

Knowledge, Performance and Stress Level among Nurses in Hemodialysis Unit in Khartoum State, Sudan

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Abstract

Background: Increasing workload can aggravate stress and cause burnout and exhaustion. The study aimed to assess knowledge, performance and stress level among nurses in hemodialysis unit. **Methodology:** A descriptive study was carried out to assess Knowledge, Performance and Stress Level among Nurses in Hemodialysis Unit .The study was conducted in general hospital in Khartoum state. A Convenience sample was used to include 50 nurses. Data Collection methods: A self-administered study questionnaire was used to collect the data about social demographic, knowledge about hemodialysis process and level of stress. The second tool was observational check list to measure performance of nurses in hemodialysis unit. **The result:** A significant portion of nurses, 42%, demonstrated a satisfactory level of knowledge about the Hemodialysis process. Regarding performance 58% of the nurses achieved a satisfactory rating. In relation to stress level 60% of the studies nurses suffer from severe level of stress. There was significant correlation between stress score with total score of knowledge, performance and years of experience. **Conclusion:** The study revealed that more than half had unsatisfactory knowledge, but 58% demonstrated satisfactory performance. A concerning finding is that around two-thirds reported severe stress, indicating a significant workplace challenge. **Recommendations:** Develop and implement targeted stress management programs tailored to the specific needs of nurses.

Keywords: hemodialysis nurses in Sudan, knowledge, performance, stress levels

Introduction

Hemodialysis is process of cleaning the blood from the accumulated waste produce. It is used for patient with ESRD or for acutely ill patient requires short term dialysis, Stress in human life is often equated with tension, anxiety, Hemodialysis nurses experienced high levels of burnout even though their work environment was favorable and they had acceptable levels of job satisfaction and stressors reduction programs should mainly focus on nursing professionals (*Spigolon & Shinde & Mane, 2014*).

Nursing staff are usually exposed to different types of stress, which include increasing demands of care for excess number of patients, sicker and older patients, work overload with extra responsibilities and shortage of staff, timing and duration of working hours, personality conflict and fear of losing the job, In addition, theoretical education, practical training, continuous orientation program for new staff nurses and clinical supervision with proper protocols and guidelines that assess individual performance are necessary to ensure achievement of adequate skills and knowledge to independently manage patients on dialysis (*Karkar, Dammang, 2015*).

the dialysis nurses are registered nurses who hold associate degree in nursing, specialized in caring for patients undergoing hemodialysis, initiates dialysis, monitors patients and dialysis machine and terminate dialysis procedures so she evaluate patients with kidney failure and plans, implements and documents nursing care. So she should be familiar with standard concepts, procedure in hemodialysis field. Relies on experience and judgment to plan accomplish goals. To performs a variety of tasks. With a wide degree of creativity and latitude is expected. Typically nurse should reports to a manager or head of a unit department (*Mubarok, 2021 & de Queiroz Frazão, et al., 2014*).

Hemodialysis nurses responsibilities are to administer medications to oversee and coordinate care, ensuring treatment and access of sites should be done correctly with safety checks, correct and complete charting, physician order should be carried out, lab work drawn as needed or per protocols or orders , social work or dietitian or other ancillary services are involved in patient care .Nursing intervention started from explain procedure to client, and monitor for hemodynamic status continuously . Insure sterility of system and

maintain a closed system, discuss diet restriction, nurse should be aware about reinforce adjustments to prescribed medications that may be affected by the process of hemodialysis. Then monitor for complication of dialysis, and intervention as the condition (*Abd Alfatah, 2013 & Mohamed, 2016*).

Nursing Education The present study emphasis on enhancement regarding knowledge among nursing students, and staffs regarding the stressors and the coping strategies used by the patients undergoing hemodialysis. In order to achieve this nurse as an educator should focus on assessment of level of knowledge regarding the stressors and coping strategies used by the patient's undergoing hemodialysis. Nursing schools, college, and teachers should come forward and encourage the students to improve their knowledge (*Shinde & Mane 2014*).

In Sudan the first hemodialysis center in Soba hospital was open in 1975, started with one Gambro machine used for a few number of patients. Aum Kalthoum Ibraheem is the first sister whom work in Soba center after she had trained in England, in the period between 1976-1981 the number of trained staff and machines started to increase gradually in different hospital in different area in Sudan (*Alkhaqani, & Ali, (2021)*).

Significance of the study: The different studies have been conducted on stress and burnout among nurses in the general profession, but fewer were conducted among dialysis nurses. But in Sudan not found any study there for am search about this problem, it is important that nurses recognize the problem, confront stressors and learn to change the environment to reduce stressful situations in a productive and positive way.

Aim of the study

“Knowledge, Performance and Stress Level among Nurses in Hemodialysis Unit in Khartoum State, Sudan.”

Objectives

- To explore the knowledge nurses about hemodialysis process.
- To explore the performance of nurses during hemodialysis process.

- To identify the levels of stress among nurses work in hemodialysis unit.

Hypothesis:

- The knowledge of nurses is Satisfactory about work hemodialysis unit.
- The performance of nurses is Satisfactory (good) about work hemodialysis process
- The nurses is very sever level of stress about work in hemodialysis field or unit.
- Was there a strong negative correlation between nurses' knowledge and their stress levels.

Methodology:

Study designs: A descriptive study was carried out to assess Knowledge, Performance and Stress Level among Nurses in Hemodialysis Unit.

Study setting: The study was conducted in general hospital in Khartoum state, There are Khartoum teaching hospital And Ahmed Gassim hospital , Khartoum teaching hospital located south Khartoum. And Ahmed Gassim hospital there is located in north Khartoum. They are have many department example hemodialysis unit.

Sampling Technique

A Convenience sample method was applied to select the sample size from all nurses in general hospital in Khartoum .The sample size was determined through use Epi Calc program, 2000. The final sample size (50) nurses were selected from general population according to calculation 14 system with consideration to determine the precision at (5%), and 95% for confidence level.

Inclusion criteria:

1. Resident in Khartoum state.
2. Experience more than 1 year
3. Accept to participate in study.

Exclusion criteria

Who don't fulfill the previous criteria.

Data collection methods: The questionnaire was preparing by researcher by English language and translated from Arabic to obtain the aim of study.

Tool of study: Tere are two tools were used to achieve the aim of the study. All nurses were

told to sign the consent form, the first was interview questionnaire which was composed of three parts. The first part was about socio-demographic data and the second part was about the knowledge of the nurses and was observational check list to evaluate the performance of the nurses. The third part was about the stress level.

Scoring system:

1. Knowledge questionnaire

It was composed of 20 items and total score is 0 to 20
 ≥ 60 satisfy

2. Stress level questionnaire

It was composed of 12 items and total score: 12 to 36
0 to 20 is low stress
21 to 29 moderate stresses
30 to 36 severe stresses

The second tool was observational check list to evaluate the performance of the nurses. It was composed of 30 items total score 0 to 60
 ≥ 60 satisfy

Statistical analysis:

A packaged computer analysis program, statistical package for the social science (SPSS 24.0) the researcher was using statistical analysis of these data types. Descriptive statistics or frequency, percentage and find out the P-value those was depended on the natural of data. To find the association between knowledge and demographic characteristics was using chi-square test for categorical data, and P-value ≤ 0.05 was considered significant.

Pilot study:

Pilot study was carried out on (10) (5%) nurses in Khartoum Hospital and Ahmed Gassim Hospital before the period of data collection, it was done to test the clarity and practicality of the tools. The result of data obtained from pilot study should help in modification of the tools. Items have been modified and corrected as needed.

Ethical consideration:

Ethical approval was obtained from Shandi University to Ahmed Gassim and KTH teaching hospital manager. Permission from manager of Ahmed Gassim and KTH teaching hospital and Medical Director for data collection through

official letters was obtained. Verbal Permission was taken from participants after objectives of research was explained, then confidentiality was insured, participation was voluntary the participant can withdraw, if he want at any time. Consent done form all Nurses in the hospital.

Field Work:

The researcher visits the unit three days per the week distribution on the three shift morning, afternoon and evening .The researcher discusses the aim of the study and the oral consent was obtained. The time and collected data ranger form 30 - 40 minute. while the part of ranging performance, was done three time and depend on the average A questionnaire and observation checklist were developed by the researchers as a tool to collect data in order to Knowledge, Performance and Stress Level among Nurses in Hemodialysis Unit in Khartoum teaching hospital and Ahmed Gassim hospital. The Data was collected from March 2021 to July 2021.The hemodialysis unit which include: 38 machine work 4 session per day for 137 Patients, nurses staff work 3 shift divided in three group each one include 17 nurses, with ration as 1:6 patients.

Limitation:

Despite several positive aspects, such as the knowledge and performance of nurses, weaknesses of this study should be mentioned. The nurses is suffering psychological, social factor and finical, so they face problems of stress at work, in addition to the large number of patients and the patients' psychological and social problems.

Result:

Table 1 shows that 68% were females, 76% of the study sample had experience ranged from 1-4 years. All most of nurses (86%) were Bachelor degree.

Table 2 shows that a little over half of the nurses (52%) were have a satisfactory performance in the pre-hemodialysis phase, about the half of nurses (56%) demonstrated a satisfactory performance, with 62% of nurses exhibiting a satisfactory level, 58% of the nurses achieved a satisfactory rating. Conversely, 42% fell into the unsatisfactory.

Table 3 identifies that a breakdown of nurses' knowledge about the Hemodialysis unit, categorized into three levels, 42%, demonstrated a

satisfactory level of knowledge. 36% of nurses average knowledge. 22% of nurses were classified as having poor knowledge about the Hemodialysis unit.

Table 4 explores that 60% of the studies nurses suffer from severe level of stress while 6% had mild level.

Table 5 presents the correlation between various study variables and the stress levels experienced by the studied nurses. There is a strong negative correlation between nurses' knowledge and their stress levels where $R = -0.62$ &

$P = 0.0001$. There is a strong negative correlation of -0.59 between nurses' performance and their stress levels. Higher performance is associated with lower stress levels among the studied nurses. There is a strong negative correlation of -0.66 between the number of experience years and the stress levels of nurses.

Table 6 shows that the chi-square test indicates a statistically significant association between the gender of the studied nurses and their levels of stress where $P = .0001$.

Table (1): Frequency distribution of the studied sample regarding socio-demographic data

Items	N	%
Gender		
Male	16	32
Female	34	68
Experience		
1-4 years	38	76
5 -8 years	10	20
9 to more	2	4
Level of education		
Master	2	4
Bachelor	43	86
Diploma	5	10

Table (2): Frequency distribution of the studied nurses regarding their performance pre, during and post hemodialysis process.

Items	Satisfactory		Unsatisfactory	
	N	%	N	%
Pre	26	52	24	48
During	28	56	22	44
Post	31	62	19	28
Total	29	58	21	42

Table (3a): Show nurses Knowledge about Hemodialysis process

Items	N	%
Satisfactory	21	42
Average	18	36
Poor	11	22

Table (3b): Description of nurse's knowledge in hemodialysis unit

Knowledge items	Satisfactory		Average		poor	
	N	%	N	%	N	%
Definition of patient safety	27	54%	13	26%	10	20%
Complications of hemodialysis	23	46%	16	32%	11	22%
Types of adverse events	29	58%	13	26%	8	16%
Causes of hemodialysis	27	54%	17	34%	6	12%
Factors contributing of hemodialysis	23	46%	18	36%	9	18%
Sign and symptoms of hemodialysis	35	70%	17	34%	8	16%
Aware of hemodialysis nursing care standards	27	54%	15	30%	8	16%
Forms for assessment of A-V fistula	33	66%	12	24%	5	10%
Follow up of abnormal lab investigations	27	54%	13	26%	10	20%
Shunt care	35	70%	17	34%	8	16%
Nutrition and medication	27	54%	13	26%	10	20%
Infection control	33	66%	12	24%	5	10%
Periodic estimation of incidence of infections	35	70%	17	34%	8	16%
Preparing patient	35	70%	17	34%	8	16%
Termination dialysis phase	33	66%	12	24%	5	10%

Table (4a): Frequency distribution of the studied sample regarding their stress Level in hemodialysis unit

Items	N	%
Mild	3	6%
Moderate	17	34%
Sever	30	60%

Table (4b): Description of top ten stress-causing among nurses in hemodialysis unit

Items	Yes		NO	
	N	%	N	%
Job insecurity	41	82%	9	18%
Demanding and manipulative patients	37	74%	13	26%
Technological breakdowns	29	58	21	42%
Bad behavior/unfair treatment by a nursing supervisor	49	98%	1	2%
Patient care activities (difficult access)	37	74%	13	26%
Pressure from doctors	47	94%	3	6%
Exposure to needlestick injury/bloodborne infection	44	88%	6	12%
Less job compensation	45	90%	5	10%
Frequent rotation of area assignment	47	94%	3	6%
When assigned an unstable/critical patient	44	88%	6	12%

Table (5): Correlation between study variables and the stress level experienced by studied nurses

Items	Stress	
	R	P
Knowledge	-0.62	0.0001
Performance	-0.59	0.001
Experience years	-0.66	0.0001

Table (6): Association between gender of the studied nurses and their levels of stress

Items	stress			X ²	P
	Mild (3)	Moderate(17)	Sever(30)		
Gender				18.3	0.0001
Male16	1	12	3		
Female34	2	5	27		

Discussion:

Nursing staff are usually exposed to different types of stress, which include increasing demands of care for excess number of patients, sicker and older patients, work overload with extra responsibilities and shortage of staff, timing and duration of working hours, personality conflict and fear of losing the job. The study most of them females, and had experience ranged from 1-4 years. All most of staff were Bachelor degree. **The study is different to study of Akman O, Ozturk, 2016.** Then **my study is different to Maren Kersten, et al, 2020.** Then The study shows that a little over half of the nurses were deemed to have a satisfactory performance in the pre-hemodialysis phase, then during the hemodialysis process, about the half of nurses demonstrated a satisfactory performance, and the post-hemodialysis phase saw an improvement in performance, The nurses

exhibiting a satisfactory level. When considering the overall performance across all three phases, the nurses achieved a satisfactory rating. Conversely, and the fell into the unsatisfactory category when assessing their performance throughout the entire hemodialysis process. **The study is different to study of Noha A. Abdel-Latif, 2019.** **My study is different to study of Bronwyn Hayes et al, 2015.** The study identifies that a breakdown of nurses' knowledge about the Hemodialysis unit, categorized into three levels: Satisfactory, Average, and Poor. Therefore A significant portion of nurses, demonstrated a satisfactory level of knowledge about the Hemodialysis process. Approximately 36% of nurses fall into the average knowledge category. A noteworthy of nurses were classified as having poor knowledge about the Hemodialysis unit. The study is **different to study of Noha A. Abdel-**

Latif, 2019 and then is similar to study **Inger Miriam Janssen, 2015**. The study explores the nurses suffer from severe level of stress while some had mild level. My article is similar to the study of **Xie Z, Wang A, Chen B, 2011**. Then have also shown the moderate stress of nurses therefor this is similar to my study **Karkar, Ayman, et al, 2015**.

There is a strong negative correlation between nurses' knowledge and their stress levels where. There is a strong negative correlation between nurses' performance and their stress levels. There is a strong negative correlation between the number of experience years and the stress levels of nurses. **In the same line Hayes, Bonner & Douglas (2015)** reported that nurses who had high levels of knowledge and performance had low levels of stress.

The present study showed that the chi-square test indicates a statistically significant association between the gender of the studied nurses and their levels of stress. Female nurses show a higher prevalence of severe stress compared to male nurses, as evidenced by the distribution of stress levels in the respective categories. The current study was supported by **D'Ettorre, Pellicani & Vullo (2019)** who concluded that stress level was significantly high among females. On the other hand **Osei-Mireku et al., (2020)** who revealed that revealed that there was a significant association between stress and gender. And male nurses were more stressed than female nurses.

Conclusion

Based on the results of this study, the half of nurses had unsatisfactory level of knowledge. While a substantial proportion of nurses had satisfactory level of performance. The nurses reported experiencing severe stress, signifying a significant challenge in the work environment. The significant correlation observed between stress scores and the total scores of knowledge, performance, and years of experience underlines the interconnectedness of these variables. Female nurses show a higher prevalence of severe stress compared to male nurses.

Recommendations:

1. Develop and implement targeted stress management programs tailored to the specific

needs of nurses. These programs should address coping mechanisms, resilience-building

2. Encourage and facilitate ongoing professional development opportunities for nurses to enhance their knowledge and performance. This could include regular training sessions, workshops, and access to updated educational resources.
3. Establish a supportive framework for mental health within the workplace. Provide access to counseling services, support groups, and resources to help nurses manage and cope with stress effectively.
4. Other studies are needed also to determine other key elements that could improve the quality of care in these settings and in hemodialysis units.
5. We argue that dialysis-specific programs aiming at implementing a feedback culture represent a promising approach to reduce stress and promote psychological well-being in the workplace.

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