

# Knowledge of the nursing team in the measurement of blood pressure in the screening

**RESUMO** | Objetivo: avaliar o conhecimento da equipe de enfermagem sobre a técnica correta de mensuração da Pressão Arterial. Método: Trata-se de um estudo descritivo, exploratório, com abordagem quantitativa, aprovado pelo Comitê de Ética em Pesquisa sob protocolo CAAE nº 42130720.2.0000.5587, realizado em instituições públicas de saúde do norte de Mato Grosso, avaliando 34 profissionais de enfermagem; utilizando um questionário validado para analisar o conhecimento dos profissionais. Resultados: o conhecimento dos enfermeiros e técnicos de enfermagem foram semelhantes, os maiores erros foram sobre a definição de pressão arterial, identificação dos sons de korotkoff, preparo dos materiais, largura do manguito, método palpatório, auscultatório e sobre os fatores que podem superestimar a pressão. Os maiores acertos foram sobre preparo do paciente e os fatores que podem contribuir nos erros de leitura. Conclusão: os profissionais de enfermagem têm déficit de conhecimento prático e teórico sobre a verificação da pressão arterial, sugerindo programas de capacitação.

**Descritores:** Pressão Arterial; Enfermeiros e Enfermeiras; Técnicos de Enfermagem; Conhecimento.

**ABSTRACT** | Objective: to evaluate the nursing staff knowledge about the correct technique for measuring blood pressure. Method: This is a descriptive, exploratory study, with quantitative approach, approved by the Research Ethics Committee under protocol CAAE nº 42130720.2.0000.5587, conducted in public health institutions in northern Mato Grosso, assessing 34 nursing professionals; using a validated questionnaire to analyze the professionals' knowledge. Results: the knowledge of nurses and nursing technicians was similar, the biggest errors were about the definition of blood pressure, identification of korotkoff sounds, preparation of materials, cuff width, palpatory and auscultatory method and about the factors that can overestimate the pressure. The greatest hits were about patient preparation and the factors that may contribute to reading errors. Conclusion: nursing professionals have a deficit of practical and theoretical knowledge about blood pressure checking, suggesting training programs.

**Keywords:** Blood Pressure; Nurses; Nursing Technicians; Knowledge.

**RESUMEN** | Objetivo: evaluar los conocimientos del personal de enfermería sobre la técnica correcta de medición de la presión arterial. Método: Se trata de un estudio descriptivo, exploratorio, con enfoque cuantitativo, aprobado por el Comité de Ética de la Investigación bajo el protocolo CAAE nº 42130720.2.0000.5587, realizado en instituciones de salud pública del norte de Mato Grosso, evaluando a 34 profesionales de enfermería; utilizando un cuestionario validado para analizar los conocimientos de los profesionales. Resultados: los conocimientos de las enfermeras y de los técnicos de enfermería fueron similares, los mayores errores fueron sobre la definición de la presión arterial, la identificación de los ruidos de korotkoff, la preparación de los materiales, la anchura del manguito, el método palpatorio y auscultatorio y sobre los factores que pueden sobrestimar la presión. Los mayores aciertos fueron sobre la preparación del paciente y los factores que pueden contribuir a los errores de lectura. Conclusión: los profesionales de la enfermería tienen un déficit de conocimientos prácticos y teóricos sobre la verificación de la presión arterial, lo que sugiere programas de capacitación.

**Palabras claves:** Tensión arterial; enfermeros; técnicos de enfermería; conocimientos.

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## INTRODUCTION

**B**lood Pressure (BP) is characterized as the pressure that blood exerts on the wall of an artery, measured in millimeters of mercury (mmHg).<sup>1</sup> Blood pressure is essential to maintain the circulation of blood in the human body, it is what conditions the oxygen necessary to supply tissues, organs and human life, however, in values above normal, it causes great harm to health and even death.<sup>2</sup>

The prevention and adequate management of diseases and morbidity and mortality are fundamental points in the early diagnosis of altered BP values, thus reducing costs in the care of chronic pa-

tients and offering them a better quality of life.<sup>3</sup>

One of the consequences of uncontrolled BP is the development of Systemic Arterial Hypertension (SAH), which is a highly prevalent disease and is considered a risk factor for the development of renal and cardiovascular diseases. Early diagnosis is essential for the initiation of treatment, which has an arsenal of diverse, effective drugs with few side effects, yet its control is a challenge because it is a disease that is often asymptomatic, making early detection difficult.<sup>4</sup>

SAH is a chronic disease that affects 30% of the adult world population, there are still 700 million people with untreated hypertension, and it is still the main reversible cause of morbidity and mortality.<sup>5-6</sup> In Brazil, Hypertension is a public health problem affecting 30% of the population, this catastrophic data is related to difficulty in diagnosis, lack of adequate treatment, difficulty in following the medications and prescribed regimen.<sup>7</sup>

In this sense, the nursing team is very important, among the strategies for BP control are the interventions carried out that have shown to be promising, with actions aimed at patient care, including performing the Blood Pressure Measurement correctly.<sup>8</sup>

Clinically, within the Basic Health Units and in hospitals, the responsibility for measuring blood pressure is the responsibility of the nursing team, thus, the correct measurement of Blood Pressure is of great benefit to the continuing education service and training organizations. The figure of the nursing professional in the monitoring of patients with hypertension is of great importance, mainly being the main educational motivator of the entire team according to their attributions, promoting correct actions based on scientific evidence.<sup>9</sup>

Incorrectly checking blood pressure can cause unnecessary actions to the patient, such as unnecessary treatments, in addition, it can lead to a delay in diagnosis, which can lead to the onset of car-

diovascular diseases, cause irreversible consequences and even death.<sup>10-11</sup>

It is estimated that few studies describe the failures of the nursing team in the verification of BP. Therefore, the objective was to evaluate the knowledge of the

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nursing team about the measurement of blood pressure.

#### METHOD

This is a descriptive, exploratory research with a quantitative approach, through a questionnaire with closed

questions about sociodemographic characteristics and questions about blood pressure measurement through a validated instrument with questions about knowledge about the blood pressure measurement technique.<sup>12</sup>

The universe of this study was ten Basic Health Units and two Hospital Units in the northern region of Mato Grosso, the sample consisted of n=34 nursing professionals, with n=17 nurses and n=17 nursing technicians.

The inclusion criteria for this research were: Nurses and Nursing Technicians who are part of the permanent staff of Basic Health Units and Hospital Units in the North of Mato Grosso and who work in screening with at least one year of experience. The exclusion criteria were nurses and nursing technicians who were absent on the day of data collection due to absenteeism in general.

Data collection took place upon approval of the Ethics and Research Committee with Human Beings, the data collected were through the following sociodemographic information: age, sex, level of training, time of professional experience and place of work.

The questionnaire was applied on the premises of the establishment, in a reserved room free of noise, the time for filling out the questionnaire will be approximately thirty minutes in the morning and afternoon periods. Data collection was carried out over a period of one month.

Data were tabulated in the Statistical Package for Social Sciences (SPSS) software version 19.0 for Windows and statistically treated as absolute frequency, relative frequency, mean and percentage, and will be presented in the form of tables.

The participants were approached and invited to participate in the research within the basic unit and the hospital unit, after being given guidelines regarding the objective of the research and all of them signed the Free and Informed Consent Term (FICT). This research

was approved by the Ethics Committee and Research with Human Beings, as determined by Resolution No. 466 of December 12, 2012 of the National Health Council, according to No. CAAE: 42130720.2.0000.5587.

**RESULTS**

N=34 (100%) nursing professionals participated in the research, being n=17 (50%) Nursing Technicians and n=17 (50%) Nurses. Most aged between 31-40 years 38.2%, most had between 11 and 20 years of experience with 35.2%, the majority 70.5% worked in a Basic Health Unit, with a predominance of females around 82.4%.

It is shown in Table 1 the ratio of the correctness index of the professionals' knowledge about the measurement of Blood Pressure.

When analyzing the nurses' knowledge, there is a deficit regarding the definition of blood pressure (11.8%), factors that can overestimate blood pressure values (17.6%), on Korotkoff sounds (29.4%), definition of the auscultatory method (29.4%), on the palpatory method (35.3%), respectively. The best results of the nurses were on the preparation of the client with (76.4%) and on the factors that can interfere in the measurement of blood pressure (82.4%).

Table 2 shows the continuation of the questionnaire about the correctness rate of the professionals' knowledge about the measurement of Blood Pressure.

When analyzing the knowledge of nursing technicians, the deficits were about the palpation method (11.8%), identification of reading errors (11.8%), definition of the necessary materials (17.7%), factors that may overestimate pressure (23.6%), identification of the auscultatory method (29.4%), dimensions between the width and length of the cuff, as well as the definition of blood pressure, both with (35.3%).

The best results were on patient

**Table 1 – Knowledge questionnaire on the Blood Pressure Measurement Technique. Northern region of Mato Grosso, Mato Grosso, Brazil, 2021**

Questions	Nurses		Nursing Technician	
	n	(%)	N	(%)
1 – Blood pressure is determined by the pumping efficiency of the heart and the degree of resistance to blood flow offered by the vascular system.	2	11,8	6	35,3
2. Regarding the Korotkoff sounds, it is correct to say that they are heard during the measurement of blood pressure resulting from the variation of pulsatile flow:	5	29,4	5	29,4
3 – The materials necessary for the ideal performance of indirect blood pressure measurement are: stethoscope, sphygmomanometer, measuring tape, cotton with antiseptic and material for recording.	7	41,2	3	17,7
4 – The arteries that can be used for the indirect verification of blood pressure are: pedal, radial, brachial and popliteal.	8	47,1	7	41,2
5 – The dimensions of the width and length of the inflatable bag of the cuff must correspond to, respectively, 40% and 80% of the circumference of the arm.	8	47,1	6	35,3
6 – When preparing the client to perform the indirect technique of blood pressure measurement, it is necessary to ask if the client does not have a full bladder, if they have not practiced physical exercises between the last 30 and 90 minutes, if they have not consumed alcoholic beverages, coffee, food or smoked in the 30 minutes before the measurement.	13	76,4	9	52,9

Source: authors data, 2021

preparation (52.9%), nursing records (52.9%) and factors that may interfere with blood pressure measurement (70.5%).

**DISCUSSION**

The accuracy of blood pressure measurement is essential for early and safe diagnosis, adequate treatment and definition of associated risk factors, for this it is necessary to have a trained and qualified team for the correct measurement.<sup>13</sup>

In this study there was a predominance of females (82.4%), this factor was already expected and addressed in other studies. The Federal Nursing Council portrays the profile of nursing professionals, mostly women, however, it is important to emphasize that the male gender is in gradual ascendancy, establishing a male trend in the category as well.<sup>14</sup>

A prevalence of young adults aged between 31-40 years and with between 11 and 20 years of professional experience was obtained. Currently, studies report similar data, such as a mean of 37.3 years and a median of 36 years of age, as well as the definition of the average time of profession 21.7 years, it is considered that professionals are in the maturation phase, including full professional development.<sup>15-16</sup>

Another study carried out with 68 nurses from a university hospital in the

state of São Paulo found that 75% could not theoretically correctly distinguish the Korotkoff sounds, however, about 22% managed to get the beats ratio to last until the zero point, one should estimate the DBP in the muffled sounds and record the result of SBP, DBP and zero, according to the recommendations of the VII Brazilian Hypertension Directive (2016).<sup>17-18</sup>

Despite these difficulties, even ignored, it is necessary that the nursing professional has theoretical and practical knowledge and becomes able to perform the BP measurement correctly, in addition to routinely adhering to preventive and diagnostic actions for probable irregular pressure signs.<sup>19</sup>

Another factor evaluated were the factors that can overestimate BP values, with low results for nurses (17.6%) and nursing technicians (23.6%). In a study with 108 pregnant women in São Paulo, it was found that the cuff width influenced the overestimation and underestimation of blood pressure values, which could trigger a false diagnosis.<sup>20</sup>

Selection of suitable materials can also interfere with BP verification. One study describes that patient preparation and selection of appropriate materials is essential to avoid reading errors and enable a more reliable BP verification. The use of protocols that aim to standardize blood pressure measurement can be useful in clinical practice, in order to help nursing professionals if they have doubts about the procedure, however its implementation is still a challenge due to time and space limitations.<sup>21</sup>

High error rates by nurses and nursing technicians were evidenced in the identification of the auscultatory and palpatory method. BP measurement is essential for SAH diagnoses, correct measurement is an essential standard and is one of the most performed procedures in health units, both hospitals and basic health units, especially in triage and by the nursing team.<sup>22</sup>

The nursing technicians presented

**Table 2 – Knowledge questionnaire on the Blood Pressure Measurement Technique. Northern region of Mato Grosso, Mato Grosso, Brazil, 2021**

Questions	Nurses		Nursing Technician	
	n	(%)	N	(%)
7 – Regarding the palpatory method of indirect blood pressure measurement, it is incorrect to say that it allows the precise determination of diastolic blood pressure.	6	35,3	2	11,8
8 – Regarding the auscultatory method of checking blood pressure, it is correct to say that the cuff should be deflated slowly with a speed of 2 to 4 mmHg per second and, after determining the systolic pressure, increase the speed to 5 to 6 mmHg per second.	2	29,4	5	29,4
9 – Observer-related factors that contribute to blood pressure reading errors, knowledge gaps, both in technical and anatomo-physiological aspects, decrease in auditory acuity, incorrect interpretation of Korotkoff sounds and decrease in visual acuity.	14	82,4	12	70,5
10 – To avoid blood pressure reading errors resulting from the sphygmomanometer and stethoscope, it is necessary, except: to raise the device above the level of the heart when measuring blood pressure	8	47,1	2	11,8
11 – Factors may overestimate blood pressure values, except: Excessive pressure of the stethoscope on the artery, causing partial obstruction of blood flow.	3	17,6	4	23,6
12 – In the nursing record regarding blood pressure measurement, it is incorrect to round blood pressure values to digits ending with zero or five.	8	47,1	9	52,9

Source: authors data, 2021

unsatisfactory results on the dimensions between the width and length of the cuff.

The best results were on records and factors that may interfere with BP measurement. The literature found different results, in a quasi-experimental study, with a sample of medical records, in the emergency room of a hospital in São Paulo, evaluated 354 records, and found that only 0.6% of the medical records had recorded the circumference of the arm and in another 0.6% there were notes of the limb used. No records were found reporting the position and dimensions of the cuff during the BP measurement.<sup>23</sup>

Observing the knowledge deficits of nursing professionals regarding blood pressure measurement, a practice so widespread and used in health units, it

emphasizes the importance of training and continuing education aimed at improving the technical and scientific knowledge of professionals focused on this practice.

One of the limitations of this study is the small number of professionals who made up the research sample, due to the limitation of the study site. Another limitation was due to local data, which may be related to the regional characteristics of nursing professionals' work.

**CONCLUSION**

This research identified that nursing professionals are predominantly female, formed by young adults, with an average time of professional activity and with a lack of knowledge about the measure-



ment of blood pressure.

It is noticed that nursing professionals have little theoretical knowledge, which directly influences the practice. These data are worrying as it is one of the most performed procedures by the

nursing team in health units.

In view of these findings, it is suggested that professionals be encouraged to seek professional training and that health managers enable permanent education that address the subject, which is

often underestimated. It is suggested that more research be carried out with the aim of delineating, with more precision, the knowledge of nursing professionals that predisposes to BP measurement errors. 🐦

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