

Effect of Designing Nursing Instructions on Adherence to Medication among Patient Undergoing Hemodialysis

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Abstract:

Background: One of the most important variables in determining the efficacy of treatment is adherence to therapies. Adherence failure is a severe issue that impacts the patient as well as the health care system. Patient who do not take their medications as prescribed have significant deterioration of their illness, death and higher medical expenses. **This study aimed to** assess the level of patients' adherence to medications, designing nursing instructions about adherence to medications and Implement and evaluate the effect of nursing instructions on patient's adherence to medications. **Research design:** A quasi experimental (pre and post- test) research design was used in this study. **Sample:** A Convenience samples of one hundred adult patients who are willing to participate in the study and are within age range of (20 – 65) who receive regular hemodialysis. **Setting:** The study was conducted in Hemodialysis Unit at Assiut University Hospital. **Tool:** A structured interview questionnaire concerning demographic and medical data, and simplified Medication Adherence Questionnaire (SMAQ) and designing nursing instructions was used. **Results:** This study was composed of a higher proportion of men than women (51%), the majority of patients were unemployed (80%), the majority of patients were married, that the patients' age ranged from 50-65, and that the majority of patients had only completed secondary. **Conclusion:** There were a statistically significant differences between total scores of adherence to medication (pre / post-test) (after two month) after implementing nursing instructions (P=0.001) and Hemodialysis patients who follow their nursing instructions are more likely to take their medication as prescribed. **Recommendations:** Improving hemodialysis patients' medication adherence can be achieved by creating methods related to medication adherence.

Keywords: Adherence, Hemodialysis, Medication & Nursing Instructions.

Introduction:

The term "Chronic kidney disease" (CKD) refers to a broad category of anomalies that eventually lead to anomalies kidney structure and function. It is described as bilateral renal dysfunction resulting from structural damage that lasts longer than three months. Decreased glomerular filtration rate (GFR) ≤ 60 mL/min/1.73 m², elevated renal profile, abnormal electrolytes and minerals balance, proteinuria, and radiographic abnormalities are typical manifestation of this. The histological analysis of renal biopsied tissue frequently confirms this. (Habas et al., 2021)

The only two alternatives available to patients with end stage renal disease are kidney transplantation or hemodialysis or peritoneal dialysis for life. Dialysis is regarded as the preferred course of treatment among these choices. Hemodialysis is the most common form of treatment for patients 98.7% of patients undergo hemodialysis, whereas 1.3% receive peritoneal dialysis. (Gaipov et al., 2020).

Due to end-stage renal disease (ESRD), more than two million people worldwide now depend on dialysis or transplant to survive. Only 10% of patients

are taught to actually require medical attention in order to survive. (Elif & Fatma., 2019)

When the kidneys are in a condition of renal failure, hemodialysis (HD) is a technique used to achieve the extracorporeal elimination of waste product like creatinine and urea as well as free water from the blood. (Pradesh, et al., 2021) Since the HD cannot fully replace the functions of the kidney, patients must strictly adhere to dietary and hydration limitations. Conversely, individuals undergoing hemodialysis need to adhere to a complicated treatment plan that include dietary and hydration restrictions. (Cano et al., 2020) & (Kono et al., 2020).

Treatment adherence is more crucial with hemodialysis than with peritoneal dialysis because of its greater reliance on hospital care. Poor treatment adherence, on the other hand, is prevalent issue among hemodialysis patients, increasing the risk of both acute and chronic problems as well as morbidity and mortality. (Kim, et al., 2022)

Hemodialysis patients must adhere to rigorous treatment plan that entails regular HD sessions,

stringent food restrictions, a convoluted medication schedule, and exercise recommendations. (Khalil & Frazier., 2019). If this routine not followed there could be short and long term effect on survival and health. Short term treatment regimens non-compliance may raise the risk of emergency hospital admissions. (Aggarwal, et al., 2019)

The secret to every treatment method's success is treatment fade if the patient doesn't follow through with it, which lowers the overall effectiveness of health services. The process by which a patient consents to and follows treatment protocols is known as treatment adherence. Essential components of treatment adherence include initiating and completing a course of therapy, going to check-ups, taking prescription drugs as directed for the recommended length of time, altering on's lifestyle and controlling on's illness. (Elif & Fatma., 2019)

Dialysis nurses also known as (registry nurses) are required to possess a high level of expertise regarding patient processes, the correct operation of all dialysis related equipment in order to provide treatment that prevents complications or infection in patients and to effectively educate each dialysis. (Gaines., 2022)

The role of dialysis nurse (registry nurse) include keeping an eye on patients prior to, during advising patients on appropriate diet an activates to avoid; and making sure that the patients dialysis equipment is always operating as intended. (American Nephrology Nurses Association (ANNA) 2022)

Significance of the study

The nephrology nurse work as a patient care coordinator, coordinator with other medical professionals and members of the health care team to deliver necessary care as efficiently as feasible. Nephrology nurses support patient in their quest for information by serving as their teacher and champion. (American Nephrology Nurses Association (ANNA) 2022)

This study will assist the patient group in maintaining enough knowledge regarding medication adherence. Additionally, all hemodialysis patients with renal insufficiency may benefit from this study.

Aims of the study:

- 1- Assess the level of patients' adherence to medications.
- 2- Designing nursing instructions about adherence to medications.
- 3- Implement and evaluate the effect of nursing instructions on patient's adherence to medications.

Research Hypothesis:

Following the implementation of nursing instructions, the mean patient's medication adherence scores will be greater post than pre.

Patients and Method:

Research design:

Quasi experimental (pre –posttest) research design was used in this study.

Sample:

A convenience samples of (100) adult patients on regular hemodialysis, their age range between (20 - 65) from both sexes and are willing to participate in the study one group less than five years and another more than five years undergoing dialysis. The sample is selected by using the following equation according to

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times \left(d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

Steven K. & Thompson (2012).

N=total patient population size of 287 patients who undergoing hemodialysis of Assiut university hospitals. Z= confidence levels is 0.95 and is equal to 1.96. D= the error ratio is = 0.05 P= the property availability ratio and neutral = 0.50. Sampling was conducted at morning and evening shift.

Setting:

The study was conducted in Hemodialysis Unit at Assiut University Hospital.

Tool:

Tool I: A structured interview questionnaire:

This tool was developed by the researcher based on literature review and will consist of the following parts:

Part 1: Demographic data characteristics including patient code, age, sex, level of education, place of residence, marital status, income and employment.....etc.

Part 2: Medical data it include patient past history of chronic condition such as hypertension, diabetes mellitus and chronic glomerulonephritis, family history, long term use of analgesics drugs; smoking and complaint following hemodialysis session,....etc.

Tool II: Simplified Medication Adherence Questionnaire (SMAQ) developed by (Alikari et al., 2017). SMAQ evaluates eight items which include (forgetfulness, timeliness, stop taking medicine, not taking medicine, not taking medicine over past week , not taking medicine over past 3 month, during the last week, how often did you follow the instructions on fluid restrictions and during the last week, how often did you follow the instructions on diet).

Scoring system for medication adherence: A positive response to any of the questions, more than two doses missed over the past week, or over two days of total non-medication during the past three month = non- adherence

Tool III: Designing nursing instructions for hemodialysis patients developed by use of literature review. Researcher experience, and opinion of the medical and nursing expertise. The objective of this instructions is to improve patients' knowledge and informations after implementation of this instructions it was consist of:

- Knowledge about hemodialysis .
- Nutrition.
- Adherence to dialysis session
- Adherence to medication
- Activity and exercise.

Data collection procedure:

The researcher conducted a literature in order to formulating the tool of this study as well as for designing nursing instructions about medication adherence among patients with hemodialysis.

Content validity:

Three knowledgeable professors in the fields of medicine and nursing examined the study tool's content validity. They looked for aspect such as comprehensiveness, ease of use, clarity and administrative ease. Any minor adjustments that needed to be made were made appropriately.

Ethical approval:

The scientific research ethics committee at Assiut University Faculty of Nursing provided ethical approval for the study before it was carried out, citing code number1120240467.

A pilot study:

A pilot study was done on10% of the sample (10 patients) were included in the study; it carried out in June 2023 to assess the validity and practicability of the study tools. Additionally, it had given an approximate time estimate for completing the tools

Methods:

The appropriate hospital authorities of the hemodialysis unit at Assiut University Hospital granted formal permission to conduct the study.

Data were gathered at Assuit University Hospital from hemodialysis unit for four months from July 2023 to October2023. (Summer time) for every patient that was available, the study was conducted throughout morning and afternoon shifts.

During the first interview, the researcher introduces herself to establish a report, explains the nature and goals of the study to the chosen patients who to take part, and ask them to complete questionnaire so that demographic and medical data may be collected.

Following that, the research uses the Simplified Medication Adherence

Questionnaire (SMAQ) which the patient filled out, to evaluate the patient's medication adherence.

A designed nursing instruction for hemodialysis patients had been developed; the content meets the patients' needs, and their levels of understanding. All

patients received the contents of designed nursing instructions by the researcher herself. The patients were split up into small groups of (5-6 patient). A designed nursing instruction were conducted through (5 sessions) and the duration of each session was around 30 to 40 minutes include 10 minutes for discussion and feedback.

Each of the following session usually started by a briefing about what had been discussed in the previous session, using simple Arabic Language. Each session ended by a summary of what has been taught during the previous session and the objectives of new topics.

Feedback and reinforcement of designed nursing instructions was performed according to patients need to ensure their understanding.

Giving recognition to the interested patients was emphasized for motivation during the instructions. Each patient obtained a copy of the designed nursing instructions booklet that included the instructions content.

The first session: It used to assess the patient using A structured interview questionnaire Tool (1).

The (second) session: Was done used Simplified Medication Adherence Questionnaire (SMAQ) for the patient using Tool (2).

The (Third) session: Was done used to implementing the theoretical part of providing designed nursing instructions for patients.

The (fourth) session: After two month was done to evaluate the effectiveness of designed nursing instructions on knowledge of hemodialysis patients using Tool (1).

The (fifth) session: After two months was done to evaluate the effectiveness of nursing instructions on medications adherence using Tool (2) .

Protection of human right:

Every patient was made aware of the study's objective. The researcher underlined that the participation is entirely optional and that patient safety and confidentiality would be maintained by data coding and anonymization. Prior to each patient's participation in the current study, verbal consent was obtained .Any information gathered was protected in terms of confidentiality. The patients who were taking part gave their oral consent.

Ethical considerations:

1. Research proposal was approved from Ethical Committee in the faculty of nursing.
2. There is no risk for study subject during application of research.
3. The study was following common ethical principles in clinical research.
4. Oral consent was obtained from patients or guidance who are willing to participate in the

study, after explaining the nature and purpose of the study.

5. Confidentiality and anonymity will be assured.
6. Study subject have the right to refuse to participate and or withdraw from the study without any rational any time.
7. Study subject privacy was considered during collection of data

The statistical design:

The data obtained had reviewed, prepared for computer entry, coded, analyzed and tabulated, Descriptive statistics include (frequencies and percentages, mean and standard deviation) use Pearson chi- square (cross tabulation) between pre, and post-test after two months, correlation and one way a nova test were done using computer program (SPSS).

Results:

Table (1): Distribution of demographic data for patients (n=100)

Variables	No.	%
Age		
20<40yrs	28	28.0
40<50yrs	25	25.0
50-65yrs	47	47.0
Sex		
Male	51	51.0
Female	49	49.0
Marital status		
Single	12	12.0
Married	76	76.0
Divorced	2	2.0
Widow	10	10.0
Level of education		
Illiterate	20	20.0
Primary school	15	15.0
Secondary school	50	50.0
High education	15	15.0
Occupation		
Working	20	20.0
Not work	80	80.0
Residence		
Rural	47	47.0
Urban	53	53.0

Table (2): Distribution of medical data for patients (n=100)

Variables	N	%
Duration of dialysis		
Less than 5	49	49.0
More than 5 yrs	51	51.0
How many session per week?		
2 times	20	20.0
3 times	80	80.0
How many hours per session?		
4hours	96	96.0
more than 4 hours	4	4.0
Do you smoke?		
No	78	78.0
Yes	22	22.0
Do you take some medications such as analgesic for long periods?		
No	36	36.0
Yes	64	64.0
Do you take other medication for long periods?		
No	36	36.0
Yes	64	64.0

Table (3): Total level of patient Simplified Medication Adherence (SMAQ) (pre / post)Nursing Instructions (n=100) (Alikari et al., 2017)

Level of Medication Adherence		Pre	post	Total
Poor Medication Adherence	N	42	23	8.228 .006*
	%	42.0%	23.0%	
Good Medication Adherence	N	58	77	
	%	58.0%	77.0%	

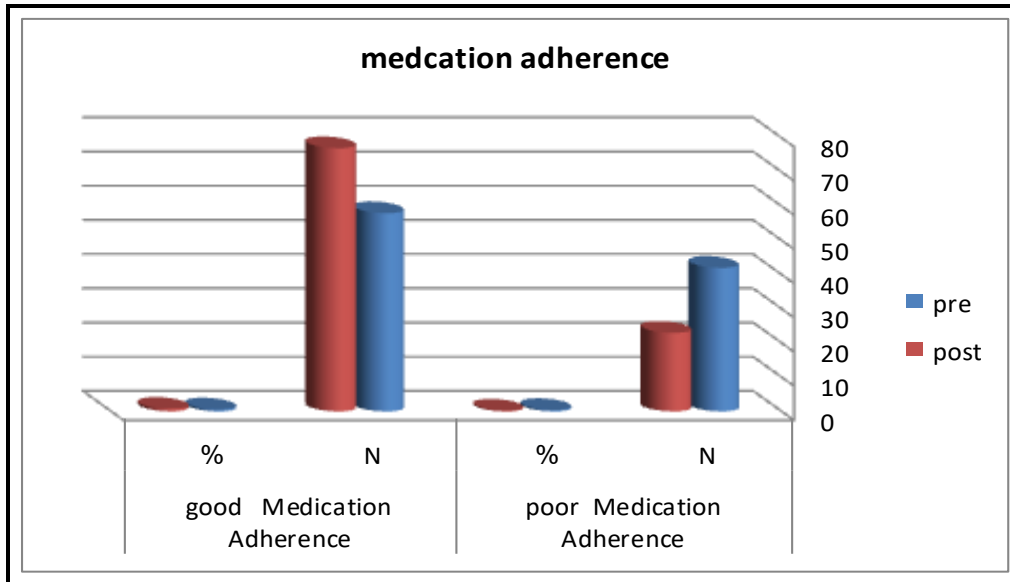


Figure (1): Total Level of medication Adherence (pre / post) Nursing Instruction (n=100)

Table (4): Correlation between demographic data and Simplified Medication Adherence (n=100)

Correlation pre		Age	Education level	occupation	Types of work
Simplified Medication Adherence	Pearson Correlation	-.040-	.030	.120	-.120-
	Sig. (2-tailed)	.694	.770	.235	.235
Correlation post					
Simplified Medication Adherence	Pearson Correlation	.069	-.043-	-.050-	.050
	Sig. (2-tailed)	.498	.672	.623	.623

Table (5): Correlation between medical data and Simplified Medication Adherence (n=100)

Correlation PRE		Simplified Medication Adherence
Duration of dialysis	Pearson Correlation	.238*
	Sig. (2-tailed)	.017
How many session per weeks	Pearson Correlation	-.144-
	Sig. (2-tailed)	.154
How many hours	Pearson Correlation	.078
	Sig. (2-tailed)	.439
Correlation Post		
Duration of dialysis	Pearson Correlation	-.116-
	Sig. (2-tailed)	.249
How many session per weeks	Pearson Correlation	.144
	Sig. (2-tailed)	.154
How many hours	Pearson Correlation	.195

Table (1): Show that the study sample was composed of a higher proportion of men than women (51%), that the majority of patients were unemployed (80%), that the majority of patients were married, that the patients' age ranged from 50-65, and that the majority of patients had only completed secondary school.

Table (2): Show that with references to the medical data of the sample under study, the majority of the patients have been receiving hemodialysis for more than five years, three times a week and for four hours a session. Additionally the majority of participants don't smoke, and when it comes to taking analgesics for an extended period of time, the percentage is equal.

Table (3): This table demonstrated that there was a statistically significant difference in the total level of Simplified Medication Adherence between hemodialysis patients in the pre and post-test (after two months) for the study group.

Figure (1): Regarding medication adherence display that 77% of patients respectively had good medication adherence, with statistically significant difference of total score level medication adherence (pre/post) providing nursing instructions among hemodialysis patients

Table (4): Demonstrates that, for the study sample, there is a statistical significance difference ($P=0.001$) between demographic data and Simplified Medication Adherence.

Table (5): Demonstrates that, for the study sample, there is statistical significance difference (value=0.001) between medical data and Simplified Medication Adherence for the study sample with value=0.001

Discussion

Chronic kidney disease (CKD) is a worldwide health issue that is highly prevalent. In the past few years, there has been a rise in the quantity of CKD patients switching to maintenance hemodialysis. In 2020, over 25 million individuals needed dialysis treatment; by 2030, that number is predicted to increase. (Collaboration, 2020)

For individuals with kidney failure, hemodialysis has been regarded as a conventional alternative treatment (Yang et al., 2021). Hemodialysis is a medical procedure where blood is filtered via a semi-permeable membrane or filter. The filter then excretes the excess water, waste products from the body, and toxic substances from the blood. This method preserves normal blood pressure, the body's homeostasis environment, and the cleanliness of the blood. (Ashraf, et al., 2019).

The objectives of this study were to measure the patient's adherence to medication; create nursing instructions regarding adherence medication

adherence, execute those instructions, and analyze the impact of those instructions on the patient's medication adherence.

According to the current study, the majority of the sample under study took analgesics and certain drugs for extended periods of time. This is in line with the finding of (Atta., et al., 2023) who discovered that most of the patients under study were chronic analgesic drug users. Drug use may be the cause of this, as hemodialysis patients depend on them to maintain their quality of life and ability to function in daily life. The current study finding also concerned with (Zain-ELdin et al., 2018), who discovered that majority of hemodialysis patients took medications for extended amount of time. Furthermore, the result are consistent with (Hamza et al., 2022), who discovered that more than half of the hemodialysis patients they evaluated had been used analgesic drug for an extended length of time.

Lastly, this study demonstrated the relationship between the SMAQ scale and the demographic information of the patient under the study. Demonstrate for the study sample, there was a highly statistical significance difference ($p<0.001$) between the demographic data and Simplified Medication Adherence. This outcome consistent with (Goma., et al., 2021). The result show that adherence varied significantly depending on factors including age, sex, marital status, occupation, degree of education, place of residence and economic status (p -value was less than 0.001**).

Conclusion:

Based on the study's finding, it can be said that nursing instruction have positive impact on hemodialysis patients' adherence to their medication. Additionally, there was a significance statistical difference between pre and post-test (after two month) total scores for adherence to medication ($P=0.001$). Following nursing instructions at Assiut University Hospital's hemodialysis unit.

Recommendation:

Creating plans to help hemodialysis patients adhere to their medication regimens; regular in-service training sessions pertaining to nursing instructions for hemodialysis patients must be held in the unit to continuously maintain and enhance medication adherence.

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