

# CRITICAL CARE NURSES' KNOWLEDGE AND PRACTICES ON ADMINISTERING TOTAL PARENTERAL NUTRITION FOR CRITICALLY ILL PATIENTS IN TWO SELECTED TEACHING HOSPITALS IN SRI LANKA

*D. Rupawaththa<sup>1</sup>, E. S. A. Dilrukshi<sup>2</sup>, H. M. A. R. Chandrasena<sup>3</sup>, G.G. W. C. Wijesekara<sup>4\*</sup> and A. V. P. Madhavi<sup>4</sup>*

<sup>1</sup>*Teaching Hospital, Anuradhapura*

<sup>2,3</sup>*Teaching Hospital, Kurunegala*

<sup>4</sup>*Department of Health Sciences, the Open University of Sri Lanka*

## INTRODUCTION

Nutrition is a vital requirement of every person and is essential for their survival (Warber, Warber and Simon, 2000). When people become ill, nutrition is the major supportive tool for their healing and recovery process (Eulalia and Dawn, 2013). In that sense, slowed or impaired recovery from illness or surgery is strongly associated with poor nutrition. For wound healing, tissue maintenance, and faster recovery, patients need optimal nutritional intake. If patients become critically ill or have digestive tract problems or have undergone a surgery to remove a part of the digestive organs, the nutrition must be supplied in a different way than the normal oral route. In such situations, nutrition can be supplied via a tube passed to the digestive tract (enteral nutrition) or as an intravenous solution (parenteral nutrition) (Mohammed & Taha, 2014). Parenteral nutrition (PN) is feeding of patients via a line placed over their vein which bypasses usual eating and digestion process (Jain and Teckman, 2014). Total Parenteral Nutrition (TPN) is used for patients who have non functional gastrointestinal tracts (GITs) and are unable to take meals by other routes. TPN provides nutrients such as glucose, amino acids, lipids and added vitamins and dietary minerals which are essential elements for the survival of a person (Thomas, 2010). TPN is mostly used for the patients who are admitted to the critical care units owing to the dependent nature of their diseases. The critical care nurses have a big responsibility in taking care of patients who are admitted to critical care units. The critical care nurse is a licensed nursing professional who is responsible for ensuring optimal care to acutely and critically ill patients and to their families (American Association of Critical-Care Nurses, 2015). As the provision of nutritional support is one of the most important elements of a critical care nurse's caring role, they should have proper knowledge and practice regarding administering TPN. Therefore this study was planned to examine critical care nurses' knowledge and practices regarding administering TPN for critically ill patients in critical care units in teaching hospitals of Anuradhapura and Kurunegala. The study was further guided by the following objectives; to assess the critical care nurses' existing knowledge on TPN administration, to identify critical care nurses' practices on TPN administration and to determine the critical care nurses' perceived barriers in administering TPN for critically ill patients.

## METHODOLOGY

Quantitative approach and descriptive design were used for the study. Using convenient sampling technique, a sample of 150 critical care nurses from eight critical care units of Kurunegala and Anuradhapura Teaching Hospitals in Sri Lanka was obtained for the study. Having a minimum of six months work experience at critical care units was the inclusion criteria. A researcher administered questionnaire was used as the research tool for the data collection. Content validity of the tool was assured by referring to the TPN guideline of North York General Hospital and modifications were done by the supervisor. Reliability of the tool was assured by performing test-retest reliability procedure. Ethical clearance was granted

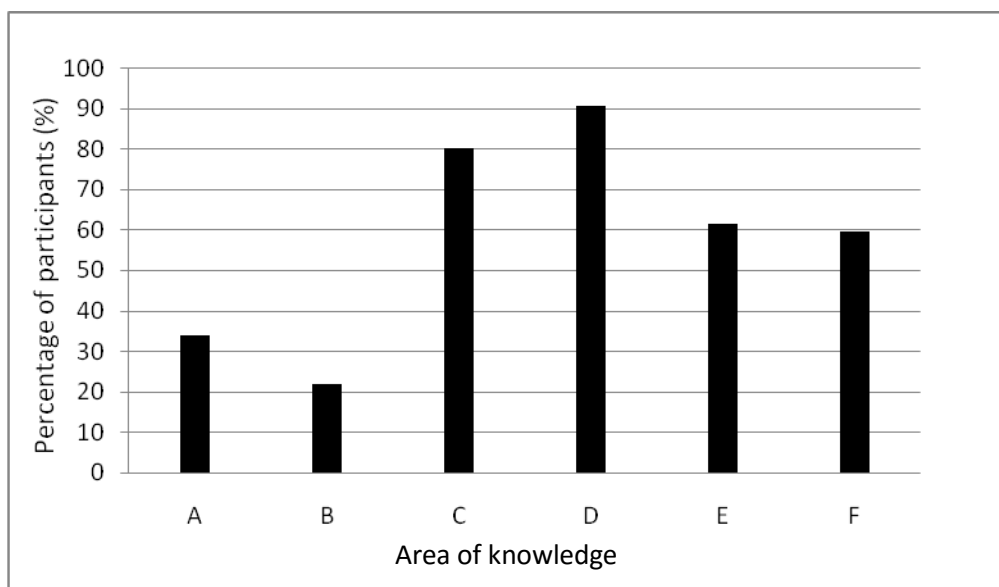
---

\* Corresponding author: Email - [ggwij@ou.ac.lk](mailto:ggwij@ou.ac.lk)

from the Ethical Committee of the Teaching Hospital Kurunegala. Written informed consent was obtained from each participant prior to the data collection while assuring voluntary participation. The data analysis was done by using SPSS statistical software. The questionnaire consisted of two parts, part A and part B. Part A consisted of socio-demographic questions and part B consisted of knowledge related questions (section 1) and practices related questions (section 2) on TPN. The knowledge and practices related to each area of TPN administration (6 areas for knowledge and 5 areas for practices) were assessed.

## RESULTS AND DISCUSSION

The response rate of the study was 70.7%. In the sample, a majority was females (93.4%). When considering working experience in critical care unit as a nurse, 70.6% of the sample had six months to five years experience, 24.5% had 5-10 years experience while 4.7% had more than ten years experience. When considering the highest level of nursing education amongst participants, 0.9% were graduates, 15.1% were under graduates and 84.0% were diploma holders.

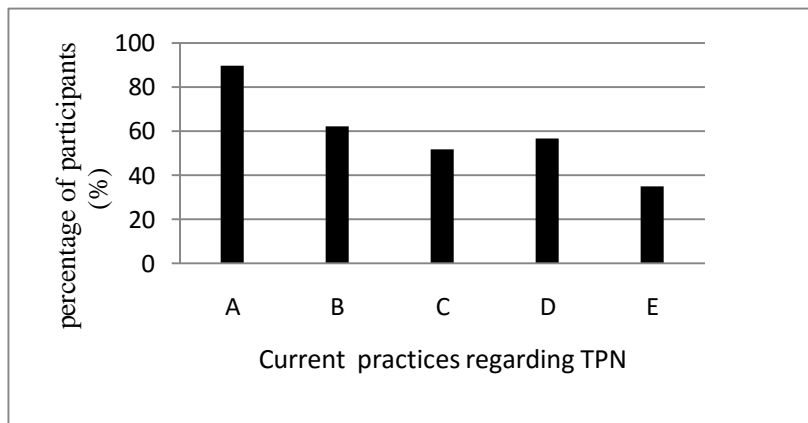


- |   |   |
|---|---|
| A. Knowledge in identifying correct venous access for Total Parenteral Nutrition (TPN) administration | D. Knowledge on required observations during TPN administration |
| B. Knowledge on required investigations before TPN administration                                     | E. Knowledge on TPN administration related complication         |
| C. Knowledge on standard composition of TPN   | F. Knowledge on fluid management during TPN administration      |

**Figure 1.** Critical care nurses' existing knowledge regarding TPN administration

The study findings showed a variation in knowledge regarding TPN administration amongst nurses. The majority of the participants knew the required observations during TPN administration. Many participants knew about standard composition of TPN and the complications related to TPN administration. More than half of participants knew about the correct way of fluid management during administration of TPN. But, the majority had insufficient knowledge regarding identification of correct venous access for TPN administration and required investigations before TPN administration as similar to the findings of Mohammed and Taha (2014) and Erdil and Dinc (2000) (Figure 1). In the clinical setting in Sri Lanka, the persons who are mostly involved in identifying correct venous access are medical persons. Thereby, nurses do not have many chances to get involved in this task. Hence, they do not have opportunities to gain hands on experience to identify correct venous access as they do not practice it in clinical setting. This might be a possible reason for their

relatively poor knowledge in this regard.



- A. Hand hygiene during TPN administration      D. Correct use of central venous catheter  
B. Use of dedicated intravenous line for TPN administration      E. Frequent changing of intravenous infusion set  
C. Maintenance of intravenous catheter site

**Figure 2.** Critical care nurses' current practices regarding TPN administration

According to the findings, a majority of participants had maintained hand hygiene during TPN administration and a majority had used dedicated intravenous line for TPN administration. Similar results were shown by Daniel et al. (2013) in their study. But, relatively few participants practiced changing the intravenous infusion set frequently. The possible reason may be the lack of resources for frequent changing of intravenous infusion sets which is a common problem in the current health care setting. More than half of the participants had practiced maintenance of intravenous catheter site, which is similar to the findings of Dudrick (2009) (Figure 2).

The results showed that the participants had identified few barriers for TPN administration such as inadequate resources, inadequate knowledge and having a tendency of getting complications during TPN administration. Majority of participants were not satisfied about their present knowledge of TPN.

## CONCLUSIONS/RECOMMENDATIONS

The critical care nurses who are working in Anuradhapura and Kurunegala Teaching Hospitals had knowledge and practices in many areas on TPN administration for critically ill patients. But, it was also reported that the critical care nurses lacked in knowledge and practices on some areas. The reported lack of knowledge and practices may be due to lack of educational materials, policies and protocols about TPN and lack of resources in the critical care units. Specifically, as the task of identifying venous access for TPN is not a current practice of nurses, it may be another reason for them to lack in their knowledge. Based on the results, it is recommended to establish written updated protocols and guidelines about TPN to ensure enough knowledge and standardized nursing practice. Further, educational programmes and practical sessions should be implemented on regular basis to update critical care nurses' knowledge regarding the TPN. Moreover, it is important to focus on revising nursing curriculum of basic nursing diploma programme to ensure provision of sufficient knowledge and practice on TPN administration for nursing students. As this study is limited only to critical care units of two Teaching Hospitals, replication of the study in critical care units of other hospitals in Sri Lanka is important to have a wider picture of nurses' knowledge and practices regarding TPN.

## REFERENCES

- American Association of Critical-Care Nurses (AACN). (2015). About critical care nurses. AACN. Retrieved from <http://www.aacn.org/wd/publishing/content/pressroom/aboutcriticalcarenursing.pcms?menu=> on 19.07.2015
- Dudrick, S.J., (2009). History of parenteral nutrition. *J. Am. Coll. Nutr.* 28(3): 243-251.
- Erdil, F. and Dinc, L. (2000). The effectiveness of an educational intervention in changing nursing practice and preventing catheter-related infection for patients receiving total parenteral nutrition. *Int. J. Nurs. Stud.* 37: 371-379.
- Eulalia, K. and Dawn, D. (2013). Nutrition in critical illness: Critical care nurses' knowledge and skills in the nutritional management of adults requiring intensive care. *Caribb. J. Nurs.* 1: 49-55.
- Jain, A.K. and Teckman, J.H. (2014). Newly identified mechanisms of total parenteral nutrition related liver injury. *Adv. Hepatol* 2014(2014): 1-7.
- Mohammed, E. K. and Taha, A.S. (2014). Critical care nurses knowledge and practice regarding administration of total parenteral nutrition at critical care areas in Egypt: Descriptive exploratory design: *J. Biol. Agr. Health. Care.* 4(13): 10-22.
- Thomas, R. D. (2010). Total parenteral nutrition. U.S. National Library of Medicine, National Institutes of Health. Retrieved from <http://www.nlm.nih.gov/medlineplus/druginfo/meds/a601166.html>, on 15.10.2014
- Warber, J.I., Warber, J.P. and Simone, K.A. (2000). Assessment of general nutrition knowledge of nurse practitioners in New England. *J. Am. Diet. Assoc.* 100(3): 368-370.

## ACKNOWLEDGMENTS

We would like to express our deepest appreciation to all the participants of this study, Directors and Chief Nursing Officers and other nursing staff in Teaching Hospital of Anuradhapura and Teaching Hospital Kurunegala.