



**THE INVESTIGATION OF PHYSIOLOGICAL KNOWLEDGE AND FIRST AID
APPLIED TO THE CURRICULAR GRID OF PREHOSPITAL CARE IN PHYSICAL
EDUCATION COURSES IN BELÉM-PA, BRAZIL, EASTERN AMAZON**

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ABSTRACT

The present study aims to analyze the degree of knowledge about physiology and first aid applied to the prehospital care of the graduating students of the physical education course of the main colleges of the metropolitan area of Belém. Three educational institutions were selected, two public and one private, Thus totaling a sample of 36 students. In order to analyze students' knowledge, a questionnaire with 25 objective questions of knowledge about human physiology and first aid used in prehospital care protocols was performed, the results were treated in Microsoft Excel and transformed into a table for a better understanding. Having as main result the analysis almost 70% of the graduates of the public college 1 did not know the discipline in its curriculum, which shows ignorance of the curricular grid of the course itself. As it was shown that the graduates of the 2 public colleges of this study presented better performance when evaluated the theoretical knowledge about emergency and emergency care. Demonstrating the concern to obtain knowledge during graduation by attending courses related to the subject, participating in training courses, or in a commitment to learn alone in books and the internet. And yet the students of the Faculties evaluated have been able to make correlations between physiology and first aid in more than 50% of the time. Faculty published 2 presented the best average of correct answers (74%) during the evaluation of this knowledge, even though it did not have an exclusive discipline of physiology applied to first aid in its curriculum. It can be concluded that the students of the 2 public schools in Belém are prepared to act in an emergency situation, but all the interviewees need to be constantly updated over time, and it was also suggested to reengineer the physical education courses of Belém in order to include specific disciplines of applied physiology to the prehospital care or interdisciplinary ones that mixes expertise in prehospital care and applied physiology, in order to change the paradigm of the action of the physical educator through emergency and emergency actions in Belem from Pará.

KEYWORDS: Applied physiology, First aid, Prehospital care, and Physical education.

1. INTRODUCTION

Since ancient times humanity has always wanted to understand the functioning of the body and how to maintain health to extend life. At that point they began to register the idiosyncrasies most external to the functioning of the body, since religion generally

precluded more detailed studies of anatomy and human physiology (COPETTI, 2004). But even against certain religious customs, the Sumerians, Hebrews, Chinese, Egyptians, Greeks and Romans created the first records of how the human body was constituted and of what the human body was constituted (BARROS, 2003). Firstly,

with empirical and pseudoscientific theorizations, more tangential to religion than science itself, which later gave way to more precise anatomical investigations in the Renaissance period and much more complex, with advanced physiology and biochemical and even quantum mechanisms, in current days (LIMA, 2017).

Having therefore in mind the importance of this knowledge, on the bodily functioning, for the treatment and prevention of diseases, diseases and traumas that the body suffers. It becomes imperative to understand these trivial knowledge during the training of all professionals who act in the intervention and maintenance of human health. Therefore of fundamental primacy to understand the body's homeostasis process in emergency pre, peri and postoperative emergency procedures.

This, since the physical education professional does not work very much in hospitals, will need to apply physiology during training, scientific research and accidents resulting from bodily practices. It is necessary to understand the procedure to choose the best protocol, from first aid action, to the relocation of the victim to the nearest hospital. This creates the elucidation of the connection between what is said normal or physiological and what is dysfunctional or pathological, that is, what deserves a greater attention and investigation by the peri and post-hospital care, performed by other therapists professionals. Since malpractice or neglect during health emergencies can define life and death, as well as sentence victims to more complex or mild sequelae, depending on how they were approached during the accident and also increase or decrease rehabilitation time and reintegration into the daily and working life of this victim (JÚNIOR ET AL, 2005). Therefore the understanding of this knowledge by the physical educators is of fundamental importance in this initial approach until the arrival of more specialized help.

2. THEORETICAL REFERENCE

Being physical education is a wide area, and having as object of study the human body and the corporal practices, that happen in the most varied spaces, like court, swimming pool, gym, room of fights, field, gym, squares, etc. These environments presuppose a propensity for situations of risk to physical integrity, ranging from the classic ergonomic risks to the risk of accidents of different types, varying according to the type of activity, characteristics of the public involved, security measures adopted, characteristics of the means and preparation of the professionals involved (THORNDIKE, 1959). Physical activity also has as main characteristic the possibility of practices in diversified environments, which can sometimes create danger at different levels, such as academia, the aquatic environment, forests, mountains and even ice (DALTON ET AL, 2016).

These risks occur in the most varied types of physical-sports activities, regardless of whether they are high-

income or amateur. Risk factors will always exist. Being the most worrying is the physical risk factor, which can cause injuries by the application of opposing forces, characteristics of several sports modalities, where individuals measure strength with each other, in order to immobilize or dribble their opponent, in strength training, in the use of equipment or in the displacements and abrupt changes of direction common to several physical activities. These factors can cause traumas of different natures (DELEE AND FARNEY 1992, MYER ET AL, 2015).

Pre-hospital care is important in this context, because being executed quickly and correctly can prevent simple injuries from worsening to disabling, permanent or transient injuries (JÚNIOR ET AL, 2005). In extreme cases prehospital care will make the difference between survival and death.

The physical education professional for acting in various sports environments will be prone to certain risk situations with his students, making him the person closest to a victim. Therefore he should be in days with his knowledge of physiology and is able to perform emergency care (SIEBRA, OLIVEIRA 2010).

First aid is emergency procedures that must be applied to a person in order to maintain vital signs, avoid worsening of the condition and / or prepare and maintain body homeostasis until the victim receives definitive assistance, so the importance of understanding the parameters of normality and knowledge of bodily functioning (human physiology). Because first aid should be provided whenever the victim is not able to take care of herself, at the place of an occurrence. And the person with the most experience and knowledge is the one who will lead the care (BOMBEIROS EMERGENCIA, 2016).

2.1. Physiological Changes of Vital Signs and Frequent Injuries in Sports Activities

The understanding of what is accepted as normal for the parameters of vital signs, from the perspective of physiology, is of fundamental primacy for good pre-hospital care, in case of emergency during sports practice, as well as knowledge about the main injuries and traumas that may occur in these sports. Therefore it is of elementary importance the knowledge of the physiological parameters and lesions shown below:

2.1.1. Vital signs

Significant indicators of vital physiological functions are important, which can guide an initial preventive analysis and guide the progression of the clinical situation of a trauma victim. They can also be considered as the signals sent by the body in order to show that its physiological functions are normal, so any sudden changes in them indicate an abnormality in the bodily functioning. Included in this item are temperature, radial pulse, respiration and blood pressure.

2.1.1.1. Temperature

In a didactic way, the temperature is used to measure the heat transfer of the body, being, therefore, the balance between the heat lost and the heat produced. They are considered as reference values of physiological temperature in humans between 36°C and 37°C. That may change according to the body region, such as axillary temperature, which is between 36°C and 36.8°C; inguinal temperature, which is between 36°C and 36.8°C; mouth temperature, between 36.2°C and 37°C; and rectal temperature, between 36.4°C and 37.2°C.

2.1.1.2. Radial pulse

It is as if you observe the signs of heart rate activity, usually in the vessel of the radial region of the victim's pulse is most often checked. It varies its average normal pattern depending on the moment of the life that is the victim: In the infants observed between 110 and 130 beats per minute; below 7 years, between 80 and 120 bpm; above 7 years, between 70 and 90 bpm; puberty, between 80 and 85 bpm; in men, between 60 and 70 bpm; in women, between 65 and 80 bpm; and when over 60 years, between 60 and 70 bpm.

2.1.1.3. Breath

Its main function is to supply the cells of the body with oxygen and to remove the excess of carbon dioxide, in order to produce more energy and to avoid metabolic and respiratory disorders. Its reference values are in men, between 16 and 18 irpm (respiratory incursions per minute); in women, between 18 and 20 bpm; and in children, between 20 and 25 pmpm.

2.1.1.4. Blood pressure

It is defined as the force that the blood exerts on the walls of the arteries. The standard spectrum, considered physiological for blood pressure, is comprised between the maximum pressure check, also known as systolic, at 140x90mmHg; and the minimum pressure, called diastolic, at 90x60mmHg. But with an average physiological normality, established in adults in most cases, in the range of 120x80mmHg blood pressure for healthy people.

2.1.2. Main Traumatic Injuries in Sports Activities

Injuries that may occur more frequently in sports practices and their main peculiarities, as well as their main protocols of pre-hospital intervention for each case.

2.1.2.1. Extremity Lesions

They are banal in the work routine of health professionals. Eventually they are less serious. They can not injure and damage nerves and vessels. And it has by etiology accidents in motor sports, and that involve falls (RODRIGUES *et al.*, 2000).

2.1.2.2. Fractures

Fractures are discontinuities that can occur in a bone, caused by high kinetic and potential energy traumas, such as: bruises, falls or crushing, they are classified into

two types: Internal, in which, despite bone deformity, the skin is intact, and external, where the bone is exposed, crossing the skin and causing wounds. Fractures can occur in the most diverse physical education practices, such as fights, soccer, handball, cycling, swimming and so on. In a speed racing situation, an athlete may fall on his elbow and because of this the trauma may occur (DINIZ *et al.*, 2001).

When faced with a fracture victim, the protocol recommends not let the victim move, immobilize the bone or joint with the help of splints, control bleeding, if applicable, apply ice packs and make dressings if there are open wounds (CZECZKO, 1991).

2.1.2.3. Dislocations

Dislocations are end lesions whose bone undergoes a loss of contact with its original joint. They can cause severe joint capsular lesions, since they affect blood vessels, nerves and the joint capsule (RODRIGUES *et al.*, 2000).

In physical education can occur in fights, soccer, handball, dance, bodybuilding, Olympic sports and etc. In a game situation in which an athlete falls after a ball contest, the same, almost reflexively, puts his arm to try to cushion the fall, and this arm ends up receiving the full impact of the fall thus having a trauma.

The protocol for victims of dislocation recommends placing the bones in a position of comfort that allows the immobilization and the transport with the minimum of pain. The joint should only be replaced in place by medical professionals. (DINIZ *et al.*, 2001).

2.1.2.4. Sprains

Sprains are minimal or severe ligamentous lesions that occur in a joint due to a sudden movement that exceeds the normal limits of range of motion of a joint, and may still result in a dislocation (RODRIGUES *et al.*, 2000).

In physical education they may occur during a jiu-jitsu contest, where an athlete attempting to apply an arm immobilization may end up exceeding the range of arm movement range of his / her training partner's arm and thereby cause a sprain. In a sprain, the protocol recommends using ice in the affected area in order to decrease pain and immobilize the limb (CZECZKO, 1991).

2.1.2.5. Traumatic Amputations

Traumatic amputations are injuries in which the separation of limbs or structures of the body occurs, and can occur by crushing and sharp objects. The longer the amputee fails to receive supplies, the less chance of reimplantation (RODRIGUES *et al.*, 2000).

In physical education, it can occur when a student goes against a sharp surface, and may suffer avulsion from the limb, such as the hook of a soccer net, or through

crushing, when a weight falls over the edge of a student a gym.

The protocol for a traumatic amputation should be rapid, due to the severity of the injury, as it can cause death by hemorrhage, in addition to the urgency to reimplant the amputated limb. (DINIZ *et al.*, 2001).

The rescuer must first control the bleeding, to prevent the victim's shock, and after the victim is stable, he / she should take care of the amputated segment. Cleaning the segment without immersion in liquid, for this should be wrapped in dry gauze or clean compress and protect the amputated limb with two plastic bags, then put the plastic bag in a container with ice or ice water and still not allow the amputated end is in contact with the ice. (RODRIGUES *et al.*, 2000).

2.1.2.6. Bleeding

Hemorrhage is an injury defined as the intense loss of blood due to a cut in the blood vessel, it is classified according to the blood vessels and according to its location, dividing it into external and internal (RODRIGUES *et al.*, 2000).

In physical education can occur when a student undergoes a cut through puncture structures during the practice of physical exercise.

The bleeding protocol recommends that you call emergency services, raise ends with blood above the level of the heart, compress the wound with a protected hand, place a compress with direct compression on the wound and wait for specialized care. If none of the measures described above do not respond, it is recommended to use the tourniquet, as it is considered the last resort for serious bleeding. (RODRIGUES *et al.*, 2000).

2.1.2.7. Convulsions

Convulsions are involuntary muscular contractions resulting from disorganized electrical activity of the brain, which are manifested by repetitive movements, hypertonia, tachycardia and unconsciousness (DINIZ *et al.*, 2001). It can be divided into three moments: Tonic, which lasts from 15 to 20 seconds; Clonic, which lasts from 30 to 60 seconds; and the post-comical state, which is the state in which the victim is at the end of the seizure (RODRIGUES *et al.*, 2000).

In physical education, seizures may occur after severe trauma to the head region, recurrent from a soccer match, rugby match, and so on. The recommended protocol for a seizure victim is to look for signs of drug use or poisoning, take protective measures (safety position), check the victim's level of consciousness and, if the patient still has seizures, trigger emergency services, the head of the patient placing a support under it and wait for the end of the seizure, as well as removing the victim of

dangerous objects, open the airways and await specialized relief. (RODRIGUES *et al.*, 2000).

2.1.2.8. Drowning

Drowning is the accident that occurs by asphyxiation from submersion, whether in liquid media or not. It is divided into two types, the wet drowning where the victim has liquid aspiration and the dry drowning other than the liquid aspiration (DINIZ *et al.*, 2000).

In physical education, drowning can occur in classes that involve the pool.

The Drowning protocol recommends removing the victim from the water as soon as possible. The rescuer should always be aware of his personal safety during the rescue, in which he should not attempt water rescue if he is not trained or in poor physical condition. If the rescuer has any object that floats, it is recommended that you shoot for the victim and then try to pull it to the margin, to open the airways that is the priority through the usual techniques, perform pulmonary ventilation, if indicated, perform the resuscitation Cardio Pulmonary (CPR) in the absence of carotid pulse and wait for specialized care (DINIZ *et al.*, 2000).

2.1.2.9. Cardiopulmonary resuscitation

Cardiopulmonary arrest is the sudden interruption of the pumping function of the heart, which expects the return of cardiac and cerebral function (DINIZ *et al.*, 2000).

Physical education can occur as a result of intense training, in which an individual can reach the limit of physical effort and consequently have a cardiorespiratory arrest.

The protocol of a cardiorespiratory resuscitation recommends checking if the victim is responsive, touching it and asking questions, after which a pulse must be verified through palpation in the carotid artery, and this evaluation of the victim should not last more than 10 seconds, then the rescuer should activate emergency services, start CPR through chest compressions, perform 30 heart compressions, at the rate of 100 compressions per minute, each breath cycle should be carried out 2 breaths, with a frequency of 30 heart compressions and 2 breaths. The pulse should be checked every 2 minutes, if there is no response, it should be continued with CPR, keeping the victim with the blood circulating until the specialized care reaches the place (RODRIGUES *et al.*, 2000).

2.2. Training of the Physical Educator

Article 3 of Resolution No. 7 of March 31, 2004 of the National Curricular Guidelines for Undergraduate Courses in Physical Education, at a full undergraduate level, deals with:

"Physical Education is an area of knowledge and academic-professional intervention that has the object of

study and application of human movement, focusing on the different forms and modalities of physical exercise, gymnastics, game, sport, struggle / martial art, dance, on the perspectives of prevention of health problems, promotion, protection and rehabilitation of health ... "

It is suggestion of the National Curricular Parameters - NCPs that are included as part of the academic first aid; the basic knowledge of bodily functioning and basic procedures for sanitizing superficial wounds; cold compresses on contusions; the control of superficial bleeds are knowledge of students and professionals in the field. In addition, it is recommended that students have a discernment of what is said physiologically when there are problems of greater complexity, recognizing then the need to seek help from specialized help, thus also acting as primary agents in human health.

"Souza and Tibeau (2008) report in their study that the majority of professionals interviewed stated that they had a discipline that dealt with first aid in their academic training, but the content was considered superficial. This made 60% of the interviewees seek a qualification in the area of first aid. "

According to Silva (2016), the majority of the interviewed professionals obtained the first aid discipline in their undergraduate degree, but the majority did not consider it enough to be effective in the face of a situation of urgency. For Bertini & Tassoni (2013) in the curricular matrices of physical education courses, after 1987, provided an arrangement to meet the need for almost exclusive professional training for school and another matrix for other functions attributed to the area of baccalaureate in physical education, outside the school, the reason for some degree courses in physical education have little workload in physiology and anatomy, as well as a slightly more superficial content on the subject, or with little practical applicability. However, according to Silva *et al.* (2011) the academic knowledge of human physiology is of fundamental primacy for a massive professional formation and, mainly, for the provision of a quality service by physical education for society. As well, the relation of scientific knowledge in Physiology with the professional performance of Physical Education, and other professionals of Sport, should be considered for the due process of training future professionals in the area.

3. JUSTIFICATION

Physical Education in Brazil was created in the mid-1940s, where professional training was strictly linked to military colleges, its origin was driven by practice through motor activity. It was attributed to the general and broad responsibility of nationalism where man should have a morally healthy body to represent the Brazilian youth, from these concepts was shaped the curriculum of physical education courses at the time. There was no basis for human motives and no compromise on the educational process, they only

formed professionals who were executors and repeaters. Consequently, disciplines overvalued the practice of motor activities, in contrast, today the professional of the area of physical education needs to possess the scientific knowledge allied to a set of theoretical and practical knowledge about the bodily functioning to perform a correct, effective and safe (GHILARDI 1998).

There was a vertiginous increase of students in search of physical activities for the most varied ends. Since at the beginning of modernity the body was associated with a machine, by this association it was reflected as a mechanism elaborated by principles that fed the gears of this machine, thus promoting its proper functioning. This transformation of the body into a machine made it possible to control, divide, reconstruct, study, manipulate and predict the functioning of the body, helping to decipher this in a more appropriate way. But changes in science and social paradigms have allowed for a better understanding of hylc functioning and its limits. Thus giving place to a more functional view of the body in detriment of the aesthetic (DANTAS 2011). Health became a priority, for example, the Ministry of Health through the Unified Health System created the health academy program that aims to promote physical practices and physical activities, as well as contribute to the production of care and healthy lifestyles (HEALTH PORTAL, 2014). Contrary to the infamous androgenic standards once imposed by society, which after paying a high price, through diseases caused by the misuse and management of the body, includes in this context the use of anabolic hormones with the premise of obtaining a body However, excessive use causes the most diverse side effects such as renal failure, cardiovascular events, jaundice, liver adenocarcinoma, among others (SILVA, 2002).

There was a need to adjust these standards to the nearest physiological one; aesthetic for each sex, and functional for the most diverse work activities imaginable. For these reasons, the National Health Council in 1997 created Resolution No. 218, which qualified the Physical Educator as a professional in the area of health, therefore being subject to the same duties, sanctions and obligations of any other professional of the area for human health, which advocate the knowledge of the peculiarities of the body and its functioning, as well as the minimum expertise of professionals in performing a Pre-Hospital Care. Therefore, the present study aims to analyze the degree of knowledge of the students about Physiology and First Aid, and to find out the orientation that they have had in their educational institutions, for the most varied situations that may occur in an emergency on a day to day basis. of the area.

The study brings as questionings, how important is the knowledge of the functioning of the body and the procedures of prompt care in the professional scope of a physical educator. As well as, what are the guidelines received in the faculty on these subjects and how they

can help in a situation of prompt care and to finalize what guidelines are given to the faculty members in relation to this topic.

4. GENERAL OBJECTIVE

To analyze the degree of knowledge about applied physiology and first aid, of the final students of the main faculties of the metropolitan region of Belém, of the Physical Education course of the State of Pará.

4.1. SPECIFIC OBJECTIVE

Check the competence of the students about human physiology and applied first aid through the application of a questionnaire.

Analyze the curriculum of the physical education courses, verifying if they have thematic axes on Human Physiology and First Aid in the discipline Pre-hospital Care or similar and what degree of subjective importance of this discipline, from the student's gaze.

5. METHODOLOGY

The research is descriptive and quantitative in nature, with the main objective of verifying the knowledge of physical education students about first aid.

The work will also verify the curriculum of each chosen educational institution, to determine if the institution has the discipline of physiology in a way applied to first aid, and whether the discipline is regular or optional.

An exploratory cross-sectional study will be carried out with the population composed of the students of the Physical Education course of the main Higher Education Institutions of the city of Belém do Pará, regularly enrolled in the academic semester of 2016. The sample will be composed by the final students of the undergraduate degree in physical education. After the acceptance of the coordinator of the Physical Education course and the consent of the Informed Consent Term of the students involved.

Data collection will be performed by an examiner with the application of the questionnaire developed by the authors of this study. This questionnaire was composed of 25 multiple choice questions, including the general aspects of applied physiology knowledge and first aid in prehospital care.

To obtain the data will be applied statistical, descriptive and inferential technique. The statistical package used for analysis will be used in Microsoft Excel.

6. RESULTS

From the survey made in the institutions of higher education (HEI) that had the physical education course, whether a baccalaureate degree or university, peculiarities were verified regarding the time load; the disciplines; the modality in which the discipline is offered; as well as whether the institution was public or private. As can be seen in Table 1 below:

Table 1: Survey of HEIs in Belém do Pará and their curricular characteristics.

Type IES	Course	Duration	Disciplines that have physiology applied to first aid	C.H.	Situation
Public I UFPA	Full Degree in Physical Education	8 semester	First aid	51 hours	Optional
Public II UEPA	Full Degree in Physical Education	8 semester	Does not have	Not applicable	Not applicable
Private I FAMAZ	Bachelor of Physical Education	8 Semester	Emergence in Physical Activities	80 hours	Required
Private II ESAMAZ	Full Degree in Physical Education	8 Semester	Does not have	Not applicable	Not applicable
Private III ESMAC	Bachelor in Physical Education	7 semester	Physical Education and Emergency Care	40 Hours	Required
Private IV UNAMA	Bachelor in Physical Education	8 semester	Prevention and Emergency in Physical Education	40 Hours	Required

From the listed institutions, in table 1, the following questionnaire was obtained: Public I, Public II and Private (PART). Thirty-six undergraduates, graduates of the Physical Education course of the main colleges of the metropolitan region of the city of Belém of Pará. Altogether, the three main colleges in the city of Belém participated in the study. The result was obtained through the average percentage of students' answers about the answers of the applied questionnaire.

As for the curricular formation, the students were asked if they had in their graduation some discipline of applied

physiology related to first aid. The result related to the public faculty I was that 68.75% of the graduates answered did not have the discipline in their curriculum, in contrast 31,25% said they have the discipline. It was observed, in Table 1, that in this institution the discipline is not mandatory, which shows this discrepancy in the result.

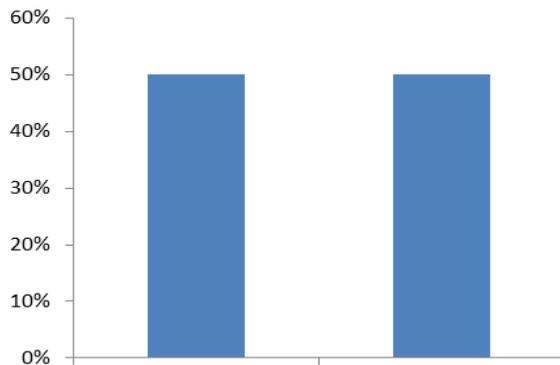
Following the same questioning, the results demonstrated by the undergraduate students of the Private Faculty I, resulted in a lack of knowledge of the discipline in their curriculum, confirmed by 50% say they do not have the

discipline, 40% of students affirm that they do not know the curriculum and 10% claim to have discipline. This result shows that the undergraduate students of this institution are not aware of the curricular design of the course, since this is a regular course within the course, as can be seen in table 1 above.

Finally, the same questioning made to Faculdade Publica 2 presented as a result, 90% of undergraduates said they did not have the discipline in their curriculum, while 10% said they had the discipline. Among the institutions that have released access, this is the only one that does not have the discipline in its curriculum, it is explained within other disciplines as a sub-topic without having much depth.

When questioned about the capacity to act in an emergency situation, according to Figure 1 below, the following result was obtained for Public School 1 (PUB1): 50% stated that they had this capacity, while another 50% stated that would not be able to proceed.

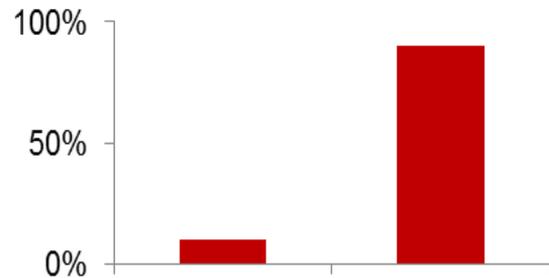
**Curricular training
PUB1**



Graph 1: Graph on percentage of individuals who reported being able to intervene in an emergency situation in the public faculty1.

Following the same questioning, the result of figure 2 below, for the Faculdade Private was that 90% of the graduates stated that they did not have the capacity to act in an emergency and 10% stated that they had this capacity.

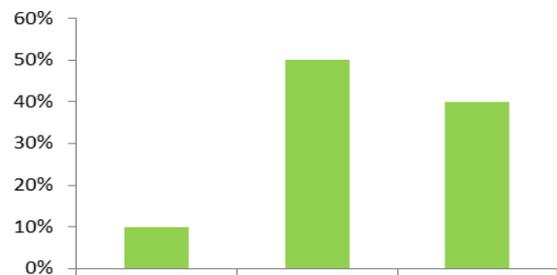
**Curricular training
PRIV.**



Graph 2: Graph on percentage of individuals who reported being able to intervene in an emergency situation in private college.

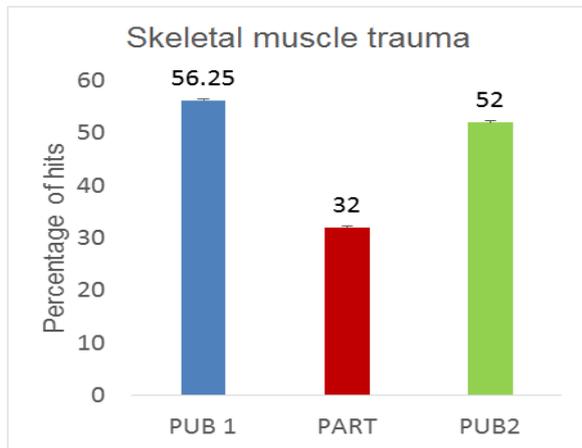
Finally, according to graph 3 below, Faculdade Publica 2 resulted in the affirmation where, 10% of undergraduates reported that they would be able to proceed in an emergency situation, while 50% of them responded negatively to this question and 40% of them affirmed that they would know how to proceed assertively by having knowledge outside the undergraduate degree.

**Curricular training
PUB2**



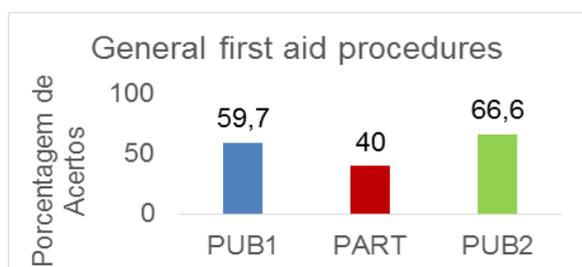
Graph 3: Graph on the percentage of individuals who reported being able to intervene in an emergency situation in the public faculty2.

Regarding the block of questions about the prehospital care protocol for Skeletal Muscle Trauma, the result, in figure 4, relevant for research was between the Public Faculty1 and the Private Faculty, in which the former had a mean of 3 questions in 5, totaling a percentage of 56.25% of hits. Whereas in the Private Faculty the average of correct answers in percentage was of 32%.



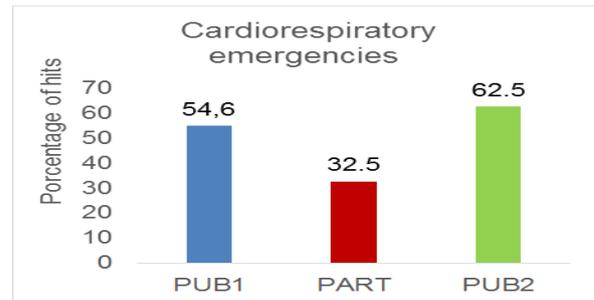
Graph 4: Graph on the percentage of correct block of skeletal muscle trauma, applied to the three main faculties.

Regarding the block of questions about the protocol of general procedures in first aid, it was obtained as a relevant result, in figure 5, a better use of Public Faculty2 in relation to the other two faculties, in which the difference of correctness occurred as follows, Faculdade Publica2 had in average 6 hits in a total of 9 questions, corresponding to a percentage of 66.66% of correctness. While the Public Faculty1 presented as an approximate mean of correct answers 5 questions in 9. Totaling a percentage of 59.72% of correct answers. In the Faculdade Private, an average of 4 hits was obtained, totaling a percentage of 40% of correct answers.



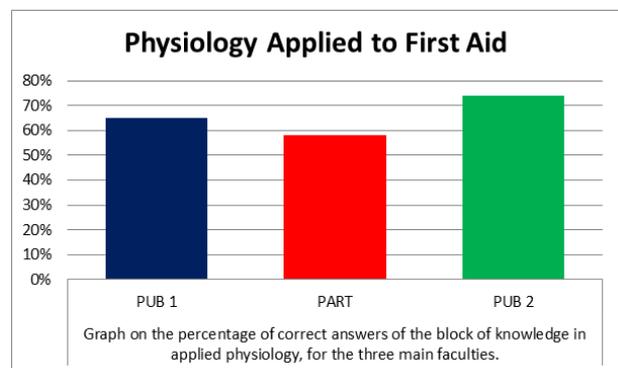
Graph 5: Graph on the percentage of correct answers of the Block of General First Aid Procedures, applied to the three main faculties.

For the block of questions about prehospital procedures related to cardiorespiratory emergencies, we obtained as a relevant result, in Graph 6 below, the difference between the Private Faculty, which obtained a mean percentage of 32.5% of correct answers and the Public School2, which presented a 62.5% average percentage of correct answers.



Graph 6: Graph on the percentage of correct answers for the block of Cardiorespiratory Emergencies, applied to the three main faculties.

And finally to the block of questions about knowledge in physiology applied to emergencies, it was obtained as a relevant result to the research, in chart 7 below, that all individuals answered more than half of the questions of the block. However, in the case of public schools, the percentage of errors in public education was 74%.



Graph 7: Graph on the percentage of correct answers of the block of knowledge in applied physiology, for the three main faculties.

7. DISCUSSION

After the systematic analysis of the most relevant results in each block of questions we could observe some standards when compared with the academic literature and some divergences. These will be explored below.

When verifying the curricular curriculum of the faculties in question, it is observed that Public and Private Faculties present the disciplines that are the focus of this study, being that in Public Faculty 1, the subject is an elective subject with a workload of 51 hours, and in the Faculdade Private the course is compulsory and has a workload of 80 hours. Public School 2 does not have any specific discipline that deals with applied physiology or related to first aid, the subject is treated within other disciplines in a very subjective way. However, from table 1, it can be observed that in the public faculty 1, 68.75% of undergraduates were not aware of the discipline in their curriculum and in the Private Faculty 1 half said they did not have the discipline, showing both faculties a certain lack of knowledge its own curriculum. In contrast, 90% of the graduates of Public School 2 were aware of the lack of subjects of this nature in their curriculum.

Corroborating this, Souza and Tibeau (2008) showed that there was a difference in the proportion of their study, since a percentage of 96% of individuals who reported having the existence of disciplines related to first aid were found as a result. In a very similar way, Siqueira (2011) in his study, pointed out that 100% of the individuals consulted were aware of the existence of disciplines that approached the first aid topic. This also diverged from Batista (2013), which revealed that 38.90% of respondents stated that they had knowledge of the existence of disciplines dealing with first aid. And in correlation with Siebra, Oliveira (2010), who stated in his research that 100% of the interviewees are unaware of the existence of disciplines that approach the first aid topic. For Sell (2010), 80% of the interviewees had knowledge of the first aid discipline offered in the Physical Education course.

When analyzing the results obtained, it was observed that the students enrolled in Public Faculty 1 and 2, showed more theoretical knowledge about the urgency and emergency attendance than the students of the other Faculty. This demonstrates that they gained knowledge during undergraduate courses through subject-related subjects, or participated in some course on the subject, or even struggled to learn alone in books and the internet. As can be seen in graphs 1, 2 and 3, which revealed that in the Public School 1 half of the individuals interviewed stated that they had the capacity to act in cases of urgency and emergency, as well as in Public School 2, where 50% of interviewed individuals demonstrated knowledge on how to act in these cases. Contradicting the 90% of the Private Faculty that affirmed not having the capacity to act in cases of urgency.

What differs from the results of Siebra, Oliveira (2010) who reported in their study that 66.6% of respondents do not have the knowledge necessary to act in an emergency situation. And with Siqueira (2011) who stated in studies that 70% of respondents feel prepared to act in an emergency.

Regarding the division of hits divided by the type of occurrence, it was noticed that there was a greater percentage of correctness of the students in relation to the occurrences that deal with the following subjects: Skeletal Muscle Trauma and Basic Procedures of First Aid; in relation to the occurrences that deal with cardiorespiratory emergencies, in which there was a lower rate of correctness, and a certain deficiency in this theme was observed by the undergraduate students evaluated. As can be seen in graphs 4, 5 and 6. In which graph 4, on the knowledge of questions about the prehospital care protocol for Skeletal Muscle Trauma, revealed that Public School 1 had a mean of 3 questions answered in 5, totaling a percentage of 56.25% of hits. Going against the findings of Dal-Bó (2013) revealed that 66.67% of the interviewees said they were not prepared to perform adequate pre-hospital care procedures for musculoskeletal trauma. As well as for

Bernardes *et al.* (2007) more than 34% of respondents did not say they were prepared to act in traumatic emergency care.

As in Graph 5, on the knowledge of questions about the protocol of general procedures in first aid, showed that Public Faculty 2 had in average 6 hits in a total of 9 questions, corresponding to a percentage of 66,6% of correctness, even not having related subjects in their curriculum. In contrast to the findings of Dal-Bó (2013), in which 57.1% of the individuals answered in a completely correct manner a theoretical questionnaire on the preparation to provide first aid in situations arising from emergency and first aid. For Tibeau (2008) 50% of the interviewees showed practical knowledge about general procedures or some minimum knowledge in emergency first aid. Also, in Chart 6, about prehospital procedures related to cardiorespiratory emergencies, it can be observed that Public School 2 presented the best percentage percentage with 62.5% of correct answers, compared to 32.5% of the Private Faculty and the 54.6% of Faculdade Publica 1, contrary to expectations, because it does not have exclusive disciplines that teach this type of knowledge applied in its curriculum. Corresponding to the findings of Dal-Bó (2013) in which 66.7% of the respondents answered correctly about the cardiorespiratory emergency protocols. According to Batista (2013), 72% of the interviewees showed knowledge about the correct performance of cardiorespiratory evaluation of vital signs in first aid.

After a systematic analysis it was observed that the results obtained from the interview of the students of the 3 Colleges showed that they can make correlations between physiology and first aid in more than 50% of the time. However, Faculdade Publica 2 presented 74% in the average percentage of correct answers to this block of knowledge, even though it did not have an exclusive first aid discipline in its curriculum, which showed that they must have obtained this information through their own studies or through during graduation.

This correlation with the findings of Guimarães (2014), in which 47% of respondents answered satisfactorily the questionnaire on morphofunctional knowledge. E de Conceição (2008), because in his study reported that the students interviewed about knowledge in physiology developed a better level of autonomy in relation to the execution of their physical activities and increased awareness of their limits when assessing levels of physical activity. What differs from Mendes (2007), showed that only 16% of the interviewees mentioned that the block on the functioning of the human body is the content that most attracted the attention of students interviewed. And yet Kogut (2012) reported in his study that the disciplines of anatomy and physiology, as well as others on body knowledge, were reported by a little more than 5% of the students interviewed as priority in their training. And even with an unorthodox theme in his study, Ulasowicz (2004) performed the evaluation by

questionnaires and showed that elementary school students already had knowledge regarding the anatomical part and physiology of the Cardiorespiratory System, but did not know how to relate to physical activity. Of the interviewees, 33.33% attributed the importance of this knowledge in a practical way to understanding and knowledge of their bodies, as well as matching more than half of the questions that were taught in an interrelated and practical way. As for Silveira and Moulin (2006), the signs of life are all signs that indicate the existence of life and are correlated with adequate human physiology. Sufficient to have a clear parameter of life measured by observation of respiration, heart rate, blood pressure, skin color, ability to move and state of consciousness. According to Batista (2013), the most assertive decisions are made, which optimize the physiological health conditions of the victims, so that 83.4% of the interviewees showed knowledge about the subject, and a questionnaire priority in prehospital care and can deduce aggravation due to accidents. What Godoy (2011) would not be new, since the author reports that even when you have disciplines on knowledge in applied physiology and first aid in the menu of physical education courses, they are almost always not fully applied to the reality of education physics, as well as in training given by other professionals, as well as in emergency and emergency literature used in these graduations. Corroborating with Ghirotto (1998), he noticed that, although there are subjects directly related to the subject, the lack of content orientation in 58% of the bibliographical references used, which focus on the medical, pathophysiological and sports medicine areas, limit learning prehospital care in physical education.

8. CONCLUSION

The Brazilian guidelines regulating Physical Education courses consider that the Physical Education professional should, above all, preserve the physical integrity of his / her student, so it is assumed that there is a mastery of the most basic knowledge of body functioning applied to pre-school attendance -hospital prone to situations where injuries may occur.

It should be remembered that the knowledge coming from Physiology can be applied directly in the professional daily life, thus offering support for activities applied in the areas of pre-hospital care and first aid. Such knowledge will guide and enable the physical education professional to elaborate interventions based on the physiological responses already studied, in the short, medium and long term to achieve the objectives listed. In addition to being able to measure, if necessary, these answers and if need also modify intervention strategies for each emergency.

Based on this premise, the present study concluded that the graduates of the Public Faculties of the metropolitan area of Belém are prepared to act in an emergency situation, whereas the undergraduate students of the Private Faculty need to seek a second contribution of

foundation outside of the graduation, in order to be able to act more appropriately in a pre-hospital care in case of emergency.

Of the Faculties observed in the study, only Faculdade Publica 2 does not have any subject related to the theme First Aid in its curriculum, however it was the college where the students reported having extra curricular knowledge about the subject. In Public School 1 the discipline that deals with the subject is elective, with that not all the participants of the research chose to look for the subject. In the Private Faculty the discipline that deals with the subject is obligatory, but was to the institution had a smaller performance among the institutions of higher education researched. Regarding knowledge in applied physiology 3 Faculties have demonstrated that they can make correlations between physiology and first aid in more than 50% of the time. With emphasis on Faculdade Publica 2, which presented 74% in the average percentage of correct answers about the knowledge in physiology.

Therefore, it is suggested to reengineer the physical education courses, with the suggestion of implementing a specific discipline, which combines expertise in prehospital care and applied physiology, in order to deal more holistically and efficiently with this problem. In order for the graduates to leave the university with the ability to act in the presence of an emergency and to perform a professional service in a more secure way. In addition to suggesting that this theme is only a starting point for future studies with this theme to condemn and change the paradigm of the action of the physical educator through emergency actions that users of their services may suffer.

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