JOURNAL OF SCHOOL OF NURSING USP
REVISTA DA ESCOLA DE ENFERMAGEM DA USP

ORIGINAL ARTICLE

DOI: 10.1590/S0080-623420150000700010

Evaluation of Programs of Infection Control related to Healthcare Assistance in Hospitals*

Avaliação de programas de controle de infecção relacionada a assistência à saúde de hospitais

Evaluación de los programas de control de infecciones asociadas en el cuidado de la salud

Débora Cristina Ignácio Alves[1,2], **Rúbia Aparecida Lacerda**[3]

* Extracted from the dissertation "Programas de prevenção e controle de infecções relacionadas com assistência à saúde: diagnóstico de situação em hospitais do Estado do Paraná", Programa de Pós-Graduação na Saúde do Adulto, Escola de Enfermagem, Universidade de São Paulo, 2015.

[1] Universidade de São Paulo, Escola de Enfermagem, Programa de Pós-graduação na Saúde do Adulto, São Paulo, SP, Brazil.

[2] Universidade Estadual do Oeste do Paraná, Toledo, PR, Brazil.

[3] Universidade de São Paulo, Escola de Enfermagem, Departamento de Enfermagem Médico-Cirúrgica, São Paulo, SP, Brazil.

ABSTRACT

Objective: To evaluate the Infection Control Programs in the state of Paraná's hospitals, considering a hypothesis of a minimum overall performance of 75%. **Method:** This was a cross-sectional study of procedural evaluation, using a previously established instrument comprised of four indicators that evaluate the technical-operational structure (PCET), the operational guidelines (PCDO), the system of epidemiological surveillance (PCET), and activities of control and prevention (PCCP). The study was carried out between 2013 and 2014 in 50 hospitals for the initial sample. **Results:** The overall compliance obtained was 71.0% (23.88pd), with the indicators of PCET being 79.4% (18.9pd); PCVE 76.0% (30.5pd); PCDO 65.5% (26.9pd); and PCCP 63.2%/(39.5pd). There was statistical significance to indicate the greater performance of PCIRAS in carrying out internal audits (p=0.0099), quality certification (p=0.01949), exclusive nurses (p<0.0001), contracted or permanent medical professionals (p=0.0005), longer work schedule of doctors exclusively dedicated for 4 hours (p=0.001), greater experience of doctors (p=0.0028) and nurses (p=0.0094). **Conclusion:** The general compliance of these programs did not prove the hypothesis originally formulated, due to the PCDO and PCCP indicators. As such, it is possible to argue that the programs demonstrate the minimal suitability for their operations and to carry out the epidemiological surveillance of HAI, but they are impaired by the quantitative and qualitative insufficiency of the operational guidelines (PCDO) and the actions for control and prevention of these infections (PCCP).

DESCRIPTORS

Cross Infection; Infection Control; Hospitals; Health Services Evaluation.

Correspondence Addressed to:
Rúbia Aparecida Lacerda
Av. Bartolomeu de Gusmão, 180, Ap. 1506
CEP 11030-500 – Santos, SP, Brazil
rlacerda@usp.br

Received: 04/14/2015
Approved: 08/03/2015

INTRODUCTION

The issue of evaluation is directly related to quality, or rather, the essence of the concept of evaluation implies the idea of quality. Evaluation is a process in which one develops an explicit judgment. From this is triggered an impetus for transformation in the direction of the desired quality[1].

The evaluation of health services became a relevant movement at the end of the twentieth century, related to changes in the political, economic, technological, and social scene, and contributing especially to an increase in competitiveness in organizations[2]. Evaluation has expanded, influenced by factors such as the higher cost of healthcare, the increase in litigation over medical errors, greater demand on the part of users, and the accuracy of better-organized services. Currently another movement, initiated recently by the World Health Organization (WHO), is also implicitly linked to quality in healthcare in terms of global challenges for the safety of the patient[3-4].

Control and prevention of infections related to healthcare (HAI) is established as one of the evaluation parameters of healthcare, even being considered a paradigm of quality care in hospitals[5]. By extension, it is one of the practices most associated with the movement for patient safety, in view of the fact that the first global challenge of the WHO is focused on the prevention of such infections, using the motto "Clean Care is Safer Care"[3], involving improvements in hygiene. In this same way, the second challenge, "safe surgeries save lives"[4], includes preventative actions against infection in the surgical center.

The practices of control and prevention in HAI are established by the Programs for Control and Prevention of Infections Related to Healthcare (PCIRAS), whose existence in Brazil is obligatory by law[6], and its work process is guided by Ordinance, which recommends the installation of a Commission and a Control Service for HAI (CCIH and SCIH)[7]. Nonetheless, the main evaluations of these programs are mostly restricted to the rate of their frequency and prevalence, which are insufficient to recognize the structure and work process of these programs, as well as their conformity to legal recommendations and scientific principles. Another issue is that the evaluations in this area do not always use the relevant theoretical models and instruments that are conducive to recognition of problematic aspects, reapplication, and feedback between interventions for improvements.

In considering such questions, this study had the goal of evaluating PCIRAS, based on the theoretical standard proposed by Donabedian[8], which allows for understanding the compliance of these programs in relation to legal recommendations and existing scientific justification, as well as identifying intervening factors that give rise to local and governmental health actions. The PCIRAS of hospitals in the state of Paraná, Brazil, were chosen for the evaluation. In light of the fact that the Secretary of Health of this state gives incentives in this area, we proposed the hypothesis of a minimally reasonable general compliance of 75%, according to what has been acceptable in evaluation studies of such programs[9].

METHOD

The study was a cross-sectional evaluation of PCIRAS in hospitals in the state of Paraná, Brazil, with more than 50 beds (the minimum capacity demanded for a complete PCIRAS, in accordance with government recommendations). Starting with the current inventory of the National Registry of Health Establishments, made in 2011 and excluding those not found or inactive, the total sample corresponded to 110 institutions. Data collection took place between 2012 and 2014, among nurses from the HAI Control Committees (CCIH) and the HAI Control Services (SCIH) of these hospitals, via the application of two research instruments. The first of these is an evaluation instrument in itself, previously put together and validated regarding its content, theoretical concepts, discriminant function and reliability (internal consistency)[9-10], being comprised of four clinical indicators:

1) Structure of PCIRAS (PCET): structural evaluation of its formation and technical operational support, such as human resources, infrastructure, and technical and administrative instruments to identify, define, discuss, and divulge events in HAI; 2) Operational guidelines for HAI control and prevention (PCDO): structural evaluation regarding the existence of these guidelines in hospital areas or services, in the form of manuals, operational standards and procedures, and resolutions, among other factors, elaborated or incorporated by the PCIRAS; 3) System of HAI epidemiological surveillance (PCVE): to evaluate if the PCIRAS possesses and exercises such a system, through the active seeking of, notification about, and formulation and communication of epidemiological indicators in HAI cases, as well as carrying out consultations. 4) HAI control and prevention activities (PCCP): processual evaluation of these activities in the different services and sectors, by the SCIH professionals, including inspections, orientations and guidelines introduced, participation in meetings, consultations and clarifications on spontaneous demands, among others.

Each indicator leads the evaluation process, equally as much in collecting and substantiating information as in establishing its compliance or performance index. The content under evaluation is identified according to levels of evidence, using the scientific literature and governmental determination current in Brazil. To calculate compliance, each unit of analysis presents a relevance value, obtained by the validation of its content in the judgment of specialists, in a psychometric scale of 0 to 4[9].

The other instrument sought to form a characterization of hospitals and their PCIRAS, in a way that correlates their findings with the general compliances gathered in the evaluation of these programs, by the Mann-Whitney test, having a decision-making rule with a p-value lower than 0.05. The listed variables were: I) Sponsoring entity (private/philanthropic/public); II) Critical services (ICU, Surgical Center, Neonatalology, transplants, hemodialysis); III) Accreditation/certification/internal audits; IV) Minimal services represented in the CCIH; V) Designated nurse to work in the control of HAI; VI) Type of employ-

ment arrangement of the nurse and doctor of the SCIH; VII) Daily workload specific to the nurse and doctor of the SCIH; VIII) Longest time of work experience of the nurse and doctor of the SCIH; IX) Previous knowledge for working in the SCIH; X) Training in control and prevention of HAI in the admission of human resources.

The data was gathered by interviews and documentary analysis; in the latter case, to substantiate information and elaborate levels of compliance with the indicators.

By nature of the data, non-parametric methods were deployed to associate the results of compliance in the indicators with chosen variables. Tables of contingency were constructed and evaluated with tests with levels of significance of 5%, using the p-value as a decision-making rule for the hypothesis. For obtaining results, the R statistical method was used. The study was approved by the Committee on Ethics in Research (CEP) of EE/USP, on the 14th of August, 2012, with the protocol number 74386, and the Terms of Free and Informed Consent (TCLE) were presented and signed at each interview, together with the professional responsible for furnishing the information.

RESULTS

Of the total opening sample of 110 institutions, 50 (45.5%) agreed to participate, constituting the final sample with representation for all the healthcare macro-regions for the state of Paraná. Other institutions, in spite of various attempts to contact them by email or telephone, either did not respond or refused to participate. Regarding the maintenance entities among the participants, they were split equally between private and mixed with 15 (30%) of each, followed by the classification of "other," which indicates philanthropic institutions that totaled 13 (26.0%) of the hospitals. Institutions maintained by the State totaled 4 (8.0%), and only 3 (6.0%) were public hospitals.

The PCIRAS demonstrated general compliance of 71% with a pd of 23.8%. Taken separately, the indicator 1-PCET presented the highest compliance (79.4%) and the lowest pd (18.9%), followed by the indicator 3-PCVE, 76.0% of a compliance and pd of 30.0%. The remaining components obtained compliance below 70%, for example 65.5% for 2-PCDO, with a pd of 26.9%, and 63.2% for 4-PCCP, with a great pd of 39.5 (Table 1).

The compliances of the PCET units of analysis, which evaluate the structure of a PCIRAS, varied between 34% and 98%. The PCETMS unit (CCIH represented, at a minimum, by members of the medical service, nursing, and administration) obtained the highest rate (98%), and the PCETDO unit (has one other college-educated professional, who works exclusively at the service for at least 4 hours per day) had the lowest (34%) (Table 2).

Table 1 - Distribution of hospitals according to the compliance of indicators in the evaluation of PCIRAS – State of Paraná, Brazil, 2013.

Indicadores	n	MEAN (pd)	Average	Min-Max	p-value
PCET	50	79.4 (18.9)	80.8	38.4/100	0.0002
PCDO	50	65.5 (26.9)	69.0	0/100	0.0010
PCVE	50	76.0 (30.5)	90.0	0/100	<0.0001
PCCP	50	63.2 (39.5)	87.8	0/100	<0.0001
GERAL	50	71.0 (23.8)	79.5	16.11/100	0.0002

1-PCET: Technical-operational structure; **2-PCDO:** Operational guidelines; **3-PCVE:** System of epidemiological surveillance; **4-PCCP:** Activities of control and prevention of hospital infections

Table 2 - Compliance distribution of the components of indicator 1-PCET: Technical-Operational Structure of the HAI Program in Hospitals of the State of Paraná, Brazil, 2013.

Code	Unit of Analysis	Evidence Level	Relevance	Compliance
PCETMS	The CCIH is represented, at a minimum, by members of the medical, nursing, and administrative service teams.	B/C	4	98.0
PCETRG	There is a rule that determines the functioning of the CCIH and/or SCIH	B/C	4	96.0
PCETPE	There are two college-educated professionals who carry out actions exclusively in the prevention and control of HAI for every 200 hospital beds, with one of them being a nurse (either exclusive or non-exclusive)	B/C	4	62.0
PCETDE	The nurse works exclusively in the service for at least 6 hours a day.	B/C	4	68.0
PCETDO	There is another college-educated professional that works exclusively in the sector for at least 4 hours a day.	B/C	4	34.0
PCETRP	The CCIH holds periodic meetings with the participation of executives and leaders.	B/C	3	94.0
PCETMP	There is laboratory support for microbiology and pathology, either in-house or outsourced.	B/C	4	94.0
PCETEF	There is physical space set aside for the exclusive use of the daily activities, records, etc. of the CCIH or the SCIH.	B/C	4	64.0
PCETRI	There are IT resources available for the activities developed for the CCIH or SCIH.	B/C	4	88.0
PCETRE	Statistical data (number of admissions, discharges, deaths, patient days) are made available by the administration for creating reports for the CCIH or SCIH.	B/C	4	96.0
Total			**39**	

For the PCDO indicator, which evaluates the existence of operational guidelines for HAI control and prevention, the units of analysis varied between 38% and 92%. The largest corresponded to the PCDOLM (there are recommendations for hand sanitizing techniques) and the smallest was the PCDOLV (recommendations for the washing and sanitizing of clothing) (Table 3).

The PCVE indicator, which evaluates whether the SCIH possesses and uses a system of epidemiological surveillance for HAI, demonstrated compliance varying between 64% and 88%. The highest, at 88%, corresponded to the PCVEIH units (carries out epidemiological surveillance – system wide or by component – with a determined frequency) and PCVEMI (monitors, with frequency and regular records, the results of cultures that identify strains or species of microorganisms). The lowest compliance, 64%, was obtained for the PCVEAL unit (the reports analyze and inform about alterations in the epidemiological profiles – descriptive or visual) (Table 4).

Table 3 - Compliance distribution for the components of indicator 2-PCDO: Operational Guidelines for HAI Control and Prevention in hospitals in the State of Paraná, Brazil, 2013.

Code	Unit of Analysis	Evidence Level	Relevance	Compliance
	Factor 1 – Recommendations for the prevention of HI			
PCDORS	There are recommendations for the disposal of waste in the health service (RSS)	B/C	4	82.0
PCDOIR	There are recommendations for the control and prevention of respiratory diseases.	B/C	4	54.0
PCDOIU	There are recommendations for the control and prevention of urinary diseases.	B/C	4	54.0
PCDOCS	There are recommendations for the control and prevention of bloodstream infections.	B/C	4	62.0
PCDOSC	There are recommendations for the control and prevention of infections at the surgical site.	B/C	4	52.0
PCDOLM	There are recommendations in the technique of hand sanitization.	B/C	4	92.0
PCDOCU	There are recommendations in the techniques of bandaging and the frequencies of changing bandages.	B/C	4	52.0
	Factor 2 – Recommendations for the Standardization of Prophylactic Procedures			
PCDOPB	There are recommendations for the evaluation and referral of accidents with needles and other sharp instruments, and other exposure to biological material.	B/C	4	72.0
PCDOAB	There are recommendations for the use of prophylactic antibiotics for the prevention of infection at the surgical site.	B/C	4	64.0
PCDOGA	There is standardization of germicidal and anti-septic solutions.	B/C	4	54.0
PCDOME	There are recommendations in the techniques of cleaning, disinfecting, and sterilization of material and equipment.	B/C	4	74.0
PCDOLS	There are recommendations for the routine cleaning and disinfection of surfaces.	B/C	4	82.0
PCDOLV	There are recommendations for the washing and sanitizing of clothing used at the institution.	B/C	4	38.0
PCDOMC	There are recommendations for the techniques of collecting material for making cultures.	B/C	4	54.0
PCDOPI	There are recommendations for the isolation of patients with infectious-contagious or immunosuppressed diseases.	B/C	4	86.0
Total			**60**	

Table 4 - Compliance distribution for the components of indicator 3-PCVE: System of Epidemiological Surveillance for HAI in hospitals for the State of Paraná, Brazil, 2013.

Code	Component	Evidence Level	Relevance	Compliance
PCVEIH	Carries out HAI epidemiological surveillance (overall or by component) with a determined frequency.	B/C	4	88.0
PCVEBA	Carries out VE for HAI by actively seeking out cases.	B/C	4	82.0
PCVEUR	Carries out active searches for cases of HAI in the units of highest risk (ICU, nursery, burn unit, etc.)	B/C	4	76.0
PCVEMI	Monitors, with frequency and regular records, microbiological results of cultures that identify strains or species of microorganisms, including resistant ones.	B/C	4	88.0
PCVECD	There are pre-determined criteria for the diagnosis of HAI.	B/C	4	82.0
PCVERE	Produces regular report of the results of epidemiological surveillance (endemic levels)	B/C	4	80.0
PCVEAL	The reports analyze and inform about alterations in the epidemiological profile (descriptive and/or visual)	B/C	4	64.0
PCVECP	The reports correlate results with adopted strategies of control and prevention (intervention)	B/C	4	70.0
PCVESS	The reports are regularly made available to the different sectors and leadership in the institution.	B/C	4	74.0
PCVEOP	The reports are regularly made available to the public offices concerned (management)	B/C	4	84,0
Total			**40**	

In the PCCP indicator, which evaluated activities for the prevention and control of HAI in the services/sectors of the hospital, compliance varied between 10% and 80%, with the highest being in the PCCPUI units (admissions sector) and PCCPCC (surgical center), with 80% each. The lowest was found in the PCCPAP (laboratory for pathological anatomy) (Table 5).

Table 5 - Compliance distribution for the components of indicator 4 – PCCP: Activities for Control and Prevention of HAI in hospitals in the state of Paraná, Brazil, 2013.

Code	Component	Evidence Level	Relevance	Compliance
	Factor 1 – Interface with treatment units			
PCCPDI	Dialysis unit	B/C	4	16,0
PCCPBS	Blood bank	B/C	4	24,0
PCCPUI	Admissions units	B/C	4	80,0
PCCPUT	Intensive care units (Adult, Children, and Neonatal)	B/C	4	64,0
PCCPCM	Center for materials and sterilization	B/C	4	78,0
PCCPCC	Surgical center	B/C	4	80,0
PCCPPS	Emergency room	B/C	4	66,0
	Factor 2 – Interface with Support Units			
PCCPAC	Laboratory for clinical analysis	B/C	4	48,0
PCCPAP	Laboratory for anatomical pathology	B/C	4	10,0
PCCPBE	Nursery	B/C	4	24,0
PCCPAM	Outpatient	B/C	3	62,0
PCCPSF	Pharmacy service	B/C	3	70,0
PCCPSN	Nutrition and dietary service	B/C	4	64,0
PCCPDT	Participates in the technical decisions for the specification and acquisition of products.	B/C	4	72,0
Total			**54**	

In the correlation of general compliance obtained by the PCIRAS with the studied variables, only the characteristics of the hospitals related to the carrying out of internal audits (p=0.0099) and obtaining quality certification (p=0.0194), as well as the presence of a nurse to exclusively work in the SCIH (p<0.0001), presence of contracted or permanent professionals (p=0.0005), greater work schedule with doctors exclusively dedicated for 4 hours (p=0.0005), and greater work experience of doctors (p=0.0028) and nurses (p=0.0094) demonstrated statistically significant association for the better performance of the PCIRAS.

DISCUSSION

There is a vast literature about healthcare evaluation. But this literature is far from presenting a consensus about the best methods, aside from the authors demanding a conceptual approach integrated with other areas such as the economic, epidemiological, or clinical practices, as well as the social sciences, in order to demonstrate not only the effectiveness and results of an intervention, but to improve the quality of services in order to meet the needs of an ever more demanding public[11-13]. The legal existence of the Unified Health System (SUS) in Brazil, generated, year by year, a dense and complex web of regulative, programmatic, and operational experiments in respect to models for healthcare, management, service delivery, health sector work, funding, and social participation[14]. Through the logic of *best practices,* the evaluation and monitoring of new practices became urgent, even if it was not always explicitly debated. Evaluations of health programs carried out in 2014[15] show the necessity of attempting to understand the breadth of this area of knowledge, principally when interventions are complex and multifaceted, as in the present study. The evaluator needs to identify the processes linked to the intervention's effects, beginning with knowledge about its totality, and illuminating the gaps between what was planned and what was accomplished[16].

Compounding the movement for quality in assistance are the global challenges for patient safety required by the WHO. Believing that the practices for control and prevention of HAI respond directly to these demands, the proposal of this study was to recognize the performance of PCIRAS in hospitals in the state of Paraná, linking factors that contribute to or complicate results. To achieve this, a system of evaluation previously constructed and validated regarding its content and measurement properties was utilized[9-10], in the method of clinical indicators used in the evaluation system[8].

There is also growing interest in the recognition of quality in the practices of control and prevention of HAI by way of more comprehensive evaluations, apart from the results of their incidence and prevalence, that include processual and structural methods. This is because such methods help to identify the problems encountered and determine actions directly addressing them. Some studies hint at this direction, for example, in utilizing process indicators to evaluate the use of antibiotic prophylaxis in sur-

gery, whether applied in all its parameters (start time, type of drug, dose, duration, redose)[17-18], or including only one of them (use or redose in prolonged surgeries)[19]. Process indicators were also created and validated to evaluate the quality of practices such as control of biological occupational risks[20], dental hygiene[21], urinary tract infections[22], and bloodstream[23]. Regarding the quality of the actual PCIRAS we found four evaluations that applied the same indicators as the present study in hospitals of other Brazilian cities. One of them, in São Paulo, is responsible for the validation of these indicators[10]. The others were in Ribeirão Preto[24], Aracaju[25], and Teresina[26].

The general compliance of the 50 hospitals of the state of Paraná (71%) was inferior only to that obtained in 50 hospitals in the municipality of São Paulo, with scores above 90.0% in all indicators[10]. But it was superior to the performance of 13 hospitals in Ribeirão Preto, with an overall average of 69.0%[24], and 16 hospitals in Aracaju, in which case none of the 4 indicators reached a compliance above 68%[25]. In Teresina, compliance varied between 60% and 100% among the 10 hospitals[26].

In the present study, the indicator of greatest compliance corresponded to the PCVE, relative to the system of epidemiological surveillance of HAI (90%). The PCVE also obtained the highest compliance among the other indicators of the hospitals in São Paulo (99%)[10] and Ribeirão Preto (82%)[24]. A different result was obtained in the hospitals of Aracaju, whose best performance was in the PCET and PCDO (68% for each)[25]. We can infer, with these results, that the PCIRAS of the hospitals of the state of Paraná and the cities of São Paulo presented a greater processual performance due to the achievement of epidemiological surveillance (PCVE). Whereas in the city of Aracaju, the PCIRAS demonstrated greater structural performance[25].

The presence of another professional assigned exclusively to SCIH, aside from the nurse, and a designated physical space for its activities were the aspects of least compliance in the evaluation of the technical and operational structure (PCET) of the PCIRAS (34% and 64%, respectively). In the study of Ribeirão Preto, the area of least compliance was the physical space (30%), nurses not being exclusive to the SCIH (38%), and lack of doctors (46%)[24]. In Aracaju, the most critical performance areas were meetings with executive members of the SCIH and leadership (31%), another professional in the SCIH with exclusive assignment and minimum workload of 4 hours per day (44%), and support for the microbiology and pathology laboratory (56%)[25]. As shown here, the presence of professionals exclusively assigned to a sector was the most common issue in these studies. In the São Paulo hospitals, the component of least compliance was 92%, indicating the excellent structure of these PCIRAS[10].

Recommendations for cleaning and sanitization of the institution's clothing had the worst performance (38%) in the structural evaluation of the PCDO. Other guidelines also contributed only average performance: bandaging techniques and prevention of infections at the surgical site (52% for each), control of respiratory and urinary infections, standardization of germicidal and anti-septic solutions, and techniques for the collection of material for cultivating cultures (54% each). In the hospitals of Ribeirão Preto, the least compliance was also the recommendations for cleaning and disinfecting clothing (30%), followed by the standardization of germicidal and anti-septic solutions (46%)[24]. In the hospitals of Aracaju the recommendations for techniques to collect material for cultures had the lowest performance (44%), followed by techniques for the cleaning, disinfections, and sterilization of material and equipment (50%), standardization of germicidal and anti-septic solutions (56%), and the cleaning and disinfection of surfaces (56%)[25]. In the PCIRAS of the São Paulo hospitals this indicator presented satisfactory compliance, with its least compliance occurring in the state of Paraná and the city of Ribeirão Preto, referring to the recommendation for the cleaning and sanitization of clothing used in the institution (64%)[10].

It can be observed that the issue of standardization of germicidal and anti-septic solutions was common to the three main studies cited. The lowest compliances found in the recommendations for cleaning and disinfecting of clothing suggests, in a general way, the issue of the increase in outsourcing of services in hospitals, which include hospital laundry services. Even so, and perhaps principally, they are not exempt from establishing standards of services, which can interfere with the quality of goal activities.

In the process of epidemiological surveillance (PCVE), the activities of development and dissemination of reports were those which presented the least compliance, principally in relation to content regarding epidemiological profiles (64%) and the correlation of results with adopted control strategies (70%), followed by the availability of these results in all sectors (74%). In the Ribeirão Preto hospitals the worst performance was in reporting the correlation of occurrences of HAI with strategies of control and prevention (46%)[24]. In the Aracaju hospitals, only 1% made their reports on sanitary surveillance available; other low performance indicators also referred to reporting, whether regarding the correlation of results with the adopted strategies of control and prevention (31%); or in making those reports available to sectors within the institution (38%)[25]. It can therefore be determined that the most problematic question in common among activities of epidemiological surveillance involves the act of reporting, with the exception of the hospitals in the city of São Paulo, whose compliance varied between 98% and 100%[10].

The activities of Control and Prevention of HAI (PCCP) demonstrated low compliance in some services or sectors, contributing to the fact that the evaluation of this indicator had presented the worst performance in the hospitals in the state of Paraná. This was the case in activities taking place in the sectors of pathological anatomy (10%), dialysis units (16%), blood banks (24%), and clinical analysis laboratories (48%). In the hospitals of Ribeirão Preto these activities were non-existent for clinical analysis laboratories and pathology, and low for blood

banks (20%) and technical decisions (38%)[24]. In the Aracaju hospitals these activities were also non-existent in laboratories of pathological anatomy, and low in the dialysis unit (10%), the clinical analysis laboratory (38%), the pharmacy service (43%), and the blood bank (44%)[25]. The hospitals in the city of São Paulo once again obtained high performance, with the exception of the anatomical pathology laboratory (64%)[10].

It can be observed that the PCIRAS in these studies concentrate their activities in sectors where there are patients, such as admissions units and surgical centers, where the highest performance rates were obtained. However, activities for control and prevention of HAI and support sectors, with very low or even null compliance, can compromise the quality of goal activities, and do not exempt PCIRAS from their responsibilities. Examples of this are the laboratories for clinical analysis and microbiology, fundamental for the recognition of microbial strains and tests for resistance to antibiotics.

The compliance results for the Paraná hospitals demonstrate significant correlation for better performance in the PCIRAS only in those aspects related to carrying out internal audits (p=0.0099) and the obtaining of quality certifications (p-0.01949) by the institutions, as well as the presence of a nurse assigned exclusively to the SCIH (p<0.0001), contracted or permanent medical professionals (p=0.0005), dedicated work schedules of 4 hours for doctors (p=0.0001), and greater work experience for doctors (p=0.0028) and nurses (p=0.0094).

The general compliance associated with training in human resources and admissions does not demonstrate enough significant difference to state that nurses carrying out training of employees would score higher than those who do not carry out such activities. But the fact that work experience of nurses and doctors in the SCIH obtains statistical significance denotes that experience in this area is fundamental, as it involves a variety of knowledge.

CONCLUSION

The present study evaluated PCIRAS in hospitals in the state of Paraná. In light of the general compliance obtained of 71%, it is possible to assert that these programs present a reasonable performance. However, to identify each indicator and its units of analysis in isolation shows a high variation in the results of their compliance. The average values between the indicators ranged from 63.2% to 79.4%. The values of their units of analysis reached extreme variance, from 10% to 98%. By the general compliance results of each indicator, we can determine that these programs present a minimum structural suitability for their operationalization (79.4%) and achievement of epidemiological surveillance of HAI (76%). On the other hand, they need improvement in the development of guidelines for control and prevention (65.5%), as well as actions of control and prevention of HAI in some specific hospital sectors (65.5%), particularly those which offer indirect assistance, in other words those services where a patient is not present. However, there is no justification for these differences in the sense that practically all of the analytical units of these indicators possess the same level (4) of relevance. It appears that some factors are associated with better performance in these programs, such as the search for qualification by the institutions and better working conditions (full-time dedication, greater workload) of the nurses and doctors of the SCIH.

Finally, we emphasize the relevance of the participation and implementation of policies by the government health organizations at the municipal, state, and national level in the face of the scenarios encountered.

RESUMO

Objetivo: Avaliar os Programas de Controle de Infecção em hospitais do Paraná, considerando como hipótese desempenho geral mínimo de 75%. **Método:** Estudo transversal de avaliação processual, por meio de instrumento previamente validado, composto por quatro indicadores que avaliam a estrutura técnico-operacional (PCET), as diretrizes operacionais (PCDO), o sistema de vigilância epidemiológica (PCVE) e as atividades de controle e prevenção (PCCP). O estudo foi realizado de 2013 a 2014 em 50 hospitais por amostra de acesso. **Resultados:** A conformidade geral obtida foi 71,0% (23,88dp), sendo indicador PCET 79,4% (18,9dp); PCVE 76,0% (30,5dp); PCDO 65,5% (26,9dp); e PCCP 63,2%/ (39,5dp). Houve significância estatística para melhor desempenho dos PCIRAS a realização de auditorias internas (p=0,0099), certificação de qualidade (p=0,01949), enfermeiro exclusivo (p<0,0001), profissionais médicos contratados ou concursados (p=0,0005), maior carga horária de dedicação exclusiva dos médicos, 4 horas (p=0,001), maior tempo de experiência de médicos (p=0,0028) e enfermeiros (p=0,0094). **Conclusão:** A conformidade geral desses programas não alcançou a hipótese inicialmente formulada, devido aos indicadores PCDO e PCCP. Desse modo, é possível considerar que os programas apresentavam adequação mínima para sua operacionalização e para realizar a vigilância epidemiológica de IRAS, mas estavam prejudicados quanto à insuficiência quantitativa e qualitativa de diretrizes operacionais (PCDO) e de ações para o controle e prevenção dessas infecções (PCCP).

DESCRITORES

Infecção Hospitalar; Controle de Infecções; Hospitais; Avaliação de Serviços de Saúde.

RESUMEN

Objetivo: Evaluar el desempeño de estos programas en los hospitales de Paraná, considerando como hipótese desempenho geral mínimo de 75%. **Método:** Estudio transversal de la evaluación del proceso, mediante instrumento previamente validado que consta de cuatro indicadores que evalúan la estructura técnica y operativa (PECP), directrices operacionales (PCDO), el sistema de vigilancia epidemiológica (PCVE) y las actividades de control y la prevención (PCCP). El estudio se llevó a cabo desde 2013 hasta 2014 en 50 hospitales de la muestra gratuita. **Resultados:** El cumplimiento global obtenida fue de 71,0% (23,88dp) y el indicador PECP 79,4% (18,9dp); PCVE 76,0% (30.5dp);

PCDO 65,5% (26,9dp); y 63,2% PCPP/(39,5dp). Hubo un mejor rendimiento estadísticamente significativa de PCIRAS realización de auditorías internas (p=0,0099), la certificación de calidad (p=0,01949), enfermera exclusiva (p<0,0001), contrajo profesionales médicos o boletín oficial (p=0,0005) más horas de dedicación exclusiva médica, 4 horas (p=0,001), experimento más largo médico (p=0,0028) y enfermeras (p=0,0094). **Conclusión:** A conformidade geral desses programas não alcançou a hipótese inicialmente formulada, devido aos indicadores PCDO e PCCP. Desse modo, é possível considerar que los programas tienen la aptitud mínima para su funcionamiento y para llevar a cabo la vigilancia epidemiológica de las IRAS, pero es posible considerar que el proceso se ve afectada por la falta cuantitativa y cualitativa de las directrices y acciones para el control y prevención de estas infecciones operacionales.

DESCRIPTORES
Infección Hospitalaria; Control de Infecciones; Hospitales; Evaluación de Servicios de Salud.

REFERENCES

1. Akerman M, Nadanovsky P. Evaluation of health services: what to evaluate? Cad Saúde Pública. 1992;8(4):361-52.
2. Reis EJFB, Santos FP, Campos FE, Acúrcio FA, Leite MTT, Leite MLC, et. al. Avaliação da qualidade dos serviços de saúde: notas bibliográficas. Cad Saúde Pública. 1990;6(1):50-61.
3. World Health Organization. World Alliance for Patient Safety. Global Patient Safety Shallenge 2005-2006: clean care is safer care [Internet] Geneva: WHO; 2005 [cited 2015 Apr 08]. Available from: http://www.who.int/patientsafety/events/05/GPSC_Launch_ENGLISH_FINAL.pdf
4. Organização Mundial da Saúde. Segundo desafio global para a segurança do paciente: manual - cirurgias seguras salvam vidas [Internet]. Rio de Janeiro: OPAS/OMS; 2009 [citado 2015 abr. 08]. Disponível em: http://www.into.saude.gov.br/upload/arquivos/pacientes/cirurgias_seguras/Seguran%C3%A7a_do_Paciente_guia.pdf
5. Novaes HM, Paganini JM. Estándares e indicadores para la acreditación de hospitales em America Latina y el Caribe [Internet]. Washington: OPAS, 1994 [citado 2015 abr. 08]. Disponível em: http://apps.who.int/medicinedocs/documents/s16603s/s16603s.pdf
6. Brasil. Ministério da Saúde. Lei nº 9.431, de 06 de janeiro de 1997. Dispõe sobre a obrigatoriedade da manutenção de Programas de Controle de Infecções Hospitalares nos hospitais do país. Diário Oficial da União, Brasília, 07 jan. 1997.
7. Brasil. Ministério da Saúde. Portaria nº 2.616, de 12 de maio de 1998. Dispõe sobre diretrizes e normas para a prevenção e o controle das infecções hospitalares. Diário Oficial da União, Brasília, 13 maio 1998.
8. Donabedian A. Gestão da qualidade total: a perspectiva dos serviços de saúde. Trad. de Roberto Passos Nogueira. Rio de Janeiro: Qualitymark; 1994.
9. Silva CPR, Lacerda RA. Indicadores para avaliação de programas de controle de infecção hospitalar: construção e validação. Epidemiol Serv Saúde. 2007;16(2):128-31.
10. Silva CPR, Lacerda RA. Validação de proposta de avaliação de programas de controle de infecção hospitalar. Rev Saúde Pública. 2011;45(1):121-8.
11. Hartz ZMA, organizador. Avaliação em saúde: dos modelos conceituais à prática na análise da implantação de programas. Rio de Janeiro: FIOCRUZ; 1997.
12. Hartz ZMA, Silva LV, organizadores. Avaliação em saúde: dos modelos teóricos à prática na avaliação de programas e sistemas de saúde. Salvador: EDUFBA; 2005.
13. Champagne E, Contandriopoulos AP. A avaliação no campo da saúde: conceitos e métodos. In: Brousselle A, organizadora. Avaliação: conceitos e métodos. Rio de Janeiro: FIOCRUZ, 2011. p. 41- 60.
14. Santos NR dos. Desenvolvimento do SUS: rumos estratégicos e estratégias para visualização dos rumos. Ciênc Saúde Coletiva. 2007;12(2):429-35.
15. Oliveira HM. Programas de prevenção e controle de infecções relacionadas à assistência a saúde: diagnóstico situacional em hospitais da cidade de Manaus, estado do Amazonas [projeto de pesquisa]. São Paulo: Escola de Enfermagem, Universidade de São Paulo; 2014.
16. Denis JL, Champagne F. Análise da implantação. In: Hartz ZM, organizador. Avaliação em saúde: dos modelos conceituais à prática na análise da implantação de programas. Rio de Janeiro: FIOCRUZ; 1997. p. 49-88.
17. Schmitt C, Lacerda RA, Padoveze MC, Turrini RN. Applying validated quality indicators to surgical antibiotic prophylaxis in a Brazilian hospital: learning what should be learned. Am J Infect Control. 2012;40(10):960-2.
18. Schmitt C. Características e iniciativas institucionais que aprimoram as práticas de uso de antibioticoprofilaxia cirúrgica [tese doutorado]. São Paulo, Escola de Enfermagem, Universidade de São Paulo; 2015.
19. Schmitt C, Lacerda RA. Fatores relacionados à adesão às recomendações para administração de redose em cirurgias limpas. Rev Eletr Enf [Internet]. 2015 [citado 2015 abr. 13];17(1):78-84. Disponível em: https://www.fen.ufg.br/revista/v17/n1/v17n1a09.html
20. Takahashi RF, Gryschek ALFPL, Nichiata LYI, Lacerda RA, Ciosak SI, Gir E, ET AL. Evaluation of biologic occupational risk control practices: quality indicators development and validation. Am J Infect Control. 2010;38(4):e16-20.
21. Silveira IR, Gnatta JR, Lacerda RA. Reproducibility and confiability of a processual indicator to evaluate adherence to oral hygiene in patients with orotracheal intubation. Online Braz J Nurs. 2011;10:3207.
22. Fernandes MVL, Lacerda RA, Hallage NM. Construção e validação de indicadores de avaliação de práticas de controle e prevenção de infecção do trato urinário associada a cateter. Acta Paul Enferm. 2006;19(2):174-89.
23. Mendonça SHF, Lacerda RA. Impacto dos conectores sem agulhas na infecção da corrente sanguínea: revisão sistemática. Acta Paul Enferm. 2010;23(1):43-9.

24. Meneguetti MG, Canini SRMS. Avaliação dos programas de controle de infecção hospitalar em serviços de saúde. Rev Latino Am Enfermagem. 2013;23(1):98-105.

25. Lyrio LNS. As ações para o controle das infecções hospitalares em Aracaju: resultados de um inquérito da Vigilância Sanitária Municipal [dissertação]. Salvador: Instituto de Saúde Coletiva, Universidade Federal da Bahia; 2012.

26. Lima LAP. Avaliação do Programa de Controle de Infecção Hospitalar em hospitais do município de Teresina-PI [dissertação]. Fortaleza: Faculdade de Medicina, Universidade Federal do Ceará; 2011.

Financial support: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)