ABSTRACT

**Objectives:** to describe the creation of teams of expertise in mobile emergency care services along highways in the region of Campinas. **Method:** this as a descriptive and exploratory study with pre-built instruments validated by experts applied to APH coordinators of concessionaires of the highway network in the region of Campinas. Data were stored in a computerized database through the MS Excel® 2000 program and analyzed through descriptive analysis. The project was approved by the Research Ethics Committee, Protocol No 674/201. **Results:** the sample of four coordinators, males, with an average age of 34.75 ± 6.9 years, and time elapsed since graduation between 3 and 19 years. The average number of professionals in the business was 10 doctors, 7 nurses, and 38 nursing technicians. The daily workday was from 12 to 24 hours. The average updating time was more than 12 months. **Conclusion:** the teams consist of doctors, nurses, and technicians. The material resources compiled with Ordinance 2048, assistance records were documented accordingly.

**Descriptors:** Communication Systems between Emergency Services; Emergency Medical Services; Nursing.

RESUMO

**Objetivos:** descrever a constituição das equipes de atuação nos serviços de atendimento móvel de urgência das rodovias da região de Campinas. **Método:** estudo descritivo e exploratório com instrumentos pré-elaborados e validados por especialistas, aplicado aos coordenadores do APH das concessionárias da malha rodoviária da região de Campinas. Os dados foram armazenados em banco de dados informatizados, por meio do programa MS Excel 2000® e realizada a análise descritiva. O projeto foi aprovado pelo Comitê de Ética em Pesquisa, Protocolo nº 674/201. **Resultados:** a amostra de quatro coordenadores, do sexo masculino, com média de idade 34,75 ±6,9 anos, tempo de formação de três a dezenove anos. Número médio de profissionais nas empresas foi dez médicos, sete enfermeiros, 38 técnicos de enfermagem. Jornada de trabalho diária de 12 a 24 h. O tempo de atualização médio foi acima de 12 meses. **Conclusão:** as equipes são constituídas por médicos, enfermeiros e técnicos. Os recursos materiais atendem a Portaria 2048, os impressos registram o atendimento adequadamente. **Descritores:** Sistemas de Comunicação entre Serviços de Emergência; Serviços Médicos de Emergência; Enfermagem.

RESUMEN

**Objetivos:** describir la constitución de los equipos de actuación en los servicios de atención móvil de urgencia de las carreteras de la región de Campinas. **Método:** estudio descritivo y exploratorio con instrumentos pre-elaborados y validados por especialistas, aplicado a los coordinadores del APH de los concesionarios de la red de carreteras de la región de Campinas. Los datos fueron almacenados en banco de datos informatizados, por medio del programa MS Excel 2000® y realizado el análisis descriptivo. El proyecto fue aprobado por el Comité de Ética en Investigación, Protocolo nº 674/201. **Resultados:** la muestra fue de cuatro coordinadores, del sexo masculino, con media de edad 34,75 ±6,9 años, tiempo de formación de tres a diecinueve años. El número medio de profesionales en las empresas fueron diez médicos, siete enfermeros, 38 técnicos de enfermería. Jornada de trabajo diaria de 12 a 24 h. El tiempo de actualización medio fue más de diecinueve años. **Conclusión:** los equipos son constituidos por médicos, enfermeros y técnicos. Los recursos materiales atienden al Decreto 2048, los impresos registran la atención adecuadamente. **Descripciones:** Sistemas de Comunicación entre Servicios de Emergencia; Servicios Médicos de Emergencia; Enfermería.
INTRODUCTION

The pre-hospital care (APH) is an emergency assistance with the goal of keeping the victim alive or as close to normality until arrival at the hospital. It also encompasses victims in acute state when the goal is to preserve functional conditions in injured organs and prevent adverse events during pre-hospital care including transportation from the scene of accident to the hospital.¹

General guidelines for a regionalized network of assistance to emergencies were elaborated to compose the text of Ordinance GM/MS No. 2048/2002, which lays down the principles and guidelines of State emergency and urgent systems, defines standards, operating criteria, classification and registration of emergency hospitals, and determines the creation of the Coordination Units of State System of Urgencies.¹²⁻³

Subsequently to this Ordinance the GM/MS No. 1863 and No. 1864 of September 29, 2003 Ordinances were created instituting the mobile pre-hospital component through the implementation of the Urgent Assistance Mobile Service - SAMU, its regulations, and centers of Education in emergencies.²⁴

In 2011, Ordinance 1600/2011 reformulated the National Policy on Attention to Urgencies and established the network of attention to urgencies in the SUS, 1601/2011 with guidelines for implantation of the Ready Assistance Unit (UPA) 24 h, and the set of urgent services 24 h from the attention to urgencies network. Ordinance 2395/2011 laid down the guidelines for the organization of the hospital component in the Attention to Urgencies Network (RAU) under the SUS.⁵⁻⁷

The concession of some highways in the State of São Paulo became under the domain of the Regulatory Agency for Public Services of Transportation of the State of São Paulo (ARTESP) by the complementary law No. 914/2002. The private mobile APH service was created in the roads belonging to the Concessions Program to provide assistance to victims of traffic accidents, which satisfies the requirements of ARTESP.⁸

The service of customer assistance (SAU) is predicted in the concession contract of highways that includes first aid and medical care to casualties and removal of victims to backup hospitals with qualified personnel.⁹⁻¹⁰

These services must, obligatorily, count on the Centers for Medical Regulations, regulation physicians, nursing staff, and pharmaceutical assistance (for cases of clinical care services).⁹⁻¹⁰

By contract, all administrators of highways have the assistance service free of charge to the user and rescue teams, with “ambulance” removal vehicles manned by doctors, nurses, nursing technicians, and driver/rescuer who performs the pre-hospital care in cases of accidents and sudden illness (clinical cases) in the stretch of the concession.⁹⁻⁵

This study identifies how the APH road mobile happens and serves as the bases for emergency services/hospital emergencies regarding planning and implementation of the sequence of care to victims assisted by these services. Considering that the APH-mobile in Brazil’s highways is a recent service and that in the region of Campinas four concessionaires took over the exploration of the road system, the study aims to:

- Describe the formation of teams of expertise in mobile emergency care services along highways in the region of Campinas.
- Check materials and equipment to assist in the occurrences present in the vehicles.
- Verify the contents of printed records from assistance events performed by the teams from the concessionaires.
- Identify how the communication between the pre-hospital care and the destination hospital is performed.

METHOD

Study conducted for obtaining the Master’s degree in health sciences by the Graduate Program of the Nursing College at the University of Campinas, conducted in the concessionaires along the highways in the metropolitan region of Campinas.

This was an exploratory descriptive research conducted in four Concessionaires of São Paulo Highways, in the region of Campinas, in the Customer Assistance Service (SAU).

The population/sample consisted of doctor or nurse professionals indicated by the representative of each of the companies. The inclusion criterion was the company belonging to the roads’ network in the region of Campinas and obtaining authorization and indication of at least one member of the professional category, nurse or doctor, from the APH mobile. The exclusion criteria were obtaining authorization from one member of the APH team who had not an advanced degree, not a doctor or nurse, and the company not belonging to roads’ network in the region of Campinas.

Two instruments were developed for data collection based on Ordinance GM No. 2048 of November 5, 2002¹, which regulates and
establishes the principles and guidelines of the Urgency and Emergency Systems. The first instrument named "Data about the scale of human and material resources" and the second named "Instrument of verification of contents in the assistance records", both submitted to content validation by four experts from the emergency area, which evaluated according to the presence or absence of criteria of comprehensiveness, objectivity, organization, and relevance defined by the researchers. These instruments also contained blank spaces for comments about the presence of necessary items that were absent, unneeded items, and comments and/or suggestions.

Permission for data collection was requested from the APH road mobile services of concessionaires before the study start. First, a contact via e-mail was conducted in July 2011 with the proper service in each of the participating companies to learn who was the responsible party to whom that request should be forwarded. The answers, with the names of those responsible returned almost after two months from the initial contact. In the possession of these names, letters with the authorization request were delivered personally to each of the representatives of the respective concessionaire.

The representative of each company, via email, scheduled the day, time, location, and who would hold the interview. One of the researchers attended the interview location, which took place in a private room of the Operation Control Center in each of the companies. Respondents were APH coordinators, who after proper clarification, received the instruments to fill in and inform about the items present in their services. The researcher remained in the environment for clarification of doubts.

The data were stored in a computerized database through the MS Excel® 2000 program and descriptive analysis was performed. The project was submitted to the Research Ethics Committee in the Institution in compliance with Resolution 196/96 from the National Health Council, and approved by the CEP No. 674/201 protocol.

**RESULTS**

The characteristics of the professionals who work in the studied concessionaires are described in Table 1.

The time of operation ranged from 3 to 9 years. The average time of the doctor's work was of two years and, of that of nurses, technicians, and nursing assistants was not answered. The average number of professionals is: 9.8 doctors, 7 nurses, 38.5 nursing technicians, and as for nursing assistants, two companies (B and D) did not have such professional, and two (A and C) did not respond; one of them (C), had 40 professionals hired as rescuers for work in the assistance of APH mobile whose trainings were as nurses, nursing assistants, or technicians.

The distribution of the daily work (hours) for the doctors at (A, C, and D) was of 24 h and in B, 12 h, while that of the nurses in A was of 24 h, in two concessionaires (B and D) was 12 h, and in C no response was provided. Nursing technicians worked on 12 h shifts in A and D. Nursing assistance worked 12 h shifts in (A, B, and D), and C did not report this professional.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Concessionaires</th>
<th>Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Age (years)</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>Professional training</td>
<td></td>
<td>Doctor</td>
</tr>
<tr>
<td>Institution</td>
<td>PUC</td>
<td>USP/RP</td>
</tr>
<tr>
<td>Time of work</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Time of graduation (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialization</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>PhD</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Residence in APH area</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>APH Specialization</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>APH Training</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Time of activity in APH</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>

Caption: S (yes), N (no), M (male)
The (A and B) companies had employees who worked in other places besides the APH service, also acting in hospitals. The one from C reported working in hospitals or in another SAMU, while the D referred not having double workdays. The A and B companies do not require experience in the field of APH while C and D have this requirement.

Table 2 presents the distribution of professional participation in continuing education courses and the respective elapsed time.

Table 2. Distribution of participation of professionals from concessionaires in continuing education courses and respective elapsed times. Campinas, 2012.

<table>
<thead>
<tr>
<th>Concessionaires</th>
<th>Variables</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Continuing education in BLS</td>
<td>Elapsed time (months)</td>
<td>12</td>
<td>24</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of employees</td>
<td>06</td>
<td>03</td>
<td>09</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Continuing education in ACLS</td>
<td>Elapsed time (months)</td>
<td>60</td>
<td>0</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of employees</td>
<td>0</td>
<td>09</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuing education in PHTLS</td>
<td>Elapsed time (months)</td>
<td></td>
<td>24</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of employees</td>
<td></td>
<td>0</td>
<td>09</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Continuing education in ATLS</td>
<td>Elapsed time (months)</td>
<td>48</td>
<td>12</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of employees</td>
<td>2</td>
<td>2</td>
<td>09</td>
<td>55</td>
</tr>
</tbody>
</table>

Concessionaires A, C, and D indicated having all materials in the airways package classified as material on oxygenation and ventilation. The B concessionaire did not indicate having jelly and "spray" lidocaine.

Materials for artificial circulation, in the package for venous access, were indicated by all coordinators. In the A concessionaire, items of macro and micro drop devices and Kocher forceps were not marked, in B, catheters specific for the dissection of veins in adult/child sizes, scissors, scalpel blades, three-way valve, and 3-way infusion equipment were indicated. In C, three-way valve, and in D, all items have been marked.

All concessionaires indicated having all materials in the childbirth package. Other materials used in emergency and/or emergencies and the percentage of items not marked ranged from 6.7% to 43.3% among companies. None indicated having the infusion pump with battery and equipment, in three of them (A, C, D), the folding wheelchair, children respirator (A, B, C), and suitable equipment for newborns (A, B, C) (Table 3).

Most of the medicines recommended by Ordinance No. 2048/2002 were indicated, except for: Dopamine and Dobutamine (A and B), Hydantoin (A, B, and D), Meperidine and Ketalar (B), and Lanatoside (C) absent at the A and D concessionaires.
All coordinators reported registering emergency care in two copies, filling the first in varied times and purposes; concessionaires A, C, and D provided copies to the destination hospital, except B. In A and D, any participant in the service can fill out the form, in B, only the doctor and nurse, the professional named rescuer could also fill assistance records.

The items that must be recorded were present in the forms from each concessionaire: the victim's identification, time and place of the accident, scene of the accident, type of trauma occurred, mechanism of trauma, types of procedures performed, professionals who participated in the assistance, and victim's destination are always present in these records.

**DISCUSSION**

National studies found in the literature 10-14 show that the age was between 22 and 47 years old, with predominance of performance of male professionals, time of performance from 3 to 14 years, with reports of professionals with expertise in the area, having more than one job, and weekly workload ranging from 20 to 40 hours.

The creation of APH teams pointed out in studies suggests that these are professionals who may be in evolutionary processes in their ability to act for the care of victims assisted in those services because the professional experience and maturity are related to time in exercising and training activities. It is noted that the APH services are partly in line with...
the legislation established by the policies of attention to urgencies and emergencies.

A study that assessed the socio-demographic aspects, health, lifestyle, and working conditions between professionals of SAMU in a municipality in the State of São Paulo, identified that almost half of employees (42.1%) had other employment, most of them, 38.3%, besides acting in SAMU, worked in another location related to health care in 80.5% of cases. This fact corroborates the variability duty scales present in the health sector allowing professionals to have more than one employment.15-16

According to Ordinance No. 2048/2002, emergencies do not constitute medical or nursing specialty; the same ordinance indicates that the attention given in undergraduate courses is insufficient to meet the demand for services and suggests that Education in Urgent care Centers be created for training, continuing education, and qualification of workers of pre-hospital care, and offers programmatic content and workload that ensure quality of learning.1

What can be observed in this research is that all companies had periodic trainings with varying time intervals, and in continuing education courses, the average time was long, i.e. more than 12 months. Employees who participated in BLS courses had average elapsed time of around 19 months. The participation in the ACLS course by six professionals showed inferior average in number and superior in time elapsed since the update (32 months), excluding company B, which did not have any participant. In the PHTLS course, the average of participants was 18 members, except in the A company that did not have it, with the average elapsed time of 24 months. In ATLS, the average participant was of 17 members with average elapsed time of approximately 27 months.

The participating concessionaires in this study had material and human resources for the service regulated by contractual standards, which must be suitably sized in function of the characteristics of the road system in which they operate in order to meet the minimum level of service expressed by the following indexes: average time of arrival at the accident scene, which must not exceed 10 (ten) minutes; average time to transport victims to the hospital not exceeding 20 (twenty) minutes, in 85% of cases considered for supervisory purposes, as stated in the ARTESP contracts. To ensure these requirements, contractors need to have trained/capacitated/updated staff who can act with speed and efficiency.8,18-19

In this study, the vehicles that provide care in these highways are partially equipped to comply with the established protocols of clinical and traumatic emergency care because some items are not present in these vehicles. In principle, the absence of materials and equipment do not directly endanger the lives of victims because there will be other material resources that could be replaced or provided quicker if the victim is sent to a hospital medical service.

By analyzing these concessionaires according to what is laid down in Ordinance No. 2,048/GM, it is possible to verify that, as for equipment and medicines, they are closely equipped for what is established and vehicles are defined in accordance with the National Policy for Assistance in Urgencies; as for human resources, functions for all professionals are adequate and they have appropriate training, however, not all are trained on ATLS. In general it is possible to identify concerns, from the coordinators’ answers, about continued improvement, implementation and monitoring, seeking excellence in the performance of activities, and integration with all the urgency and emergency system in force in the country.

The records of the emergency calls are performed by the concessionaires in two copies, filing the first one in the company. The need to document APH assistance must be stimulated and based on principles that guide the rules of knowledge and skills in the promotion of efficient and qualified health care.17,18-20

Considering that the number of respondents corresponded to the coordinators of APH in the concessionaires, one can envision that, from the information obtained, they are partially satisfactory to comply with the assumptions established by Ordinance No. 2048; victims who require pre-hospital care seem to receive proper mobile assistance. To obtain this information, further studies in relation to users’ profile, types of most frequent calls, referrals made to victims, and degree of satisfaction and/or efficaciousness attested by served users would be needed.

Based on the results and observations throughout the data collection in this research, it is suggested that new research on APH-mobile care be developed due to the limited number of studies present in the national and international literature focusing on victim’s assistance and resolution of each occurrence because this is a relatively new service.
CONCLUSION

The teams working in mobile emergency care services along the highways in the region of Campinas were composed of doctors, nurses, nursing technicians and assistants and professionals named rescuers.

The materials and equipment present in the vehicles partially comply with the requirements laid out in Ordinance No. 2048/2002; records of assistance show content that allows the appropriate information for receivers of victims and their follow up with the therapeutics. Communication between the APH and the destination location is conducted by the central control; when the victim is delivered, one of the record's copies is delivered.

REFERENCES


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