



## The impact of accreditation on health care quality in hospitals

### Uticaj akreditacije na kvalitet zdravstvene zaštite u bolničkim ustanovama

Gordana Marković Petrović\*, Mira Vuković†, Aleksandra Jović Vranes‡

Primary Healthcare Center Zemun, \*Department of Social Medicine, Belgrade, Serbia;  
General Hospital Valjevo, †Education Center, Valjevo, Serbia; University of Belgrade,  
Faculty of Medicine, ‡Institute of Social Medicine, Belgrade, Serbia

#### Abstract

**Background/Aim.** Accreditation is considered to be the oldest and most widespread mechanism of independent external evaluation of health care quality and is implemented in over 70 countries worldwide. Despite numerous studies in this field, there is still no solid evidence about its impact on health care quality and patient safety. The goal of this paper was to investigate if the accreditation process has an effect on the difference in values of health care quality indicators. **Methods.** The study was conducted in two tertiary level health care hospitals, one accredited, the other non-accredited. Values of seven quality indicators in the period before, during and immediately after the completion of accreditation (from 2007–2015), which measure health care quality, patient safety, the efficiency and productivity of the institution, were compared. **Results.** Of the seven monitored quality indicators, a positive effect of the accreditation process can be attributed to a shorter length of waiting for the first scheduled health check at the institution, shorter length of waiting for the first scheduled surgical check, lower rate of patients with decubitus as well as a decrease of the rate of hospital days per patient with acute myocardial infarction. No effect of accreditation was found on the mortality rate, mortality rate within the first 48 hours of hospitalization, and the average rate of hospital days per patient at the level of the institution. **Conclusion.** The process of accreditation undoubtedly intensifies activities that contribute to improving health care quality, which results in better health outcomes. Additional research in this field and new evidence about the relationship between accreditation and quality upgrading in health care institutions are required because this could motivate their managers to decide more easily to enter into this process and implement it, despite the additional efforts and financial investments associated with accreditation.

**Key words:** accreditation; quality assurance, health care; health status indicators; quality improvement.

#### Apstrakt

**Uvod/Cilj.** Akreditacija se smatra najstarijim i najrasprostranjenijim nezavisnim mehanizmom spoljašnjeg ocenjivanja kvaliteta zdravstvene zaštite i sprovodi se u preko 70 zemalja širom sveta. Uprkos velikom broju istraživanja u ovoj oblasti i dalje nema čvrstih dokaza o njenom uticaju na kvalitet zdravstvene zaštite i bezbednost bolesnika. Cilj ovog rada je da se istraži da li proces akreditacije utiče na razliku u vrednostima pokazatelja kvaliteta zdravstvene zaštite. **Metode.** Istraživanje je sprovedeno u dve bolnice tercijernog nivoa zdravstvene zaštite, od kojih je jedna akreditovana, a druga nije. Poređene su vrednosti sedam pokazatelja kvaliteta u periodu pre, za vreme i neposredno posle završene akreditacije (od 2007–2015 godine), koji mere kvalitet zdravstvene zaštite, bezbednost bolesnika, efikasnost i produktivnost ustanove. **Rezultati.** Od sedam praćenih pokazatelja kvaliteta, pozitivnom uticaju procesa akreditacije se može pripisati kraće čekanja na zakazan prvi pregled za nivo ustanove, kraće čekanje na prvi pregled kod hirurga, niža stopa bolesnika sa dekubitusima, kao i pad dužine bolničkog lečenja bolesnika sa akutnim infarktom miokarda. Nije naden uticaj akreditacije na stopu mortaliteta, procenat umrlih u prvih 48h hospitalizacije i prosečnu dužinu bolničkog lečenja za nivo ustanove. **Zaključak.** Proces akreditacije nesumnjivo intenzivira aktivnosti koje doprinose unapređenju kvaliteta zdravstvene zaštite, što rezultira i boljim zdravstvenim ishodišta. Potrebna su dodatna istraživanja u ovoj oblasti i novi dokazi o povezanosti akreditacije sa unapređenjem kvaliteta u zdravstvenim institucijama, jer bi to moglo motivisati njihove menadžere da se lakše odluče za ulazak u ovaj proces i njegovu realizaciju uprkos dodatnom trudu i finansijskim ulaganjima povezanih sa akreditacijom.

**Ključne reči:** akreditacija; zdravstvena zaštita, obezbeđenje kvaliteta; zdravstveno stanje, indikatori; kvalitet, unapređenje.

## Introduction

Accreditation is considered to be the oldest and most widespread mechanism of independent external evaluation of health care quality and is implemented in over 70 countries worldwide<sup>1,2</sup>. The very fact that it is present to such a degree, according to some authors, is a tangible signal that it is important for increasing the quality and safety of health care<sup>3</sup>. Given that the process of accreditation requires quite a considerable engagement of employees and the investment of significant financial funds<sup>4</sup>, its purposefulness is still a topic that is often discussed among all stakeholders involved in this process<sup>5</sup>.

Because of the limitations of studies conducted to date, literature does not offer enough evidence about the effects of accreditation on the quality of health care<sup>6</sup>, so that there are conflicting opinions in the professional community, pertaining to its potential contribution to improving quality and the safety of patients.

According to one group of authors, quality improvement is incorporated into the accreditation process via accreditation standards that encourage the institution to achieve quality while accreditation bodies periodically revise standards according to new knowledge<sup>1,7,8</sup>. Thus, patients receive the maximum of what science knows and applies. This is a direct contribution to the quality of health care. Authors with this point of view argue that accreditation improves health care outcomes for a wide range of clinical states<sup>9</sup>.

On the other hand, there are groups of authors with more scepticism about the impact of accreditation on quality. These doubts result from the fact that there are insufficient numbers of studies that could document the impact of accreditation on quality as well as the mechanism of that impact<sup>10-12</sup>.

Some authors believe that the impact of accreditation on quality can be seen immediately after the completion of the process, but that over time this impact ceases<sup>13</sup>.

The quality of health care in the Republic of Serbia has been recognized as one of the most important characteristics of the health care system<sup>14</sup>, and in line with this, in 2010 a Rulebook on Quality Indicators was adopted. According to this Rulebook, all health care institutions are required to collect data and calculate quality indicators envisaged for them as well as to submit, within the set deadline, a report pertaining to this to district public health institutes and departments. These "quantitative indicators can be used to monitor the quality of care and treatment of patients, but also to support health care activities"<sup>15</sup>.

Given that the effects of accreditation can be seen through its capacity to improve the quality of care and patient safety, studies that monitor changes in these segments, before and after the accreditation process as well as the differences that may occur by monitoring the quality of medical treatment in accredited and non-accredited hospitals are of great importance<sup>16</sup>.

The aim of this study was to investigate if the process of accreditation contributes to differences in values of quality

indicators of work in two hospitals, one accredited and the other non-accredited.

## Methods

### *Study venue and period*

The study was conducted in two tertiary level hospitals, one accredited (Institution A) and the other non-accredited (Institution B). Institutions where the study was conducted were selected based on the fact that at the time of enrollment, Institution A was a hospital where in 2014 accreditation of all organizational segments, established statutorily and from the aspect of systematization, was fully implemented, while Institution B was chosen because during the entire period of monitoring it had still not started the accreditation process. The study was approved by institution directors as well as by ethical committees of the institutions where it was conducted.

Monitored data were indexed values according to quality indicators presented annually for the 2007–2015 period.

### *Study design*

The study was designed as a quasi-experimental research of the "Difference-in-Difference" (DiD) between two groups of chronologically arranged data and included the following activities: assessment of the difference of quality indicators between institutions for the entire monitored period (institution factor); assessment of the trend of variation for values of selected quality indicators, for the 2007–2015 period (year factor); assessment of the direct impact of activities related to accreditation on quality indicators between hospitals (year × institution factor interaction).

### *Quality indicators*

Seven quality indicators were monitored: total hospital mortality rate (%), mortality rate within the first 48 hours of hospitalization (%), average length of waiting for the first scheduled health check at the institution (days), average length of waiting for the first scheduled surgical check (days), average rate of hospital days per patient, rate of patients with decubitus (%), and rate of hospital days per patient with acute myocardial infarction (AMI).

Data sources were annual reports on performance indicators for quality and productivity (measures) of the monitored hospitals. Data were obtained from the competent city Institute for Health Care.

### *Statistical methods*

The assessment of difference of chronologically ordered data by quality indicators between the two institutions was done using the so-called Difference-in-Difference (DiD) method. Basically, the DiD method is the use of multiple regression with three predictors: time; intervention and intervention × time interaction. The accepted minimum level of significance was 0.05. Statistical analysis was performed using the statistical package IBM SPSS Statistics 20, New York, USA.

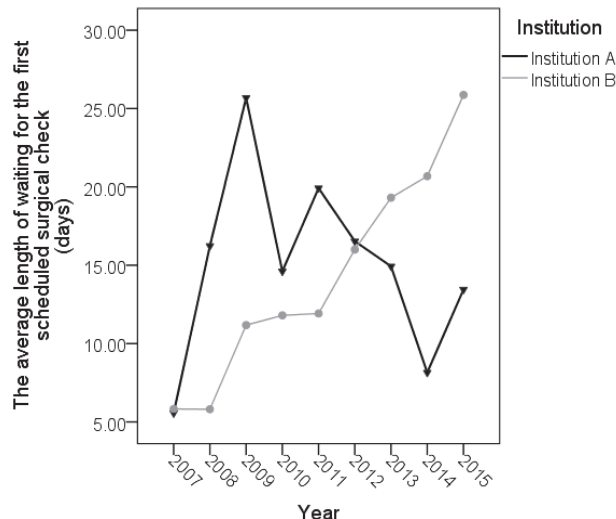
**Results**

According to the data as on 31 December 2015, the Institution A employed 294 doctors and 866 nurses and technicians. During 2015, a total of 247,636 specialist examinations were done, while the number of registered patients was 25,930. The Institution B employed 258 doctors and 700 nurses and technicians and during this period 187,825 specialist examinations were done for 21,109 registered patients.

DiD analysis showed that compared to the Institution B, the Institution A had a significantly lower total mortality rate for the entire period covered by the investigation while the Institution B had a significantly lower mortality rate within the first 48 hours of hospitalization (Table 1). Average values of these quality indicators demonstrated their common significant decline from 2007 to 2015.

DiD analysis detected a significant impact of the accreditation process reflected in significant influence of the institution × year interaction on the length of waiting for the first scheduled health check at the institution (Table 2) as well as the length of waiting for the first scheduled surgical check (Figure 1). In the 2010–2015 period, the Institution A recorded a significant decrease, while the Institution B recorded a significant increase of the length of waiting for the first scheduled health check at the institution. Taking into account the average value for the entire study period, the Institution A had a significantly shorter length of waiting for the first health check compared to the Institution B. On the other hand, since 2012 the Institution A has had a signifi-

cantly steeper decline of the trend of the length of waiting for the first scheduled surgical check compared to the Institution B.



**Fig. 1 – The average length of waiting for the first scheduled surgical check per Institution and per year. Institution A – accredited Institution B – non-accredited.**

The results showed a significant impact of the institution factor on the average rate of hospital days per patient whereas no significant impact of the year factor and the year × institution factor was found. The Institution A had a significantly lower average rate of hospital days per patient compared to the Institution B.

**Table 1**

**The mortality rate within the first 48 hours of hospitalization (DiD analysis)**

DiD Model Predictors	Unstandardized coefficients		Standardized coefficients Beta	T	p	95% Confidence interval for B	
	B	SE				lower bound	upper bound
Constant	52.622	3.968		13.262	0.000	44.112	61.132
Year	-1.568	0.705	-0.718	-2.224	0.043	-3.080	-0.056
Health institution	-13.970	2.509	-1.239	-5.567	0.000	-19.352	-8.588
Health institution x Year	0.789	0.446	0.670	1.770	0.098	-0.167	1.746

DiD – Difference in Difference; SE – standard error.

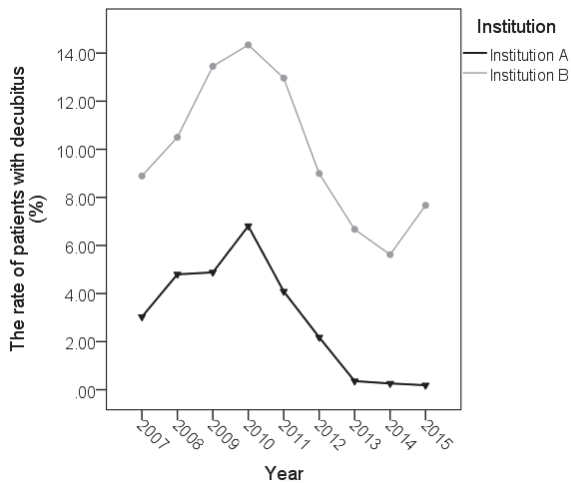
**Table 2**

**The average length of waiting for the first scheduled health check at the Institution per Institution and per year (DiD analysis)**

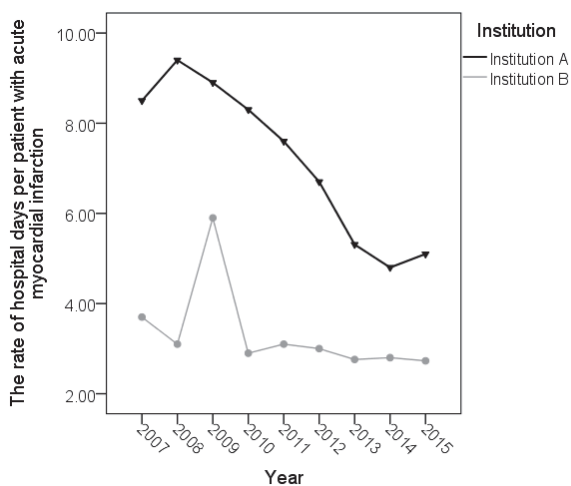
DiD Model Predictors	Unstandardized coefficients		Standardized coefficients Beta	T	p	95% confidence interval for B	
	B	SE				lower bound	upper bound
Constant	55.623	5.268		10.558	0.000	44.323	66.923
Year	-7.091	0.936	-2.779	-7.574	0.000	-9.099	-5.083
Health institution	-20.012	3.332	-1.519	-6.006	0.000	-27.159	-12.866
Health institution x Year	3.939	0.592	2.862	6.652	0.000	2.669	5.209

DiD – Difference in Difference; SE – standard error.

In addition, the DiD analysis showed that the impact of the accreditation process (institution  $\times$  year interaction) was also detected for the rate of patients with decubitus (Figure 2), and rate of hospital days per patient with AMI (Figure 3), where the Institution A had significantly lower both values compared to the Institution B. Since 2008, the Institution A has recorded a significantly steeper decline of the rate of hospital days per patient with AMI compared to the Institution B. The reduction of the rate of patients with decubitus in the Institution A is particularly evident in 2013 while, in that same year, the Institution B showed an increase in the rate of patients with decubitus.



**Fig. 2 – The rate of patients with decubitus per Institution and per year.**  
**Institution A – accredited**  
**Institution B – non-accredited.**



**Fig. 3 – The rate of hospital days per patient with acute myocardial infarction per Institution and per year.**  
**Institution A – accredited**  
**Institution B – non-accredited.**

## Discussion

The essential idea of accreditation is to contribute to the creation of continuous quality improvement in health care to include the patient and his family as partners in the treatment

process and to improve employee satisfaction by improving work safety and efficiency. However, in addition, accreditation should also lead to quality improvement, reflecting in improvement of specific indicators and to use of achieved improvements, in negotiations with stakeholders as an argument that would encourage them to make new financial investments in the institution<sup>17</sup>.

Research conducted in South Africa, showed that the very participation of hospitals in accreditation programs improves harmonization of their standards with accreditation standards while this is not the case with non-accredited hospitals. On the other hand, results obtained in the same study do not suggest that accreditation had contributed to improving the value of quality indicators<sup>18</sup>.

According to our study, although during the monitored period the accredited hospital had a lower mortality rate compared to the non-accredited hospital, this fact did not reflect the impact of activities associated with accreditation. However, it can be said that factors that contribute to a lower mortality rate were present in the Institution A years before preparation for accreditation began and that institutions with lower mortality might possibly decide to undergo accreditation sooner, comparing to the ones where the total mortality rate is high. Given the fact that no significant variation in the values of this indicator was found during the entire monitored period, necessary steps should be undertaken at the level of the health care system which would contribute to reducing mortality in hospitals. In addition, the current accreditation standards should be revised, so that in the future, the impact of harmonization of hospital standards with them would result in the reduction of the total mortality rate.

The fact that in percentages the mortality rate within the first 48 hours of hospitalization, in both hospitals, during the monitored period decreased continuously, speaks in favor of the presence of positive interventions at the level of the health care system. It is very interesting that in the Institution A, in the year immediately following the accreditation, there was an increase of this indicator. This increase could be explained by more precise reporting due to the introduction of a new information system at the institutional level at the beginning of 2015. Given that our results do not show the impact of activities related to accreditation on the value of this indicator, this is another argument that speaks in favor of the need to revise the accreditation standards. In addition to the fact that it is an imperative for the standards to be adequate for a particular medical institution and to be defined in accordance with potential specificities of the health services that this institution provides, it is also necessary to continuously modify and adjust them to the technological progress in the health care system<sup>19, 20</sup>.

Our results showed that during the 2010–2015 period the accredited hospital recorded a significant decrease of the average length of waiting for the first scheduled health check while the non-accredited hospital recorded a significant increase. This positive development in the Institution A is the result of organizational changes that occurred in 2010, which included the introduction of work in two shifts in the outpatient department every day. On the other hand, our analysis

showed a significant impact of activities related to accreditation on the value of this indicator. It is interesting to note that in 2015 the length of waiting for the first scheduled health check at the institution at the accredited hospital was less than 11 days, while at the non-accredited hospital, the length of waiting for the first health check was about 26 days. The situation is similar with the average length of waiting for the first surgical check, which is the result of activities related to accreditation. Before 2013, the length of waiting for the first surgical check was longer in the Institution A than in the Institution B, while in 2015 the length of waiting in the accredited hospital was half the length of waiting time in the non-accredited hospital (26 days).

However, although the results showed that during the monitored period the Institution A had a significantly lower average rate of hospital days compared to the Institution B, this cannot be attributed to the impact of accreditation but to the fact that the reduction of the rate of hospital days per patient follows the reduction of mortality rate in the hospital, generated in intensive care units among the critically ill<sup>21,22</sup>.

During the 2010–2015 period, in the Institution A the value for the rate of the patients with decubitus continuously decreased, but it was from 2013 (the year in which the decision was made to enter the accreditation process) that its value fell below 1%, becoming the lowest in the year after accreditation. Notwithstanding the continued downward trend of this indicator value during the monitored period, results of our research show that there is a direct impact of activities related to accreditation on the decline of the rate of patients with decubitus. It has already been confirmed that certain accreditation standards related to the prevention of decubitus significantly influenced the decrease of the rate of patients with decubitus<sup>20</sup>.

On the other hand, despite the fact that the rate of hospital days per patient with AMI was significantly lower in the Institution B compared to the Institution A, the accredited hospital has recorded a significantly steeper downward trend of this indicator value, especially since 2013. According to the results of our research this is the effect of the significant impact of activities related to accreditation.

Results of our study confirm that it is important for the accreditation agencies to continuously revise their programs and standards and to introduce new methods<sup>17</sup>, because, in addition to resulting in improving the work of the agencies themselves, this could serve as an incentive for a new research in this area and for collecting new evidence about the relationship between accreditation and the improvement of the quality of the medical procedures in institutions. Green-

field et al.<sup>19</sup> stated that very critical issues related to the process of accreditation were the reliability of self-assessors in accredited programs, the criteria for selection of new assessors for the accreditation process as well as the quality of their training<sup>23</sup>. There is also uncertainty about the level of transparency that the accreditation agencies might be ready to demonstrate when it comes to presenting results. They allege that it is a challenge for the accreditation agencies to publish their research protocols and their either positive or negative results in literature which are subjected to a review<sup>1</sup>.

Limitations of this study result from a relatively small number of monitored indicators, the fact that they were observed in only two health care institutions as well as the short period of monitoring of their values after implemented accreditation. Taking into account that the research done, included the application of the “quasi-experiment” design and that the possibility of randomization was excluded, it is clear that the institutions which were the subject of the research, can differ in a number of characteristics. Having in mind that these “baseline” characteristics can have a significant impact on the accessed values of the researched indicators, it is possible that the observed differences between the health institutions could be attributed to those other factors and not to the process of accreditation itself. Such bias corresponds more to confounding rather than to the bias of choice, and could be called „confounding by hospital-specific baseline characteristics“.

## Conclusion

Results of our study confirm that the process of accreditation leads to a significant improvement of individual quality indicators, both during the phase when the management of the institution makes the decision on accreditation, i.e., the preparation for accreditation, and during the accreditation process, as well as immediately after the completion of accreditation.

Given the fact that a considerable number of studies have been conducted about the impact of accreditation on the quality of health institutions and that despite this fact there is not enough evidence that would confirm this influence with certainty, the question about the sensitivity and discriminatory value of certain quality indicators in measuring the effects of accreditation, arises. Thus, a new research which would focus on measuring the benefits of accreditation for a health care institution, could give a new meaning to this and for some health care institutions financially and organizationally a very challenging process.

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