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Introducing eHealth solutions in Slovenia to gain time for health education: a case of electronic patient appointment scheduling

Wprowadzenie rozwiązań w zakresie e-zdrowia w Słowenii w celu uzyskania czasu na edukację zdrowotną: elektroniczny system rezerwacji wizyt

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STRESZCZENIE

WPROWADZENIE ROZWIĄZAŃ W ZAKRESIE E-ZDROWIA W SŁOWENII W CELU UZYSKANIA CZASU NA EDUKACJĘ ZDROWOTNĄ: ELEKTRONICZNY SYSTEM REZERWACJI WIZYT

Wstęp. Zwiększona komputeryzacja systemu opieki zdrowotnej w Słowenii rozpoczęła się w 2008 roku projektem e-zdrowie (eZdravje). Różne aspekty tego systemu pozwalają pacjentom lepiej kontrolować kwestie związane ze zdrowiem. Część systemu związana z e-Rezerwacjami (eNaročanje) umożliwia pacjentom bardziej aktywne włączanie się w usługi zdrowotne, a także stanowi istotną pomoc w pracy administracyjnej i umożliwia przeznaczenie dodatkowego czasu na edukację zdrowotną.

Cel pracy. Celem badania było pokazanie który system rezerwacji wizyt jest najmniej uciążliwy dla pielęgniarek.

Materiał i metodyka. W badaniu zastosowano podejście ilościowe. Gromadzenie materiałów miało miejsce w maju 2017 roku. Zebrano informacje dotyczące różnych modeli zapisywania pacjentów na wizyty w ciągu miesiąca w przychodni położonej w północno-wschodniej części Słowenii. Zgromadzone dane dotyczyły czasu potrzebnego do rezerwacji wizyty w różnych modelach zapisywania pacjentów na wizyty, i zostały zinterpretowane przy pomocy statystki opisowej.

Wyniki i wnioski. Między styczniem 2016 a styczniem 2017, mniej niż 1% pacjentów umówiło się na wizytę przez system e-Rezerwacji. Od stycznia 2017, kiedy system e-Rezerwacji zaczął być używany w badanej przychodni, procent pacjentów dokonujących rezerwacji przy jego użyciu wzrósł, a do maja 2017, 60 pacjentów (20%) z 298 wszystkich badanych, zapisało się na wizytę przy pomocy systemu. Stwierdzono, iż w ciągu 17 dni roboczych w maju 2017 miało miejsce 126 (42%) wizyt umówionych przez mężczyzn oraz 172 (58%) wizyty umówione przez kobiety. Średni czas spędzony na osobistej lub telefonicznej rezerwacji był istotnie dłuższy niż czas spędzony na umówieniu wizyty przez system e-Rezerwacji. Wykazano, że w ciągu 17 dni roboczych, pielęgniarka poświęca więcej niż cały dzień roboczy na obowiązki związane z rejestracją pacjentów (8 godzin, 13 minut i 31 sekund). Rozwiązania oparte na technologiach informacyjno-komunikacyjnych niosą ze sobą wiele zalet, zwłaszcza tych związanych z obciążeniem czasowym pielęgniarek, optymalizacją pracy administracyjnej, a także z promocją zdrowia przez edukację pacjentów.

Słowa kluczowe: **e-zdrowie, e-rezerwacje, system rezerwacji wizyt pacjentów, pielęgniarka**

ABSTRACT

INTRODUCING EHEALTH SOLUTIONS IN SLOVENIA TO GAIN TIME FOR HEALTH EDUCATION: A CASE OF ELECTRONIC PATIENT APPOINTMENT SCHEDULING

Introduction. Accelerated computerization of health systems begun in Slovenia in 2008 with the eZdravje (eHealth) project. Various aspects of the system enable patients to track different aspects of their health care more efficiently. The eNaročanje (eScheduling) part enables patients to be more actively integrated into the health services, as well as presents significant help for administrative work and more time for health education.

Aim. The aim of our research was to show which type of patient appointment scheduling is the least burdensome for nurses.

Material and methods. We used a quantitative research methodology. Collecting data took place in May 2017. We gathered the various patterns of scheduling patients for appointments in a single month at an outpatient care unit in the north-eastern region of Slovenia. We collected the data concerning the time needed to perform different patients' appointment scheduling and we interpreted the data with the help of descriptive statistics.

Results and conclusion. Between January 2016 and January 2017 less than 1% of patients made appointments through eNaročanje. Since January 2017, when eNaročanje started in studied unit, the percentage of patients who made their appointments through eNaročanje increased, and by May 2017 there were 60 (20%) of the overall 298 patients in the study who used the system. We came to the conclusion that in the 17 workdays in May 2017 there were 126 (42%) appointments made by men and 172 (58%) by women. An average time spent personally or on the phone calls scheduling was significantly higher than the time spent through the eNaročanje service. We have shown that out of 17 workdays, the nurse spends more than an entire workday for the patient appointment scheduling tasks (8 hours, 13 minutes and 31 seconds). Information and communication based solutions can bring many advantages, especially regarding the time burden challenges that the nurses currently face, optimization of administrative work as well as promoting health care through education of patients.

Key words: **eZdravje, eNaročanje, patient appointment scheduling, nurse, nursing, time burden**

INTRODUCTION

Digitalization has been increasingly making an impact on health care with its various technological achievements [1]. Health care professionals and health care users are of the opinion that the use of information and communication technologies (ICT) in health care, such as electronic medical records or computerized order entries are crucial for the transformation of the health system [2]. Reliable and precise ICT in health care is essential for monitoring, evaluating and improving public health [3]. Good information in health care improves public health [4].

The use of the Internet for health purposes is constantly rising due to the Internet's availability across the world, also people share their experiences more often and seek for help in health services [5]. While the use of the Internet is increasing, the use of information and communication technology for health systems among people in Europe is still relatively underdeveloped [6]. However, in recent years interactive computer tools have become deeply embedded in health care [7].

Contrary to paper test results, electronic medical records are available anywhere, with only a few clicks. Another important advantage is the availability of electronic medical records anytime and anywhere [8]. A survey involving 16,352 nurses in 316 USA hospitals showed that the use of ICT in health care improves permanent patient care, contributes to their safety, and leads to better and more effective health care delivery [9]. However, health professionals are often sceptical and show low support for the informatization of health care, as they anticipate that new technologies will not bring any benefits to their patients [10]. Studies show that many challenges have to be overcome at the beginning, but once the systems are in use, the care ultimately benefits from it. Ultimately, nurses in particular were grateful for better access to patient information and other data with the use of electronic records in health care [11]. The use of electronic records in primary health care contributes to greater efficiency and productivity [12]. Looking at the usage data, it becomes possible to discern the use of ICT based on the age and experience of doctors. More senior doctors, who show higher work productivity do not use electronic records in health as much as younger and inexperienced doctors who use modern technology more frequently, but are less productive [13].

Slovenia has been going through a health care information transformation since 2008 with the eZdravje project. This project will come with many new and useful information services that will ease the everyday struggles for health care experts, as well as for patients in coping with administrative work. It is obvious from experts' literature that introducing ICT into health care brings positive effects in areas where they are already used [4].

In this research, we tried to understand which type of appointment scheduling is the least burdensome for nurses, more efficient and less time consuming. We also needed to be clear as to what the introductory effects of eNaročanje service in an outpatient care unit (OCU) are and then, advocate them.

AIM

We used a sample of all the patients with an outpatient appointment in May 2017 at an OCU for a quick or regular referral. Numerically, we defined which type of appointment scheduling patients usually use. We set a hypothesis and a research question.

Hypothesis:

- Advanced patient appointment scheduling using ICT technology is less burdensome for nurses in terms of time than other types of appointment scheduling.

Research question:

- Which type of appointment scheduling is the least burdensome for the nurses and which one takes the smallest amount of time?

MATERIALS AND METHODS

In this research, we used a quantitative methodology, and within these boundaries, we carried out a cross-sectional descriptive study. The theoretical part is based on home and foreign literature. We used stop watches for appointment scheduling for patients during one month, and also measured the average time needed by nurses in minutes for individual appointment scheduling also for a month.

In compiling the research, we used printed material and electronic sources, monographic publications and serial publications. We used descriptive research to measure appointment scheduling time of the patients, scheduled for an appointment at an OCU. Gathered data on time spent for appointment scheduling have been checked for errors and systematically processed. We used a Samsung Galaxy A5 (2016) smart phone as a measuring device with an Android 6.0.1 operating system, and we entered the data into Excel 2016 and IBM SPSS 24 for further analysis.

The institutional ethics committee approved the study (number 02/010/03-023/01/17).

RESULTS

In May 2017 during 17 workdays we had 298 patients scheduled for appointments at an OCU. Of those, 126 (42%) were men and 172 (58%) women.

Tab. 1. Number of scheduling appointments by methods and patients' gender.

Methods of appointment scheduling	Number of male patients	Number of female patients	Number of all scheduled patients
eNaročanje	22 (7%)	38 (13%)	60 (20%)
In person	29 (10%)	33 (11%)	62 (21%)
By telephone	75 (25%)	101 (34%)	176 (59%)
Total	**126 (42%)**	**172 (58%)**	**298 (100%)**

Table 1. shows the number of scheduled patients by separate methods of scheduling appointments and by gender. It can be seen that more female patients (22%) decided to use eNaročanje system in comparison to male patients (18%).

Tab. 2. Average time of scheduling in seconds.

Appointment scheduling method	Average time spent on appointment scheduling (seconds; confidence interval - CI)
eNaročanje	0 s
In person	136 s (95 % CI: 126–146)
By telephone	120 s (95 % CI: 113–127)
By telephone & in person together	124 s (95 % CI: 118–130)

In Table 2. we have shown an average time spent for each method of appointment scheduling measured in seconds. For the patients who make an appointment by themselves, no extra time is required from the nurse. There are no significant differences between "in person" and "by telephone" scheduling times in contrast to eNaročanje.

A total sum of the time the nurse spent in May 2017 (17 workdays) for these two methods, by telephone and in person, the estimated time was 29611 seconds (8 hours, 13 minutes and 31 seconds).

Tab. 3. Scheduled patients based on the scale of urgency.

Scale of urgency	Number of scheduled patients
Quick	138 (46%)
Regular	160 (54%)
Total	**298 (100%)**

Table 3. shows how we scheduled patients by their urgency scale that is used to schedule more urgent cases earlier than others. There is approximately the same number of patients in each group.

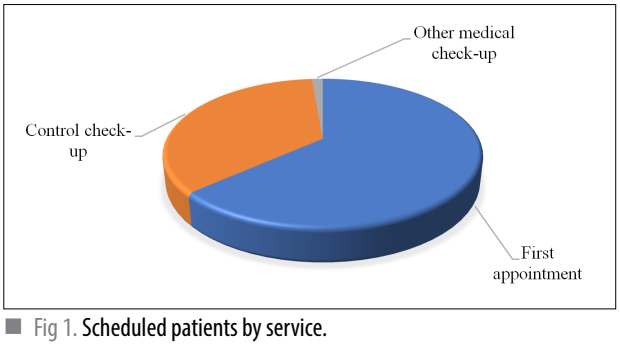

Fig 1. Scheduled patients by service.

Figure 1. shows the number of scheduled patients by services. For a first appointment we had 189 (64%) patients, for a control check-up we had 105 (35%) patients and for other medical check-ups we scheduled 4 (1%) patients.

As a part of the research, we also carried out study among the patients who made an appointment through eNaročanje service from 1st January 2016 to 31st May 2017. We gathered the data of all the patients who made an appointment themselves by using the web portal and eNaročanje service. The merger of the traditional referral with an electronic one was announced on 15 January 2017, but due to early problems with implementation of the system faced by health care workers, this deadline was extended (NIJZ, 2017b). Finally, the electronic referral was officially introduced on April 10th 2017. All the prescribed paper referrals after this date are still valid.

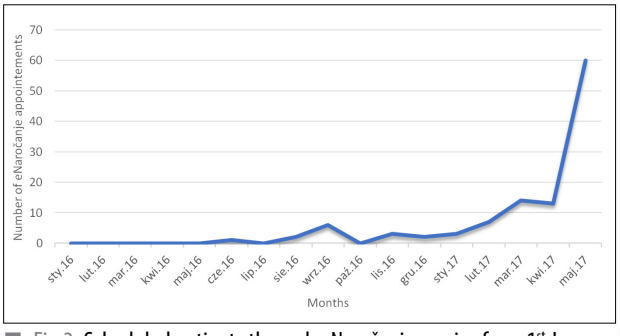

Fig 2. Scheduled patients through eNaročanje service from 1st January 2017 to 31st May 2017.

Figure 2. shows that a major move with patients' appointment scheduling took place when the eNaročanje service was started to be used, when the tie-up between the electronic and the classic paper referral was announced. In January 2016, no patients made appointments themselves via the eNaročanje service, even though it was ready. In January 2017, we witnessed a positive trend in this field. Since the first announcement of the referral tie-up, the number of patients who make an appointment through eNaročanje themselves started to increase, and the biggest growth occurred when the official transition and merger of electronic referral with the traditional one came into use in April 2017.

DISCUSSION

Our research encompassed all the patients who made an appointment at an OCU using a quick or regular referral. We did not include patients with an urgent referral level as there is no waiting period for those types of patients. We examined three types of appointment scheduling: in person at an OCU, by telephone and via eNaročanje service, and defined which was the least burdensome method for the nurses who supervise a waiting list at an OCU, measured in seconds.

We were trying to establish which method of appointment scheduling is the least burdensome to nurses, and we came to the conclusion that the electronic appointment scheduling via the eNaročanje service operated by the patients themselves, is the least onerous. We established that nurses spend averagely 120 seconds (95% CI: 113–127) for the appointment scheduling by telephone, 136 seconds (95% CI: 126-146) for making the appointment in person at the OCU, and no time at all for patient scheduling appointments through the eNaročanje service.

In this way, we answered the research question ourselves about which type of appointment scheduling is the least burdensome for nurses.

A nurse usually uses the eNaročanje service only when consulting and helping patients who are not skilled at using a computer and cannot use the eNaročanje service, or encounter problems with the system. We calculated that nurse saved 124 minutes (2 hours and 4 minutes) in one month, because if it was not possible to use the service, patients would choose among the other methods of appointment scheduling, which would mean an additional time burden to the nurses.

The electronic appointment scheduling demands some effort, skills and knowledge from nurses to see that the system functions impeccably or restore it if it fails. To know how to restore the electronic appointment scheduling, nurses spend time to study the instructions about activating and re-setting the electronic scheduling calendar and cooperating with co-workers (doctor, information service), but they are soon rewarded when patients return to the eNaročanje service. In this way, nurses have more time for medical care and improved personal data security, because access to these is only possible with qualified digital certificate. However, there is also fear in people's minds because of security of their personal data being used online. In research conducted in the USA, one third of the asked people had second thoughts about the security of their personal data stored in ICT systems that are accessible on the Internet [14].

With traditional referrals, the level of management and access to patients' data are much lower than when using the eZdravje service. The introduction of ICT brought some good results: we gained better oversight over all the patients' data; patients cannot make an appointment at several OCUs for the same time; tests and procedures cannot be duplicated; we save time; and we proved with our research that as a long-term consequence, we save money.

Research conducted between 2005 and 2007 in some European countries [15] showed, that there was an obvious increase of Internet use for medical and health care purposes. Of interest in that research is a substantial increase among young women. Our research also compared men and women who used the eNaročanje system with 38 (63%) women and 22 (37%) men. Based on all the scheduling methods by gender, the eNaročanje was used by 22 (17%) men and 38 (22%) women. In the research, we had a total of 126 (42%) men and 172 (58%) women using all the scheduling methods.

We can now confirm that the hypothesis we used for our research turned out to be correct, i.e. the advanced types of appointment scheduling, such as eNaročanje, put patients in an active role in scheduling their own appointments and therefore, released nurses from this activity and put them into a more advisory role about appointment scheduling itself.

In the period from 1st January 2017 to 10th April 2017 we had an extremely small number of written electronic patient referrals, because the guidance notes that tied electronic referrals with the paper referrals had not been in force yet. As there were no electronic referrals handed out, the patients themselves could not make appointments on their own, and had to use the telephone or call into the OCU in person. For these reasons alone, we witnessed a significantly low level of patients who made appointments entirely by themselves. On 10th April 2017 the merger between the electronic and the traditional systems took place, and since then, there have been many more electronic referrals made, and consequently, more patients made their appointments themselves through a web portal to our OCU. Figure 2. shows the increase of the eNaročanje service from 1st January 2017 to 31st May 2017 and the increase from the time of the merger of electronic and classic referral systems is evident. In May 2016, appointments made by patients themselves via the eNaročanje service equalled to zero, but a year later, in May 2017, we had 60 (20%) such patients. The eNaročanje appointment scheduling is possible beyond working hours of the OCU as well as in holiday time, which is a significant advantage. The patients can make their appointments on their own outside the work time limits and they do not have to wait for nurses to pick up the telephone, nor do they have to wait in line to do it in person. The research conducted in some European countries also showed that the use of ICT in health care is increasing and has enormous potential. Electronic prescriptions are widely used and patients can arrange their appointments on their own, as well as use ICT to communicate with their doctor etc. [16].

The web portal zVEM (Heath - Everything in one place) is still only in a so-called beta version and does not offer all the functionalities. A code register of health services still lacks clarity on its definition, for example in the case of service "Allergy test – first". There are at least two different specialties in health care where this service takes place, i.e. dermatology and pulmonology, and there is a risk of patients making appointments at a wrong OCU.

In choosing the available term for an appointment check-up, where the web portal enables patients to type in the time and date of when they want to come, the portal's performance is still sloppy and unclear, and also functions irregularly. This is why patients then have to call the healthcare experts. In this case, the eNaročanje service turns into appointment scheduling by telephone or personally at the OCU or some other health care institution, which again presents an unnecessary time burden for nurses. Another cause of losing time unnecessarily is because the eNaročanje service does not offer any option for other than a limited number of specialist examinations and clinics. The patients needing these services have to choose other ways of making an appointment. In our research there were 105 (35%) patients who made check-up appointments. If eNaročanje enabled appointment scheduling for patients needing specialist treatment or investigations, the share of those patients would steadily increase.

Electronic appointment scheduling puts patients in an active role by making an appointment at the OCU, easing the time burden on nurses and putting them more in a position of consulting with patients about appointment scheduling. In this way nurses do not spend the same amount of time compared to traditional methods of appointment scheduling.

CONCLUSIONS

The project eZdravje will bring many positive innovations to the ICT field in health care. It means that the everyday work of employees in health care will be easier and patients will gain better insight into their medical data. Although the eNaročanje project still has some technical problems, we can already see many advantages it brings. The patients can now actively and personally cooperate in appointment scheduling at specialist clinics.

The electronic appointment scheduling demands different levels of effort. Nurses who are less skilled in computer work need more effort to see their results and gain insight into how patients' scheduled appointments function and how medical data becomes visible through information technology. The nurses in our research gained time with eNaročanje and will be able to focus more on work, especially on health education. They will also have more time to spend in direct work with patients.

We concluded that ICT brings advantages by reducing the time that nurses spend doing administrative work. With the traditional referral system, patients had to make their appointment within five days of being given an appointment reservation. This was the longest waiting time allowed for individual medical services and for the managing waiting lists. Nurses then had to enter the referrals into computer programs and store them until patients came in for the check-up, and afterwards they had to properly archive it with the rest of the medical documentation. In case of the patients' absence and their apology within 15 days from their appointment term, the nurses had to return their referral, what they did by sending them back by standard mail. The nurses faced an additional time burden when patients, who had not come to the OCU on their scheduled time, as well as unused referrals and returns received by mail. With the establishment of electronic appointment scheduling these things are unnecessary, what means that the nurses gained time, and their institutions saved financially by not sending unused referrals back to the patients.

The eZdravje and eNaročanje projects face "postnatal spasms" because there are still some problems that annoy health care workers as well as patients. When the eZdravje project comes fully into service and when all the medical documentation is available on ICT, the contribution of eZdravje will further increase.

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