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Behavior of the multidisciplinary team about Bundle of Central Venous Catheter in Intensive Care

Comportamento da equipe multiprofissional frente ao Bundle do Cateter Venoso Central na Terapia Intensiva

Comportamiento del equipo multiprofesional frente al Bundle del Cateter Venoso Central en la Terapia Intensiva

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Abstract

Objective: To analyze the behavior of nursing and medical staff related to Bundle insertion and good practices in the management of Central Venous Catheter. **Methods:** Analytical cross-sectional study conducted from June to September 2014. It was applied a questionnaire to 76 professionals of a sector of intensive care. Performed descriptive statistics and odds ratio to evaluate the association. **Results:** In the pre-catheter insertion was 1.6 higher risk of antiseptic cleaning procedures of the hands and choice of vein to be punctured be questioned, if not met the current recommendations, if accompanied by a top level professional. In the maintenance of the catheter, the assessment of daily permanence was presented 12 times greater risk of being realized through higher education professionals ($p < 0.05$). **Conclusion:** Was demonstrated need for improved assistance. New studies on infection prevention and multidisciplinary team educational programs can contribute to this.

Keywords: Patient Care Team; Catheterization; Central Venous; Infection Control; Intensive Care Units; Nursing Care.

Resumo

Objetivo: Analisar o comportamento das equipes de enfermagem e médica relacionada ao *Bundle* de inserção e às boas práticas no manejo do Cateter Venoso Central. **Métodos:** Estudo transversal analítico realizado entre junho a setembro de 2014. Aplicou-se um questionário em 76 profissionais de um Setor de Terapia Intensiva. Realizada estatística descritiva e Odds Ratio para avaliar a associação. **Resultados:** Na pré-inserção do cateter há 1,6 mais chances dos procedimentos de higienização antisséptica das mãos e opção pela veia a ser puncionada, serem questionados, quando não atendem as recomendações vigentes, se forem acompanhados por profissional de nível superior. Na manutenção do cateter, a avaliação diária de sua permanência apresenta 12 vezes mais chance de ser realizadas por profissionais de nível superior ($p < 0,05$). **Conclusão:** Demonstrada necessidade de melhoria da prática assistencial. Novos estudos sobre prevenção de infecções e programas educacionais dirigidos a equipe multidisciplinar podem contribuir nesse sentido.

Palavras-chave: Equipe de Assistência ao Paciente; Cateterismo Venoso Central; Controle de Infecções; Unidades de Terapia Intensiva; Cuidados de Enfermagem.

Resumen

Objetivo: Analizar el comportamiento de los equipos médico y de enfermería con respecto al Bundle de inserción y buenas prácticas de manejo del Catéter Venoso Central. **Métodos:** Estudio transversal analítico, realizado entre junio y septiembre de 2014, con aplicación de cuestionarios para 76 profesionales del sector de cuidados intensivos. Fueron realizadas estadísticas descriptivas y Odds Ratio para evaluar la asociación. **Resultados:** La pre-inserción del catéter tiene 1,6 más posibilidades de procedimientos de asepsia de las manos y cuestionamiento para elección de vena a ser perforada, si no cumplen con las recomendaciones vigentes, cuando acompañados por profesionales de nivel superior. Cuanto al manejo del catéter, la evaluación diaria de su permanencia tiene 12 veces más probabilidad de realización por profesionales de nivel superior ($p < 0,05$). **Conclusión:** La práctica asistencial debe ser mejorada. Nuevos estudios sobre prevención de infecciones y programas educativos dirigidos al equipo multidisciplinar pueden contribuir en este sentido.

Palabras clave: Grupo de Atención al Paciente; Cateterismo Venoso Central; Control de Infecciones; Unidades de Cuidados Intensivos; Atención de Enfermería.

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INTRODUCTION

The use of central venous catheter (CVC) short stay is seen as one of the most important risk factors and known for primary bloodstream infections (PBI), which are among the more frequent health care-related infections (HCRI)[1-3]. Evaluation of the HCRI indicator in Brazil, realized in 2012, shows that 62,1% of the infections observed in Intensive Care Units (ICU) had confirmation in laboratories and that the largest index of microbiological confirmation (74%) was found in adults ICU[4].

Because it is standard procedure in the ICU, the catheterization of a central venous access requires appliance of good care practices from insertion and handling to the moment of withdrawal[5-7].

The *Institute for Healthcare Improvement* (IHI), created a set of interventions indicated for patients with CVC denominated *Bundle* of the Central Venous Cateter[7].

These on scientific evidence based interventions effectively reduce the PBI when implemented simultaneously. These interventions are: hand hygiene (HH); precautionary use of maximum barrier; skin antisepsis with chlorhexidine; selection of best site for passage of CVC, considering the subclavian vein (SCV) as the preferred site, avoiding the femoral vein catheterization in adults; and daily review of the need of CVC permanence, removing those without indication of use.

After inserting the CVC, the aspects to be considered during its handling refer to HM, use of protective equipment, obeying antiseptic techniques when administering the injectable and collocating bandages[8,9]. In spite of these initiatives, health care teams have not fully adhered to recommended practices, incorporating inadequate actions into daily assistance, thus compromising the quality of assistance and patient security[8]. Mortality from HCRI in Brazil is estimated at 6.7% to 75.0%[8].

The control and evaluation of the results of the PBI indicator should be known to all health care professionals who insert and handle catheters, the Hospital Infection Control Committee (HICC), the managers and leaders of the ICU, to professionals allocating materials and financial resources and, where possible, by the patient aiming for a comprehensive approach in all areas of assistance[5-9].

Given the above, this article aims to analyze the behavior of the nursing and medical staff towards Bundle insertion and good practices in the management of Central Venous Catheter.

METHODS

A cross-sectional study conducted in the Intensive Care Unit (ICU) of a university hospital in the Northern area of the city of Rio de Janeiro, following approval in the Ethics in Research (CEP) of the home institution (Concept Nº 665 905 of 27/05/2014 - CEP EEAN) and co-participating institution (Concept Nº 702 350 of 06/19/2014 - CEP HUCFF). Participants signed the Informed Consent (IC), drafted in accordance with the Resolution 466/2012 of the National Health Council. Data collection took place from June to September 2014.

The population for this study consisted of nurses, nursing technicians and physicians participating in insertion related activities, handling and removal of the CVC. The professionals were selected via a nominal list provided by the head of the sector (n = 99).

Criterion for inclusion was to actively give assistance in insertion, handling and withdrawal of CVCs.

The criterion for inclusion is justified by the fact that actions of inserting, managing, handling and removing CVCs are the responsibility of medics and nurses who, especially during insertion, work together as a team. Resident nurses and physicians were excluded.

The study included 77 professionals, with 22 record losses: three people for being on maternity leave, seven for unavailability of e-mail contact and twelve for not returning the survey questionnaire.

For data collection, a self-administered questionnaire with 17 questions (attached) was sent via e-mail to studied professionals, despite their different assignments, considering that activities related to CVC permeate through all teams[8,9].

The questionnaire was evaluated in a pilot study of seven judges (two nurses of the catheter team, a nurse and a doctor HICC and a professor of nursing at the investigated institution, a professor of nursing at another institution of higher education and a nurse from a private hospital), and necessary adjustments put through to the used final version.

The questionnaire was composed of two parts: the first with issues 01-09 addressing the characterization of professionals, their training and their search for scientific updates on the theme of CVCs. The second part, with issues 10 to 17 ruled by Bundle CVC as proposed by IHI[7], the recommendations of the National Health Surveillance Agency (ANVISA)[2,3,5] and the Center for Disease Control and Prevention (CDC)[6], adopted by HICC of the institution.

In this second part, responses were made available as closed dichotomous (yes/no, always/never), except in the case of number 14, addressing the form of hand hygiene, which had two more descriptive options.

Of the 77 responses, one was put aside for not being filled in completely, thus leaving 76 responses for analysis. The obtained return rate was 76.76%.

Given the initial expectation that a higher level professionals would present similar knowledge of and behavior towards the assessed topics, and also to allow further evaluation of the mid-level professionals, participants were divided into two groups: higher education (nurses and doctors) and medium level (nursing staff). To identify proximities and dispersions in the obtained answers, consecutively the two levels were compared.

In this study, for the professional behavior to be considered adequate as to adherence to recommended care practices[2,3,5-7], it was expected that 60% or more of the top-level participants would answer questions number 10 to 17 correctly and mid-level professionals 50% or more. Professionals not reaching this

percentage would be conducted to their superiors and to the Permanent Education Service[10].

As the intention was to include all professionals, we worked with the population instead of a sample. To analyze the data, the responses were coded and transcribed to an Excel spreadsheet 2007®, revised to exclude possible typos and later Statistical analyzes were performed using OpenEpi version 3.03®.

Descriptive analysis of variables was performed, and the continuous presented according to their mean values and standard deviation and categorical variables according to their absolute value and proportions. Gender, as well as categorical variables concerning matters 10-17 were expressed in percentage and its *p*-value was calculated using Fisher's exact test, considered significant if < 0.05. Odds Ratio (OR) identified the association between behaviors of occupational groups. For these comparisons, a *p*-value < 0.05 was used to denote statistical significance[11].

RESULTS AND DISCUSSION

The population comprised 16 nurses (21.05%), 38 nursing technicians (50%) and 22 doctors (28.95%). The top-level staff, over 50% of nurses and doctors havecomplete graduation latusensuand 26.32% (n = 10) have complete graduation strictusensu. In the mid-level staff 52.63% (n = 20) have professional training at college level, of which 50% (n = 19) have a full degree in nursing.

The level of the teams might suggest an effective application of theoretical knowledge in everyday practice; however, as in another Brazilian study we could not confirm this correlation[12]. Thus emerges the need to include directives based on evidence approaching the theme of prevention bloodstream infection related to catheter (CRBSI) in schools and universities[13-15].

On positions held it stands out that 31.03% (n = 09) of doctors and 5.26% (n = 1) of the nurses performed managerial activities counselling the Head of the sector. This suggests reflections in view of the relationship between nurses and sizing risk of CRBSI[16].

Management activities require planning, organization, coordination and control to guarantee quality and safety in health care, and depends on the dimensioning of personnel, qualified human resources and material resources appropriate to the presented demand. The presence of nurses in to these activities seems to allow greater attention to these factors[17]. It stands out that good relationships and satisfactory working conditions generate motivation and contentment with work done for all professionals[18].

Characterizing data of the professionals as to questions 04-07 are shown in Table 1 below.

Between the upper and mid-level professionals, respectively predominated mature adults (md = 40.5 and 44.5 years), higher training time to ten years (md = 16 to 14), practice time on the top CTI five years (md = 9:10) and females (63.15% and 60.53%), in this case of a mostly experienced team.

Age older than 37 years was identified in a Greek study as one of the independent variables associated with high scores on questions about good practice in the insertion and handling of CVC[13]. In CVC insertion practices, the best scores were for female professionals and for those with a training in the prevention of infections. Being a nurse was associated with the best scores as to the handling off CVC[13].

This study did not cross variables as gender, age, profession, training with the responses obtained in the survey, but the results suggest the need for greater theoretical knowledge and improve care practices with CVC, pointing out that educational programs for the multidisciplinary teams of UTIs can collaborate on this issue[3,5-7,13-15].

A statistically significant difference ($p < 0.05$) found in the variables age and time of action may be related to hiring, by the research institution, outsourced professionals (doctors, nurses, nursing technicians), for an average period of two years. This type of contracting along causing a faster rotation may generate direct effects on provided assistance, in addition to increasing the need for training and educational investment for the hired professional to appropriate institutional policies[15]. A revision study shows that the exchange of regular nurses with substitutes also tends to augment the risk on CVC related infections[15].

About updating on theme of CRBSI, the top level is updated through articles and participation in conferences and the average level through continuing education, articles and books. Of the 76 studied professionals, 9.21% did not actualize in any way and 71.05% (n = 27) of superior level professionals and 55.26% (n = 21) of medium level professionals confirmed that the thematic was present in their academic/professional schooling.

Permanent education and health staff training strategies are based on CDC[6] and ANVISA[2,3,5]. Educational interventions in the catheter insertion through simulation, nurses training programs in catheter care ("intravenous therapy teams") were associated with a reduction in CRBSI in an American study[15].

Next, in Table 2, presents the results related to Bundle CVC insertion of the corresponding issues 10 to 13.

In this set of questions, there was no statistically significant difference in the responses, sequentially the association measure calculated for the behavior of professional groups has been the OR. The *p*-value expresses the statistical significance related to the application of knowledge and the two professional groups. These data are in Table 3.

The strength of this association was only significant (OR > 1) for aspects concerning the HM warning and the choice of the subclavian vein as the primary puncture site. This allows to infer that there is 1.6 times more chance of HM be questioned if held incorrectly, just as there is 1.6 times more chance of observing the preferred site happen when these procedures are accompanied by top-level professional.

There was no statistically significant difference between the professional groups to guarantee the use of maximum barrier and following the skin antisepsis, suggesting a similar behavior, regardless of academic or professional duties.

Table 1. Distribution of higher education professionals and middle age, training time, operating time in CTI and gender. Rio de Janeiro, in 2014

Variables	Higher education (n = 38)						Mid level (n = 38)		*p*
	Physicians (n = 22)		Nurses (n = 16)		Total (n = 38)		Technicians (n = 38)		
	M (б)	Md	M (б)	Md	M (б)	Md	M (б)	Md	
Age	41.5 (9.30)	41	40 (7.24)	40	40.75 (8.27)	40.5	43.18 (7.38)	44.5	< 0.05
Education (years)	16.72 (9.25)	16.5	14.06 (6.81)	15.5	15.39 (8.03)	16	15.21 (9.18)	14	0.059
Action (years)	11.27 (9.39)	10	9.43 (8.31)	08	10.35 (8.85)	09	9.63 (4.05)	10	< 0.05
Gender	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Male	13	59.09	1	6.25	14	36.84	15	39.47	0.999
Female	9	40.9	15	93.75	24	63.15	23	60.53	

M: Median; (б): standard deviation; Md: Ages. 95% and 2% t error.

When HM is not performed with degerming chlorhexidine, 68.42% (n = 52) of participants said they question this inadequacy, however, there was no difference in the proportion of negative responses between the upper and mid-level professionals.

The difficulties encountered within the health team are evident, especially among the nursing staff, to address another professional who is not performing antiseptic hand hygiene before insertion of the CVC as recommended, going against proposals in the Protocol for the practice of hand hygiene in health care, when it comes to the creation of an Institutional Security Climate[5].

Brazilian researchers have emphasized the HM through studies using management strategy Positive Deviance* on goals that range from maintaining the accession of HM at satisfactory levels until the discussion of new technologies used in monitoring the compliance of this practice[19-24].

On the preparation of the skin with chlorhexidine, before central venous puncture, this is not observed by 28.95% of top-level professionals and 21.05% of the mid-level, data similar to those identified by a study conducted in Mongolia[25].

Chlorhexidine, is recommended worldwide and, as strongly supported by scientific evidence, is superior in skin antisepsis and has excellent tolerance in rare cases of severe anaphylactic reactions, which enhances the safety of its use[5,6,15].

On the use of maximum barrier methods, 31.58% of top-level professionals and 18.42% medium level professionals answered not to interfere with the performance of the central venipuncture if inadequacies are remarked, indicating the need for more involvement, especially in the group of nurses.

A trend observed in recent studies refers to the "empowerment" of nurses to influence the suitability of CRBSI prevention

Table 2. Results on Bundle insertion of central venous catheter by professional category. Rio de Janeiro, in 2014

Question	Higher education (n = 38)						*p*	Average level (n = 38)		*p*
	Doctor (n = 22)		Nurses (n = 16)		Total (n = 38)			Technician (n=38)		
	N	%	N	%	N	%		N	%	
10 - Alert on HM*										
1 - Yes	17	77.27	11	68.75	28	73.68	0.822	24	63.16	0.459
2 - No	05	22.73	05	31.25	10	26.32		14	36.84	
11 - Sequence of antisepsis										
1 - Yes	17	77.27	10	62.50	27	71.05	0.527	30	78.95	0.597
3 - No	05	22.73	06	37.50	11	28.95		08	21.05	
12 - Maximum Barrier Guarantee										
1 - Yes	16	72.73	10	62.50	26	68.42	0.747	31	81.58	0.289
2 - No	06	27.27	06	37.50	12	31.58		07	18.42	
13 - SCV**as puncture reference site										
1 - Yes	11	50	11	68.75	22	57.89	0.411	17	44.74	0.358
2 -No	11*	50	05	31.25	16	42.11		21	55.26	

* HM: Hand hygiene; ** SCV: Subclavian vein.

Table 3. Association between occupational groups and good practice in the insertion of central venous catheter. Rio de Janeiro, in 2014

Procedure	OR	*p*-value	confidence limits
Alert on HM	1.633	0.4596	0.6145 - 4.341[1]
Sequence of antisepsis	0.6545	0.5970	0.2294 -1.868[1]
Maximum barrier guarantee	0.4892	0.2893	0.1682 - 1.423[1]
SCV as the preferred site of puncture	1.699	0.3588	0.6854 - 4.209[1]

processes. The Comprehensive Unit Safety Program (CUSP) recommends the initiatives that are cited as positive in reducing infections[26-29]. In Brazil, similar trends can be found in the manuals of ANVISA, where it reads: "The nurse can be empowered to suspend the elective procedure if there is no adherence to the recommendations"[3:27,5:16].

The use of a recommendation for the subclavian vein as the preferred site of the CVC insertion is observed by 51.31% (n = 39) of respondents, but only 50% of doctors said they observe this recommendation when choosing the central venous puncture site.

The subclavian vein as the site of choice is quoted by all the studies that have addressed the application of Bundle CVC[7,9,13-15,27,30,31]. The recommendations of CDC[6] and ANVISA[5] Guidelines are explicit where indicating to avoid, whenever possible, using the femoral vein with adult patients as a routine, to reduce the risks of ICSRC.

Conditions related to the flora of the skin at the insertion site stand out as major risk factor to be evaluated, as the catheters inserted into the internal jugular have a high risk for colonization while the femoral catheters had high colonization when used in adults. The femoral site in adults is also associated with increased risk of deep vein thrombosis[6,15].

ANVISA mentions that perhaps the risk of infection in femoral sites is limited only to patients with a body mass index greater than 28.4, noting that for hemodialysis catheters the jugular and femoral veins are more suitable due to the high risk of stenosis presented by the subclavian vein[5].

An American study recognizes that the choice of some doctors to opt for the femoral vein or the internal jugular is linked to complications related to access subclavian vein as arterial puncture, pneumothorax, and/or hemothorax[27]. Use of ultrasound to localize the veinfor puncture and following insertion of CVC has diminished the number of puncture failures, associated complications and catheter insertion time[15,27].

Continuing the presentation of the results of best practice in the management of CVC regarding the number of questions 14-17 is shown in Table 4.

These issues found no statistically significant difference between the upper and mid-level ($p < 0.05$) for daily evaluation of CVC permanence. These data are shown in Table 5.

Among the respondents 69.73% (n = 53) reported performing HM with water and liquid soap associated with antiseptics before and after management of CVC and its infusion systems. The mid-level professionals had a higher rate (78.95%) in this response, the medical profession predominated (45.45%) of alcohol 70% gel.

It is known that the impact of any failure of, or inadequate achievement, HM is expressed through health care-related infections, given that this action is recognized as the primary intervention in infection control, including being the lack of adherence by health professionals to HM protocols considered a violation[5]. The Multimodal Strategy towards Improvement of Hand Hygienic emphasizes the importance of creating an environment permitting the sensibility of all levels in the execution of this practice as highest priority[5].

About not realizing disinfections previous venous systems before administering medicaments, 63,16% of the superior level professionals affirmed not correcting this inadequacy in other professionals, overruling medium level professionals who show 44,74%. The lack of disinfection of infusion systems is closely linked to the increase in bloodstream infection rates, considering that this risk is increased, not only by the CVC length of stay or the contamination of its insertion site, but also by colonization these input ports of the infusion circuit[15].

The reduced approach by the nursing staff and medical professionals who do not meet this recommendation, may suggest a departure from the managerial issues and leadership, linked to the institutional safety climate establishment foregoing. The handling of CVCs, especially in drug administrations is a routine nursing action, which, although regarded as simple activity, requires knowledge and specific care[8].

Preceded by washing hands with antiseptic solution, the recommendation to use the antiseptic chlorhexidine base through friction fifteen seconds before accessing the infusion system for intravenous administration has been verified as an important measure of infection control[15,32]. In the studied institute, this recommendation is at disposal within the networks of the hospital (intranet) through the folder "Recommendations for the Prevention of Infections Related to Central Vascular Access"[33:1].

Current literature still demonstrates sources indicating 70% alcohol before the CVC handling[34]. The recommendation found in ANVISA indicates a disinfection of the connections with a solution containing alcohol, not making the indication of chlorhexidine explicit[5:47].

The procedure for CVCs bandage exchange unknown to 18.42% of top-level professionals and 13.15% of medium level professionals. There was a predominance of responses from participants in the "Every 24 hours for standard dressing and

Table 4. Results about good practice in the management of central venous catheter by professional category. Rio de Janeiro, in 2014

Question	Higher education (n = 38)						*p*	Average level (n = 38)		*p*
	Doctor (n = 22)		Nurses (n = 16)		Total (n = 38)			Technician (n = 38)		
	N	%	N	%	N	%		N	%	
14 - HM Pre-handling										
1 - Water and antiseptic liquid soap	12	54.55	11	68.75	23	60.53	0.586	30	78.95	0.133
2 - Alcohol 70% (gel)	10	45.45	05	31.25	15	39.47		08	21.05	
15 - Alert on disinfection connections										
1 - Always	08	36.36	06	37.5	14	36.84	> 0.999	21	55.26	0.166
2 - Never	14	63.64	10	62.5	24	63.16		17	44.74	
16 - Bandage Replacement Procedure										
1 - Yes	17	77.27	14	87.50	31	81.58	0.717	33	86.84	0.754
2 - No	05	22.73	02	12.50	07	18.42		05	13.16	
17 - Dayly evaluation of CVC permanence										
1 - Yes	20	90.91	10	62.50	30	78.95	0.086	09	23.68	< 0.05
2 - No	02	9.09	06	37.50	08	21.05		29	76.32	

HM: Hand hygiene; MTS: Clear Semipermeable Membrane.

Table 5. Association of professional groups and best practices in the management of central venous catheter. Rio de Janeiro, in 2014

Procedure	OR	*p*-value	confidence limits
HM pre-management of CVC	0.4089	0.133	0.1481 - 1.129[1]
Alert on disinfection connections	0.4722	0.166	0.1885 - 1.183[1]
Dressings Replacement	0.671	0.754	0.1927 - 2.337[1]
Daily evaluation of CVC permanence	12.08	> 0.05	4.102 - 35.6[1]

every seven days for semipermeable membrane transparent", corresponding to 34.21% in top-level professionals and 42.11% in medium level professionals.

The knowledge of the staff proved to be homogeneous within the practices carried out in the institution. The exchange of bandage recommendations advocating the changed every 48 hours to standard dressing, i.e. with sterile gauze and adhesive tape (tape) and every seven days for transparent membrane[5,6]. In the scenario researched due to insufficient adhesion to the skin of the tape used, replacing the standard healing occurs every 24 hours, which seems to have suggested the responses.

The last question addressed the daily assessment need for CVC permanence and the appointment of their removal when no indication of use. The calculated OR permitted infer the existence of 12 times greater chance of daily evaluation of catheter permanence realized by upper level professionals. Among the top-level professionals 78.95% (n = 30) stated realize it predominantly from the medical profession.

These data highlight the need for greater the nursing team's approach to this recommendation ($p < 0.05$), especially when this correlates to the fact that 50% of the population of nursing technicians graduated in nursing.

The longer the stay CVC is associated with higher rates of infection due to extra luminal contamination, intraluminal contamination, contamination by hematogenics and contaminated infusion of fluids and medications[29]. Another consideration bears to the inevitible formation of biofilm, with longer catheter utilization times and subsequent infection of the bloodstream as one of the reasons for CVSs to be removed as soon as they are no longer needed[29].

An Australian study found that the safest residence time corresponds to the first nine days of the short stay CVCs, and until the seventh day for dialysis catheters. Extending the catheter residence time for more than 12 days leads to an increased likelihood of infection to 3 in every 100 catheters[35]. Daily revision of CVC permanence requires a multi-disciplinary

attention, therefore nursery needs to be scientifically prepared and supported by the management when making these decisions.

Responses referring to good care practice evaluated questions 10-17, pointed to 62.5% accuracy for higher education and 50% for the average level.

CONCLUSION

Despite the academic profile of the sample, 9.21% of the subjects did not update the focal issue. There is the need for the mid-level professional approach in antiseptic hygiene items hand, the option for subclavian vein puncture and daily evaluation of catheter; and, to all professionals in the topics on the guarantee of maximum barrier use and sequencing of skin antisepsis.

As there was no educational intervention was not possible comparisons pre and post-intervention to assess differences on the theoretical knowledge and ICU staff tack on specific practices, however, the results point to opportunities for improvement of care practice.

The small number of respondents in one clinical setting may limit the use of these data in other medical conditions, especially to other countries and cultures. However, these results can provide important information to sector managers, the HICC, the catheter time and Continuing Education can be replicated elsewhere in the institution.

For education and job training to be effective, structural and procedural conditions need to be considered as working with behavioral change in institutions with fewer workers, high turnover and no specific dimensioned team to carry out the extremely laborious and challenging education service.

Realize further studies to address the outcome of the accession of the multidisciplinary team with good practice in infection prevention can contribute to the improvement of results obtained assistance.

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* Concept rooted in the fact of any group having participants presenting less frequent behavior, even well succeeded, that lead them to attain better results in problem solving when compared to other components that live with the same conditions, difficulties, and challanges[19-24].

ERRATUM

In the article **Behavior of the multidisciplinary team about Bundle of Central Venous Catheter in Intensive Care**, DOI number: 10.5935/1414-8145.20160008, published in **Escola Anna Nery Revista de Enfermagem** 2016;20(1):55-62, page 55 “Marluci Andrade da Conceição Stipp” should be read as “Marluci Andrade Conceição Stipp”.