Original Article

Physiologicalparameters of comfort inpatients undergoing hemodialysis

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Abstract

Background: Comfort make patients feel strengthened in an untouchable, personalized sort of way. The whole of nursing care and health care industry revolves around the concept of maximizing the comfort level of the patients. In the present health care system where patients are more demanding, it becomes important to recognize the factors affecting the comfort level of patients.

Objectives: Objectives of the study were to assess the physiological parameters of comfort (vital signs, edema, pain) in patients undergoing hemodialysis,to find out the association between physiological parameters of comfort with sociodemographic and clinical data of hemodialysis patients.

Materials and Methods: A quantitative research approach and exploratory research design was used to assess physiological parameters of comfort in patients undergoing hemodialysis. Total 84 patients were selected by non-probability convenience sampling technique in the research study. Structured questionnaire of sociodemographic and clinical data, Vital signs chart, Pain assessment scale, Edema assessment scale(Tools to assess physiological parameters)were used for assessing the physiological parameters of comfort. Data was analysed using descriptive and inferential statistics using SPSS (version 25).

Results: During assessment of the physiological parameters, 73(86.9%) patients were with abnormal physiological parameters (vital signs, pain, edema) and 11(13%) were with normal physiological parameters of comfort. The most common abnormal physiological parameter found during assessment was pain which was present maximally in 51(60.7%) patients. In association of respiration with sociodemographic variables, gender ($\chi2$=3.584 df=1, P=0.058) and among the clinical variables, position of patients ($\chi2$=8.768, df=3, P=0.033) were significantly associated at 0.05 level of significance. Temperature was significantly associated with clinical variable, weight ($\chi2$=10.141, df=4, P=0.038) and comorbid condition hypertension of patients ($\chi2$=4.245, df=1, P=0.039). Blood pressure was significantly associated with clinical variable like, types of diet ($\chi2$=9.256,df=2, P=0.010), daily intake ($\chi2$=11.048a df=3, P=0.011) and position of patients ($\chi2$=8.678, df=3, P=0.033). Edema was significantly associated with clinical variable types of diet of patients ($\chi2$=7.198, df=2, P=0.02).

Conclusion: - Socio-demographical and clinical variable have a significant effect on physiological parameters of comfort among patients undergoing hemodialysis. Hence, the role of the Nephrology Nurse requires more attention in the implementation of appropriate nursing interventions throughout the dialysis treatment in relation to all the above identified factors.

Keywords: Comfort, Physiological parameters, Hemodialysis, Patients.

1. INTRODUCTION

Chronic kidney disease (CKD) has emerged as one of the most prominent causes of death and suffering in the 21st century. Due in part to the rise in risk factors, such as obesity and diabetes mellitus, the number of patients affected by CKD has also been increasing, affecting an estimated 843.6 million individuals worldwide in 2017.[1]

Nearly 220000 patients are diagnosed with end-stage renal disease (ESRD) every year, which puts an additional demand of 34 million dialysis sessions in India.[2] In 2018, it was estimated that nearly 1,75,000 patients have been on chronic dialysis in India, giving an occurrence of 129 in keeping with million population.[3]

In Gujarat, however, the prevalence of significant chronic kidney disease is around 8.9% of the state population. A shocking

revelation that came from city-based nephrologist says that roughly 5 lakh people in Ahmedabad are estimated to suffer from a kidney disorder.[4]

Successful hemodialysis treatments for patients with renal failure depends on patient readiness to follow prescribed treatment regimens. Lack of constancy may cause patient discomfort during hemodialysis treatments. Dependent on continuous therapy makes the patient live with uncomfortable symptoms such as nausea, vomiting, hypotension and fatigue, which may lead to decreased comfort. [5] Identifying the various comfort parameters in patient during hemodialysis can improve care quality. [6]

Researches highlights that factors of impaired comfort can be identified in the patients, and among them, there are changes in the sleep pattern, anxiety, discomfort and dissatisfaction with the situation, restlessness, irritability, fear, heat sensation, discomfort sensation, hunger sensation, cold sensation, sign and symptoms of struggling and sigh. [7]

Raja, S.M., Seyoum Y. conducted study on Intradialytic complications among patients on twice-weekly maintenance hemodialysis in 2020 in which a total of 29 patients were included in the five-month study period. Out of the total 573 hemodialysis sessions, 176 (30.7%) of them involved one or more intradialytic complications. Hypotension was the most common complication occurring in 10% of the sessions followed by nausea and vomiting (5.24%), hypertension (5.06%), muscle cramps (4.71%), and headache (4.54%). Other complications such as back pain, chest pain, fever, chills and itching occurred in less than 3% of the dialysis sessions.[8]

Hence, as per the evidences stated above, the researcher found that during dialysis, patients may experience various physiological symptoms which includes pain, nausea, vomiting, muscle cramps, hypotension and fever chills. So, the need was felt to study physiological parameters of patients undergoing hemodialysis.

RESEARCH HYPOTHESES

- H1: There will besignificant association between physiological parameters of comfort (vital signs, edema, pain) with sociodemographic data of hemodialysis patients.

- H2: There will be significant association between physiological parameters of comfort (vital signs, edema, pain) with clinical data of hemodialysis patients.

2. MATERIALS AND METHODS

A quantitative research approach with exploratory research design was used to assess physiological parameters of comfort in patients undergoing hemodialysis. Total 84 patients participated in the research study. Patients admitted in dialysis unit of Parul Sevashram Hospital, Vadodara were considered as sample for the present study. Structured questionnaire was used to assess sociodemographic and clinical data, Tools to assess physiological parameters developed by the investigators includes three part: Part-A Vital signs chart (Temperature, pulse, Respiration and Blood pressure), Part-B Numerical Pain assessment scale and Part-C Edema assessment scale.Prior to data collection written permission was obtained from the concerned authorities. The study was conducted in selected hospital, Vadodara. Patients who were undergoing hemodialysis and fulfilled the criteria were selected as sample by using Non Probability convenience sampling technique. Data was collected from patients by structured interview method after getting their consent.Data was analysed using descriptive and inferential statistics using SPSS (version 25).Descriptive statistics included frequency and percentage to assess physiological parameters of comfort (vital signs, edema, pain). Inferential statistics like chi-squareis used to find out the association of physiological parameters with sociodemographic and clinical data of hemodialysis patients.

3. RESULTS

The data were tabulated in Microsoft excel spread sheet and analysis was done using descriptive and inferential statistics using SPSS according to the objectives of the study.

Data is presented on following section in accordance with the objectives:

SECTION I: Distribution of hemodialysis patients according to their sociodemographic data.

SECTION II: Distribution of hemodialysis patients according to their clinical data.

SECTION III: Distribution of hemodialysis patients according to their physiological parameters of comfort (vital signs, edema, pain).

SECTION IV: Association between physiological parameters of comfort with sociodemographic datain patients undergoing hemodialysis.

SECTION V: Association between physiological parameters of comfort with clinical datain patients undergoing hemodialysis.

SECTION I- Distribution of patients according to their sociodemographic data

Table 1 Reveals frequency and Percentage distribution of patients according their sociodemographic data. Result shows that majority of patients 25(29.8%) were between 28-37 years and only 10(11.9%) of patients were found between the age group 18-27. Majority of the patients 59(70.2%) were male and 25(29.8%) were female. In relation to marital status, maximum numbers of patients 63(75%) were married. According to education level maximum numbers of patients 52(61.9%) were having formal education. In terms of employment status maximum numbers of patients 52(61.9%) were unemployed. Majority of patients 50(59.5%) had monthly income 5001-10000rs.

Table 1: Frequency and Percentage distribution of hemodialysis patients according to their sociodemographic data n=84

DEMOGRAPHIC VARIABLE		**Frequency (f)**	**Percent (%)**
Age (In Year)	18-27	10	11.9
	28-37	25	29.8
	38-47	13	15.5
	48-57	24	28.6
	58-67	12	14.3
Gender	Male	59	70.2
	Female	25	29.8
Marital Status	Married	63	75.0
	Unmarried	10	11.9
	Separated/Divorced	5	6.0
	Widowed/Widower	6	7.1
Education Level	Formal education	52	61.9
	Bachelor	15	17.9
	No formal education	17	20.2
Employment Status	Private employee	9	10.7
	Self-employee /Businessman	14	16.7
	Unemployed	52	61.9
	Labourer	9	10.7
Monthly Income (In Rs.)	<5000	5	6.0
	5001-10000	50	59.5
	10001-15000	22	26.2

	>15000	7	8.3

SECTION II- Distribution of patients according to their clinical data

As per the clinical data, maximum numbers of patients 25(29.8%) were found between 40-49 kg only 5(6%) of patients were found between the weight groups 30-39 kg. Majority of the patients 56(66.7%) living with comorbid condition (like, cardiovascular disease, diabetes mellitus, hypertension and any other) and 28(33.3%) were without comorbid conditions and from that maximum 38.1% had hypertension. According to duration of dialysis treatment maximum numbers of patients 59.5% were taken dialysis treatment from 1-5 years. 96.4% patients attend dialysis session for 3-4 hours. Regarding to types of diet of patients 53.6% were taken veg and non-veg food. According to daily intake of patients majority 57.1% were taken 701-1000ml fluid, and only1.2% patients were taken less than 200ml fluid, maximum 38.1% were 51-150ml urine excretion, 76.2% patients paid through Ayushman card. Regarding to position of patients during dialysis majority of patients 69% were situated in semi fowler's position.Total 73.9% patients were used different comfort devices and 26.2% were not used any comfort devices.Maximum 83.3% patients did not do any activities, 16.7% did daily activities like yoga, walking and exercise.

SECTION III- Distribution of hemodialysis patients according their physiological parameters of comfort (vital signs, edema, pain)

Figure 1 illustrate that Frequency and Percentage distribution of Physiological parameters of comfort (vital signs, edema, pain) in patients undergoing hemodialysis.Results shows majority of 71.4% patients had normal temperature, 28.6% had abnormal temperature like hypothermia. With references to pulse of patients maximum 78.6% were normal pulse and 21.4% were abnormal pulse (tachycardia).According to respiration maximum numbers of patients 84.5% were normal respiration and only15.5% were abnormal respiration (tachypnea).Regarding blood pressure of patients 50% were abnormal blood pressure either hypertension or hypotension and 50% were normal blood pressure. With regards to pain of patients majority 60.7% had pain mild, moderate or severe and 39.3% had no pain. Maximum number of patients 28.6% were edema mild, moderate or severe and 71.4% were no edema.It was concluded that, total 73 patients were with abnormal physiological parameters and only 11patients were normal physiological parameters of comfort in patients undergoing hemodialysis.

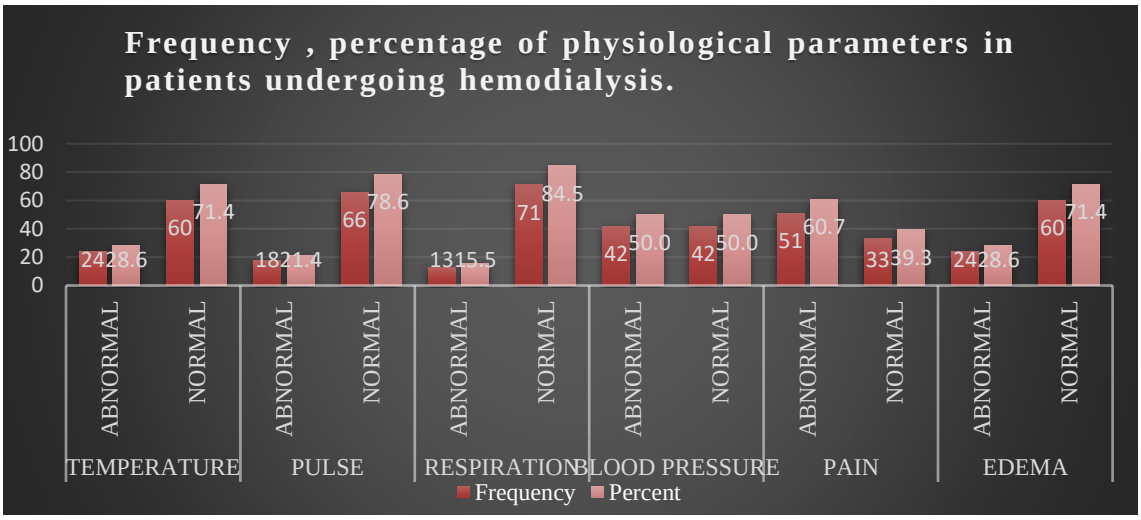

Figure: 1 Frequency, percentage distribution of patients according their physiological parameters

SECTION IV- Association between physiological parameters of comfort with sociodemographic data.

Association between Respiration and sociodemographic data in patients undergoing hemodialysis.

Results showed that socio-demographic variable Gender ($\chi 2=3.584$,df=1, P=0.058) was found statistically significant association with respiration in patients undergoing hemodialysis and was found significant at $p<0.05$ level of significance. Other sociodemographic variables such as, Marital status, Education level, Employment status and Monthly income were statistically not-significant at $p<0.05$ level with respiration in patients undergoing hemodialysis.

There was a no significant association of other physiological parameters like, temperature, pulse, blood pressure, pain and edema with socio-demographic data.

SECTION V- Association between physiological parameters of comfort with clinical data.

Table 2 depicts that the association between clinical variable and temperature in patients undergoing hemodialysis. Results showed that selected clinical variable like weight ($\chi 2=10.141$,df=4, P=0.038) and hypertension ($\chi 2=4.245$, df=1, P=0.039) were found statistically significant association with temperature in patients undergoing hemodialysis and was found significant at $p<0.05$ level of significance. Other clinical variables such as, types of diet, Daily intake, Daily output, Payment source, Position, comfort devices and Daily activity were statistically not-significant at $p<0.05$ level with temperature in patients undergoing hemodialysis.

Table 2: Association between temperature with clinical data in patients undergoing hemodialysis.

VARIABLE	CHARACTERISTICS	TEMP.		Total	χ^2 df	P value
		ABNORMAL	NORMAL			
Weight (In k.g.)	30-39	0	5	5	10.141 4	0.038*
	40-49	11	14	25		
	50-59	8	23	31		
	60-69	2	16	18		
	>69	3	2	5		
Cardiovascular Disease	No	24	57	81	1.244 1	0.265 NS
	Yes	0	3	3		
Diabetes Mellitus	No	19	51	70	0.420 1	0.517 NS
	Yes	5	9	14		
Hypertension	No	19	33	52	4.245 1	0.039*
	Yes	5	27	32		
Any Other Disease	No	20	51	71	0.036 1	0.849 NS
	Yes	4	9	13		
No Any Disease	No	14	42	56	1.050 1	0.306 NS
	Yes	10	18	28		
Duration Of Dialysis Treatment	<1year	3	10	13	0.434 2	0.805 NS
	1-5year	14	36	50		
	>6year	7	14	21		
Duration Of Dialysis Session	3-4hour	24	57	81	1.244 1	0.265 NS
	>4hour	0	3	3		
Types Of Diet	Veg	10	27	37	0.495 2	0.781 NS
	Non Veg	1	1	2		
	Mixed	13	32	45		
Daily Intake	<200ml	0	1	1	1.269 3	0.737 NS
	401-700ml	1	6	7		
	701-1000ml	15	33	48		
	>1000ml	8	20	28		
Daily Output	0ml	3	9	12	5.500 4	0.240 NS
	<50ml	10	19	29		
	51-150ml	11	21	32		
	151-250ml	0	7	7		

	>250ml	0	4	4		
Payment Source	Pm Jay	5	15	20	0.164	0.685
	Ayushman	19	45	64	1	NS
Position	Supine Position	1	4	5	1.394	0.707
	Fowler's Position	3	9	12	3	NS
	Semi Fowler's Position	16	42	58		
	Trendelenburg Position	4	5	9		
Comfort Devices	Knee Rest	4	11	15	2.187	0.701
	Arm Rest	8	13	21	4	NS
	Stress Ball	1	4	5		
	Others	4	17	21		
	No Device	7	15	22		
Daily Activity	Yes	2	12	14	1.680	0.195
	No	22	48	70	1	NS

*p<0.05 indicates significant association, NS- Not- significant.

Association between Respiration with clinical data in patients undergoing hemodialysis. Results showed that selected clinical variable like position ($\chi 2$=8.768,df=3, P=0.033) was found statistically significant association with respiration in patients undergoing hemodialysis and was found significant at p<0.05 level of significance. Other clinical variables such as, weight, comorbid conditions, types of diet, duration of dialysis treatment, duration of dialysis session, Daily intake, Daily output, Payment source, comfort devices and Daily activity were statistically not-significant at p<0.05 level with respiration in patients undergoing hemodialysis.

Association between Blood pressure and clinical data in patients undergoing hemodialysis

Results showed that selected clinical variable like types of diet ($\chi 2$=9.256,df=2, P=0.010), daily intake ($\chi 2$=11.048, df=3, P=0.011), position ($\chi 2$=8.678, df=3, P=0.033) were found statistically significant association with blood pressure in patients undergoing hemodialysis and was found significant at p<0.05 level of significance. Other clinical variables such as, Weight, Comorbid conditions, Duration of dialysis treatment, Duration of dialysis session, Daily output, Payment source, Comfort devices and Daily activity were statistically not-significant at p<0.05 level with blood pressure in patients undergoing hemodialysis.

Association between Edema assessment scale score with clinical data in patients undergoing hemodialysis

Results showed that selected clinical variable like types of diet ($\chi 2$=7.198, df=2, P=0.02) was found statistically significant association with Edema assessment scale score in patients undergoing hemodialysis and was found significant at p<0.05 level of significance. Other clinical variables such as, Weight, Comorbid conditions, Duration of dialysis treatment, Duration of dialysis session, Daily intake, Daily output, Payment source, Position, Comfort devices and Daily activity were statistically not-significant at p<0.05 level with Edema assessment scale score in patients undergoing hemodialysis.The other physiological parameters such as, pain and pulse were not significantly associated with clinical data.

4. DISCUSSION

The study highlighted that maximum 71.4% were normal temperature and 28.6% were abnormal temperature like hypothermia. Only 21.4% were abnormal pulse (tachycardia) and majority of patients 78.6% were normal pulse. 15.5% were abnormal respiration (tachypnea) and maximum numbers of patients 84.5% were normal respiration. In blood pressure of patients 50% were abnormal blood pressure either hypertension or hypotension and 50% were normal blood pressure. Maximum numbers of patients 60.7% were pain mild, moderate or severe and 39.3% were no pain. Majority 71.4% had no edema and 28.6% had mild, moderate or severe edema.

The similar cross-sectional study conducted by Aravind Kumar, et al, Vital Signs Variation in Pre and Post Hemodialysis Session among Chronic Renal Failure Patients. Results showed that In pre and post dialysis the blood pressure was around 160±20.33, 90±0.8 off p <0.01*value In pre and post dialysis the heart rate was around 98±5.93, 85±4.66 off p <0.01*In pre and post dialysis the body temperature was around 96.02±2.00, 95.05±1.22 off 0.23.[9]

Sadigova, E., et al, conducted cross- sectional study on Pain Assessment in Hemodialysis Patients in 2020 in the Turkish HD patients. This study results showed that, 244 experienced pain (74.4%), and this pain had a neuropathic character in 61.8% of these patients. Patients with pain had a longer dialysis duration than those without pain (4.00 (2.00-8.00), 3.00 (2.00-4.75), p=0.01). The most common site of pain was the lower extremities. Pain was observed more often among females and with increasing age.[10]

The present study highlighted that, in association of respiration with sociodemographic variable gender ($\chi 2$=3.584 df=1, P=0.058) and clinical variable position of patients ($\chi 2$=8.768, df=3, P=0.033) were significantly associated at 0.05 level of significant. Temperature was significantly associated with clinical variable, weight ($\chi 2$=10.141, df=4, P=0.038) and comorbid condition hypertension of patients ($\chi 2$=4.245, df=1, P=0.039). Blood pressure was significantly associated with clinical variable like, types of diet($\chi 2$=9.256, df=2, P=0.010), daily intake($\chi 2$=11.048a df=3, P=0.011) and position of patients($\chi 2$=8.678, df=3, P=0.033) . Edema was significantly associated with clinical variable types of diet of patients ($\chi 2$=7.198, df=2, P=0.02).

5. CONCLUSION

The most common abnormal physiological parameter found during assessment was pain. Sociodemographic variablessuch as, genderwas associated with respiration andclinical variables such as, weight, comorbid condition hypertension associated with temperature, patient's position associated with respiration and blood pressure, daily intake by patients associated with blood pressure and types of diet of patients associated with both blood pressure and edema. The study concludes that the various physiological parameters of comfort are related with the clinical and demographic variables of the patients undergoing hemodialysis and hence need to be taken into account while providing care to patients.

DISCLAIMER

The research was not funded by any internal or external agency, rather it was funded by personal efforts of the authors.

CONSENT AND ETHICAL APPROVAL

The required ethical clearance were obtained for the conduction of the study from the concerned authorities of the institution (PU-IECHR/PIMSR/00/081734/4104), and also individual informed consent was obtained from the patients of the dialysis unit.

CONFLICT OF INTERESTS

Authors have declared that no competing interests exist.

Authors Contribution:

Author 1- Approval and finalizing of study conception and design, Drafting of manuscript.

Author 2- Data collection and analysis, Interpretation of results.

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