

Correlation between Nurses' Behavior and Ability to Perform Fluid-and Electrolyte-Related Nursing Diagnoses

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Abstract Fluids and electrolytes are one of the basic human needs. Imbalance of fluids and electrolytes in the body can cause disturbances in various body systems. Nurses play a major role in fluid and electrolyte management of patients. Proper management will provide optimal results for the patient. This study aims to determine the correlation between nurses' behavior (knowledge, attitude, practice) and the ability to perform fluid- and electrolyte-related nursing diagnoses. This cross-sectional research analysed data collected using questionnaires from July to August 2021. The survey involved 65 nurses at Bangli Hospital, asking about socio-demographics, competence proxied by knowledge, attitude, and practice, and the ability to perform patients' fluid- and electrolyte-related diagnoses. Data were analysed using a Spearman Rank. The average value of knowledge was 16.46 (score 0-20), attitude 43.06 (score 10-50), practice 46.50 (score 10-50), and the average rating of the ability to perform diagnoses was 14.06 (score 5-20). The Spearman Rank test results show that attitude correlates to the ability to perform diagnoses with a p-value of 0.04, $r = 0,251$. The study results show a positive correlation between attitude and the ability to perform diagnoses. Efforts are needed to improve nurses' abilities in performing fluid- and electrolyte-related diagnoses.

Index Terms— Electrolyte management, nurses' behavior, nursing diagnoses

I. INTRODUCTION

The body systems' optimal function depends upon fluid and electrolyte balance. Disorders can offset the balance, and the causes may vary. The management includes medication, accurate intake and output measurements, and fluid and electrolyte replacement. Management depends on age and individual conditions. Nurses play a role in this, and they must employ strategies to optimise fluid and electrolyte balance, which include assessment of fluid and electrolyte status, prevention, and replacement [1]. Nurses need to increase their knowledge and performance regarding intravenous fluid therapy to optimise treatment and prevent complications [2].

Nurses perform an assessment, nursing diagnoses, planning, implementation, and evaluation in providing care. Each nursing process step is interconnected and important for accurate problem solving [3]. A nursing diagnosis is a clinical judgement about individual, family, or community

experiences/responses to actual or potential health problems/life processes. A nursing diagnosis provides the basis for selecting nursing interventions to achieve outcomes for which the nurse has accountability. Nurses must identify diagnoses that are appropriate for their area of practice, that fit within their scope of practice or legal regulations, and for which they have competency [4].

A preliminary study with ten nurses at Bangli Hospital showed two nurses (20%) performed fluid and electrolyte management of patients incorrectly, and five nurses (50%) did not perform proper nursing fluid- and electrolyte-related diagnoses. This study aims to identify the correlation between nurses' behavior (knowledge, attitude, practices) and the ability to perform nursing diagnoses related to patient electrolyte management at Bangli Hospital, Bali.

II. METHOD

This research is of a correlational design with a cross-sectional approach. Using purposive sampling, a sample of

65 respondents was recruited from the emergency room, intensive care unit (ICU), inpatient room, surgery room, and haemodialysis unit. The inclusion criteria in this study were: care giver nurse and working more than 3 months. The exclusion criteria in this study were: uncooperative nurse. A set of questionnaires were distributed to the 65 nurses over a period of three weeks (July-August 2021). Participation was voluntary and anonymous. Participants were requested not to discuss their responses with one another.

We developed the questionnaire and divided it into five sections. The validity and reliability were tested before use. The first section asked about the socio-demographic data, the second section consisted of 20 statements about the nurses' knowledge regarding fluid and electrolyte management, the third section comprised ten statements about attitude regarding fluid and electrolyte management, the fourth section comprised ten statements about practices regarding fluid and electrolyte management, and the fifth section consisted of five cases regarding fluid and electrolyte management.

The authors followed all ethical requirements of research involving human participants. The participants signed a consent form before their enrolment in the study. The procedures for this study were approved by the local Ethics Committees (2021.02.1.0793).

Data were analysed using descriptive and inferential statistics. Univariate statistics, including frequencies and percentages, were calculated to summarise respondents' demographic scores. Univariate statistics, including minimum-maximum scores, mean, SD, and 95% CI, to summarise nurses' competence (knowledge, attitude, and practices) scores. Bivariate analysis was performed using the Spearman Rank test to determine a correlation between nurses' competence (knowledge, attitude, and practice).

III. RESULTS

Table 1 shows that most nurses in the study were female (43 people or 66.2%), aged 36-35 (29 people or 44.6%), had a bachelor's degree (44 people or 67.7%), had been working for 11-20 years (30 people or 46.2%), and stationed in the inpatient room (29 people 44.6%). Table 2 shows that the average knowledge score was 16.46, the average attitude score was 43.06, the average practice score was 46.51, and the average ability to perform nursing diagnosis was 14.06.

As depicted in Table 3, the analysis shows a positive correlation between nurses' attitudes toward electrolyte management and the ability to perform nursing diagnoses related to electrolyte management ($r = 0,25$; $p = 0.04$). Meanwhile, knowledge ($p = 0.57$) and practices do not correlate with the ability to perform nursing diagnoses related to electrolyte management ($p = 0.75$) (Table 3).

TABLE I NURSES' CHARACTERISTICS BASED ON GENDER, AGE, EDUCATION LEVEL, LENGTH OF WORK, AND EMPLOYMENT AREA

Characteristics	n	%
Gender		
Male	22	33,8
Female	43	66,2
Age (years)		
26-35	28	43,1
36-45	29	44,6
46-55	8	12,3
Education Level		
Diploma	21	32,3
Bachelor	44	67,7
Length of Work (years)		
1-10	19	29,2
11-20	30	46,2
21-30	14	21,5
31-40	2	3,1
Employment Area		
Intensive Care Unit (ICU)	13	20,0
Surgery Room	6	9,2
Emergency Room	12	18,5
Inpatient Room	29	44,6
Haemodialysis Unit	5	7,7

TABLE II KNOWLEDGE, ATTITUDE, PRACTICE AND THE ABILITY TO PERFORM NURSING DIAGNOSIS

Variable	Min-Max	Mean	SD	95% CI
Knowledge	7-20	16,46 (20)	2,41	15,87-17,06
Attitude	34-50	43,06 (50)	4,00	42,07-44,05
Practice	38-50	46,51 (50)	3,04	45,75-47,26
Ability to perform Nursing Diagnosis	10-19	14,06 (20)	2,30	13,49-14,63

TABLE III THE CORRELATION BETWEEN NURSES' BEHAVIOR AND THE ABILITY TO PERFORM NURSING DIAGNOSES RELATED TO ELECTROLYTE MANAGEMENT

Variable	r	p
Knowledge and the ability to perform nursing diagnosis	-0,07	0,57
Attitude and the ability to perform nursing diagnosis	0,25	0,04
Practice and the ability to perform nursing diagnosis	0,04	0,75

This study found a positive correlation between nurses' attitudes toward electrolyte management and the ability to perform diagnoses related to electrolyte management ($r = 0,25$; $p = 0.04$). Fluid and electrolyte administration is one of the most common procedures in critical care and inpatient wards [5]. Nurses' sufficient knowledge and correct practices are needed to provide good quality care and help reduce morbidity and mortality rates. Evidence-based practices can be applied if nurses have the knowledge and practices to provide quality care to patients [6].

Nurses are responsible for initiating, monitoring, terminating, and preventing complications in intravenous fluid therapy. They must identify and prevent complications caused by a catheter inserted through a vein or intravenous fluid therapy. A nurse must know how to estimate the fluid needed and how to prepare it to prevent fluid dosage errors

and complications, such as fluid overload, hypovolemia, right ventricular failure, and pulmonary oedema, and prevent fluid and electrolyte imbalance [7-9]. Inadequate knowledge of intravenous fluid therapy can cause errors resulting in morbidity and mortality among hospitalised patients. Nurses play a central role in infusion therapy, so their knowledge of this subject is critical [10].

Competence development is a continuous process of improving knowledge, attitudes, and skills. Factors affecting the development of nursing competence are work experience, type of nursing environment, educational level, adherence to professionalism, critical thinking, and personal matters. Work experience and education significantly influence competence development [11]. Knowledge of key concepts and nursing diagnostic foci is necessary before starting an assessment. Understanding these concepts allows the nurse to see patterns in the data and make accurate diagnoses. Knowledge of fluids and electrolytes includes the risk of electrolyte imbalance, fluid deficiency, or excess fluid volume [4].

The limitation of this study is the measurement of electrolyte management practices using a questionnaire. Direct observation is more suitable and less biased. However, this study can still conclude that there is no correlation between knowledge and practice and the ability to perform nursing diagnosis and that there is a correlation between attitude and the ability to perform nursing diagnosis related to electrolyte management.

IV. CONCLUSION

The study results show a positive correlation between nurses' attitude and the ability to perform diagnoses. Efforts are needed to improve nurses' abilities in performing fluid- and electrolyte-related diagnoses.

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REFERENCES

- [1] Kear, T.M. Fluid and Electrolyte Management Across the Age Continuum. *Nephrology Nursing Journal*. November-December 2017 Vol. 44, No. 6.
- [2] NICE, National Institute of Health and Care Excellence guidance on giving intravenous fluids, *Nursing Times*, 2014;110 (6), 12-13.
- [3] Potter & Perry. 2005. *Buku Ajar Fundamental Keperawatan, Konsep, Proses, dan praktik*, edisi 4, Penerbit Buku Kedokteran EGC, Jakarta.
- [4] Herdman et al., 2021. *NANDA International, Inc. Nursing Diagnoses: Definitions and Classification*, Thieme Medical Publishers, Inc., New York.
- [5] Trikhatri, C., Rana, G Angadi, SS. Knowledge and Practice regarding Fluid and Electrolytes Administration among Nurses Working in a Teaching Hospital, Chitwan. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* e-ISSN: 2320-1959.p- ISSN: 2320-1940 Volume 8, Issue 5 Ser. II. (Sep-Oct .2019), PP 12-19.
- [6] Aslam, S., Afzal, M., Kousar, R., Waqas, A., Gilani, S.A. The Assessment of Nurses' Knowledge and Practices about Fluid and Electrolytes Monitoring and Administration among Cardiac Surgery Patients: A Case of Punjab Institute of Cardiology. S. Aslam et al. (2017) *Int. J. Appl. Sci. Biotechnol.* Vol 5(2): 208-215.
- [7] Moradi Y, Rahmani A-R, Gholipour KH, Mirzaie R, Samadi N, A Sharaa S. Nurses' pharmacology knowledge of food-drug interactions in Ayatollah Taleghani Hospital of Orumieh, Iran. *Journal of Chemical and Pharmaceutical Sciences*. 2016;9(3):1083-7. 3.
- [8] Hossain-Gholipour K, Mashallahi A, Amiri S, Moradi Y. Prevalence and cause of common medication administration errors in nursing. *Journal of Chemical and Pharmaceutical Sciences*. 2016:18-21. 4.
- [9] Frost P. Intravenous fluid therapy in adult inpatients. *bmj*. 2015;350: g7620.
- [10] Njung'e a,W.W. , Kamol, E.K. Nurses' knowledge regarding intravenous fluid therapy at a County hospital in Kenya. *International Journal of Africa Nursing Sciences* 14 (2021) 100305.
- [11] Rizanya, I., Hariyati,R.T. R. Handayani, H. Factors that affect the development of nurses' competencies: a systematic review. *Enferm Clin*. 2018;28(Supl 1 Part A):154-157.