OBJN
ONLINE BRAZILIAN JOURNAL OF NURSING
ISSN: 1676-4285

ORIGINAL

Advanced Nursing Practice: experience report of an infusion therapy team

Prática Avançada de Enfermagem: relato de experiência de um time de terapia infusional

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Submission: 12/19/2023
Approved: 06/04/2024

ABSTRACT

Objective: To report the experience of the infusion therapy team of a university hospital regarding their duties and the expansion of their activity scope in advancing to advanced nursing practice. **Method:** This is an experience report of the Infusion Therapy Team in a university hospital. **Results:** The Infusion Therapy Team aims to implement the safest and most suitable type of venous device for each patient and conduct training and monitoring activities. Besides, they develop enhanced competencies and skills to address complex needs within the institution, where advanced, specific, and pioneering practices have transformed clinical practice. **Conclusion:** The team's experience converges towards the concept of Advanced Nursing Practice by expanding their practice boundaries, focusing on user needs, and adopting a clinical approach based on robust scientific evidence applicable to the institutional context.

Descriptors: Evidence-Based Nursing; Advanced Practice Nursing; Vascular Access Devices; Catheterization, Peripheral.

RESUMO

Objetivo: relatar a experiência do time de terapia infusional de um hospital universitário acerca de suas atribuições e da ampliação do escopo de suas atividades no progredir para a prática avançada de enfermagem. **Método:** trata-se de um relato de experiência do Time de Terapia Infusional em um hospital universitário. **Resultados:** o Time de Terapia Infusional busca implementar o tipo de dispositivo venoso mais seguro e adequado para cada paciente, além de realizar atividades de capacitação e monitoramento, desenvolver competências e habilidades ampliadas com a atuação em necessidades complexas da instituição na qual práticas mais avançadas, específicas e pioneiras transformaram a prática clínica. **Conclusão:** A experiência do time supracitado converge para o conceito de Enfermeira de Prática Avançada por meio da expansão dos limites de sua prática, com foco nas necessidades dos usuários e de atuação clínica baseada em evidências científicas robustas e aplicáveis à realidade institucional.

Descritores: Enfermagem Baseada em Evidências; Prática Avançada de Enfermagem; Dispositivos de Acesso Vascular; Cateterismo Periférico.

INTRODUCTION

The International Council of Nurses (ICN) defines an Advanced Practice Nurse (APN) as follows: "A nurse who has acquired an expert knowledge base, complex decision-making skills, and clinical competencies for expanded practice, whose characteristics are shaped by the context and country in which they are certified to practice. A master's degree is recommended for entry-level"[1].

It should be noted that the regulation of this professional role is specific to each country and institutionalized according to local health needs. In the United States of America (USA), for example – a federation whose states have autonomy to legislate – the expansion of Advanced Practice Nursing (APN) occurs distinctly across different states. In that

How to cite: Souza D de OM de, Lins SM de SB, Cavalcanti AL da S, Tomaz CPR. Advanced Nursing Practice: experience report of an infusion therapy team. Online Braz J Nurs. 2024;22 Suppl 2:e20246725. https://doi.org/10.17665/1676-4285.20246725

country, as of 2023, 30 states had the so-called Full Practice, meaning that certified and licensed nurses can assess patients, request and interpret diagnostic tests, diagnose diseases, initiate/manage treatments, and prescribe medications, including controlled substances[2].

The global expansion of APNs began in the USA in the 1960s due to an urgent need in the American healthcare system. The World Health Organization (WHO) recognizes APNs as a strategy to improve population access to healthcare and health indicators. In 2013, WHO published a document encouraging the training of APNs to achieve the goal of universal health coverage based on the development of primary health care systems. Today, APN is a reality in Canada, England, the Netherlands, Australia, and other countries[3].

In 2015, all United Nations member countries signed a document to achieve the 17 Sustainable Development Goals (SDGs) by 2030. This document recognizes that human health contributes to the 17 SDGs and that the nursing workforce is strategic and fundamental. High-quality investment in nurse education and training is one recommended path. In 2022, the Pan American Health Organization (PAHO) released the document "Strategic Importance of National Investment in Nursing Professionals in the Region of the Americas," with guidelines for public health policies in the Latin and North American regions[4].

In Brazil, discussions have already begun. In July 2023, the Federal Nursing Council (COFEN) released Technical Note 001/2023 on APN, reiterating the country has favorable conditions for implementing APN, primarily due to its leadership in postgraduate programs. COFEN has been working with the Ministry of Health to formulate solutions that expand user access to the Unified Health System (SUS), also committing to professional training and qualification through an agreement with the Coordination for the Improvement of Higher Education Personnel (CAPES) of the Ministry of Education, which has already trained over 490 master's-level nurses linked to SUS[5].

The Brazilian Nursing Association (ABEN) recently expressed its views on the matter, highlighting the predominance of market logic in private education and the low investment in public institutions. Some of the assumptions that ABEN supports in the APN discussion include respect for the SUS principles of comprehensiveness and equality, the principle of autonomy in regulating professional practice, and increased state investments to strengthen the training process, which should occur in person[6].

Thus, there is a growing movement in Brazil regarding APNs, with various specialized areas of nursing standing out for their activities and scientific research. Although there is no formal regulation in the country, this scenario has contributed to the implementation of advanced nursing practices throughout Latin America.

Whenever this scope of the Advanced Practice Nurse role is presented, questioning roles overlap those of nursing and medical professionals. This is usual in the community. As a result, it is appropriate to clarify that, although it is an expanded practice, the APN will work with a restricted population segment, focusing on a specific health condition or disease for which they have been certified for advanced nursing practice[7].

APNs can be described as "T-shaped professionals": the horizontal bar represents a nurse's general competencies, and the vertical bar represents the specific skills acquired for advanced nursing practice. This configuration sustains a holistic and comprehensive approach to individualized nursing care[7].

From this perspective, an advanced practice nurse in infusion therapy has acquired specific skills that go beyond the activities of a generalist nurse in managing venous access. This article intends to report the experience of the infusion therapy team at a university hospital in performing their duties and the expanded scope of their activities as they progress to advanced nursing practice.

METHOD

This is a descriptive study, an experience report, describing the nursing practices developed by the infusion therapy team of a university hospital in Rio de Janeiro. The Infusion Therapy Team (TTIN) was formed in 2016 to promote theoretical and practical improvement and updating in infusion therapy for the institution's health professionals.

Currently, the team consists of five nurses, two of whom work exclusively for the group, with postgraduate degrees in vascular access and infusion therapy and training courses in the field. These two professionals lead the team from Monday to Friday in the morning. The other three work as on-call nurses in their sectors,

supporting the team's demands on weekends and holidays. The team's nursing practices are following Law 7.498, which regulates the Professional Practice of Nursing. The data presented is discussed only in light of the scientific literature, without the possibility of identifying any subject, and does not present any information individually. Therefore, it does not require approval from a Research Ethics Committee.

The results are shown chronologically from 2016 to 2023, reflecting the growth of nursing practices developed by the team in terms of volume and complexity. This study brings the authors' experience of advanced nursing practice in infusion therapy, which begins with exclusively educational actions and progresses to channeling venous accesses, leading the team to become a reference in vascular access.

RESULTS

At the beginning of the team's configuration, the group's assignments had exclusively educational purposes, focusing on planning, conducting, and evaluating professional training. To this day, these assignments remain one of the team's pillars. From 2016 to April 2024, more than 50 training sessions were held for nursing teams, including training in the preparation and administration of intravenous medications, best practices with peripheral and central venous access, prevention and management of phlebitis, best practices in peripheral venous puncture, and management of peripherally inserted central catheters (PICC). The nursing team revisits these topics annually to maintain TTIN as a continuous pillar in the hospital's ongoing education.

Other training sessions were organized by themes based on demands observed by TTIN, quality of care indicators, or reports of adverse events, such as the proper use of vasoactive drugs, ultrasound-guided peripheral venous puncture, hypodermoclysis, best practices in total parenteral nutrition, and puncture and maintenance of fully implanted catheters. During this period, approximately 70% of nurses and 68% of nursing technicians received some training from TTIN at the institution.

In 2021, with the exclusive dedication of one of the nurses, TTIN began preceptorship activities with nursing students from a federal public university. It offered training in the processes involved in coordinating the group and all practical activities performed by the team. From 2021 to April 2024, TTIN contributed to training ten nursing students in their seventh and ninth semesters.

In the same hospital, the patient profile includes those with difficult peripheral venous access, with a high number of chronic, oncological, and elderly patients requiring specialized infusion therapy. Thus, the team developed a care service flow and, when requested, took over most of these punctures. The flow determines that peripheral venous network assessment is performed upon patient admission, using the Adult Difficult Intravenous Vascular Access (A-DIVA) scale[8]. Patients with moderate to high-risk scores for an unsuccessful peripheral puncture on the first attempt are preferably punctured by TTIN, with ultrasound (US) assistance.

Since late 2021, 185 patients have received group care in emergency services, medical and surgical clinics, Infectious and parasitic diseases (DIP), pediatrics, outpatient services such as chemotherapy and transfusion, and the examination sector. In 90% of these cases, TTIN used long peripheral catheters (CPL), twice the length of standard peripheral catheters, allowing puncture of deeper and more prominent veins using the US. These accesses had an average duration of ten days, greatly benefiting the continuity of treatment, especially in patients with intricate venous networks. TTIN's acquired skill in using this catheter in the US has brought more assertiveness and efficiency in a peripheral venous puncture for patients with difficult venous access, reducing the number of attempts and providing greater patient comfort due to fewer punctures.

The care service flow also includes patients requiring medication infusion for prolonged periods (more than two weeks) or vesicant medications. TTIN is activated according to the flow, with medical consultation, to insert PICCs in these cases. Until the end of 2021, PICCs were used only in the neonatal ICU, with direct puncture and visualization techniques. Since then, with dedicated nurses' training, PICC insertions have been performed with micro-introduction techniques and US-guided punctures for adult and pediatric patients. From September 2021 to April 2024, 231 PICCs were inserted in clinical, critical, and oncological patients. Requests from care teams for this type of catheter have increased exponentially over the years, with a 282% increase in PICC insertions from September 2021 to April 2024.

To maintain a cost-effective relationship at the

institution, PICCs are recommended for venous therapies lasting more than 14 days due to the high cost of this catheter compared to short--term central venous catheters (CVC), which have an average duration of 14 days in the unit. Suggesting PICCs for long-term treatments has proven to be a good patient management strategy, as their average duration is 88 days, with only 6.3% removal due to PICC-related complications.

TTIN has been recognized throughout this period for its technical skills and competencies when called to assist patients with high complexity for central catheter insertion. TTIN's developed practice assisted patients needing prone positioning, with thoracic malformations, severe skin diseases, mediastinal tumors, and superior vena cava syndrome, and those for whom CVC insertion was not possible.

The team also monitors PICC patients on an outpatient basis through nursing consultations at the catheter clinic. This clinic was created in late 2021, and 930 nursing consultations have already been conducted there. Consultations include insertions, maintenance, blood collection, and complication management with PICC use in conjunction with other care teams when necessary. The catheter clinic serves an average of 30 patients per week, remaining in contact with TTIN while they have PICC through the WhatsApp Messenger app. This app supports any doubts, disseminates care guidelines for the catheter, schedules PICC maintenance, and facilitates experience sharing among patients.

From the APN's perspective as a "T-shaped" professional, the cross-sectional actions developed by TTIN involve educating team members and hospital professionals, coordinating infusion therapy activities throughout the hospital context, leading other institutional players to ensure the necessary structure for the team's entire operation, and providing qualified care with a focus on patient safety.

DISCUSSION

Intravenous therapy presents a fertile field for innovations and continuous process improvement in pursuing quality and patient safety[9-10]. The training of specialized infusion therapy teams in hospital institutions contributes to the quality of care through the optimization of processes for inserting and monitoring peripheral and central venous access, the permanent surveillance of infusion therapy indicators, the assessment of training needs, and the establishment of protocols to mitigate complications and promote efficient management[11-13].

One of the pillars of infusion therapy teams is identifying weaknesses in intravenous therapy processes. They also continuously develop training methods for their professionals to achieve maximum adherence to best practices[13-14].

Through the institutional expansion of evidence-based practices in infusion therapy, the continuous education established by TTIN since its inception aims to reduce complications and costs, focusing on improving patient experience, safety, and hospital quality.

In addition to training and monitoring activities and the development of expanded competencies and skills by addressing the institution's complex needs, the actions carried out throughout TTIN's trajectory have led to what can be called the vertical segment of the "T-Shaped"[7], where more advanced, specific, and pioneering practices transformed clinical practice.

The paradigm shift with the inclusion of specialized nurses in peripheral venous access puncture using ultrasound in patients with difficult venous access results in fewer puncture attempts, increased duration of complication-free access, improved patient experience, reduced bedside nursing time, fewer central venous access, leading to reduced hospital costs, and increased satisfaction among professionals and patients[14-16].

In the team's experience, ultrasound-guided peripheral puncture was associated with training professionals in applying the A-DIVA scale to identify patients with complex peripheral venous networks early. The A-DIVA scale predicts the difficulty related to the success of peripheral venous access cannulation on the first attempt, which can reduce the chance of multiple punctures and facilitate the early use of technologies like ultrasound and the involvement of professionals with advanced skills, such as infusion therapy teams[15,17]. The scale's application is quick and easy to understand[15], facilitating its implementation in the patient admission process at the institution.

Seeking better outcomes regarding the duration of peripheral venous access punctured with ultrasound, TTIN standardized the use of long peripheral catheters, a device that allows the cannulation of at least 65% of the vessel, reducing the chances of displacement, infiltration, and early loss[18]. Conventional peripheral catheters have an average duration of 1 to 3 days, while the long peripheral catheter (CPL) has

proven more durable, even in patients with difficult peripheral venous access, with an average duration of 5 to 14 days[18-19]. Thus, preserving patients' venous heritage is ensured, which is especially beneficial for the patient profile in the study unit.

To meet the institutional needs of adult and pediatric patients in prolonged treatments with extreme pH, hyperosmolar, or vesicant medications, such as chemotherapy, total parenteral nutrition, and prolonged antibiotic therapy, TTIN standardized the PICC by micro-introduction. This catheter allows periodic blood collection and high-flow infusion and is considered a long-term catheter, with an average duration of 26 to 49 days[20-22]. Therefore, the implementation of this device was a significant advance in ensuring safe access not only for infusions but also for other patient demands during treatment, such as contrast examinations and reducing peripheral punctures for blood tests. Additionally, care service for patients in unfavorable conditions, such as severe thrombocytopenia, tracheostomized, and prone positioning, is safer with PICC compared to CVC[20].

For TTIN, the insertion and monitoring of PICCs in patients in these and other adverse conditions were successful experiences that resulted in the group's work being valued among different teams. The skill of ultrasound-guided venous puncture for using these catheters resulted in success on the first attempt, even in patients with complicated peripheral venous networks; enabled the evaluation of the vessel path concerning compliance, diameter, presence of thrombi and bifurcations, reducing complications during puncture and catheter permanence[9,10,15]; and allowed catheter positioning away from joints, hairy areas, or regions prone to infections, such as the axillary region, increasing the longevity of this type of catheter and patient well-being[10,20].

Compared to short-term central venous catheters, PICCs have lower risks of severe adverse events, such as pneumothorax, hemothorax, and inadvertent arterial puncture[10,20-21]. From this perspective, the significant increase in PICC insertions in a hospital unit represents a substantial change, reflecting concern for patient safety and efficient infusion therapy management[21].

With the device choice flowchart established by TTIN, we seek to ensure that all patients indicated for PICC can be promptly attended to without delaying the prescribed treatment. This process requires continuous training to call the team promptly and for the indicated patient, especially in a university hospital with a high turnover of residents and students.

Through the work of the infusion therapy team, PICC can be used not only in hospitalized patients but also in those needing periodic infusions, maintaining the device on an outpatient basis. In this scenario, the specialized nurse performs their activities autonomously, based on scientific evidence and advanced skills acquired, making necessary interactions with other teams and promoting patient and family education for self-care[23].

In this sense, TTIN's catheter clinic presents itself as another field for developing the team's specialized practices, where specific nursing care and complex decision-making are part of the team's daily experience. As for the study's limitations, we can highlight the lack of more data illustrating the positive outcomes observed in clinical practice in infusion therapy after TTIN's structuring in the hospital.

CONCLUSION

Given the trajectory followed by TTIN so far, it is clear that their practice converges towards the concept of an Advanced Practice Nurse. Over the years, the team's nurses have acquired a specialized knowledge base through specific training and education integrated with care tea ms. They have carried out their interventions with autonomy, leadership, critical thinking, and safety.

The group's holistic management of venous access provides solutions for previously urgent demands in the hospital unit in question. In this regard, patients with intricate peripheral venous networks or those undergoing prolonged venous treatments currently receive nursing care with advanced skills, leading to a transformation in clinical practice. This report highlights the relevance of the role of a specialized intravenous therapy team in the continuous improvement of infusion therapy processes in this unit.

The group has been expanding the limits of their practice, being attentive to their user's needs, and implementing direct clinical action based on robust and applicable scientific evidence. Such actions have systematically improved the management of the entire work process related to infusion therapy through monitoring indicators, investigating and preventing related adverse events, introducing new technologies, training the nursing team to expand knowled-

ge and skills in this area, and training specialist nurses with exclusive dedication to the field. Given that it is a strictly public unit, resources are limited; therefore, the practices must be based on efficiency.

The regulation of APN in Brazil has been widely discussed in educational institutions, within COFEN, and in other forums that understand the need for nursing leadership in Brazilian healthcare, aiming to promote better outcomes in global health, mainly due to the inequality in the country's health conditions. This report contributes to the discussion of this current topic. Although APNs do not yet have legal recognition and regulation in Brazil, the competencies developed in various practice settings already form part of the advanced nursing practice repertoire.

It is worth noting that the reported experience supports the propagation of the nurse's view as a professional with specific assignments acquired for advanced nursing practice, performing this activity with autonomy in a specialized and comprehensive manner. Thus, developing other publications on successful experiences is urgent, expanding nurses' access to professional qualifications.

CONFLICT OF INTERESTS

The authors have declared that there is no conflict of interests.

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