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Knowledge about first aid in different population groups in Boa Vista, Roraima

Conhecimento sobre primeiros socorros em diferentes grupos populacionais de Boa Vista, Roraima

Conocimientos sobre primeros auxilios en diferentes grupos de población en Boa Vista, Roraima

ABSTRACT

Introduction: Medical emergency situations require early recognition and appropriate initial interventions, making first aid knowledge essential for reducing complications and mortality. Despite its relevance to public health, studies indicate that a large portion of the lay population has lacks adequate preparedness to respond to common emergencies. **Objective:** To evaluate the level of knowledge regarding first aid among different population groups in Boa Vista, Roraima, Brazil. **Methods:** This cross-sectional, quantitative, and descriptive study was conducted with 316 participants distributed among users of a Primary Health Care Unit, high school students, nursing students, computer science students, and adults approached in the city center. A questionnaire consisting of 14 questions related to first aid was administered, and performance was classified as excellent, sufficient, or inadequate. **Results**: A statistically significant difference was observed among the evaluated groups ($p<0.05$). Nursing students achieved the highest scores, whereas high school students presented the lowest performance. Overall, the remaining groups demonstrated predominantly inadequate performance on the questionnaire. **Conclusions:** The findings reveal important gaps in first aid knowledge among different population segments, reinforcing the need for health education strategies in school, community, and primary health care settings.

Keywords: *Stroke; First aid; Knowledge.*

RESUMO

Introdução: As situações de emergências médicas exigem reconhecimento precoce e intervenções iniciais adequadas, sendo o conhecimento em primeiros socorros essencial para a redução de complicações e da mortalidade. Apesar de sua relevância para a saúde pública, estudos demonstram que grande parte da população leiga apresenta preparo insuficiente para atuar diante de emergências comuns**. Objetivo:** Avaliar o nível de conhecimento sobre primeiros socorros em diferentes grupos populacionais de Boa Vista, Roraima, Brasil. **Método:** Estudo transversal, quantitativo e descritivo, realizado com 316 participantes distribuídos entre usuários de uma Unidade Básica de Saúde, estudantes do ensino médio, estudantes dos cursos de enfermagem e ciência da computação, além de adultos abordados no centro da cidade. Foi aplicado um questionário composto por 14 questões relacionadas aos primeiros socorros, sendo o desempenho classificado em ótimo, suficiente ou inadequado. **Resultados:** Observou-se diferença estatisticamente significativa entre os grupos avaliados ($p<0,05$). Os estudantes de enfermagem apresentaram os maiores escores, enquanto os estudantes do ensino médio obtiveram os menores resultados. De maneira geral, os demais grupos avaliados apresentaram predomínio de desempenho inadequado no questionário. **Conclusão:** Os achados evidenciam lacunas importantes no conhecimento sobre primeiros socorros entre diferentes segmentos populacionais, reforçando a necessidade de estratégias de educação em saúde em ambientes escolares, comunitários e nos serviços de atenção básica.

Descritores: *Acidente vascular cerebral; Primeiros socorros; Conhecimento.*

RESUMEN

Introducción: Las situaciones de emergencia médicas requieren reconocimiento precoz e intervenciones iniciales adecuadas, siendo el conocimiento en primeros auxilios esencial para reducir complicaciones y mortalidad. A pesar de su relevancia para la salud pública, los estudios demuestran que gran parte de la población general presenta preparación insuficiente para actuar frente a emergencias comunes. **Objetivo:** Evaluar el nivel de conocimiento sobre primeros auxilios en diferentes grupos poblacionales de Boa Vista, Roraima, Brasil. **Método:** Estudio transversal, cuantitativo y descriptivo, realizado con 316 participantes distribuidos entre usuarios de una Unidad Básica de Salud, estudiantes de secundaria, estudiantes de enfermería y ciencias de la

computación, además de adultos abordados en el centro de la ciudad. Se aplicó un cuestionario compuesto por 14 preguntas relacionadas con primeros auxilios, clasificándose el desempeño como óptimo, suficiente o inadecuado. **Resultados**: Se observó una diferencia estadísticamente significativa entre los grupos evaluados (p<0,05). Los estudiantes de enfermería presentaron las puntuaciones más altas, mientras que los estudiantes de secundaria obtuvieron los menores resultados. En general, los otros grupos evaluados presentaron un predominio de desempeño inadecuado en el cuestionario. **Conclusión:** Los hallazgos evidencian importantes lagunas en el conocimiento sobre primeros auxilios entre diferentes segmentos poblacionales, reforzando la necesidad de estrategias de educación en salud en contextos escolares, comunitarios y de atención primaria.

Descriptores: *Accidente cerebrovascular; Primeros auxilios; Conocimiento.*

INTRODUCTION

Breast cancer is one of the most prevalent malignant neoplasms among women worldwide, representing an important challenge for public health systems[1]. In recent decades, advances in early diagnosis and therapeutic strategies have contributed to a significant increase in survival rates, contributing to increasing life expectancy after cancer treatment. This scenario has driven growing scientific interest to the health conditions of survivors, especially with regard to factors that may influence physical well-being and the risk of chronic diseases in the post-treatment period.

Studies show that women undergoing chemotherapy, radiotherapy or hormonal therapies can present important metabolic changes, including increased adipose tissue and reduced muscle mass. Among the aspects frequently observed after breast cancer treatment, changes in nutritional status and body composition stand out, with a prevalence of obesity and overweight[2].

Studies show that cancer and its treatments can lead to excess body fat, decreased lean mass, cardiotoxicity and other side effects[3]. These bodily changes can occur as a result of multiple factors, such as hormonal changes, reduced physical activity, changes in dietary patterns, and adverse effects associated with antineoplastic therapies, and a better understanding of dietary patterns can improve cancer-related outcomes for survivors of the disease[4].

The assessment of nutritional status traditionally uses the Body Mass Index (BMI) as the main anthropometric indicator. However, BMI has significant limitations, such as the inability to differentiate between muscle mass and fat, in addition to not considering the distribution of body fat, factors that can lead to inaccurate diagnoses[5]. In this context, methods that allow for a more detailed assessment of body composition become particularly relevant.

Bioelectrical impedance is widely used in clinical research because it allows estimates of fat mass, fat-free mass, and body fat distribution in a fast and non-invasive manner[5], helping to identify changes in muscle mass and adipose tissue, providing more accurate information about the body profile of the individuals evaluated.

This evaluation becomes particularly relevant in people who have already experienced a cancer diagnosis, as they commonly present bodily changes during treatment, which are related to metabolic changes induced by the tumor and also by the treatment itself[6]. Thus, the use of bioimpedance contributes to the early identification of excess adiposity or reduction of muscle mass, helping to direct nutritional interventions and rehabilitation strategies aimed at promoting health and improving metabolic conditions.

The characterization of the nutritional profile of breast cancer survivors is essential to guide care strategies and interventions aimed at health promotion. Early identification of changes in body composition can contribute to the prevention of chronic diseases and to the improvement of the nutritional status of these people[2]. In this context, the present study aimed to analyze the

nutritional profile of women survivors of breast cancer, evaluating anthropometric indicators and body composition parameters.

METHODS

This was a cross-sectional, quantitative, descriptive, and observational study that evaluated the level of knowledge regarding first aid, including the initial recognition of stroke, among distinct population groups in the municipality of Boa Vista, state of Roraima.

The study was approved by the Institutional Review Board (Ethics Committee on Research) of the Federal University of Roraima (opinion no. 7,024,196). All participants were informed about the research objectives, potential risks, and benefits, alongside guarantees of data confidentiality and anonymity. For participants under 18 years of age, the Informed Consent Form (Termo de Consentimento Livre e Esclarecido – TCLE) was signed by their legal guardians. All study stages adhered to the ethical guidelines established by Resolutions no. 466/2012 and no. 510/2016 of the Brazilian National Health Council.

Residents of the municipality of Boa Vista, Roraima, who met the inclusion criteria were invited to participate. The sample comprised 316 participants recruited through convenience sampling via personal invitations. Participants were categorized into five groups based on their population profile and recruitment site: users attending a Primary Healthcare Unit (UBS) (n=75), high school students from a public school (n=16), undergraduate nursing students from the Federal University of Roraima (n=75), undergraduate computer science students from the same institution (n=75), and adults approached in the city center (n=75).

The inclusion of distinct population groups aimed to compare first-aid knowledge levels among individuals with varying educational profiles and potential degrees of prior exposure to health-related content. Nursing students were selected because they receive formal academic training in healthcare, whereas computer science students represented university peers without specific health training; this comparison allowed us to evaluate whether higher education alone is associated with superior first-aid knowledge. High school students were enrolled to represent a younger population undergoing formal schooling and widely exposed to digital media. Lastly, primary healthcare unit users and individuals approached in the city center were included to represent different segments of the municipality's general population.

Inclusion criteria consisted of residence in Boa Vista, Roraima, and Brazilian nationality. Conversely, individuals aged 60 years or older and participants belonging to Indigenous populations were excluded due to sociocultural and linguistic specificities that would require a dedicated assessment instrument. The smaller sample size in the high school group stemmed from the requirement for legal guardians to sign the Informed Consent Form, which restricted the enrollment of eligible students into the study.

Data collection was performed using a structured questionnaire adapted from previously published literature to assess first-aid knowledge and initial stroke recognition. The instrument comprised 14 objective items: 11 addressing general first aid and three focused on stroke recognition. Questionnaire development was based on practical protocols for laypeople described in the Mobile Emergency Care Service (SAMU) Manual of the Municipality of São Paulo[16], the study by Pergola and Araujo on basic life support knowledge[4], and the investigation by Cruz et al. regarding public perception of emergency services[5].

The internal consistency of the first-aid subscale was evaluated using Cronbach's alpha coefficient with ordinal coding of responses (incorrect/unanswered = 0; partially correct = 1; correct = 2), yielding a value of α=0.879, indicating good internal consistency.

The administration of the instrument varied by recruitment site. At the UBS, participants completed the questionnaire in the waiting room prior to medical consultations. At the public school, high school students completed the instrument during a pre-scheduled period following authorization from their legal guardians. At the Federal University of Roraima, undergraduate students were approached in classrooms or academic settings and completed the questionnaire immediately after signing the Informed Consent Form. In the city center, participants were approached individually and completed the questionnaire upon providing consent.

Data collection was carried out by researchers previously trained in participant approach, standardized questionnaire administration, and clarification of doubts, aiming to minimize potential procedural bias.

For scoring standardization, responses were classified as correct or incorrect according to the criteria established in the source instruments. The level of first-aid knowledge was categorized into three levels: excellent (≥9 correct answers), sufficient (7–8 correct answers), and inadequate (<7 correct answers).

The analyzed variables included population group, total first-aid knowledge score, performance classification, and specific performance regarding initial stroke recognition (measured through items on risk factor identification, signs and symptoms, and emergency response procedures).

The collected data were tabulated into an electronic spreadsheet and subjected to statistical analysis using GraphPad Prism® software, version 6.0. First, the normality of data distribution was assessed using the Shapiro–Wilk test. Given the non-normal distribution of the knowledge scores, non-parametric tests were selected. Score comparisons among groups were performed using the Kruskal–Wallis test, followed by Dunn's post-hoc test for multiple comparisons when statistically significant differences were identified. Results were expressed as median and interquartile range (25th–75th percentiles). A significance level of 5% ($p<0.05$) was adopted.

RESULTS

Initially, the sociodemographic characterization of the sample was performed, as presented in Chart 1. A predominance of female participants was observed in the UBS, Nursing, and High School groups, whereas the Computer Science group showed a higher proportion of male participants. The parda (mixed-race) skin color/race predominated across all evaluated groups.

Chart 1 - Sociodemographic characterization of the sample according to the evaluated groups.

Variable	UBS (n=75)	Nursing students (n=75)	City Center (n=75)	High School (n=16)	Computer Science (n=75)
Age (mean ± SD)	36.2 ± 10.5	22.0 ± 3.4	29.3 ± 10.5	17 ± 0.0	21.6 ±4.5
Female sex, n (%)	51 (68.0%)	61 (81.3%)	42 (56.0%)	11 (68.8%)	9 (12.0%)
Parda color, n (%)	67 (89.3%)	46 (61.3%)	55 (73.3%)	12 (75.0%)	39 (52.0%)

Source: Survey data.

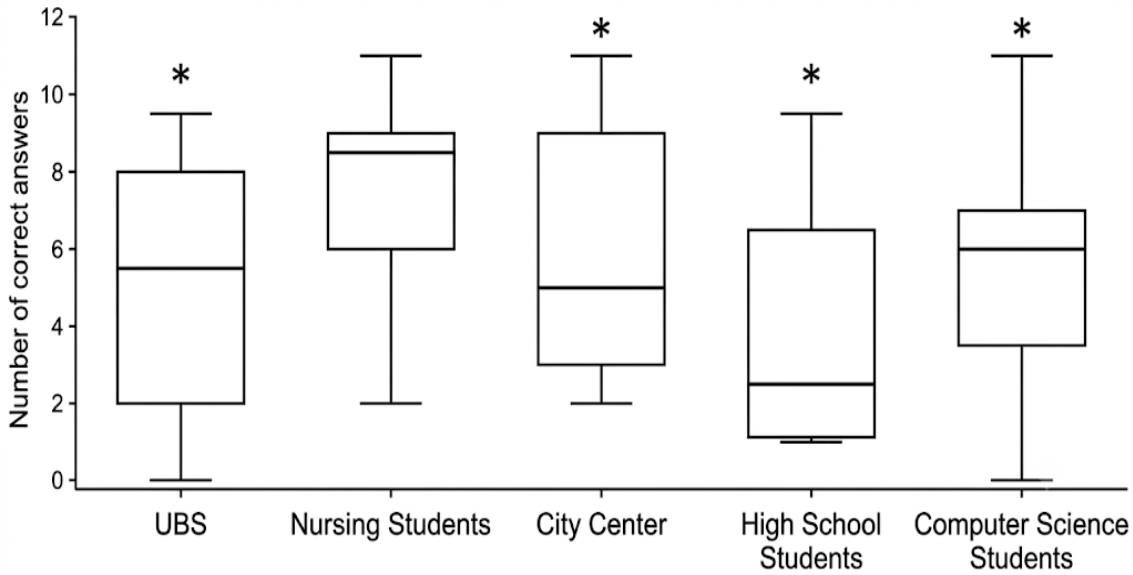
Subsequently, participants' performance on the first-aid knowledge questionnaire was evaluated. The analysis revealed a statistically significant difference in the number of correct answers regarding first aid among the evaluated groups ($p<0.05$). Nursing students presented the highest median of correct answers [8.5 (6.0–9.0)], while high school students presented the lowest scores [2.5 (1.1–6.5)] (Chart 2 and Figure 1).

Chart 2 - Comparison of general knowledge about first aid by group.

Group	Median (P25-P75)	n
UBS	5.5 (2.0 – 8.0*	75
Nursing students	8.5 (6.0 – 9.0)*	75
City Center	5.0 (3.0 – 9.0*	75
High School	2.5 (1.1 – 6.5)*	16
Computer Science	6.0 (3.5 – 7.0)*	75

Note: Maximum score = 11 points. Values expressed as median (25th–75th percentiles). Comparisons performed using the Kruskal–Wallis test, followed by Dunn's post-hoc test. *P<0.05 versus Nursing Students.

Figure 1 – First-aid knowledge scores.



Note: Maximum score = 11 points. Data are expressed as medians and interquartile ranges. Comparisons were performed using the Kruskal–Wallis test, followed by Dunn's post-hoc test. ∗p<0.05 versus undergraduate Nursing Students.

In Dunn's post-hoc test, it was observed that nursing students showed a significantly superior performance compared to the UBS, City Center, High School, and Computer Science groups ($p<0.05$ for all comparisons). No statistically significant differences were observed among the remaining groups.

In addition to the absolute score analysis, participants were classified into performance categories based on the number of correct answers obtained. A predominance of inadequate performance was observed across most evaluated groups, particularly among high school students (82%), computer science students (73%), City Center participants (65%), and UBS users (63%). The nursing group showed the highest proportion of performance classified as excellent (35%) (Chart 3).

Chart 3 - General classification of knowledge about First Aid.

Group	Excellent	Sufficient	Inadequate
UBS	10 (13%)	18 (24%)	47 (63%)
Nursing students	26 (35%)	25 (33%)	24 (32%)
City Center	21 (28%)	05 (07%)	49 (65%)
High School	01 (06%)	02 (12%)	13 (82%)
Computer Science	11 (15%)	09 (12%)	55 (73%)

Note: Data represents absolute (n) and relative (%) values. Excellent: ≥9 correct answers; Sufficient: 7–8 correct answers; Inadequate: <7 correct answers. n=75 for all groups, except high school students (n=16).

Complementarily, a descriptive analysis of the initial recognition of stroke was conducted, considering knowledge related to risk factors, signs/symptoms, and emergency procedures. A higher proportion of inadequate classifications was observed among the non-nursing groups, especially within the domain related to stroke risk factors (Chart 4).

Chart 4 - General classification of knowledge about risk factors, symptoms, and procedures in stroke.

Group	Domain	Excellent	Sufficient	Inadequate
UBS	Risk factors	21 (28%)	13 (17%)	41 (55%)
	Symptoms	18 (24%)	19 (25%)	38 (51%)
	Procedures	39 (52%)	00 (00%)	36 (48%)
Nursing students	Risk factors	32 (43%)	27 (36%)	16 (21%)
	Symptoms	49 (65%)	06 (08%)	20 (27%)
	Procedures	61 (81%)	00 (00%)	14 (19%)
City Center	Risk factors	15 (20%)	02 (03%)	58 (77%)
	Symptoms	03 (04%)	54 (72%)	18 (24%)
	Procedures	41 (55%)	00 (00%)	34 (45%)
High School	Risk factors	01 (06%)	00 (00%)	15 (94%)
	Symptoms	02 (12%)	04 (24%)	10 (64%)
	Procedures	06 (37%)	00 (00%)	10 (63%)
Computer Science	Risk factors	17 (23%)	15 (20%)	43 (57%)
	Symptoms	28 (37%)	30 (40%)	17 (23%)
	Procedures	48 (64%)	00 (00%)	27 (36%)

Note: Descriptive table. Data are rounded and represent absolute (n) and relative (%) values.

Nursing students demonstrated the highest levels of knowledge across all stroke-related domains assessed, particularly in emergency response measures (81% classified as excellent) and recognition of signs and symptoms (65% classified as excellent). Conversely, high school students showed the highest proportion of inadequate performance, especially regarding knowledge of stroke risk factors (94%).

DISCUSSION

The present study evaluated the level of knowledge regarding first aid, including the initial recognition of stroke, among distinct population groups in

the municipality of Boa Vista, Roraima. The results demonstrated a predominance of inadequate performance across most evaluated cohorts, highlighting substantial gaps in the population's readiness to initially recognize and respond to medical emergencies.

Nursing students achieved superior scores compared to the other groups, an expected outcome driven by their curricular exposure to core content regarding basic life support, pre-hospital care, and clinical simulations during their academic training. The inclusion of this specific segment aimed to establish a reference group with formal academic training in first aid.

Previous literature demonstrates that formal training in healthcare fields is associated with higher knowledge levels and greater confidence in responding to emergency situations[4]. However, more critical than the superiority observed in the nursing cohort was the high frequency of inadequate performance among the remaining population segments, particularly high school students, UBS users, and individuals surveyed in the city center.

These findings suggest important limitations in health literacy related to first aid, particularly in scenarios requiring rapid recognition and immediate decision-making. Previous literature demonstrates that a large portion of the lay population experiences difficulties in identifying common clinical emergencies and correctly contacting emergency medical services[17–19]. This scenario carries substantial public health implications, as delays in initiating proper first-aid measures can contribute to clinical deterioration, a higher burden of sequelae, and increased mortality.

Regarding the initial recognition of stroke, a high frequency of inadequate classifications was observed among non-nursing groups, primarily related to the identification of risk factors and warning signs. These findings align with national and international studies showing persistent low public awareness of stroke, despite its high burden of disease and mortality[20]. Given that stroke management is strictly time-sensitive, delays in early symptom recognition can drastically impair patients' functional prognosis.

From a regional perspective, these results assume additional relevance because they reflect the reality of a state situated in the Amazon region. This region is historically characterized by profound geographic, socioeconomic, and structural challenges, including substantial barriers and distances to access specialized healthcare services. Previous literature indicates that areas with lower densities of specialized infrastructure present heightened vulnerability to unfavorable outcomes in time-sensitive clinical conditions, such as stroke[21]. In this specific setting, adequate public knowledge concerning early symptom recognition and rapid help-seeking behavior becomes even more critical to overcome logistical and systemic obstacles.

Ultimately, the findings of the present study reinforce the urgent need to expand health education initiatives focused on first aid, both in school environments and within community spaces and primary care settings. Strategies involving hands-on training, clinical simulations, public campaigns, and

community-based interventions hold the potential to broaden public knowledge and optimize the initial response to medical emergencies[22].

Finally, certain limitations must be acknowledged when interpreting these findings. First, the cross-sectional design precludes the establishment of causal relationships among the analyzed variables. Furthermore, the convenience sampling approach limits the generalizability of the results to the entire population of the municipality. Lastly, the reduced sample size within the high school cohort stemmed from low compliance among legal guardians regarding the return of the signed Informed Consent Form, a constraint that should be factored into the overall data interpretation.

CONCLUSION

In conclusion, the present study identified significant variations in first-aid knowledge levels among the evaluated population groups in the municipality of Boa Vista, Roraima, with a predominance of inadequate performance across most analyzed groups. Nursing students achieved the highest scores, likely reflecting their formal academic exposure to basic life support and initial emergency management content.

These findings highlight substantial gaps in first-aid literacy and early emergency recognition among different population segments, reinforcing the urgent need for strengthened health education strategies in community, school-based, and primary care settings.

Furthermore, this investigation contributes to public health by providing baseline data on first-aid knowledge in the population of Boa Vista, thereby supporting the planning of targeted educational interventions tailored to this regional context.

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