Analysis of Nursing Team Knowledge About Phlebitis and Its Related Factors

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Abstract

Phlebitis is one of the local complications related to intravenous therapy, which must be managed by the nursing team. This study analyzed the knowledge of the nursing team about phlebitis and its main risk factors, prevention, and control measures. This is a cross-sectional study with a quantitative design carried out with 124 nursing professionals from a Brazilian university hospital. The data collection was carried out between the period of August 2018 to July 2019 for that, the researchers applied a multiple-choice questionnaire. The results showed the equivalence of the three nursing categories in terms of knowledge about phlebitis, however, there was a discrepancy concerning the phlebitis visualization scale, use of warm compresses, dressings, chemical properties of the solutions and factors intrinsic to the patient. The need to implement permanent education among professionals became evident.

Keywords: Intravenous therapy; Nurses' knowledge; risk factors; phlebitis;

1. Introduction

Phlebitis is a local complication of peripheral intravenous (IV) therapy, a technical-scientific process performed by the nursing team, which consists of the insertion of a peripheral venous catheter (PIVIC). Its classification is mostly ordered by visual scales, with Visual Infusion Phlebitis (VIP) being the most commonly used (MILUTINOVIC et al., 2015; GOULART et al., 2020).

There are several risk factors associated with the appearance of phlebitis, such as the duration of PIVIC, gender, the intrinsic characteristics of the patient, as well as the chemical properties of the drugs. According to the main cause, phlebitis can be classified as mechanical, biological, chemical, or post-infusional phlebitis (URBANETTO et al., 2017).

For the Infusion Nurses Society, the phlebitis rate for a given population must be less than or equal to 5% to guarantee harm reduction. Nevertheless, this rate is very variable between countries, and this scenario is also seen among studies of Brazilian institutions with rates of 5%, 25.8%, 31.6%, and 55.6%, showing values much higher than what is considered safe (URBANETTO et al., 2017; YING et al., 2019)

Considering that the nursing team is responsible for the care of peripheral intravenous (IV) therapy, from insertion to maintenance of the PIVIC, it is essential that professionals know and put into practice the

appropriate care, to prevent and reduce adverse events related to the use of peripheral devices and consequently ensure patient safety (HOSSAIN et al., 2016).

Adherence to strategies that enable the reduction of errors during the medication process and the management of peripheral accesses are attitudes that must be considered by those in management positions (WELYCZKO, 2020), such as offering opportunities for continuing education, adequate dimensioning, the purchase of devices that follow the recommended guidelines and even the installation of time protocols for changing the device and choosing the insertion location (MILUTINOVIC et al., 2015).

Knowledge about the appropriate techniques and the early identification of risk factors for the development of phlebitis can considerably reduce hospital stay, expenses with materials and, mainly, reduce the incidence of phlebitis and other complications in the same proportion as it increases patient safety (MILUTINOVIC et al., 2015).

For this reason, this study analyzed the knowledge of the nursing staff of a Brazilian university hospital, using a multiple-choice questionnaire on phlebitis and its main risk factors, prevention, and control measures.

2. Method

A unicentric, quantitative and cross-sectional study was carried out with nursing professionals from three clinics (pneumology, medical clinic, and infectious-parasitic diseases) of a Brazilian University Hospital linked to the Unified Health System (SUS) in Belém-Pará, Brazil, among the period from August 2018 to July 2019.

The sample was chosen by the probabilistic method, the population of 178 nursing professionals from the three clinics was used for the sample calculation, 95% confidence level, and 5% margin of error were considered. Inclusion criteria were (i) age over 18, regardless of gender; (ii) to be an effective civil servant or Consolidated Labor Laws (CLT) employer, and (iii) accept to participate in the study. The exclusion criteria included: professionals on leave or vacation or not working in the three mentioned clinics.

A total of 124 nursing professionals were included in the study, among them 21 nurses, 75 nursing technicians, 14 nursing assistants and 14 did not inform the professional category. The rate of refusal to study was 30%.

Data collection was performed according to the availability of each participant in the three work shifts. The applied questionnaire was adapted from Lanbeck et al., (2004), it contains 13 questions allocated in two domains: characterization of the participants and variables related to phlebitis, its average time of completion was 15 minutes by the participants. The questionnaire was adapted with the inclusion of three questions related to the knowledge of the VIP scale, the correlation of the degree of phlebitis to the manifested signs and symptoms, and the adoption of management measures when phlebitis was identified.

The Epi Info^{TM} software, version 7.2.2.6, was used for descriptive analysis. The descriptive statistics methods used in this study were: measures of central tendency (arithmetic mean) and measures of variability (standard deviation) for numerical variables. To assess the association between epidemiological characteristics and the team's knowledge about phlebitis concerning the professional category, Fisher's exact tests, and the G test were used, according to the specific criteria of each test. The significance level of 5% was used for all work. Statistical analyzes were performed on Bioestat 5.3.

The study met the legal ethical requirements in force in Resolution No. 466/2012 of the National Health Council and was approved by the research ethics committee of the Research Center for Oncology at the Federal University of Pará, under protocol 2.730.246.

3. Results

3.1 Sample characterization

The sample consisted of 124 participants, 21 (16.9%) of whom were nurses, 75 (60.5%) technicians, 14 (11.3%) assistants and 14 (11.3%) did not inform their professional category. The hospital unit that had the largest number of patients was the clinic for infectious and parasitic diseases holding 40.3% of the total sample. Table 1 below shows the main characteristics related to professionals.

Table 1. Sample characterization

Variables	Frequency (n=124)	%
Category		
Nurse	21	16.9
Technician	75	60.5
Assistant	14	11.3
Not reported	14	11.3
Sector		
Medical clinic	44	35.5
Infectious and parasitic diseases	50	40.3
Pneumology	27	21.8
Not reported	3	2.4
Genre		
Feminine	85	68.5
Male	27	21.8
Not reported	12	9.7
Age		
23 to 29	4	3.2
30 to 39	27	21.8
40 to 49	35	28.2
50 to 59	15	12.1

> = 60	2	1.6
Not reported	41	33.1
Years of work experience		
< 1 year	8	6.5
1 to 5	6	4.8
6 to 10	13	10.5
11 to 20	33	26.6
> 20 years	16	12.9
Not reported	48	38.7
Employment bond		
CTL employer	59	47.6
Civil servant	49	39.5
Others	5	4.0
Not reported	11	8.9

Source: collection data, 2018-2019.

Among the professionals, the majority had a formal contract 59 (47.6%), with a predominance of the female gender 85 (68.5), whose ages ranged from 23 to 60 years, with an average mean age of 42.7 years (±8, 43).

The education of the participants was shown in table 2, and revealed that more than 50% of the technicians and assistants answered that they had a college degree; the percentage of specializations ($p = 0.0219$), master's and doctorate degrees was higher in the nurses' class.

Table 2. Education level by professional category

	Nurse n (%)	Technician n (%)	Auxiliary n (%)	Not reported n (%)	P Value
University graduate					
Yes	20 (95.2)	36 (48)	7 (50)	5 (35.7)	-
Not informed	1 (4.8)	39 (52)	7 (50)	9 (64.3)	
Residency/specialization					
Yes	12 (57.1)	9 (12)	1 (7.1)	0 (0.0)	0.0219*
No	8 (38.1)	26 (34.7)	6 (42.9)	5 (35.7)	
Not informed	1 (4.8)	40 (53.3)	7 (50)	9 (64.3)	
Master					
Yes	5 (23.8)	3 (4.0)	0 (0.0)	1 (7.1)	0.1304
No	15 (71.4)	31 (41.3)	7 (50)	4 (28.6)	
Not informed	1 (4.8)	41 (54.7)	7 (50)	9 (64.3)	
Doctorate					
Yes	1 (4.8)	0 (0.0)	0 (0.0)	0 (0.0)	0.5751
No	19 (90.5)	34 (45.3)	7 (50)	5 (35.7)	

Not informed	1 (4.8)	41 (54.7)	7 (50)	9 (64.3)
Total	**21 (100)**	**75 (100)**	**14 (100)**	**14 (100)**

Source: collection data, 2018-2019. * Statistical significance.

3.2 Knowledge of phlebitis prevention and control measures by professional category

Table 3 related the professional categories to the knowledge of phlebitis prevention and management, practices commonly used by the category in daily work and crucial to mastering this theme.

Table 3. Knowledge of the nursing team in relation to phlebitis prevention and control measures.

	Nurse n (%)	Technician n (%)	Auxiliary n (%)	Not informed n (%)	P Value
Knowledge about the VIP Scale					
Yes	4 (19.0)	18 (24)	2 (14.3)	1 (7.1)	0.6101
No	13 (61.9)	37 (49.3)	8 (57.1)	6 (42.9)	
Not informed	4 (19)	20 (26.7)	4 (28.6)	7 (50)	
Correlation of the degree of phlebitis with its signs and symptoms (correct answers)					
0	0(0.0)	4(5.3)	0(0.0)	1(7.1)	1.000
1	1(4.8)	6(8.0)	0(0.0)	0(0.0)	
2	3(14.3)	5(6.7)	2(14.3)	0(0.0)	
3	3(14.3)	9(12.0)	3(21.4)	1(7.1)	
4	0(0.0)	0(0.0)	0(0.0)	1(7.1)	
5	12(57.1)	15(20)	1(7.1)	3(21.4)	
Not informed	1(4.8)	2(2.7)	1(7.1)	0(0.0)	
Not applicable	1(4.8)	34(45.3)	7(50.0)	8(57.1)	
Type of infusion that reduces the risk of phlebitis					
Bolus	5 (23.8)	17 (22.7)	1 (7.1)	1 (7.1)	0.5164
Short term	14 (66.7)	43 (57.3)	8 (57.1)	10 (71.4)	
Not report	0 (0.0)	2 (2.7)	3 (21.4)	1 (7.1)	
Do not know	2 (9.5)	13 (17.3)	2 (14.3)	2 (14.3)	
Infusion speed that reduces the risk of phlebitis					
10 to 15 min	3 (14.3)	9 (12)	1 (7.1)	2 (14.3)	0.3773
16 to 30 min	1 (4.8)	10 (13.3)	2 (14.3)	0 (0.0)	
31 to 60 min	4 (19.0)	18 (24.0)	7 (50)	6 (42.9)	
Greater than 60 min	11 (52.4)	29 (38.7)	3 (21.4)	4 (28.6)	
Not informed	2 (9.5)	9 (12)	1 (7.1)	2 (14.3)	
Dilution of irritating drug to reduce phlebitis risk					
Sterile water					
Yes	7(33.3)	26(34.7)	7(50.0)	9(64.3)	0.5523
No	11(52.4)	35(46.7)	5(35.7)	4(28.6)	
Unwritten	3(14.3)	12(16.0)	2(14.3)	1(7.1)	

Do not know	0(0.0)	2(2.7)	0(0.0)	0(0.0)	
Saline solution					
Yes	6(28.6)	20(26.7)	3(21.4)	1(7.1)	0.8604
No	12(57.1)	41(54.7)	9(64.3)	12(85.7)	
Unwritten	3(14.3)	12(16.0)	2(14.3)	1(7.1)	
Do not know	0(0.0)	2(2.7)	0(0.0)	0(0.0)	
5% glucose					
Yes	3(14.3)	11(14.7)	2(14.3)	2(14.3)	0.9879
No	15(71.4)	50(66.7)	10(71.4)	11(78.6)	
Unwritten	3(14.3)	12(16)	2(14.3)	1(7.1)	
Do not know	0(0.0)	2(2.7)	0(0.0)	0(0.0)	
Conduits					
Warm compress					
Yes	13 (61.9)	45 (60)	13 (92.9)	8 (57.1)	0.0042*
No	7 (33.3)	28 (37.3)	0 (0.0)	4 (28.6)	
Not informed	1 (4.8)	2 (2.7)	1 (7.1)	2 (14.3)	
Cold compress					
Yes	16 (76.2)	53 (70.7)	13 (92.9)	11 (78.6)	0.8651
No	1 (4.8)	2 (2.7)	1 (7.1)	2 (14.3)	
Not informed	4 (19)	20 (26.7)	0 (0.0)	1 (7.1)	
Medicines prescribed for the management of phlebitis					
Yes	6 (28.6)	7 (9.3)	0 (0.0)	2 (14.3)	0.0219*
No	14 (66.7)	66 (88.0)	13 (92.9)	10 (71.4)	
Not informed	1 (4.8)	2 (2.7)	1 (7.1)	2 (14.3)	

Source: collection data, 2018-2019. * Statistical significance.

Limited knowledge was noted regarding the VIP scale and its gradation to phlebitis. An imbalance of knowledge was identified between the categories related to daily practices to reduce the risk of phlebitis, the type of infusion of short duration, and the speed of infusion.

Regarding the conduct, the professionals indicated having some attitude towards phlebitis, with non-pharmacological measures being the most expressive as a warm compress among all classes (p = 0.0042). Nevertheless, medication management was disregarded by most professionals (p = 0.0219).

3.3 Knowledge of the nursing team regarding the main risk factors for phlebitis

The professionals were asked about the main risk factors related to the patient, the type of material used for infusion, as well as the characteristics of the drugs administered. Table 4 shows these results considering the participant's correct or incorrect.

Table 4. Knowledge of the nursing team regarding risk factors for phlebitis

	Nurse n (%)	Technician n (%)	Auxiliary n (%)	Not informed n (%)	P Value
Duration of catheter stay					
Correct	1(4.8)	1(1.3)	0(0.0)	0(0.0)	0.6466
Incorrect	19(90.5)	70(93.3)	14(100)	14(100)	
Not informed*	1(4.8)	4(5.3)	0(0.0)	0(0.0)	
Skillful vein					
Correct	18(85.7)	59(78.7)	12(85.7)	13(92.9)	0.6642
Incorrect	1(4.8)	8(10.7)	1(7.1)	0(0.0)	
Not informed*	1(4.8)	4(5.3)	0(0.0)	1(7.1)	
Do not know	1(4.8)	4(5.3)	1(7.1)	0(0.0)	
Risk factor (dressing)					
Correct	18(85.7)	33(44.0)	6(42.9)	5(35.7)	0.0042*
Incorrect	2(9.5)	33(44.0)	5(35.7)	8(57.1)	
Not informed	0(0.0)	2(2.7)	1(7.1)	0(0.0)	
Do not know	1(4.8)	7(9.3)	2(14.3)	1(7.1)	
Risk factor for phlebitis performed on the catheter					
Short cateter					
Correct	16(76.2)	59(78.7)	12(85.7)	13(92.9)	0.7817
Incorrect	5(23.8)	16(21.3)	2(14.3)	1(7.1)	
Long cateter					
Correct	3(14.3)	13(17.3)	3(21.4)	2(14.3)	0.8692
Incorrect	18(85.7)	62(82.7)	11(78.6)	12(85.7)	
Large gauge					
Correct	18(85.7)	68(90.7)	14(100)	13(92.9)	0.2307
Incorrect	3(14.3)	7(9.3)	0(0.0)	1(7.1)	
Small gauge					
Correct	6(28.6)	16(21.3)	2(14.3)	5(35.7)	0.6066
Incorrect	15(71.4)	59(78.7)	12(85.7)	9(64.3)	
Plastic cateter					
Correct	6(28.6)	33(44)	6(42.9)	8(57.1)	0.4394
Incorrect	15(71.4)	42(56)	8(57.1)	6(42.9)	
Metal cateter					
Correct	19(90.5)	73(97.3)	14(100)	14(100)	0.3472
Incorrect	2(9.5)	2(2.7)	0(0.0)	0(0.0)	
Risk factor for phlebitis performed at catheter location					
Forearm					
Correct	18(85.7)	58(77.3)	10(71.4)	11(78.6)	0.5777
Incorrect	3(14.3)	17(22.7)	4(28.6)	3(21.4)	

Hand

Correct	17(81.0)	64(85.3)	10(71.4)	12(85.7)	0.4919
Incorrect	4(19.0)	11(14.7)	4(28.6)	2(14.3)	

Wrist

Correct	21(100)	73(97.3)	13(92.9)	14(100)	0.5053
Incorrect	0(0.0)	2(2.7)	1(7.1)	0(0.0)	

Antecubital fossa

Correct	21(100)	72(96)	14(100)	13(92.9)	0.428
Incorrect	0(0.0)	3(4.0)	0(0.0)	1(7.1)	

Factor that increases the risk of phlebitis related to patients

Male gender

Correct	21(100)	74(98.7)	13(92.9)	13(92.9)	0.5006
Incorrect	0(0.0)	1(1.3)	1(7.1)	1(7.1)	

Female gender

Correct	13(61.9)	29(38.7)	5(35.7)	6(42.9)	0.1502
Incorrect	8(38.1)	46(61.3)	9(64.3)	8(57.1)	

Advanced age

Correct	16(76.2)	36(48.0)	8(57.1)	8(57.1)	0.0676
Incorrect	5(23.8)	39(52.0)	6(42.9)	6(42.9)	

Children

Correct	15(71.4)	67(89.3)	11(78.6)	13(92.9)	0.1458
Incorrect	6(28.6)	8(10.7)	3(21.4)	1(7.1)	

Obesity

Correct	15(71.4)	57(76)	10(71.4)	11(78.6)	0.8832
Incorrect	6(28.6)	18(24)	4(28.6)	3(21.4)	

Malignity

Correct	1(4.8)	7(9.3)	2(14.3)	2(14.3)	0.6474
Incorrect	20(95.2)	68(90.7)	12(85.7)	12(85.7)	

Cachexia

Correct	9(42.9)	65(86.7)	11(78.6)	11(78.6)	0.0005*
Incorrect	12(57.1)	10(13.3)	3(21.4)	3(21.4)	

Rheumatic disease

Correct	19(90.5)	73(97.3)	13(92.9)	12(85.7)	0.4757
Incorrect	2(9.5)	2(2.7)	1(7.1)	2(14.3)	

Alcoholism

Correct	18(85.7)	70(93.3)	13(92.9)	13(92.9)	0.6051
Incorrect	3(14.3)	5(6.7)	1(7.1)	1(7.1)	

Respiratory insufficiency

Correct	11(52.4)	32(42.7)	4(28.6)	2(14.3)	0.0885
Incorrect	10(47.6)	43(57.3)	10(71.4)	12(85.7)	

Immobilization

Correct	7(33.3)	9(12.0)	2(14.3)	2(14.3)	0.1056
Incorrect	14(66.7)	66(88.0)	12(85.7)	12(85.7)	

Arterial failure

Correct	19(90.5)	61(81.3)	9(64.3)	12(85.7)	0.1821
Incorrect	2(9.5)	14(18.7)	5(35.7)	2(14.3)	

Thromboembolism

Correct	5(23.8)	41(54.7)	6(42.9)	3(21.4)	0.0393*
Incorrect	16(76.2)	34(45.3)	8(57.1)	11(78.6)	

Diabete mellitus

Correct	8(38.1)	28(37.3)	4(28.6)	9(64.3)	0.809
Incorrect	13(61.9)	47(62.7)	10(71.4)	5(35.7)	

Infectious disease

Correct	14(66.7)	58(77.3)	11(78.6)	14100)	0.6085
Incorrect	7(33.3)	17(22.7)	3(21.4)	0(0.0)	

Risk factor (drugs)

High pH

Correct	16(76.2)	54(72.0)	10(71.4)	11(78.6)	0.925
Incorrect	5(23.8)	21(28.0)	4(28.6)	3(21.4)	

Low pH

Correct	7(33.3)	1(1.3)	1(7.1)	1(7.1)	0.0004*
Incorrect	14(66.7)	74(98.7)	13(92.9)	13(92.9)	

High concentration

Correct	15(71.4)	55(73.3)	9(64.3)	12(85.7)	0.8009
Incorrect	6(28.6)	20(26.7)	5(35.7)	2(14.3)	

Low concentration

Correct	21(100)	73(97.3)	13(92.9)	14(100)	0.5053
Incorrect	0(0.0)	2(2.7)	1(7.1)	0(0.0)	

Low osmolarity

Correct	1(4.8)	6(8.0)	1(7.1)	0(0.0)	0.8849
Incorrect	20(95.2)	69(92)	13(92.9)	14(100)	

High osmolarity

Correct	13(61.9)	65(86.7)	12(85.7)	12(85.7)	0.584
Incorrect	8(38.1)	10(13.3)	2(14.3)	2(14.3)	

Warm fluid

Correct	21(100)	70(93.3)	13(92.9)	13(92.9)	0.3313
Incorrect	0(0.0)	5(6.7)	1(7.1)	1(7.1)	

Cold fluid

Correct	20(95.2)	73(97.3)	14(100)	14(100)	0.6844
Incorrect	1(4.8)	2(2.7)	0(0.0)	0(0.0)	

Documentation routine for PIVIC insertion					
Correct	20(95.2)	67(89.3)	12(85.7)	13(92.9)	0.8726
Incorrect	1(4.8)	6(8.0)	1(7.1)	0(0.0)	
Do not know	0(0.0)	2(2.7)	1(7.1)	1(7.1)	

Source: collection data, 2018-2019. * Statistical significance.

Responses regarding the duration of PIVIC's stay were wrong in all categories (> 90%), although they considered using their coverage as a risk factor (p = 0.0042). There was a divergence in the recognition of cachexia as a risk factor between categories (p = 0.0005). Also, it was found that thromboembolism (p = 0.0393) and low pH were not listed by most professionals in the categories as an important risk factor (p = 0.0004) for phlebitis.

4. Discussion

In this study, there was a predominance of females among professionals, which corroborates the profile found in previous studies (SANTOS et al., 2020; BUGS et al., 2017; FURUKAWA et al., 2017; PAULA et al., 2017; MACHADO et al., 2016; SOUZA and TEIXEIRA, 2015). The largest of the participants were nursing technicians, followed by nurses and last nursing assistants, data similar to previous study (SANTOS et al., 2020; MACHADO et al., 2016).

The majority age group was between 40 and 49 years old, it is noteworthy that professionals aged 36 to 50 years are in the full development of their cognitive abilities (MACHADO et al., 2016). The age group above 50 years stands out here, which corresponds to 13.7%, in agreement with the profile of professionals from all over Brazil, which indicates that 14.4% of nursing professionals are over 50 years old (MACHADO et al., 2016).

It was evident that, although more than 50% of nursing technicians and assistants have degrees, most have no specialization, unlike the scenario among nurses. It is worth noting that professional qualification directly influences the level of knowledge about intravenous therapy (LAMSAL et al., 2019), and this perspective is also observed in the studies by Milutinovic et al., (2015).

As for non-pharmacological management, the warm compress was the most cited by the participants (p = 0.0042), and the cold compress also had a high rate of indication. These data demonstrate that there is a divergence in conduct among professionals. Welyczk (2020) argues that warm compress associated with elevation of the limb and administration of medications is effective in pain management, application of heat contributes to the vasodilation of the vessels, reducing symptoms of discomfort and friction of the device in the endothelium (ANNISA et al. , 2017; BARBOSA et al., 2016; WELYCZKO, 2020). While Gauttam and Vati (2016) report similar results between warm or cold compresses, however, cold compresses had immediate effects in reducing signs and symptoms.

Therefore, there is a divergence in the literature and scarcity on the subject so commonly used in clinical practice by nursing. Although effective, the compresses are insufficient to treat phlebitis alone, requiring their association with herbal medicines or other therapeutic modalities, to reduce the risk of progression to thromboembolism (BARBOSA et al., 2016; WELYCZKO, 2020; GOULART et al., 2020; ZHENG et al., 2014).

Even in the absence of statistical significance, it is worth noting the alarming fact that most participants do not know the VIP scale, results similar to the study by Alves et al., (2019). This knowledge is imperative in nursing, as it seeks the early identification of risk factors, classification of phlebitis for proper management, and reduction of complications (INOCÊNCIO et al., 2017).

In Brazil, national recommendations indicate that PIVIC should not be routinely changed in less than 96 hours (BRASIL, 2017). However, the results of this research indicated that professionals follow routine substitutions similar to the results of other studies (LI et al., 2016; YING et al., 2019). Current evidence indicates that the indication for replacement should be supported by clinical evaluation (palpation and inspection) and patient complaints (VENDRAMIM et al., 2019; OH et al., 2020). In this sense, there must be constant updating of professionals in the face of new studies.

Interestingly, the assessment of the dressing as a risk factor for phlebitis was highly considered among professionals ($p = 0.0042$) similar to the studies by Li et al., (2016) and Milutinovic et al., (2015). Recognition of this practice is of paramount importance, as non-sterile and non-transparent coverings favor mechanical and/or infectious phlebitis (SALGUEIRO-OLIVEIRA et al., 2019), although the insertion of the recommended technologies depends on available institutional resources (CORLEY et al., 2019).

The conditions intrinsic to the patient must be previously known by the nursing team for the best handling of the catheter (BITENCOURT et al., 2018). Here, thromboembolism and cachexia were not recognized as a risk factor by most participants, it is believed that these results are linked to empirical factors, since there is a lack of studies on this correlation (LI et al., 2016; ALVES et al., 2015).

Therefore, the perception and ability of nursing to recognize risk factors improves the quality of patient care, as well as reducing complications (WELYCZKO, 2020). In this perspective, knowledge of the pharmacological properties of drugs is a determining factor in increasing vigilance during care. Despite this, most professionals did not recognize this aspect regarding low pH in this study.

It is known that pH and osmolarity increase the risk of chemical phlebitis, especially when administered in a smaller caliber. Thus, it is essential to recognize that adequate hemodilution of these drugs reduces the risk of phlebitis (YING et al., 2019; WELYCZKO, 2020). However, the professionals' lack of knowledge about this variable was also identified in the studies by Li et al., (2016).

The nursing team is primarily responsible for infusional therapy, which requires manual skills, professional competence, and risk identification to plan the best care. Therefore, this care practice must be based on evidence and the updating of the professionals must be permanent for decision-making regarding the management of PIVIC (HOSSAIN et al., 2016; LAMSAL and SHRESTHA, 2019).

The limitations of this study refer to (i) the use of a non-validated questionnaire, (ii) the rate of refusal to study, and (iii) the absence of some answers in the questionnaires, which can induce the occurrence of bias. In addition, literature is scarce in terms of assessing the knowledge of this professional, especially when assessed in the categories of nursing and their skills.

5. Conclusion

Phlebitis is one of the most recurrent complications in intravenous therapy, and its management, prevention, and treatment are under the responsibility of nursing. Our study is relevant, as it was the first to assess the limited knowledge about phlebitis among the different Brazilian nursing categories. Second, it proved to be a clinical practice that was distant from scientific evidence and good care practices for venous therapy by PIVIC, mainly directed at the prevention and management of phlebitis.

Third, the refusal to participate in the study may be related to the fear of making mistakes or a high level of self-confidence. Finally, this study revealed the emergency need for continuing education in the service to improve care. Thus, additional studies are needed on the subject.

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