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## A study on assessment of medication adherence in Hemodialysis patients

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### Abstract

**Background:** Medication incompliance is one of the major problems with increase in Medications and Disease complications. The study aims in assessing Medication Adherence in Indian Population undergoing haemodialysis.

**Objectives:** To investigate and assess medication adherence in haemodialysis patients, deduce the commonly occurring comorbid condition in haemodialysis patients, access knowledge about medication adherence, find the prevalence of Hypertension, Diabetes Mellitus, and Anaemia in haemodialysis patients.

**Methodology:** A prospective observational study was conducted in the department of nephrology in BGS Gleneagles Hospital, Bengaluru for a period of 6 months.

**Results:** Out of 89 patients 61 (68.53%) were male and 28 (31.46%) were female. Morisky Green Levine scale was used to deduce the medication adherence, Pre-counselling data revealed that out of 89 patients 3 (3.37%) were highly adherent, 72 (80.89%) showed medium level of adherence and 14 (15.73%) showed low level of adherence. The post counselling data revealed improvement in adherence level. 39.3% high adherence was found in males and 39.2% was observed in females. Medium level of adherence was seen in 59.01% males and 60.71% females. Low level of adherence was observed in 0.016% males and 0% in females was observed. Fluid overload status 16 (13%), hypotension 5 (4.06%), hypertension 04 (3.25%), breathlessness 3 (2.43%), pain at fistula site 02 (1.62%), hypoglycaemia 02 (1.62%), abdominal pain 02 (1.62%), weakness, itching and cramps 3 (2.43%), and chills, fever and body pains 02 (1.62%) were the Intradialytic complications observed.

**Conclusion:** From the present study it can be concluded that many forget to take medication as prescribed. Some have shown non-adherence because of the fear of early death or forget to carry their medications with them, some stopped taking the medicine when they feel better. Very few claimed that they complete the course of the prescribed medication. The study also revealed that patients in 35-60 age groups have higher level of adherence both before and after counselling, the prevalence of hypertension diabetes mellitus and other comorbid conditions in CKD seems to follow an increasing trend with increasing age. Special consideration is required for the diagnosis and management of Intradialytic complications because such complications could be managed successfully without the need for termination of the dialysis procedure.

**Keywords:** Hypertension, intradialytic complication, medication adherence, morisky green levine scale.

### Introduction

Medication Adherence is a discipline which studies the pattern of patient's behaviour towards his/her medication, therapy or treatment. It can also be defined as the assessment of compliance of a patient towards his/her in a long-term treatment regimen. Medication adherence is the voluntary co-operation of the patient in taking drugs or medicine as prescribed, including timings, dosage, and frequency.

Recognition of medication-compliance behaviour is an immensely compound process as it varies from individual to individual and the parameters for the measurement of adherence must be wisely demarcated for individual patients. Moreover, medication non-compliance is a major concern for clinicians as well as healthcare systems, and other payers because it provides corroboration for the association of increased healthcare costs and complications<sup>2</sup>. Poor Adherence to multimodal therapy is widely recognized in haemodialysis patients and it contributes to increased morbidity and mortality.

## Types of non-adherence

### A. Unintentional Non-adherence

“Passive process in which the patient may be careless or forgetful about adhering to treatment regimen”.

Patient Ability and Resources → Practical patient barriers to adherence.

### B. Intentional Non-adherence

“Active process whereby the patient chooses to deviate from the treatment regimen”.

Patient beliefs and Motivators → Patient perceptual barriers to adherence.

## Medication adherence can also be categorized as

- Primary:** Non-Fulfilment-prescription is never filled or initiated.
- Secondary:** Non-Persistence-patients stop taking medication after taking it. Rarely Intentional-Usually arises from miscommunication or resource/capacity limitations.
- Tertiary:** Non-Confirming-Medications are not taken as prescribed.

Missed doses, incorrect doses, dose taken at wrong time.  
Measurement of medication adherence

## Measurement of medication adherence pattern involves 2 ways

### 1. Subjective measurement

They are inclusive of questionnaires given to patients, caregivers, physicians about the use of medication;

### 2. Objective measurement

- Indirect methods include counting of pills, examining pharmacy refill records, or use electronic medication event monitoring systems; and
- Direct/Biochemical measurements are obtained by adding a nontoxic marker to the medication and detecting its presence in blood or urine or measurement of serum drug levels.

In the current scenario these methods alone or in combination with each other are used to assess medication adherence pattern along with monitoring of clinical outcomes.

## Reasons for non-compliance

Non-compliance to medication can increase hospitalization period, further progression of disease or complication and can also lead to mortality. Myriad factors are responsible for the attenuation of adherence level in a patient. The multifactorial reasons to Non-Adherence as categorized by WHO are:

- Socioeconomic factors
- Health care team and system related factors
- Disease-related factors
- Therapy-related factors, and
- Patient-related factor

## Objectives of the study

### Primary objective

- To investigate and assess medication adherence in haemodialysis patients.

### Secondary objective

- To deduce the commonly occurring comorbid condition in hemodialysis patients.
- To access knowledge about medication adherence.

- To counsel patient with medication adherence in order to improve their quality of life.
- To clarify patients doubts regarding to medication and lifestyle modifications.

## Materials and methods

### Study site

BGS Gleneagles Hospital, Department of Nephrology, Kengeri, Bengaluru, Karnataka, India.

### Study design

Prospective observational study.

### Study period

Six Months.

### Inclusion criteria

- All patients who come for Haemodialysis.
- Patients of all ages.
- Both male and female.
- Patients with comorbid conditions.

### Exclusion criteria

- Patients who underwent multi-organ transplantation.
- Patients who underwent renal transplantation.
- Patients who refuse to give consent.

### Statistical tools

- SPSS software 2016 version.
- Microsoft Excel 2016 version.

## Study population and data collection

This is a prospective observational single centred study which was carried out in a tertiary care hospital, dialysis unit. The study lasted for a period of six months in clinical services of nephrology in dialysis patients. A sample of 89 patients was observed and the patients were selected based on inclusion and exclusion criteria. The patients of age >18yrs and those undergoing maintenance haemodialysis were included in the study. Those with acute renal failure and with other kidney diseases who are not on dialysis, tumours (cancer) and trauma (accident) were excluded from the study.

The identification was done in an observational manner in dialysis patients. The information was obtained by the means of patients electronic files, nursing sheets, medical reports their case file, and interviewing patients. All the cases were reviewed and those who met the study criteria were followed and drug therapy details were recorded in the suitable data collection form as per the need of the study. The study was presented to the general management, the educational area and heads of the services of medical area. The investigator submitted the project for evaluation and approval to the Institutional Ethical Committee of high speciality hospitals. During the study the privacy information of the subjects were guaranteed in an atmosphere of confidentiality, considering the voluntary participation of the health personals and taking into account and respecting their benefits and fair treatment according to Belmont report and The Declaration of Helsinki.

## Data analysis

Data was entered in MS Excel and analyzed using SPSS 22 Version software. Qualitative data will be presented in the form of proportions and pie charts, bar charts will be used to represent graphically. Chi-square test was used to determine

the level of significance. P value <0.05 will be considered as statically significant.

**Results and discussion**

**Table 1:** Level of adherence in study population

Level of adherence	No. of patients	Percentage (%)
Highly adherent	3	3.37
Medium adherent	72	80.89
Low adherent	14	15.73
Total	89	100

**Table 2:** Categorization of adherence based on gender (Before counselling)

Level of adherence	Male	Female	Percentage (%)	
			Male	Female
Highly adherence	3	0	4.91	0
Medium adherence	48	24	78.68	85.71
Low adherence	10	4	16.39	14.28
Total	61	28	100	100

**Table 2:** Categorization of adherence based on gender (After counselling)

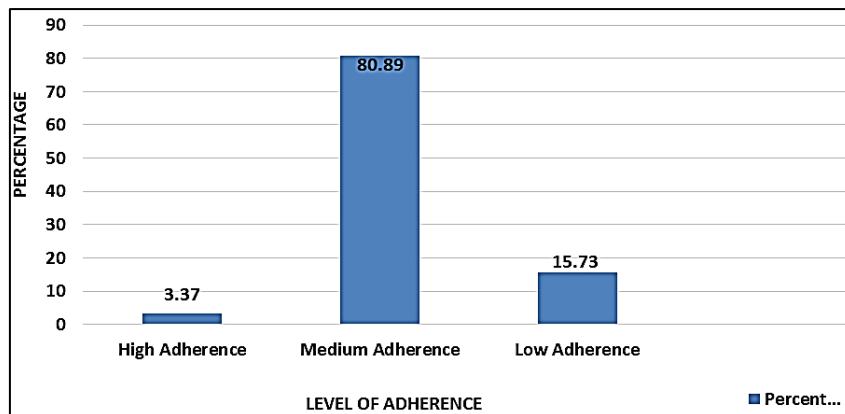
Level of adherence	Male	Female	Percentage (%)	
			Male	Female
Highly adherence	24	11	39.3	39.2
Medium adherence	36	17	59.01	60.71
Low adherence	1	0	0.016	0.09
Total	61	28	100	100

**Table 4:** Percentage distribution on Intradialytic complications

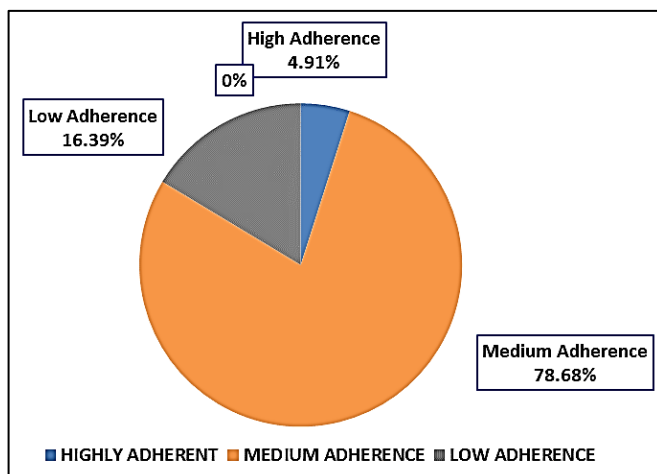
Intradialytic complications	No. of subjects	Percentage
Fluid overload status	16	14.24%
Hypotension	05	4.45%
Hypertension	04	3.56%
Breathlessness	03	2.67%
Pain at fistula site	02	1.78%
Hypoglycemia	02	1.78%
Abdominal pain	02	1.78%
Weakness, Itching and cramps	03	2.67%
Chills, fever and body pains	02	1.78%
Number of patients with no complications during dialysis	50	44.5%
Total	89	100%

**Table 5:** Comorbidities

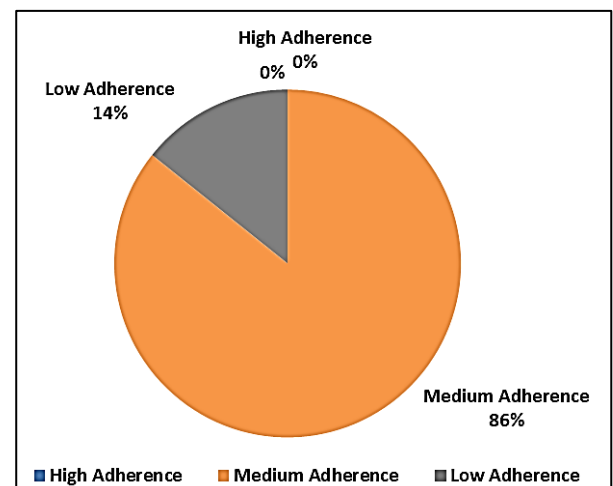
Comorbidities	No. of patients	Percentage
HTN in HD patients irrespective of other comorbidities	80	71.2%
Only HTN + CKD	70	62.3%
Other comorbidities along with CKD-V		
Anemia	10	8.9%
DM Type-2	55	48.95%
Diabetic Nephropathy	05	4.45%
Diabetic Retinopathy	02	1.78%
Renal transplant Graft Rejection	04	3.56%
CAD	06	5.34%
IHD	06	5.34%
Secondary Hyperthyroidism	02	1.78%
Hypothyroidism	02	1.78%
Acute tubular necrosis	06	4.87%



**Fig 1:** Graphical representation of level of adherence in study population



**Fig 2:** Graphical representation of level of adherence among males (Before counselling)



**Fig 3:** Graphical representation of level of adherence among females (Before counselling)

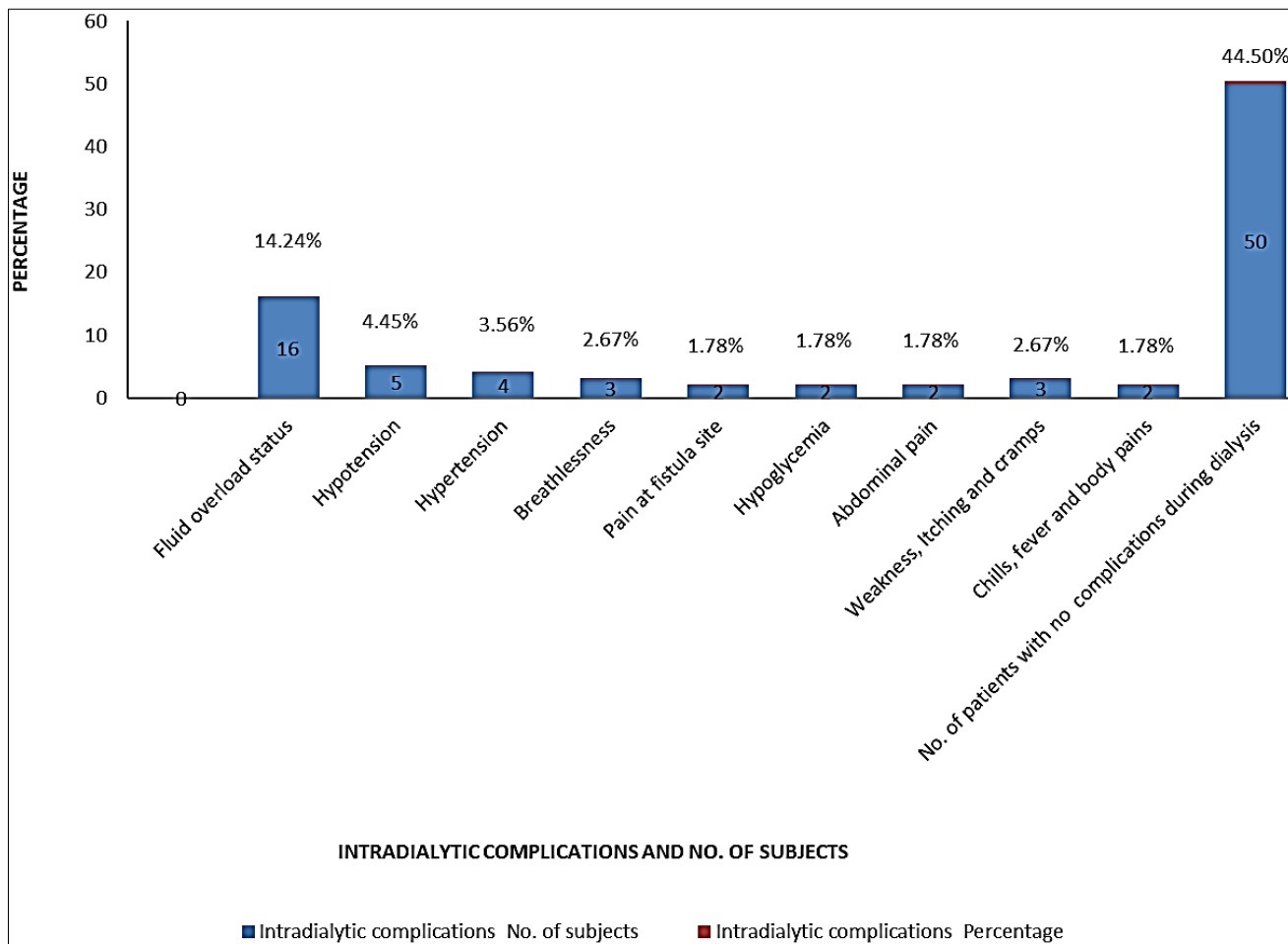


Fig 4: Graphical representation of percentage distribution of Intradialytic complications

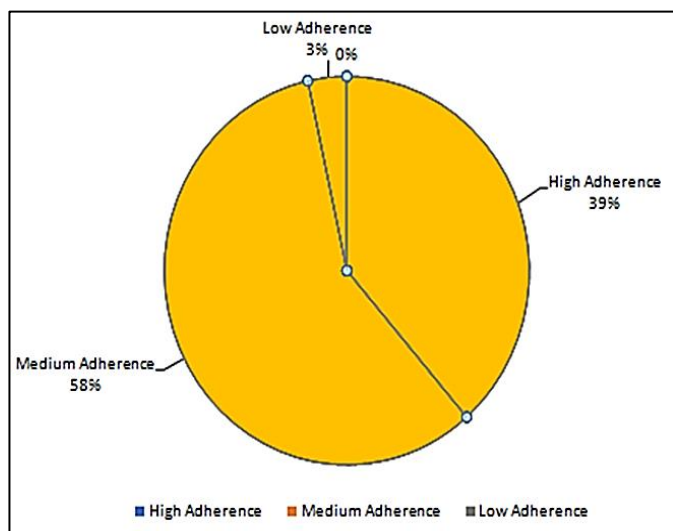


Fig 5: Graphical representation of level of adherence in males (After counselling)

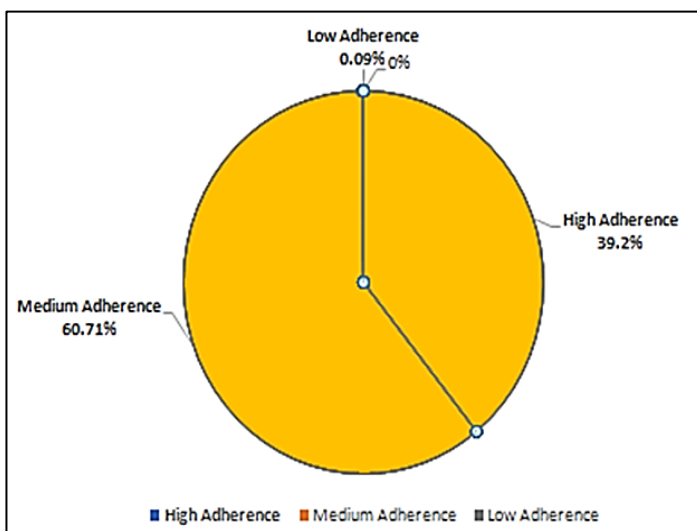


Fig 6: Graphical representation of level of adherence in females (After counselling)

In the current study the involvement of 89 patients of various age groups was studied out of which 61 (68.53.45%) are male and 28 (31.46%) are female. The study revealed that out of 89 patients 3 (3.37%) were highly adherent, 72 (80.89%) showed medium level of adherence and 14 (15.73%) showed low level of adherence towards their medication. Morisky Green Levine Scale was used to deduce the above data.

These results are consistent with the previous studies done by Abdulmalik M Alkatheri *et al.* 89 patients on haemodialysis (HD) at the King Abdul Aziz Medical City using an Arabic

version of the Morisky Medication Adherence Scale (MASS-8). The results of the study revealed that 31.46% and 40.45% of the participants showed low and medium adherence, respectively, while 28.09% showed high medication adherence. Accordingly, 71.91% of the patients visiting the dialysis unit were considered medication non-adherent. Among 220 patients and the mean age  $\pm$  standard deviation of participants was  $56.82 \pm 14.51$  years. Data was analysed and the study concluded that Dietary adherence was observed in 24% while that of fluid restriction adherence was observed in

31% of studied patients. Reported adherence to HD sessions was 52% while that for medications was 81%. Overall, 122 (55.5%) patients had good adherence, 89 (40.5%) had moderate adherence, and 9 (4.1%) had poor adherence behaviour. It was also observed that Male patients had significantly higher overall adherence scores than females ( $p = 0.034$ ) in a cross-sectional study conducted by Karam Sh. Naalweh *et al.*

From Table 1 and Figure 1, out of 89 patients 3 (3.37%) were highly adherent, 72 (80.89%) showed medium level of adherence and 14 (15.73%) showed low level of adherence consistent with a similar study conducted by Abdulmalik M Alkatheri *et al.*

From Table 2 and Figure 2 and 3, the categorization of level of adherence (before counselling) out male 61 subjects included in the study only 3 (4.91%) were highly adherent, 48 (78.68%) subjects showed medium level of adherence and 10 (16.39%) showed low level of adherence.

Out of 28 female subjects included in the study none showed high level of adherence while 24 (85.71%) showed medium level of adherence and 4 (14.28%) showed low level of adherence.

From Table 3 and Figure 5 and 6, Categorization of adherence based on gender (after counselling) describes that 39.3% high adherence was found in males and 39.2% was observed in females. Medium level of adherence is seen in 59.01% males and 60.71% females. Low level of adherence was observed in 0.016% and 0% in females. So higher adherence was observed in males than females our results were similar to previous literatures.

From Table 4 and Figure 4, fluid overload status was observed in 16 (14.24%) followed by hypotension 5 (4.45%), hypertension 04 (3.56%), breathlessness 3 (2.67%), pain at fistula site 02 (1.78%), hypoglycaemia 02 (1.78%), abdominal pain 02 (1.78%), weakness, itching and cramps 3 (2.67%), and chills, fever and body pain 02(1.78%). Our results were similar to the previous literatures.

The secondary variables were also evaluated showing the distribution of CKD with or without HTN and other comorbidities. From table 6, out of 89 subjects, HTN was seen in 80 (71.2%), followed by 55 (48.95%) were found to have diabetes mellitus type-2, followed by anaemia 10 (8.9%), diabetic nephropathy 5 (4.45%), and other comorbidities like secondary hypothyroidism, hypothyroidism etc.

Based on a study conducted by Sailaja. Chundu *et al.* on Prescribing Pattern of Medicines and Medication Adherence in CKD patients on maintenance haemodialysis had shown a similar comorbidity association among CKD patients. Most of these patients are with HTN (91%) followed by DM (48%) with several other comorbidities.

## Conclusion

According to the sample size of 89 patients out of which 61 were males and 28 females, the study revealed that males show more adherence than females. Out of all participants many forget to take medication as prescribed. Some people have shown that non-adherence because of fear of early death and forgetfulness. Very few people claimed that they complete the course of prescribed medication and some of them stopped taking medicine when they feel better. The study also revealed that 35-60 age categories showed higher level of adherence both before and after counselling amongst all other age groups that were studied. Need for special

attention for the diagnosis and management of Intradialytic complications of HD is required because such complications can be managed successfully without terminating the process of the dialysis procedure. Hyperkalaemia is the more predominantly perceived electrolyte imbalance. Physicians and clinical pharmacists should update their knowledge regarding current advances in treatment of ESRD patients in order to detect, avoid harmful effects, to provide effective therapy and address adherence issues.

## Future directions

Healthcare professionals should be more cautious while identifying the concerns to address adherence issues. Future research should be aimed at understanding healthcare professionals' perception and practice of assessing medication adherence in dialysis patients that may guide intervention to resolve this significant issue of medication non-adherence.

## Limitations

The study was done only for a shorter period of time with a limited number of patient records and patients' refusal to undergo frequent laboratory monitoring due to higher expenditure.

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## Conflicts of interest

The author declares that there is no conflict of interest to disclose.

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