Issue Rehabil. Orthop. Neurophysiol. Sport Promot. 2021; 36: 31–39. ISSN 2300-0767
DOI: 10.19271/IRONS-000142-2021-36

RESEARCH REPORT

STAFF ABSENTEEISM AND DELIVERY OF HEALTHCARE SERVICES DURING THE COVID-19 PANDEMIC AT WIKTOR DEGA ORTHOPEDIC AND REHABILITATION CLINICAL HOSPITAL IN POZNAŃ, POLAND

ABSENCJA PRACOWNICZA I REALIZACJA ŚWIADCZEŃ MEDYCZNYCH W ORTOPEDYCZNO-REHABILITACYJNYM SZPITALU KLINICZNYM IM. WIKTORA DEGI W POZNANIU W OKRESIE PANDEMII COVID-19

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ABSTRACT

Introduction

The COVID-19 pandemic has led to various interruptions in the implementation of healthcare services provided by hospitals.

Aim

The aim of this study was to evaluate the staff absenteeism during the COVID-19 pandemic at Wiktor Dega Orthopedic and Rehabilitation Clinical Hospital in Poznań as well as to present the standard of providing the healthcare services assigned to the Hospital under the contract with the National Health Fund.

Material and methods

Work attendance of more than 700 hospital employees at Wiktor Dega Orthopedic and Rehabilitation Clinical Hospital in Poznań was evaluated. The assessment of the number of medical services that were provided during the study time was based on monthly reports prepared for the national payer of health services. A retrospective analysis covered the period of January-April 2019 and January-April 2020.

Results

In the months of March and April 2020, a significant increase in staff absenteeism was reported. An evaluation of the relative values of the implementation rate of medical services for the months January-April of 2019 and 2020 showed that in April 2020, there was a substantial reduction (10%) in the implementation rate of medical services on orthopaedic wards, while on rehabilitation wards, the reduction in the implementation rate started in March 2020 and was also reported in April 2020 (6%).

Conclusions

The COVID-19 pandemic resulted in higher staff absenteeism rates in various professional groups working in our hospital. A reduction in the performance of healthcare procedures in

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Authors reported no source of funding
Authors declared no conflict of interest

Date received: 6th May 2021
Date accepted: 17th August 2021

our hospital, both orthopaedic and rehabilitation, will lead to a re-analysis of costs and will result in applying economizing mechanisms.

Keywords: COVID-19, hospitals, health services, absenteeism, healthcare, hospital employees.

STRESZCZENIE

Wstęp

W okresie pandemii COVID 19 występują zakłócenia w świadczeniu usług medycznych przez szpitale o wielorakiej genezie.

Cel

Celem pracy była ocena absencji pracowniczej w okresie pandemii w Ortopedyczno-Rehabilitacyjnym Szpitalu Klinicznym im. W. Degi w Poznaniu oraz określenie poziomu wykonania zakontraktowanych przez Narodowy Fundusz Zdrowia świadczeń medycznych w tym samym okresie.

Materiał i metody

Absencję pracowniczą oceniono u ponad 700 pracowników szpitala. Oceny ilości wykonanych usług medycznych dokonano bazując na comiesięcznych raportach kierowanych do płatnika świadczeń. Przeprowadzono analizę retrospektywną wymienionych obszarów, która dotyczyła okresu styczeń–kwiecień 2019 roku oraz styczeń–kwiecień 2020 roku.

Wyniki

Istotny wzrost absencji zaobserwowano w marcu i kwietniu 2020. Porównanie wartości względnych stopnia realizacji zakontraktowanych świadczeń medycznych w kolejnych miesiącach lat 2019 i 2020 wykazało, że na oddziałach ortopedycznych zdecydowane obniżenie realizacji miało miejsce w kwietniu 2020 roku (10%) a na oddziałach rehabilitacyjnych spadek realizacji uwidocznił się już w marcu 2020 i odnotowywany był także w kwietniu 2020 (6%).

Wnioski

Pandemia COVID-19 skutkuje zwiększoną absencją pracowniczą w wielu grupach zawodowych pracowników szpitala. Zmniejszenie ilości wykonywanych procedur ortopedycznych i rehabilitacyjnych w naszym szpitalu wymusi ponowne przeanalizowanie kosztów prowadzonej działalności a zarazem wywoła wprowadzenie mechanizmów oszczędnościowych.

Słowa kluczowe: COVID-19, szpitale, świadczenia zdrowotne, absencja pracownicza, opieka zdrowotna, personel szpitalny.

Introduction

The functioning of hospitals, understood as a professional implementation of contracted medical services during the agreed period of time, is a common way of carrying out the medical care responsibility of the state towards its citizens (Choi *et al.* 2019; Garg *et al.* 2019; Rozier *et al.* 2019; Behzadifar *et al.* 2020; Galarraga *et al.* 2020). An undoubted advantage of such a healthcare management system is the possibility of long-term planning of the provided health services including possible modifications of the ways of their execution (new methods, technologies, and the impact of scientific validation), as well as

"economization of employment" in each occupational group needed for their execution (Espinosa-González *et al.* 2019; Giménez *et al.* 2019; Mahdiyan *et al.* 2019; Yaghoubi *et al.* 2019). In general, the main "external" factors that ensure undisturbed functioning of hospitals in the areas mentioned above include: a stable situation of the health care financing system in a particular country, an overall economic situation in a given country, and adjusting the type and scope of provided medical services to the detailed epidemic indicators which are specific for the given country or its region (Hamada *et al.* 2019; Koch-Weser *et al.* 2019; Mazurenko *et al.* 2019; Onwujekwe *et al.* 2019; Petross *et al.* 2020; Tsiachristas *et al.* 2020). The economic stability of hospitals translates into their feasibility of delivering medical care services of expected quality and specific quantity that is "contracted" by the payer (Mathes *et al.* 2019; Steenhuis *et al.* 2020). The factors that determine the economic dimension of hospitals' performance include the structure of employment in different occupational groups of hospital employees, as well as the optimization of their work time and nature of the tasks they are responsible for.

In general, the above-mentioned patterns remain predictable in the situation of "continuity" and "stability" of healthcare management systems worldwide (Hazrati *et al.* 2020; Xie *et al.* 2020). In the cases of crisis, including pandemic or natural and global disasters, the question is how to maintain the "stability and efficiency" of the hospital sector (Akinleye *et al.* 2019; Grønstad *et al.* 2019). The COVID-19 pandemic has led to various interruptions in the implementation of healthcare services provided by hospitals.

Aim

The aim of the study was to evaluate the staff absenteeism in the initial period of the COVID-19 pandemic at Wiktor Dega Orthopedic and Rehabilitation Clinical Hospital in Poznań, as well as to assess the standard of providing the medical services that were assigned to the Hospital under the contract with the National Health Fund, the payer of public health services in Poland.

Material and methods

The study has been registered on ClinicalTrials.gov (ID: NCT04521010). A retrospective analysis of the above-mentioned data, covering the periods of January-April 2019 and January-April 2020, was carried out. The evaluation of the staff's absence included all employees under an employment contract: 713 employees in 2019 and 747 employees in 2020. The variable number of employees was a result of the employment dynamics in the subsequent two years, due to variable quantity of healthcare services that were contracted with the national payer and changes in the form of employment of some hospital employees. All group characteristics are presented in Table 1.

Table 1. Number of hospital employees in the subsequent 4 months of 2019 and 2020 at Wiktor Dega Orthopedic and Rehabilitation Clinical Hospital in Poznań.

Month	Total employees	Age	Women	Men
		Mean ± SD	n (%)	n (%)
January 2019	713	45.1 ± 11.8	587 (82.3%)	126 (17.7%)
January 2020	747	45.6 ± 11.9	626 (83.8%)	121 (16.2%)
February 2019	720	45.2 ± 11.8	597 (79.9%)	123 (16.5%)
February 2020	747	45.7 ± 11.8	629 (84.2%)	118 (15.8%)
March 2019	729	45.2 ± 11.7	604 (82.9%)	125 (17.1%)
March 2020	742	45.9 ± 11.8	627 (84.5%)	115 (15.5%)
April 2019	727	45.2 ± 11.7	605 (83.2%)	122 (16.8%)
April 2020	735	46.0 ± 11.8	621 (84.5%)	114 (15.5%)

Three types of analyses were carried out: a global analysis, an analysis taking into

account the division into specific professions, and an analysis of absence in different hospital organizational units/areas. Absences due to medical reasons, holidays, or childcare were analyzed together. The analysis of performing the contracted tasks was shown in relative values (%). The analysis included the structure of contracted services divided into: orthopedics (alloplasty and others), rehabilitation (person-day), rheumatology (drug trials and others). The rehabilitation unit was subdivided into inpatient and outpatient wards due to a temporary closure of the outpatient ward.

The data were analyzed using Statistica version 13.1. Demographic data and clinical characteristics are presented as means and standard deviations (SD). The implementation rate of the contract is presented as a percentage. The Shapiro-Wilk test was used to assess the normality of the distributions in the test score. In order to compare the differences between the absence from work observed in 2019 and in 2020, Student's t-test for independent variables or non-parametric U Mann-Whitney test were used. *P*-values less than 0.05 were considered statistically significant.

Results

The results of overall absence analysis (without a distinction of occupational groups and areas of treatment) are presented in Table 2. A comparison of indicators of staff absence that were assumed for the purpose of this study (average number of days of absence and the percentage of time worked during a month) showed no significant differences for the periods of January 2019 vs. 2020 and February 2019 vs. 2020. On the other hand, in March 2020 and April 2020, there were significant differences in absenteeism in comparison with the same months of 2019. In March 2020, the average time of absence was 1.8 days longer than in March 2019. In April 2020, a significant increase in staff absenteeism was observed, as compared to 2019 ($p < 0.001$). However, it is worth noting that the average time of absence in April 2020 (3.6 ± 6.1 days) was shorter than in March 2020 (4.0 ± 6.00 days).

Table 2. Analysis of global absence. Results of Student's t-test for independent variables are presented.

Month	absence in days mean ± SD	p	percentage of time worked	p
January 2019	2.8 ± 4.6	0.484	87.4 ± 20.9	0.853
January 2020	2.6 ± 4.7		87.6 ± 22.5	
February 2019	2.4 ± 4.4	0.630	87.9 ± 22.1	0.630
February 2020	2.3 ± 4.3		88.5 ± 21.6	
March 2019	2.2 ± 4.4	< 0.001	89.4 ± 21.1	< 0.001
March 2020	4.0 ± 6.0		81.8 ± 27.2	
April 2019	2.5 ± 4.2	< 0.001	88.1 ± 20.2	< 0.001
April 2020	3.6 ± 6.1		83.1 ± 28.9	

There were significant differences in the absence indicators between March and April 2019 vs. March and April 2020. Therefore, a detailed analysis of absenteeism including all professional groups of hospital employees was carried out only for the mentioned periods. According to Table 3, in March 2020, there was a significant increase in the absence from work of administrative staff, other non-medical personnel, other medical personnel, and physiotherapists, as compared with March 2019. In April 2020, there was a significant rise in the absence from work of physiotherapists, as compared with April 2019.

Table 4 shows the average time of staff absenteeism by different areas of work. The analysis demonstrated that there was a significant increase in the time of absence from work in March 2020 vs. March 2019 in the following work areas: orthopedic wards,

Table 3. A comparison of absence from work of professional groups in March and April 2019 vs. March and April 2020. Student's t-test for independent variables, U Mann-Whitney test have been used.

Professional group	March			April		
	2019	2020	p	2019	2020	p
Administrative staff	2.3 ± 4.4	4.5 ± 6.2	< 0.001*	3.1 ± 4.2	3.5 ± 5.8	0.389*
Pharmacists	3.3 ± 4.2	3.1 ± 6.5	0.356	2.1 ± 2.2	3.3 ± 6.6	0.325
Other non-medical personnel	2.2 ± 4.1	3.8 ± 5.9	0.020*	2.8 ± 4.8	3.4 ± 5.5	0.334*
Nurses	1.9 ± 4.0	2.7 ± 5.1	0.082*	2.0 ± 3.8	2.4 ± 4.9	0.340*
Other medical professions	1.8 ± 4.4	4.9 ± 6.3	0.017	3.5 ± 4.8	4.1 ± 6.2	0.699
Technical staff	2.4 ± 4.9	3.4 ± 5.8	0.228	2.4 ± 4.4	3.1 ± 6.0	0.987
Physicians	2.3 ± 4.6	3.2 ± 5.6	0.718	1.5 ± 3.5	4.6 ± 7.8	0.653
Physiotherapists	3.0 ± 5.8	7.8 ± 6.8	<0.001	2.2 ± 4.3	7.1 ± 8.6	0.008

rehabilitation wards, administration, and admissions unit. When comparing April 2020 with April 2019, the only significant rise in absence from work was reported by the orthopedic and rehabilitation wards.

Table 4. A comparison of absenteeism by hospital areas of work in March and April 2019 vs. March and April 2020. Student's t-test for independent variables, U Mann-Whitney test have been used.

Professional group	March			April		
	2019	2020	p	2019	2020	p
Pharmacy	4.6 ± 6.8	4.2 ± 7.0	0.988	4.2 ± 5.6	4.8 ± 7.0	0.751
Orthopedic wards	2.2 ± 4.2	3.7 ± 6.0	< 0.000*	2.2 ± 4.1	3.3 ± 6.0	0.011*
Lab	2.6 ± 6.1	2.5 ± 5.1	0.937	4.2 ± 6.1	2.7 ± 3.8	0.388
Administration	1.9 ± 3.7	3.6 ± 5.8	0.004*	2.4 ± 3.4	2.4 ± 4.6	0.980*
Admission room	1.8 ± 4.1	4.6 ± 5.5	0.008	4.0 ± 5.4	3.6 ± 5.7	0.214
Rehabilitation wards	2.4 ± 5.1	5.3 ± 6.5	< 0.001*	2.2 ± 4.1	4.9 ± 7.1	< 0.001*
Rheumatology wards	1.9 ± 3.5	3.0 ± 5.3	0.648	2.2 ± 4.5	4.6 ± 7.2	0.283

A comparison of the relative values of the implementation rate regarding contracted medical services in the periods of January-April 2019 vs. January-April 2020 showed that in April 2020, there was a substantial reduction in the implementation rate on orthopedic wards, while on rehabilitation wards, the reduction in the implementation rate started in March 2020 and was also reported in April 2020 (Table 5).

Discussion

The rapid development of the COVID-19 pandemic has resulted in multiple publications that address this global challenge in a multidimensional way. Nevertheless, the number of reports concerning the functioning of orthopedic and rehabilitation hospitals remains low (D'Ambrosi 2020). The aim of our analysis was to evaluate the impact of the COVID-19 pandemic on the work attendance of the personnel of Wiktor Dega Orthopedic and Rehabilitation Clinical Hospital in Poznań. It needs to be emphasized that the above-mentioned hospital is a monoprofile institution specializing in musculoskeletal pathology. A comprehensive care for patients suffering from musculoskeletal disorders is provided by orthopedic, rehabilitation, and rheumatology wards. It is necessary to add that during the pandemic, the hospital was not a COVID-19-designated institution, nor was it dedicated for patients suspected or tested positive for the coronavirus infection. Following WHO and the Polish Ministry of Health recommendations, basic preventive measures were taken including temperature measurement of all people entering the hospital (both hospital employees and patients), an assessment questionnaire checking the risk of coronavirus infection, and the requirement

Table 5. A comparison of the relative values of the implementation rate of contracted medical services at Wiktor Dega Orthopedic and Rehabilitation Clinical Hospital in Poznań in the subsequent months of 2019 vs. 2020.

Profile		Year	January	February	March	April	4 months
Orthopedics	Total	2019	96.33%	101.40%	109.66%	122.62%	107.61%
		2020	89.98%	111.79%	114.87%	76.18%	97.96%
	Alloplastic surgery	2019	90.27%	109.00%	102.97%	118.12%	105.05%
		2020	72.35%	99.90%	105.49%	71.59%	87.33%
	Other	2019	100.78%	95.83%	115.92%	126.01%	109.64%
		2020	103.19%	120.82%	122.00%	79.43%	105.90%
Rehabilitation	Total	2019	77.95%	85.53%	93.94%	93.42%	87.69%
		2020	91.63%	106.69%	81.82%	47.38%	81.88%
	Inpatient wards	2019	58.37%	79.84%	91.21%	85.69%	78.75%
		2020	76.53%	110.57%	110.48%	93.68%	97.82%
	Outpatient ward	2019	101.62%	92.42%	97.23%	102.59%	98.47%
		2020	107.09%	102.73%	52.48%	0.00%	65.57%
Rheumatology	Total	2019	74.74%	86.14%	80.13%	83.40%	81.10%
		2020	87.98%	83.13%	79.39%	86.34%	84.22%
	Drug trials	2019	94.30%	77.49%	68.70%	76.02%	79.13%
		2020	91.46%	78.46%	77.11%	102.59%	87.35%
	Other	2019	107.28%	119.20%	123.78%	111.53%	115.45%
		2020	78.63%	95.98%	85.54%	46.73%	75.98%

to wear face masks and disinfect hands upon entering the hospital. By the decision of the hospital authorities, additional regulations concerning communication within the hospital premises have been introduced (separate communication tracts for patients admitted to the hospital, patients served by the reception desk, patients served by the hospital laboratory, and those served by diagnostic labs e.g. X-ray, MRI, EMG). Similar regulations have been followed in other hospitals during the COVID-19 pandemic (Day *et al.* 2020; Huh 2020). It might be assumed that such regulations would provide a sense of security for both hospital patients and hospital employees, ensuring smooth operation of healthcare services.

Unfortunately, this was not the case and the pandemic showed certain mechanisms determining the hospital staff's attendance (see Tables 2–4). In order to evaluate the impact of the pandemic on work attendance, we compared the staff's presence at the workplace in the same months of 2019 and 2020. The analysis of global absence at the workplace in March and April 2020 showed a significant decrease in the hospital employees' attendance (see Table 2). This data is coherent with the conclusions of Sharp *et al.* (2020), who stated that even 20% of the workforce may be absent at any point in time during the present pandemic. In our study, the global absence was significant in March and April 2020 and so these two months were further analyzed. To better understand the phenomenon of absenteeism at this particular time, we divided the hospital workforce into specific professional groups (see Table 3). A more detailed study into the absence from work comparing the same months of 2019 and 2020 in each professional group showed a significant decrease in the work attendance of administrative staff, other medical personnel, other non-medical personnel, and physiotherapists. It is not possible to compare our results with those of other studies, as such an analysis has not been presented in the recent months. However, it is worth noting that it was March 2020 when WHO announced the COVID-19 outbreak a pandemic and the fear of infection from hospital patients could be the main reason for absence from work. The impact of such fears on work participation was studied by other authors (Iacobucci 2020; Joob *et al.* 2020).

Furthermore, we analyzed workforce absenteeism by considering different hospital work areas listed in Table 4. It turned out that a significant, two-month absence was common among the employees of orthopedic and

rehabilitation wards. The administrative staff and admissions room employees were significantly absent only in March 2020. As it was already reported by Neto *et al.* (2019), the fear of coronavirus infection might have been the reason for that absence.

Another research problem that was addressed in our study regarded the number of healthcare services that were provided in the subsequent months of 2020. For this purpose, we divided the hospital activity into the following groups of healthcare services: orthopedic, rehabilitation, and rheumatology. Comparing the quantity of completed orthopedic services, as relative values, in the periods of January-April 2020 vs. January-April 2019, we observed a reduction by 10% in the number of services delivered during the pandemic. The same analysis was carried out for rehabilitation – with a reduction by 6% in the quantity of delivered medical services. In the case of rheumatology, we observed an increase of about 3% in the quantity of completed medial services during the pandemic in comparison with the same months of 2019 (see Table 5). Considering the data in Table 5, it can be noted that the month of April 2020 was critical for orthopedics in terms of a reduction in the number of delivered services for both alloplastic surgery (an almost 50% reduction) and other orthopedic procedures (an almost 40% reduction). One of the reasons for such reductions was the decrease in the number of patients admitted to orthopedic wards, mainly because the patients were cancelling their scheduled admissions. Some of these patients made a written request, in which they asked for postponing their scheduled treatment, in many cases because of their fear of COVID-19.

It is worth mentioning that contrary to what has been reported by Italian and American authors (Day *et al.* 2020; Zagra *et al.* 2020), our hospital did not suspend scheduled healthcare services in the analyzed period of time. Zagra *et al.* (2020) reported a considerably larger reduction of almost 70%, in the number of orthopedic procedures delivered between the end of February and April 2020. A reduced (in relative terms) number of rehabilitation medical services delivered in the period of January-April 2020 was determined by the performance within only two months: March and April (see Table 5). It should be noted that our hospital provides rehabilitation services in both inpatient and outpatient settings. The outpatient services became disrupted, which resulted in the reduction of the relative value of rehabilitation procedures completed in the period of January-April 2020. How can this fact be explained? In the middle of March 2020, the hospital temporarily suspended the outpatient services, following the recommendations of the national health inspector. The suspension of the activities of the outpatient rehabilitation ward lasted from the middle of March until the end of April. As we already mentioned, there was a reduction by 6% in the number of completed rehabilitation services. A considerably larger decrease in the quantity of delivered outpatient rehabilitation services was noted in the peak period of the pandemic in Milan (Zagra *et al.* 2020).

As for rheumatology, a slight relative increase in the number of completed procedures was determined mostly by an undisturbed continuation of drug trials.

The reduction in the quantity of orthopedic and rehabilitation services delivered in our hospital in the initial phase of the COVID-19 pandemic (see Table 5) will certainly lead to a re-analysis of costs and will result in applying economizing mechanisms, which was also noted by other authors (Menendez *et al.* 2020).

Conclusions

1. During the COVID-19 pandemic and – in more general terms – in the times of crisis, the delivery of healthcare services provided by hospitals is disrupted. This is expressed in enhanced absenteeism in the workplace and a reduced quantity of completed healthcare services. The fear of infection from hospital patients could be the main reason for absence from work.

2. The experience gained during the COVID-19 pandemic should result in an implementation of prevention programs addressing the issue of minimizing staff absenteeism and enhancing a sense of security among the hospital patients.

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