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A PROSPECTIVE OBSERVATIONAL STUDY OF FACTORSTHAT AFFECT MEDICATION ADHERENCE ON ELDERLYPATIENTS IN OUT-PATIENT DEPARTMENT IN TERTIARY CARE HOSPITAL

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ABSTRACT

The Study entitled "A Prospective observational Study Of Factors That Affect Medication Adherence on Elderly Patients in Out-Patient Department in Tertiary Care Hospital"was designed to assess self-reported medication adherence and its factors in elderly patients. Medication adherence was tested by using validated eight-item self-report Morisky Medication Adherence Scale (MMAS-8).An observational study of 6 months was carried out in out-patient department of tertiary care hospitals. Participants older than 45 years of age were interviewed while waiting for medical checkup. Total of 320 participants, of which 156 males and 164 females were interviewed. In that 228(71.25%) are low adherent to medications. Statistically, multivariate logistic regression shows that the patients who are living in village, low income, illiterate, poly pharmacy, forgetfulness and adverse effects had lower levels of medication adherence. This analysis shows very low adherence levels in the interviewed population. Poor adherence to medications was very common. The findings ofthis study are used to identify the subset of population at risk of poor adherencewho should be targeted for interventions to achieve medication adherence and hence prevent complications.

Keywords: Medication adherence, Elderly patients, MMAS-8 etc.

INTRODUCTION:

There is a saying that 'How does a drug work without taking it by patient." So the effect of prescribed medication shows only when we take them. According to WHO, Medication Adherence is defined as the extent to which patients take their medications as prescribed by the health care providers. The terms "medication adherence" and "medication compliance" are synonyms. Here compliance is what a patient obeys to the physician's authority, whereas adherence signifies that the patient and physician collaborate to improve the patient's health by integrating the physician's medical opinion and the patient's lifestyle, values and preferences for care. The Medication persistence refers to the act of continuing the treatment for the prescribed duration. It may be defined as "the duration of time from initiation to discontinuation of therapy." Non-adherence is the major problem worldwide. Medication non-adherence is a leading cause of morbidity, mortality and health care costs by the WHO. Regardless of gender, medical condition, ethnicity or age, 50% of all patients are non-adherent. Non-adherence costs the health care system over 300 billion dollars annually including adverse health effects, treatment outcomes, increased risk for complications as well as a multitude of diseases and conditions.

METHODOLOGY

1. Study Site:

The study entitled "A Prospective observational study of Factors That Affect Medication Adherence on Elderly Patients in Out-Patient Department in Tertiary care hospital" was carried out in outpatient department of tertiary care hospitals of Trident hospital, perecherla, Guntur, Andhra Pradesh.

2. Study Design: It is an observational prospective study.

3. Study Duration:

The study was planned and carried out for a period of six months from September, 2022 toApril, 2023.

4. Study Criteria:

a) Inclusion criteria:

- Both genders.
- Above 45 years of age who are taking medication.
- Patients receiving mono or multi drug therapy.

- Patients with one or more diseases.

b) Exclusion Criteria:

- Subjects who are not willing to join the study**.**
- Subjects who have no diseases and not using any medications.
- Subjects under 45 years of age.
- Pregnant women and children.

5. Study size: 200 subjects who are on medication for a period of minimum 2 months.

6. Study Procedure:

An observational prospective study was carried out from September, 2022 to April, 2023in tertiary care hospitals. This study was approved by institutional ethics committee. Patients above 45 years of age group who are taking medications for their diseases are included after taking consent from the patient to participate in the study based on inclusion criteria.

Data collection was carried out by face-to-face interviews with the patients.The information collected includes demographic data (i.e., age and gender), level of education (referred to Indian education system), income status, number of drugs taken and type of chronic disease present such as hypertension, diabetes, heart failure, COPD, renal failure, and osteoporosis, etc. and number of drugs taken.The data collection was pre-tested through a pilot study of 10 patients who were not included in the final analysis to check for the understand-ability and language clarity of questions, and all valid comments were taken into consideration by the principal researchers in the main survey.

Medication adherence was tested by using validated eight-item self-report Morisky Medication Adherence Scale (MMAS-8).Response choices are “yes” or ‘‘no” for items 1 through 7 and Item 8 has a five-point Likert response scale. Each ‘‘no” response is rated as 0 and each ‘‘yes” response is rated as 1 except for item 5, in which each ‘‘yes” response is rated as 0 and each ‘‘no” response is rated as 1.For Item 8; A is 0 and B-E is 1. Total scores on the MMAS-8 range from 0 to 8, with scores of 0 reflecting high adherence, 1 or 2 reflecting medium adherence, and >8 reflecting low adherence. In addition, the MMAS-8provides information on behaviors associated with low adherence that may be unintentional

(e.g., forgetfulness) or intentional (e.g., stopped taking medication without telling the doctor, because they felt worse when they took it). Identification of these behaviors can facilitate tailoring of interventions to specific patient issues and is strongly related to concordance. Permission to use the scale was granted by Donald Morisky, the copyright holder of the instrument. The internal consistency and validity of the questionnaire was ensured (Cronbach's alpha value was 0.723 for the instrument used in our study).

7. Statistical analysis:

Statistical analysis was performed using SPSS version20. Means ± standard deviation was computed for continuous data. Frequencies and percentages were calculated for categorical variables. In univariate analyses, categorical variables were compared using Chi- square test.Multivariate logistic regression analysis was conducted to evaluate the odds ratios of factors that showed a statistically significant association with medication adherence in the univariate analysis. A P-value < 0.05 was considered statistically significant.

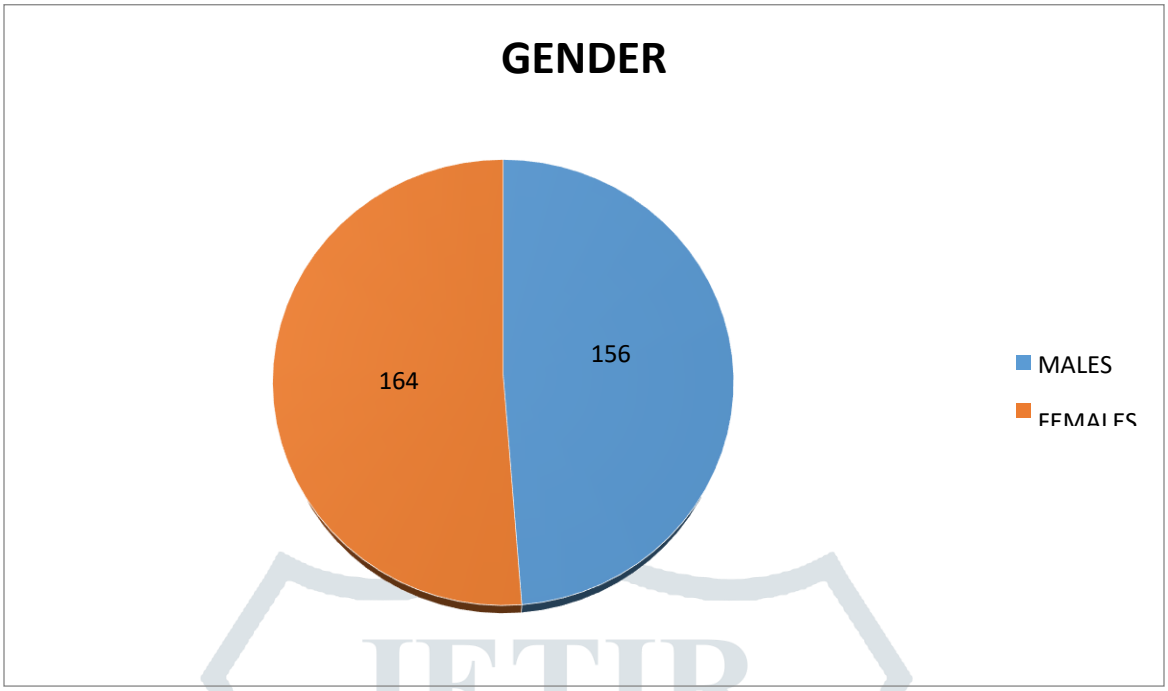
RESULTS

Participants older than 45 years were interviewed while waiting for medical checkup. Out of 320 participants156 (48.7%) are males and 164 (51.3%) are females. The mean age was 54.83 (SD ± 9.61) years.

TABLE: 1 MEDICATION ADHERENCE BASED ON GENDER

GENDER	HIGH ADHERENCE	MEDIUM ADHERENCE	LOW ADHERENCE	TOTAL
MALES	12 (7.6%)	28 (17.9%)	116 (74.3%)	156(48.7%)
Females	10 (6.09%)	38 (23.1%)	116 (70.7%)	164(51.2%)

FIGURE NO 1: GENDER DISTRIBUTION OF PARTICIPANTS

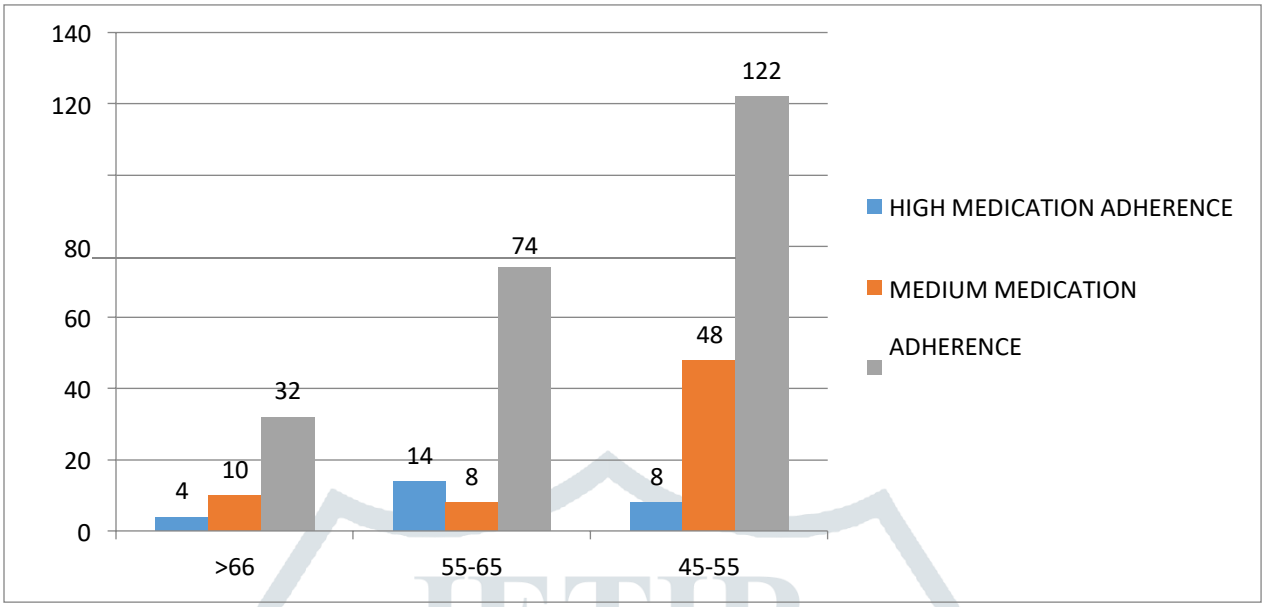


The total number of participates are 320 out of them 164 (51.3%) patients were males among them12 (7.6%) patients shows high medication adherence, 28 (17.9%) patients shows medium medication adherence, 116 (74.3%) patients shows low medication adherence and 156 (48.7%) are females among them 10 (6.09%) patients shows high medication adherence, 38 (23.1%) patients shows medium medication adherence, 116 (70.7%) patients shows low medication adherence. By using chi square test the value of p = 0.472861 .The result is not significant at P> 0.05.Hence the demographic data shows thegender does not affect the medication adherence among all the patients.

TABLE: 2 MEDICATION ADHERENCE BASED ON AGE

AGE	High Adherence	Medium Adherence	Low Adherence	T0TAL
45-55	8(4.4%)	48(26.9%)	122(68.5%)	178(55.6%)
56-65	14(14.5%)	8(8.3%)	74(77.0%)	96(30%)
>66	4(8.6%)	10(21.7%)	32(69.5%)	46(14.3%)

FIGURE NO: 2 MEDICATION ADHERENCES BASED ON AGE



The Participants belongs to the age group of (45-55) were 178(55.6%) patients, among them 8 (4.4%) patients shows high medication adherence , 48 (26.9%) patients shows medium medication adherence , 122 (68.5%) patients shows low medication adherence .

The age group of (55-65) were 96(30%) patients ,among them 14 (14.5%) patients shows high medication adherence , 8 (8.3%) patients shows medium medication adherence, 74 (77.0%) patients shows low medication adherence.

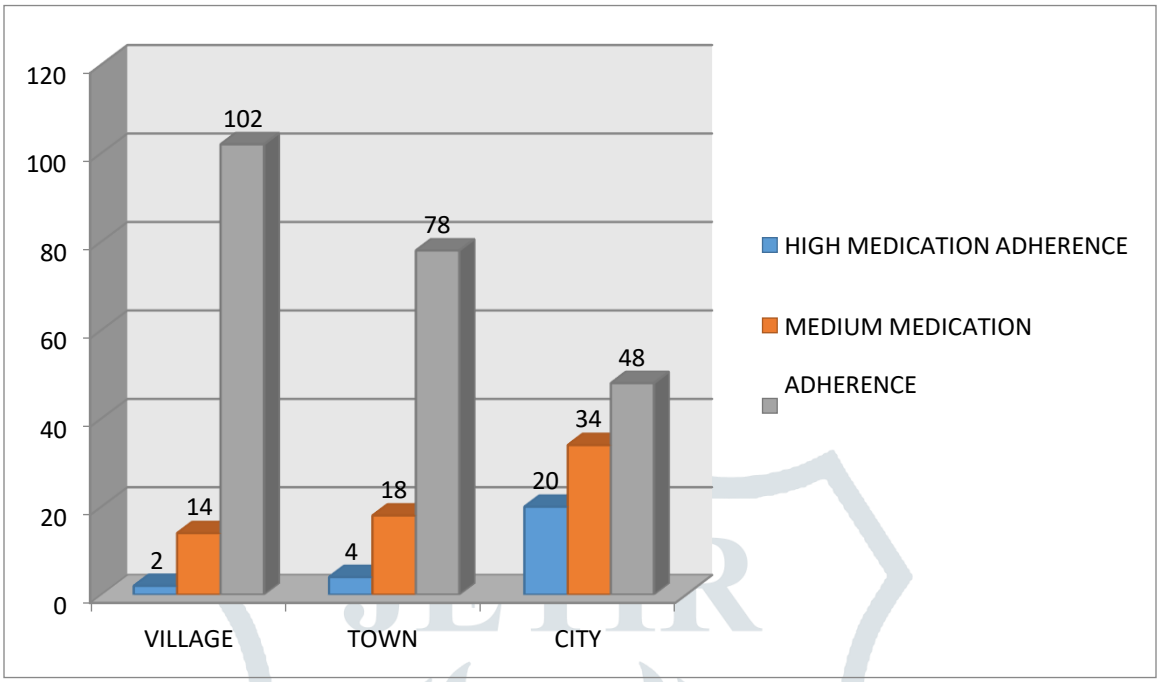
The age group of >66 were 46(14.3%) patients , among them4 (8.6%) patients shows high medication adherence, 10 (21.7%) patients shows medium medication adherence ,32 (69.5%) patients show low medication adherence.

By using chi square test the value of p = 0.000777 .The result is significant at $P<0.05$ .Hence the demographic data shows the medication adherence increases with age as the older the patient become the more care he takes.

TABLE: 3 THE MEDICATION ADHERENCE BASED ON RESIDENCE

RESIDENCE	HIGH MEDICATION ADHERENCE	MEDIUM MEDICATION ADHERENCE	LOW MEDICATION ADHERENCE	TOTAL
Village	2(1.6%)	14(11.8%)	102(86.4%)	118(36.8%)
Town	4(4%)	18(18%)	78(78.0%)	100(31.2%)
City	20(19.6%)	34(33.3%)	48(47.0%)	102(31.8%)

FIGURE NO: 3 MEDICATION ADHERENCES BASED ON RESIDENCE



A total of 118 (36.87%) of patients are from village among them 2 (1.69%) patients shows high medication adherence , 14 (11.86%) patients shows medium medication adherence , 102 (86.44%) patients shows low medication adherence.

A total of 100 (31.25%) of patients from town among them 4 (4%) patients shows high medication adherence ,18 (18%) patients shows medium medication adherence ,78 (78%) patients shows low medication adherence .

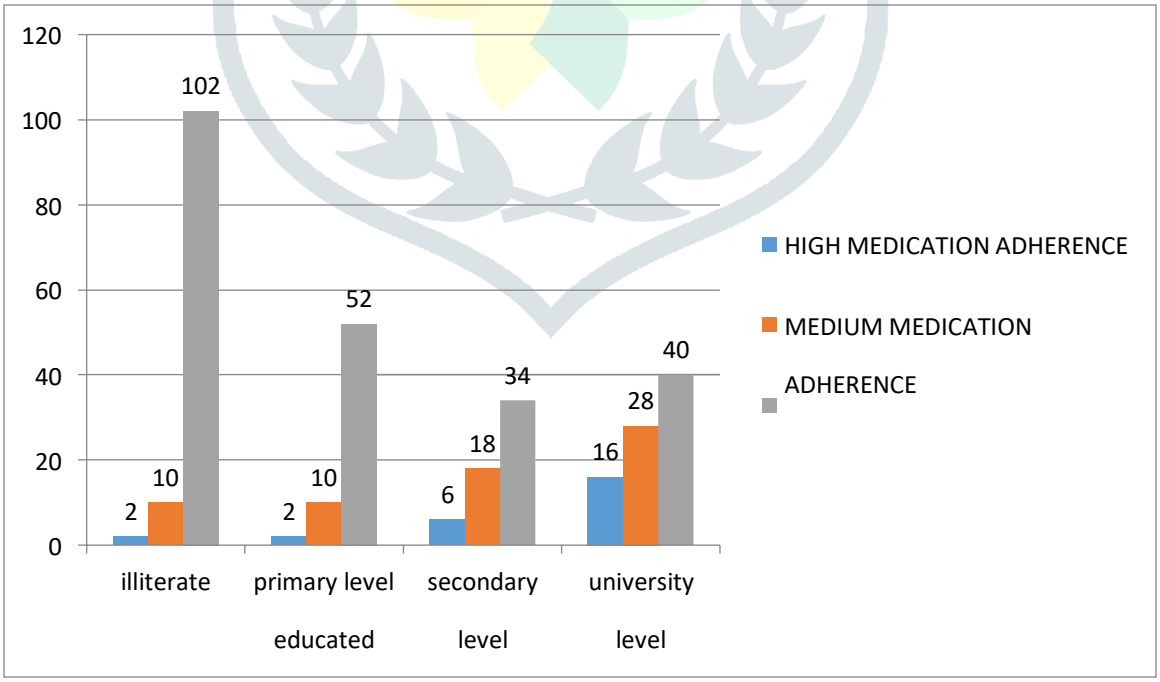
A total of 102 (31.87%) of patients are from city, among them 20 (19.6%) patients shows high medication adherence , 34 (33.3%) patients shows medium medication adherence ,48 (47.08%) patients shows low medication adherence .

By using chi square test the value of P = 0.00001.The result is significant at $P<0.05$.Hence the demographic data shows the patients living in city shows more medication adherence compared to the patients living in village.

TABLE: 4 MEDICATION ADHERENCE BASED ON LEVEL OF EDUCATION

EDUCATION	HIGH MEDICATION ADHERENCE	MEDIUM MEDICATION ADHERENCE	LOW MEDICATION ADHERENCE	TOTAL
Illiterate	2(1.7%)	10(8.7%)	102(89.4%)	114(35.6%)
Primary	2(3.1%)	10(15.6%)	52(81.2%)	64 (20%)
Secondary	6(10.3%)	18(31%)	34(58.6%)	58 (18.1%)
University	16(19%)	28(33.3%)	40(47.6%)	84 (26.2%)

FIGURE NO: 4 MEDICATION ADHERENCES BASED ON EDUCATION



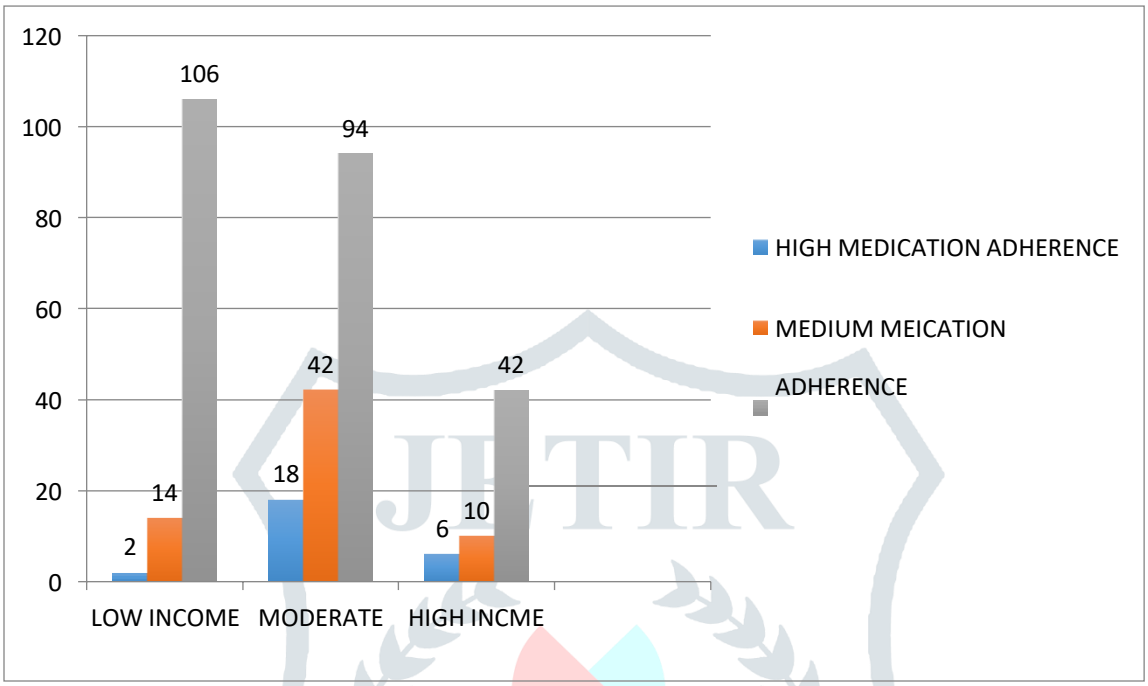
A total of 114 (35.6%) patients are illiterate among them 2 (1.7%) patients shows high adherence , 10 (8.7%) patients shows medium adherence ,102 (89.4) patients shows low adherence . a total of 64 (20%) patients are primary level educated among them 2 (3.1%) patients shows high adherence , 10 (15.6%) patients shows medium adherence ,52 (81.2%) patients shows low adherence . A total of 58 (18.1%) patients are secondary level educated among them 6 (10.3%) patients shows high adherence, 18 (31%) patients shows medium adherence, 34 (58.6%) patients shows low adherence. A total of 84 (26.2%) patients are university level educated among them 16 (19%) patients shows high adherence, 28 (33.3%) patients shows medium adherence, 20 (23.8%) patients shows low adherence.

By using chi square test the value of P = 0.00001.The result is significant at $P<0.05$.Hence the demographic data shows the patients who are university level educated having high medication adherence compared to illiterate.

TABLE: 5 THE MEDICATION ADHERENCE BASED ON INCOME

INCOME	HIGH MEDICATION ADHERENCE	MEDIUM MEDICATION ADHERENCE	LOW MEDICATION ADHERENCE	TOTAL
LOW	2(1.6%)	14 (11.4%)	106 (86.8%)	122 (38.1%)
MODERATE	18(11.6%)	42 (27.2%)	94 (61%)	154 (48.1%)
HIGH	6 (13.6%)	10 (22.7%)	28 (63.6%)	44 (13.7%)

FIGURE NO 5: MEDICATION ADHERENCE BASED ON INCOME



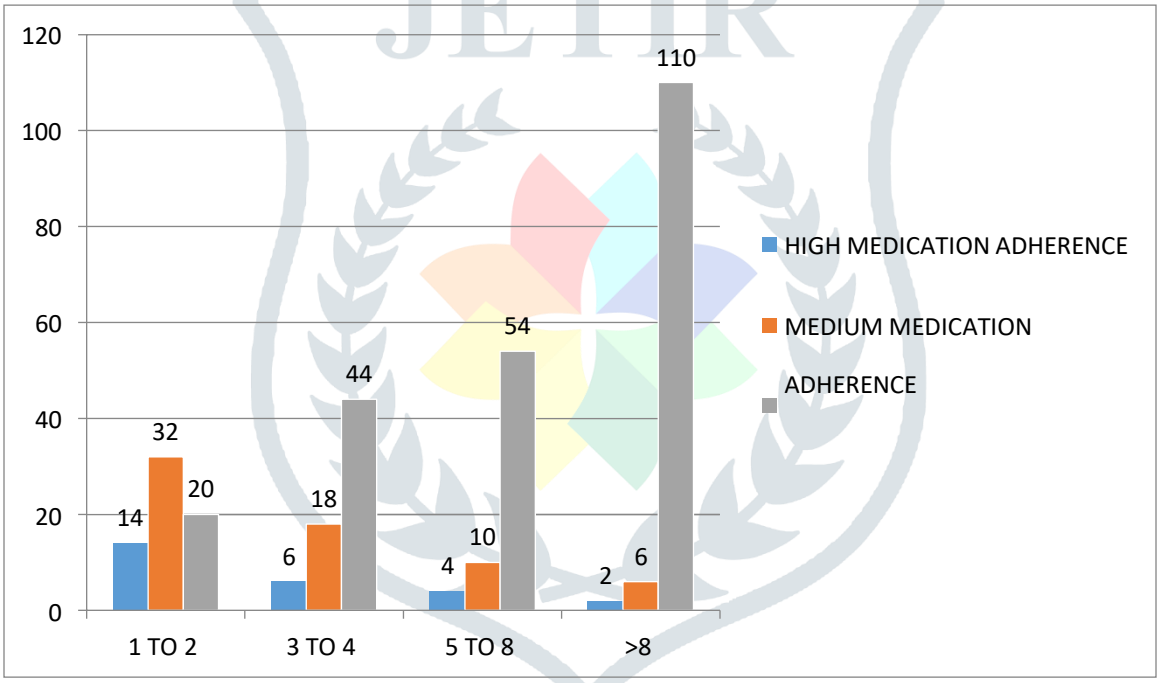
A total of 122 (38.1%) of total patients are with low income among them 2 (1.6%) patients shows high adherence , 14 (11.4%) patients shoes medium adherence , 106 (86.8%) patients shows low adherence . A total of 154 (48.1%) of total patients are with moderate income among them 18(11.6%) patients shows high adherence , 42 (27.2%) patients shows medium adherence ,94 (61%) patients shows low adherence . A total of 44 (13.7%) of total patients are with high income among them 6 (13.6%) patients shows high adherence ,10 (22.7%) patients shows medium adherence ,44 (13.7%) patients shows low adherence.

By using chi square test the value of P = 0.00004.The result is significant at $P<0.05$.Hence the demographic data shows the patients with high income shows high medication adherence compared to low income patients.

TABLE: 6 THE MEDICATION ADHERENCE BASED ON NO. OF MEDICATION

NO.OF MEDICATIONS	HIGH MEDICATION ADHERENCE	MEDIUM MEDICATION ADHERENCE	LOW MEDICATION ADHERENCE	TOTAL
1 TO 2	14(21.2%)	32(48.4%)	20(30.3%)	66(20.6%)
3 TO 4	6(8.8%)	18(26.4%)	44 (64.7%)	68(21.2%)
5 TO 8	4 (5.8%)	10(14.7%)	54(79.4%)	68(21.2%)
>8	2(1.6%)	6(5.0%)	110(93.2%)	118(36.8%)

FIGURE NO: 6 MEDICATION ADHERENCES BASED ON NO.OFMEDICATIONS



A total of 66 (20.6%) patients using 1 to 2 medications among them 14 (21.2%) patients shows high medication adherence ,32 (48.4%) patients shows medium medication adherence ,20 (30.3%) patients shows low medication adherence .

A total of 68 (21.2%) patients using 3 to 4 medications among them 6 (8.8%) patients shows high medication adherence ,18 (26.4%) patients shows medium medication adherence,44 (64.7%) patients show low medication adherence .

A total of 68(21.2%) patients using 5 to 8 medications among them 4 (5.8%) patients shows high medication adherence ,10 (14.7%) patients shows medium medication adherence,54 (79.4%) patients shows low medication adherence.

A total of 118 (36.8%) patients using >8 medications among them 2 (1.6%) patients shows high medication adherence , 6 (5.0%) patients shows medium medication adherence ,110 (93.2%) patients shows low medication adherence.

By using chi square test the value of P = 0.00001.The result is significant at $P<0.05$.Hence the demographic data shows the patients using more medications having low medication adherence compared to patients using less/1 medication.

DISCUSSION:

Medication non-adherence lowers treatment effectiveness, and is thus a very important problem in the management of patients with chronic diseases requiring long-term treatments. In our study, we applied the Morisky tool to elderly patients, and we determined that 71.25% of participant's are low adherent to medications, 20.62% are medium and 8.12% are high adherent to medications. This study found a very high percentage of low adherences. This means that the medication adherence needs to improve.

In this study, factors affecting medication adherence are age , living in a village compared with a city, illiterate and primary education, low income compared to high income, number of medications more than 2 (polypharmacy),increased frequency of medications

,forgetfulness, side effectshad a statistically significant association with lower levels of

medication adherence ($P < 0.05$) in multivariate logistic regression.

Effect of age is consistent in some other studies; for example, in a study from the United Kingdom, patients over the age of 50 were found to be more adherent than those in the younger age groups, and in Pakistan, subjects who were less than 40 years old were less adherent than those older than 70. It seems that the people takes more care when they get older and/or start to have disease complications. This should be considered during patient counseling,complications of diseases in addition to risks of poor adherence to medications should be explained well to patients in the younger age groups. Living in a village compared with a city was also a reason for poor adherence; this may be related to lower levels of education or income in addition to difficulties in reaching doctors and health-care facilities. So the better communication with health-care providers, better education about the medications and the nature of the disease will give a great value in improving patient adherence to their medications. Effective interventions can be behavioral approaches that use techniques such as reminders, memory aids, and synchronizing therapeutic activities with routine life events (e.g., taking pills before you shower or after your prayers). Effective interventions seek to enhance adherence by providing emotional support and encouragement. It should be remembered that the application of multiple interventions of different types is more effective than any single intervention.It is of utmost importance to discuss the impediments faced by each patient and to work together as partners to overcome them. Then only the full benefits of adherence will be achieved. It might be attributable to a better outcome of the treatment; this may offer the efficient patient compliance and create a positive attitudetowards the treatment. However, a bad outcome could make the patient hopeless and has a low satisfaction level, which may lead them to stop their treatment.

CONCLUSION

Globally patient medication non adherence is a major medical problem. There are many inter related factors promoting it. In our study we came to know that more than half of the study participants were found to have low adherence.Non-adherence to medications is common and is associated with adverse outcomes. Health care professionals like pharmacists should identify practically possible strategies to improve medication adherence within the limits of their practice and eventually enhancing therapeutic outcome. It should be a multidisciplinary approach that needs to be carried out with the support of all, who are involved in medication use.

Factors affecting medication adherence are age in our study we found that with increasing age medication adherence increases. It seems that the people takes more care when they get older and/or start to have disease complications ,This should be considered during patient counseling, complications of diseases in addition to risks of poor adherence to medications should be explained well to patients in the younger age groups , Residence the Patients living in a village has low medication adherence compared with city, This may be related to lower levels of education or income in addition to difficulties in reaching doctors and health-care facilities , low income compared to high income, number of medications more than 2 (poly pharmacy),increased frequency of medications , forgetfulness, side effects had a statistically significant association with lower levels of medication adherence ($P < 0.05$).

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