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Evaluation of extracurricular internships in adult intensive care units

Avaliação dos estágios extracurriculares de medicina em unidade de terapia intensiva adulto

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ABSTRACT

Objectives: Students of Salvador – BA, Brazil were trained in critical care medicine by accomplishing extracurricular internships. This study aims to detect changes in attitude and interest of students who concluded these internships as well as the most frequent activities developed.

Methods: Descriptive cross-sectional survey conducted with students who did extracurricular internships in adult intensive care units during the second semester of 2006. A self-administered questionnaire was given using objective questions.

Results: We evaluated 49 students. Interest in becoming an intensivist was classified as high/very high by 32.7% before internship, after which 61.2% reported increased interest. Before internship, students on a 1 to 5 scale rated the importance of critical care medicine as 4.55 ± 0.70 . After internship, 98% felt more confident to refer a patient to the intensive care unit, 95.9%

to evaluate with supervision, patients admitted to intensive care units and 89.8% to attend patients in the emergency room. The most common procedures observed were: central venous access (100%), peripheral venous access (91.8%) and orotracheal intubation (91.8%). Topics ranked in terms of interest from 1 to 5 were: systemic inflammatory response syndrome/sepsis (4.82 ± 0.48), shock (4.81 ± 0.44) and cardiopulmonary resuscitation (4.77 ± 0.55).

Conclusions: This study showed that internships in adult intensive care units of Salvador (BA), Brazil provided students with greater assurance to evaluate critical patients, increased their interest to follow an intensivist physician career and allowed contact with the main procedures and topics related to critical care medicine.

Keywords: Education, medical; Fellowships and internships; Clinical clerkship; Intensive care units; Students, medical; Questionnaires

INTRODUCTION

The trend to include medical knowledge in practical activities that go beyond the official university curriculum is known as a “parallel curriculum”. As such, a parallel curriculum would be the extracurricular activities that medical students do for the purpose of gaining clinical and practical experience by accompanying services and/or professionals.⁽¹⁻²⁾

The learning of intensive care medicine (ICM) in the academic environment has essentially taken place by means of the parallel curriculum. This is because current growth of ICM, as a medical specialty, has not been suitably included in the official curriculum of most medical schools³⁻⁵. Therefore, medical students

usually graduate without the required basic knowledge and with no qualification to care for patients ready for admission in intensive care units (ICU).⁽⁶⁾ There are other factors that also weigh on the interest for such activities, such as the idea of adding to a “good curriculum” and increasing the number of academic intensive medicine groups in the country⁷⁻⁸ that therefore must also be taken into account in this type of analysis.

Once it becomes evident that the clinical course of a severe patient changes when treated by an intensivist physician, the importance of amending the official curriculum of medical schools, to qualify students to deal with severe and unstable patients must be recognized.⁽⁴⁻⁵⁾ Emphasis on an improved education in ICM must have an early start, as it is an extremely specialized activity, from a technological point of view as well as that of human resources.^(4,9) Medical schools are therefore responsible for the availability of curricular clerkships encompassing ICM in the graduate preparation of general practitioners, following the guidelines of amending the medical curriculum, to reduce the search for extracurricular activities without teaching supervision.^(4,10)

In this respect new clerkships have proliferated in the ICU of public and private hospitals in Salvador (BA) and other Brazilian cities. This reflects the interest of critical care physicians to disseminate scientific, technical, and managerial and research knowledge involving this specialty, as well as the interest of students to participate in these clerkships.^(8,11)

The objective of this study was to detect changes in the attitude and interest of students after these clerkships, in addition to describing the more common activities developed (procedures, assistance to patients, contact with topics related to ICM).

METHODS

A cross sectional descriptive study was carried out using a self-administered questionnaire for medical students of two of the more traditional schools of medicine of Bahia, one public “Faculdade de Medicina da Bahia” of the “Universidade Federal da Bahia” and one private “Escola Bahiana de Medicina e Saúde Pública”. Candidates were selected after an active search for students that had completed ICM extracurricular clerkships in a public and/or private hospital of Salvador during the second semester of 2006. Initially, all ICU with extracurricular clerkships at that time were listed. Next, all respective supervisions were contacted for the list of students that had completed clerkship in the period mentioned. There were no refus-

als. Then, the names were crossed to form a single list, because of name repetition from different ICU. An active search for the students listed was carried out from February to June 2007 and the questionnaire was submitted. The questionnaire was divided into four parts: free and informed consent, general characteristics of the students and of the ICU, changes of attitude after clerkship and questions on academic and/or professional interest regarding ICM, procedures and main topics of ICM.

The questionnaire was based upon a previous one used by the Intensive Care Medicine Leagues in a study that evaluated student’s perspectives about ICM in the medical schools of Salvador. It was adapted to suit the new study and questions of the previous questionnaire were maintained, removed, modified and included. Then, it was administered to eight students that had completed extracurricular clerkships in ICM during the first semester of 2006, for validation. With these results, the questionnaire of the study was finalized. Questions with illegible replies or with erasures were not computed.

After collection of the questionnaires a data bank was built in EPIINFO 3.3.2 for Windows software. Descriptive statistics parameters were used, adopting the usual measures of central tendency and dispersion as well as estimates of simple and relative frequencies.

RESULTS

A total of 86 students were listed, of which 49 were located and contacted, this being the sample of our target population. All agreed to participate in the study. Table 1 shows demographic data of the sample of the target-population under study. Mean age of these students was 23.1 ± 1.3 years. Of the students 58.3% belong to the female gender. The 9th and 10th study semesters comprised 65.3% of the sample. There was a discreet prevalence of the public medical school 61.2%. Data showing the overall characteristics of the intensive care units where those clerkships took place are shown on table 2. Mean of shift hours was 11.6 ± 1.2 (mode: 12); 73.9% of the students reported that there was only one physician on duty in the units where they trained. For the number of beds the mode was 12 and the mean of patients cared by students in each shift was 7.6 ± 5.2 . The interest to become an intensivist physician was ranked as high or very high by 32.7% of the students before the clerkship, while 52.7% reported high academic interest or very high in the area of intensive care medicine prior to clerkship. The main motives reported to carry out an extracurricular clerkship in ICM were interest in pursuing the specialty, performance of procedures and improvement in the curric-

Table 1 – Demographic characteristics of the population

Variable	Results
Age (years)	23.1±1.3
Female gender	58.3
Semester	
5 th . 6 th and 7 th	6.1 (03)
8 th	28.6 (14)
9 th	44.9 (22)
10 th	20.4 (10)
School	
Faculdade de Medicina da Bahia	61.2 (30)
Escola Bahiana de Medicina	38.8 (19)

Results are expressed in mean ± standard deviation or %(N)

Table 2 – General characteristics of the intensive care units

Variables	Results
Hours on duty*	11.6 ± 1.2 - [12]
Number of beds**	12
Number of on duty physicians***	
1	73.9 (34)
2	15.2 (07)
3	6.5 (03)
4	4.3 (02)
Patients evaluated per shift ***	7.6 ± 5.2

Results are expressed in *(mean ± standard deviation) - [mode]; ***(mode); ***(mean ± standart deviation) or %(N)

ulum with 30.6, 24.5 and 22.4% respectively. At the end of clerkship 77.6% of the students reported a higher academic interest for intensive care medicine and 61.2% in becoming a critical care physician. The main reasons of the 38.8% that reported a lesser interest in becoming an intensivist were that it was very tiresome to always work in shifts during most of the week. And not be tuned to the life style of a critical care physician, both with 36.8%. Mean of the rating given by the students on a scale of 1 to 5 to the importance of intensive care for current medical students was of 4.55 ± 0.70 and this is the same value found when asked about the importance in academic life of extracurricular clerkship in an adult ICU. Of the interviewed students 75.5% stated that their school does not offer any curricular activity in the ICU and all stated that the subjects related to intensive care must be better addressed in their school. Only 51% of the students had participated in some situation of indication of ICU treatment prior to the clerkship. Afterwards, 98% felt more confident to refer patients to the ICU, 95.9% in a supervised evaluation of patients admitted to the ICU and 89.8% in caring for patients in emergencies.

Table 3 presents information on the observation and performance of procedures. Procedures more often observed were: central venous access (100%), peripheral venous access (91.8%) and orotracheal intubation (91.8%). Those most often performed under supervision were: punction for arterial blood gas analysis (89.8%),

Table 3 – Observation and performance of procedures during clerkship and assurance to carry out alone after extracurricular clerkship in intensive care units

Procedures	Observation	Performance	Assurance []*
Peripheral venous access	91.8 (45)	63.3 (31)	96.6 (28) [29]
Central venous access	100.0 (49)	65.3 (32)	46.4 (13) [28]
Pulmonary artery catheter	38.8 (19)	6.1 (03)	0 (0) [02]
Arterial line	89.8 (44)	53.1 (26)	73.9 (17) [23]
Punction for arterial blood gas analysis	89.8 (44)	83.7 (41)	94.1 (32) [34]
Oorotracheal intubation	91.8 (45)	32.7 (16)	30.8 (04) [13]
Thoracocentesis	53.1 (26)	14.3 (07)	20.0 (01) [05]
Tracheostomy	53.1 (26)	6.1 (03)	0 (0) [03]
Bag-mask ventilation	83.7 (41)	67.3 (33)	96.3 (26) [27]
Thoracic drainage	53.1 (26)	20.4 (10)	11.1 (01) [09]
Cricothyroidostomy	10.2 (05)	6.1 (03)	0 (0) [02]
Gallbladder probe	87.8 (43)	49.0 (24)	94.7 (18) [19]
Nasogastric tube introducion NGT	83.7 (41)	51.0 (25)	100.0 (22) [22]
CPR	91.8 (45)	49.0 (24)	57.9 (11) [19]
Introduction of intra-aortic balloon IAB	14.3 (07)	2.0 (01)	0 (0) [01]
Pericardiocentesis	4.1 (02)	2.0 (01)	0 (0) [01]

NGT – nasogastric tube; CPR –cardiopulmonary resuscitation; IAB- Intra-aortic balloon. Results expressed in %(N); * [] – total number of individuals that carried out the procedure and replied regarding assurance in each of the presented items

bag-valve-mask ventilation (67.3%) and central venous access (65.3%). When reporting performance of some procedure the student had the option to inform his assurance or not to carry out the same procedure alone, after clerkship. The students reported that they felt greater assurance to perform by themselves nasogastric tube insertion (100%), bag-valve-mask ventilation (96.3%) and peripheral venous access (96.6%). The

interest and the theoretical and practical experiences related to ICM topics are shown on table 4. On a 1 to 5 scale the topics rated as those of greater interest were: systemic inflammatory response syndrome (SIRS)/ sepsis (4.82 ± 0.48), shock (4.81 ± 0.44) and cardiopulmonary resuscitation (4.77 ± 0.55) and those of lesser interest were multidisciplinary care (3.91 ± 1.14) and nutrition (3.87 ± 1.14). Table 5 shows the opportunity

Table 4 – Interest and theoretical and practical experience with the main topics related to intensive care medicine at extra-curricular clerkships in adult intensive care units

Topics in intensive care medicine	Interest	Theoretical	Practical
Shock	4.81±0.44	95.9 (47)	93.9 (45)
Cardiopulmonary resuscitation	4.77±0.55	85.7 (42)	91.8 (46)
SIRS/Sepsis	4.82±0.48	91.8 (45)	85.7 (42)
Renal failure and dialysis	4.38±0.78	59.2 (29)	73.5 (36)
Respiratory failure and MV	4.57±0.70	89.8 (44)	91.8 (46)
Politrauma	4.46±0.89	59.2 (29)	46.9 (23)
Hydroelectrolytic and metabolic disorders	4.59±0.76	69.4 (34)	87.8 (43)
Infections in severe patients	4.46±0.71	63.3 (31)	73.5 (36)
Sedation and analgesia	4.34±0.83	55.1 (27)	75.5 (37)
Ethics and humanization	4.32±0.82	51.0 (25)	46.9 (25)
Hemodynamic monitoring	4.61±0.63	91.8 (45)	91.8 (45)
Encephalic death and transplants	4.48±0.80	44.9 (22)	34.7 (17)
Multidisciplinary Care	3.91±1.14	40.8 (20)	63.3 (31)
Nutrition in severe patients	3.87±1.14	38.8 (19)	46.9 (23)
S -Stroke/ neurological monitoring	4.65±0.66	73.5 (36)	83.7 (41)
Hepatic Decompensation/DH	4.40±0.91	44.9 (22)	38.8 (19)

SIRS – systemic inflammatory response syndrome; S – stroke; HD – digestive hemorrhages; MV - mechanical ventilation. Results expressed in % (N), except the interest (score 1 to 5), expressed in mean \pm standard deviation

Table 5 – Opportunity to treat under supervision and assurance to treat alone, diseases common in the intensive care units

Topics in intensive care medicine	Opportunity to treat under supervision	Assurance to treat alone []*
Cardiorespiratory arrest	63.3 (31)	48.3 (14) [29]
Shock	67.3 (33)	48.5 (16) [33]
Circulatory failure	24.5 (12)	30.8 (04) [12]
Politrauma	28.6 (14)	35.7 (05) [14]
SIRS/sepsis	59.2 (29)	39.3 (11) [28]
Respiratory failure	63.3 (31)	35.5 (11) [31]
Stroke	51.0 (25)	34.8 (08) [23]
Intoxications	24.5 (12)	36.4 (04) [11]
Cranioencephalic trauma	38.8 (19)	18.8 (03) [16]
Acid-base disorders	69.4 (34)	38.7 (12) [31]
Burns	26.5 (13)	62.5 (05) [08]
Metabolic disorders	28.6 (14)	38.5 (05) [13]
Acute renal failure	55.1 (27)	33.3 (08) [24]
Convulsion	34.7 (17)	69.2 (09) [13]
Hydroelectrolytic disorder	61.2 (30)	40.7 (11) [27]

SIRS- systemic inflammatory response syndrome. Results expressed in % (N); * [] – total number of individuals that carried out the procedure and replied regarding assurance in each of the presented items

that students had to treat, under supervision, typical pathologies found in ICU and their assurance when indicating treatment by themselves, after clerkship. Students had more opportunity to treat under supervision the following pathologies: acid-base disorders (69.4%), shock (67.3%) and cardiovascular arrest/respiratory failure (both with 63.3%). Students stated that after clerkship they felt greater assurance to indicate treatment by themselves for convulsion (69.2%), burns (62.5%) and shock (48.5%).

DISCUSSION

ICU clerkships are among the more often practiced extracurricular activities by medical students. Despite the high load of hours of the medical course and the intense demand of time for medicine, surveys point out that some 80 to 90% of students take on some extra-school activity related in most cases with a high level of satisfaction.^(1, 11-13) To include ICM in the official curriculum of medical schools has been suggested in other works and by specialists in the field.^(4-5,7) Some of our data substantiate this fact. After clerkship 98% of the interviewees reported feeling more confident to indicate intensive care treatment; 95.9% in the evaluation under supervision of patients admitted in the ICU and 89.8% in care for patients in emergencies. Before clerkship, only 51% had participated in the indication of intensive care treatment. As such, the influence of the practical experience in intensive care goes beyond the activity in closed units, because the experience gained translates into greater assurance to also act in emergencies. Furthermore, 75.5% state that their school does not offer any curricular activity in ICU and every subject related to intensive care must be better addressed in school. Considering that the studied population has had practical experience in intensive care, medicine these conclusions merit closer attention when assessing how important it is to include ICM in the medical curriculum of the more traditional schools of medicine in Salvador (BA).

Intensive care medicine is a new specialty which still presents a shortage of professionals to meet the current requirement and the increasing number of ICU in the country.⁽¹⁴⁾ The main reason disclosed by the students to seek a clerkship was the interest for ICM as future specialty. Furthermore, after the clerkship there was an increase in the academic, as well as professional interest for intensive care medicine (77.6% and 61.2%, respectively). These data point out that experience in the spe-

cialty during medical graduation is important, because in the medium term it may bring returns in the number of critical care professionals in the country, considering that not only is there a shortage of specialized professionals, but also often the openings for ICM residence are not filled in the greatest part of Brazil.⁽¹⁴⁾ It must be also highlighted that to work in a shift routine and to be at odds with the life style of intensive care physicians were the first reasons mentioned by those that reported a lesser interest in specializing in ICM after clerkship (38.8%). Recent studies with internal medicine, general surgery and anesthesiology resident physicians in Salvador (BA) revealed similar data on the subject⁽¹⁴⁾. Although the quality of life of critical care physicians is sometimes questioned, this aspect is quite subjective and open to criticism. However, this aspect should not be overlooked. Another survey also carried out in Salvador (BA) disclosed a high prevalence of the Burnout syndrome among the adult ICU intensivist physicians in the city, a syndrome associated to the quality of life.⁽¹⁵⁾ Therefore, when considering a future improvements of medical work in closed units, it would be prudent to take this aspect into account.

Presence of the medical student in the ICU orients him on how to manage emotions when in contact with death and suffering, topics that mobilize extreme emotion in the relatives and in society in general. Furthermore, there is contact with subjects that medical students know very little about during undergraduate studies, such as encephalic death.^(11,16)

Regarding procedures, those most frequently observed were the most common ones in the day-by-day of the ICU (central venous access, peripheral venous access and orotracheal intubation). However, performance and assurance in carrying these out alone was higher in the procedures considered as fewer complexes (punction for arterial blood gas analysis, peripheral venous access and bag - mask ventilation). Regardless of the importance of multidisciplinary assistance in the ICU environment and of the issues related to ethics and humanization, these subjects had the lower mean scores (on a 1 to 5 scale). Perhaps due to the short duration of the clerkship, students tend to profit more giving priority to the subjects of "pure medicine" such as SIRS/sepsis, shock and cardiopulmonary resuscitation that were those that had the highest mean scores. During extracurricular clerkships support to the students often relies on the physician on duty. However, these professionals are frequently not prepared for this support and/or do not want to add to the function of

assistant physician that of teacher, as no financial gains are accrued.^(11,17) This is another important role played by inclusion of ICM in the official curriculum of the medical schools, in an effort to balance these subjects within the academic environment, as well as to offer schooling supervised by teachers.

CONCLUSIONS

This study disclosed that students who completed extracurricular clerkships in adult ICU in Salvador (BA) associated it to a high level of importance, academic as well as for their future professional life. Further it increased their interest to follow the career of intensivist physician. They also reported greater assurance when indicating and assessing critically ill patients and caring for patients in emergencies. Clerkships offer students contact with the procedures and the most common topics in the day-by-day of the ICU. All the interviewees reported that ICM must be better addressed in their schools. Nevertheless, it should be emphasized that such data were assessed in a cross sectional form, therefore follow-up studies regarding students' performance will require further inputs related to their assurance in the procedures and influence in the choice of ICM as future specialty.

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RESUMO

Objetivos: A formação em medicina intensiva pelos estudantes de Salvador (BA) tem acontecido através de estágios extracurriculares. Este estudo visou detectar mudanças na postura e no interesse dos acadêmicos que concluíram estes estágios e os tipos mais comuns de atividades desenvolvidas.

Métodos: Estudo transversal descritivo realizado com estudantes que fizeram estágios extracurriculares em unidades de terapia intensiva adulto no segundo semestre de 2006. Utilizou-se um questionário auto-aplicável com questões objetivas.

Resultados: Foram entrevistados 49 estudantes. O interesse em se tornar intensivista foi classificado como alto/muito alto por 32,7% antes do estágio, ao final 61,2% referiram aumento do interesse. A média de 1 a 5, sobre a importância da medicina intensiva para o acadêmico atualmente foi de $4,55 \pm 0,70$. Após o estágio 98% sentem-se mais seguros em indicar um paciente para unidades de terapia intensiva e 95,9% em avaliar, sob supervisão, os pacientes internados em unidades de terapia intensiva e 89,8% em atender pacientes nas emergências. Os procedimentos mais observados foram: acesso venoso central (100%), acesso venoso periférico (91,8%) e a intubação orotraqueal (91,8%). Numa escala de 1 a 5, os tópicos classificados como de maior interesse foram: síndrome de resposta inflamatória sistêmica e sepse ($4,82 \pm 0,48$), choque ($4,81 \pm 0,44$) e reanimação cardiopulmonar ($4,77 \pm 0,55$).

Conclusões: O presente estudo mostrou que os estágios extracurriculares em unidades de terapia intensiva adulto de Salvador (BA) fornecem ao estudante maior segurança em avaliar pacientes graves, aumenta o interesse do mesmo pela carreira de intensivista e permite o contato com os principais procedimentos e tópicos relacionados à MI no dia-a-dia das unidades de terapia intensiva.

Descritores: Educação médica; Bolsas e estágios; Estágio clínico; Unidades de terapia intensiva; Estudantes de medicina; Questionários

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