of a bed on the ward that will be needed going forward?	6 (30)	14 (70)	10 (56)	1 (6)	7 (39)
…do you feel that the tools you use support informing all those concerned of changes in plans?	19 (68)	9 (32)	13 (59)	1 (5)	8 (36)

Table 3. Assessment of information system support in ordering examinations.

ORDERING EXAMINATIONS			**I mostly use**		
	Seldom / Poorly / Unreasonable n (%)	**Often / Well / Reasonable n (%)**	**a computer n (%)**	**paper n (%)**	**both n (%)**
How often *do you experience that*					
…samples has apparently been recorded for the wrong patient?	37 (100)	0 (0)	28 (88)	2 (6)	2 (6)
…test requests have apparently been recorded for the wrong patient?	50 (96)	2 (4)	41 (89)	1 (2)	4 (9)
… the information you need is missing from the examination request?	40 (95)	2 (5)	30 (79)	1 (3)	7 (18)
…the information concerning the examination request is impossible to read?	38 (93)	3 (7)	23 (64)	5 (14)	8 (22)
…patient-related information that has already been recorded must be entered again when ordering the procedure from a professional?	30 (83)	6 (17)	19 (73)	1 (4)	6 (23)
…requests for examinations or procedures that have been filled in are not available at the time of the scheduled test/procedure/therapy?	35 (78)	10 (22)	34 (79)	1 (2)	8 (19)
…patient-related information that has already been recorded must be entered again when ordering the procedure from an ancillary unit?	28 (78)	8 (22)	25 (78)	1 (3)	6 (19)
…physician's examination request has been recorded several times?	28 (78)	9 (24)	20 (56)	8 (22)	8 (22)
How well *(easily and quickly)*					
…are you able to access up-to-date information about the status of examination requests?	8 (16)	43 (84)	44 (88)	0 (0)	6 (12)
… is it ensured that the examination request has the signature required?	9 (29)	22 (71)	14 (56)	5 (20)	6 (24)
… are you able to access information on the availability of the ancillary unit that is needed immediately?	20 (43)	27 (57)	35 (81)	1 (2)	7 (16)
How reasonable *do you consider*					
…the amount of working time spent on writing and implementing examination requests to various professionals?	3 (8)	35 (92)	25 (68)	2 (5)	10 (27)
…the amount of working time spent on writing and implementing examination requests to ancillary units?	11 (23)	37 (77)	41 (85)	0 (0)	7 (15)
…the amount of working time you spend on looking for and scheduling an appointment in an ancillary unit?	16 (38)	26 (62)	33 (79)	0 (0)	9 (21)

Information system support at patient discharge

More than half of the secretaries gave a positive assessment of the support provided by the information system at patient discharge. However, more than one in three considered that the tools gave poor support for identification of missing entries on procedures in connection with recording clinical information at discharge. The majority of the respondents mostly used a computer to process information, whereas documents were filed in paper format. (Table 4.)

In recording clinical information at patient discharge, the most positive assessment was given to gathering and dispatching information about further treatment. Nearly two thirds were of the opinion that the tools they used provided good support for this. Support for identifying missing entries was the most negatively assessed element. Well over a third of the secretaries considered that the tools give poor support for identifying missing entries on procedures in connection with recording clinical information at patient discharge. (Table 4.)

In processing administrative information at patient discharge, the secretaries gave the most positive assessment on that they seldom have to re-enter administrative information recorded for discharge because it has not been forwarded. The most negative assessment was given to support by the tools for the filing required by law; considered this to be poorly supported. Nearly a third also considered that data filing took up an unreasonable amount of their working time. (Table 4.).

Table 4. Assessment of information system support at patient discharge.

Recording clinical information at discharge	**Poorly / Seldom / Unreasonable n (%)**	**Well / Often/ Reasonable n (%)**	**I mostly use**		
			a computer n (%)	**paper n (%)**	**both n (%)**
How well *do you think that the tools you use support*					
…gathering and forwarding of information related to patient's further treatment?	9 (27)	25 (74)	22 (67)	1 (3)	10 (30)
… the idea that information on diagnosis and procedures must be uniform for statistical purposes?	11 (31)	24 (69)	24 (69)	1 (3)	10 (29)
…the idea that you recognize missing/incorrect entries on procedures when recording clinical information at discharge?	12 (40)	18 (60)	22 (73)	0 (0)	8 (27)
Processing administrative information at discharge					
How often *does it happen that the administrative information recorded for discharge has not been forwarded and needs to be re-entered?*	30 (91)	3 (9)	25 (83)	0 (0)	5 (17)
How well *(easily and quickly)*					
…can you access patient-specific information needed for discharge and billing purposes?	5 (14)	30 (86)	25 (71)	0 (0)	10 (29)
… do the tools support the filing required by law?	13 (36)	23 (64)	19 (56)	3 (9)	12 (35)
Reasonable amount of working time *spent on filing the documents?*	13 (31)	29 (69)	4 (10)	19 (49)	16 (41)

Discussion

The purpose of this study was to describe the hospital information system support for medical secretaries' work in patient administration tasks during different phases of the care process. The majority of the secretaries considered that the information system supported their work at patient admission, when ordering examinations and procedures, and at patient discharge. In the planning and organization of care, the majority thought that the tools gave poor support for informing all the parties concerned of changes in plans. In other areas, the majority felt that the information system supported their work in the planning and organization of care. This finding is contrary to a previous study where the secretaries gave a negative assessment on the support provided for their work by the patient information system [9]. However, secretaries had just adopted a new electronic system, which replaced old electronic and profession-specific paper systems. This represents Stage 4 on the EMRAM scale [10], so the level of maturity in their study was higher.

The respondents were well representative of the medical and surgical domain as well as outpatient clinics and wards. Nearly all respondents worked in the somatic domain where electronic systems had been used for some patient administration tasks since the 1980s. The respondents' mean age was 49, corresponding the mean age of secretaries in the Nordic countries [1]. They were mostly confident with computers and considered high-quality patient information important. Previous studies have also shown that secretaries have confidence in their IT skills; in the study of Ologeanu-Taddei et al. from 2015, well over half of the respondents considered that they had the capacity to complete their work tasks using a computer [8].

At patient admission, the information system support for secretaries' work received the most negative assessment in the area of ensuring data security and compliance with legal obligations. However, patients are entitled by law to privacy and confidentiality of patient document entries [15]. Information security has been shown to increase secretaries' perception of the usefulness of the information system [7]; ensuring information security is thus important for this reason as well. The study findings indicate that going forward, investing in the usability of the system could improve the quality of the information system from the secretaries' viewpoint, as more than one in four felt that recording administrative patient information took up an unreasonable amount of time and the usability of the information was poor.

In the planning and organization of patient care, the majority (68 %) expressed the opinion that the tools used did not support informing all parties concerned about changes in plans. As communication between different units, employees, patients, their families as well as actors outside the hospital is included in secretaries' job description [4], the tools should be developed to support communication between the different parties involved. In terms of continuity of care, availability of information from the information system should be ensured.

In ordering diagnostic and therapeutic examinations and procedures, nearly half of the respondents considered that access to information on the availability of urgently needed ancillary units was poor while one in three thought that looking for and scheduling appointments took up an unreasonable amount of time. As scheduling appointments is a key element of secretaries' work [1], these findings suggest that the information system does not support secretaries' work in the area of

scheduling. In terms of functionality, the system does not seem to support the transfer of information, as slightly more than a fifth of the respondents stated that they often had to re-enter patient-related information when ordering a procedure from a healthcare professional. At this stage of care, the results indicate overlapping in recording. Recording the information in two locations may be related lack of trust in a new system. On the other hand, the new electronic system does not necessarily support complex tasks as well as a paper-based system [13].

The support from the information system at patient discharge was mostly evaluated positively. However, about one in three considered that the tools did not support them in the following: uniformity of information on diagnoses and procedures, identification of missing information on procedures, and compiling and sending information about further treatment. As the work of secretaries also includes ensuring the correctness and usability of patient information in other connections as well [4], improvement in the areas mentioned above should be a priority. This is important for the organization as well since hospital billing is based on information on diagnoses and procedures. The fact that statistical information is correct is also important when comparing organizations as well as for quality management purposes. At patient discharge, more than one in four secretaries felt that their tools supported poorly the filing required by law while nearly one in three thought that filing documents took up an unreasonable amount of time. When paper filing is used, sending documents to and ordering them from the archive is the secretary's task [4]. Just one in ten used only a computer for filing documents. Electronic tools may be expected to shorten the time needed for filing.

Nearly all questions (37/42) applied to most respondents. In five out of a total of eight questions on the planning and organization of care, more than half responded that the question did not apply them. This might indicate that these questions were not relevant for secretaries' work or that the questions do not comply with the job description of secretaries who work in both outpatient clinic and ward settings. Secretaries who only transcribe dictations seemed to match with answers "the question does not apply to me". The questions at discharge also need to be re-evaluated, because of high Cronbach alfa (0.97) indicating questions measuring the same thing.

The instrument was abridged by one researcher, which may have affected the reliability of the instrument and the results of the study. The researcher in question worked as a trainer in the patient information system implementation project and was familiar with the secretaries' work. The readability and understandability of the instrument was also pre-tested. No need for changes to the instrument emerged.

Even though the information system used for patient administration tasks by the secretaries had been used for a long time, it was necessary to reform it. It can be assumed that in the areas with the most negative assessment of the support provided for secretaries' work, such as usability, availability of information, overlapping entries, compiling and sending information, the new patient administration module is better able to support their work. If the systems function well, paper documents may be eliminated entirely. This should be addressed in further research, especially once the new systems are well established, as previous research on the subject is lacking.

Conclusions

Secretaries have a key role in processing information. The information system in use provides partial support for secretaries' work. It supported secretaries' work at patient admission, when ordering examinations and procedures, and at patient discharge. In the planning and organization of care, tools gave poor support for informing all the parties concerned of changes in plans. More comprehensive electronic systems with shared information and automatization, such as automatic identification of missing information, may improve the support provided by the information system for secretaries' work.

Acknowledgements

Funding for this research was received from the Satakunta Hospital District, which is gratefully acknowledged (EVO 83008, EVO 84024). We also gratefully thank those who participated in the study.

Declarations of interest

None declared.

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