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A STUDY ON POLYPHARMACY AND MEDICATION ADHERENCE IN ELDERLY PATIENTS

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ABSTRACT
Polypharmacy and medication adherence in elderly patients is a serious issue emerging worldwide which is leading to potential hazards. Polypharmacy is indirectly correlated with the medication adherence mainly in geriatric patients. The main objective of the study is to determine the causes and severity of polypharmacy and to assess the medication adherence and their factors of non-adherence and to improve medication adherence of elderly people with polypharmacy. In this cross-sectional observational study, Polypharmacy and medication adherence in elderly patients in a tertiary care hospital was determined in 108 patients. This study involves enquiring patients about demographic details, past medical and medication history, comorbidities, symptoms, drug chart, medication adherence and non-adherence levels by using MARS scale questionnaire form. Weakness, body pains, GI disturbances symptoms commonly associated with polypharmacy use in elderly patients. The major cause of polypharmacy is co-morbid conditions, poor medication adherence and inappropriate medications. In the study group of 108 geriatric patient's prevalence is more in males-64 than females-44. 82% of older adults take >10 medications. Forgetfulness (43.52%) and financial issues (21%) are highly addressed for poor medication adherence. Patients showed high adherence to antihypertensives, antidiabetics and thyroid agents. Simplification of drug regimens as well as better explanations of the reason for the medications, providing dosing cards, medication reconciliation, eliminating duplicate medications should be targets for intervention to avoid polypharmacy especially for co-morbid geriatric patients.

KEYWORDS: comorbidities, questionnaire, non-adherence, polypharmacy.

INTRODUCTION
It is defined as the regular use of at least 4-5 medications by an individual per day which is clinically unnecessary and unwanted.[1] This poly-pharmacy use can range from 2-11 concomitant medications. Polypharmacy and medication adherence in the elderly are significant public-health considerations worldwide and are an important focus of integrated care. Polypharmacy the use of multiple drugs or more drugs than are medically necessary causes adherence problems in older patients, particularly those not residing in nursing homes. For this reason, there is an urgent need to address this growing issue in the elderly population. Approximately 44% of men and 57% of women older than 65 years take five or more nonprescription and/or prescription medications per week, and 12% of persons in this age group take 10 or more nonprescription and/or prescription medications per week.[2] A consensus does not exist on the number of medications considered to define polypharmacy, and the number of medications designated as polypharmacy varies among studies. The use of medications that are not indicated, are ineffective, or constitute therapeutic duplication would be considered polypharmacy, and this definition necessitates a clinical review of medication regimens.[3]

The main aim of this article is to study on polypharmacy and medication adherence in geriatrics. Some objectives of this study are to assess the causes of polypharmacy in geriatrics, to find out the measures to reduce and avoid polypharmacy, to assess and improve drug adherence.

METHODS AND MATERIALS
Study design
A cross-sectional study (a transverse study, cross-sectional analysis and prevalence study) which is a type of observational study was conducted to evaluate the polypharmacy and medication adherence in elderly patients.

Sample size
108 subjects are included in this study.

Study site
MEDICITY INSTITUTE OF MEDICAL SCIENCES.

Study period
The study is carried out for 6 months.

Study criteria
Inclusion Criteria
- Elderly patients with co-morbid conditions above 50 yrs.
- Older individuals with chronic diseases exposed to polypharmacy are going to be considered.
- Prescription containing more than 1 drug and of age above 50yrs.
- Patients who are willing to give consent.
- Patients of both gender male, female**.**

Exclusion Criteria
- Patients <50yrs of age are not considered.
- Older patients who are not exposed to polypharmacy are not considered.
- Patients who are not willing to give consent.

RESULTS AND DISCUSSION
Table 1: Distribution of Subjects Based On Gender.

GENDER	NUMBER OF SUBJECTS	PERCENTAGES (%)
MALES	64	59.3%
FEMALES	44	40.7%

IMPRESSION: This pie chart represents the prevalence of poly-pharmacy
In males (59.3%) is more than females (40.7%)

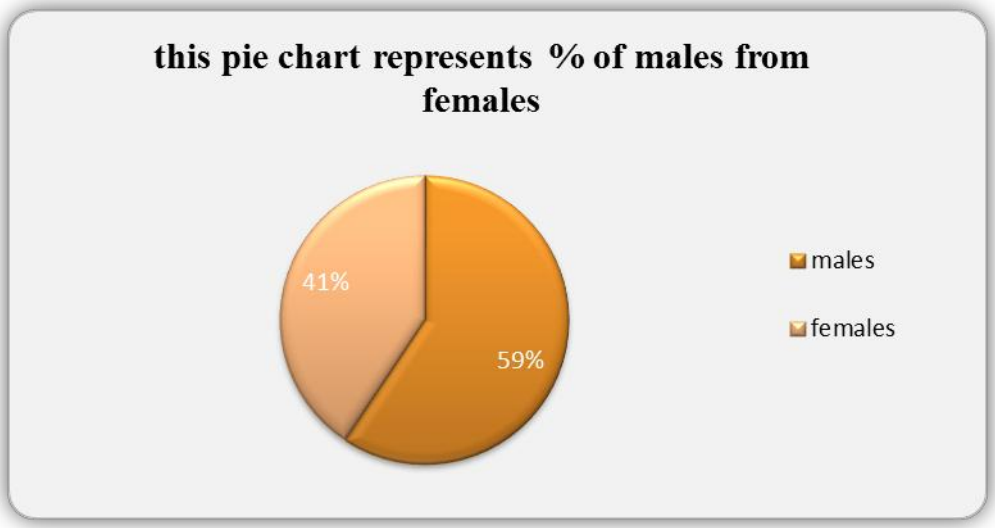

Figure 1. Graphical Representaion of Severity of Polypharmacy.

Table 2: Distribution of Subjects Based on Different Departments.

DEPARTMENTS	NO OF SUBJECTS	PERCENTAGES
General medicine (GM)	44	40.7%
General surgery (GS)	30	27.7%
Ophthalmology	5	4.61%
Pulmonology	16	14.8%
Orthopedic	15	13.8%

IMPRESSION: This bar diagram represents poly-pharmacy use is more in general Medicine (40.7%) than in other departments.

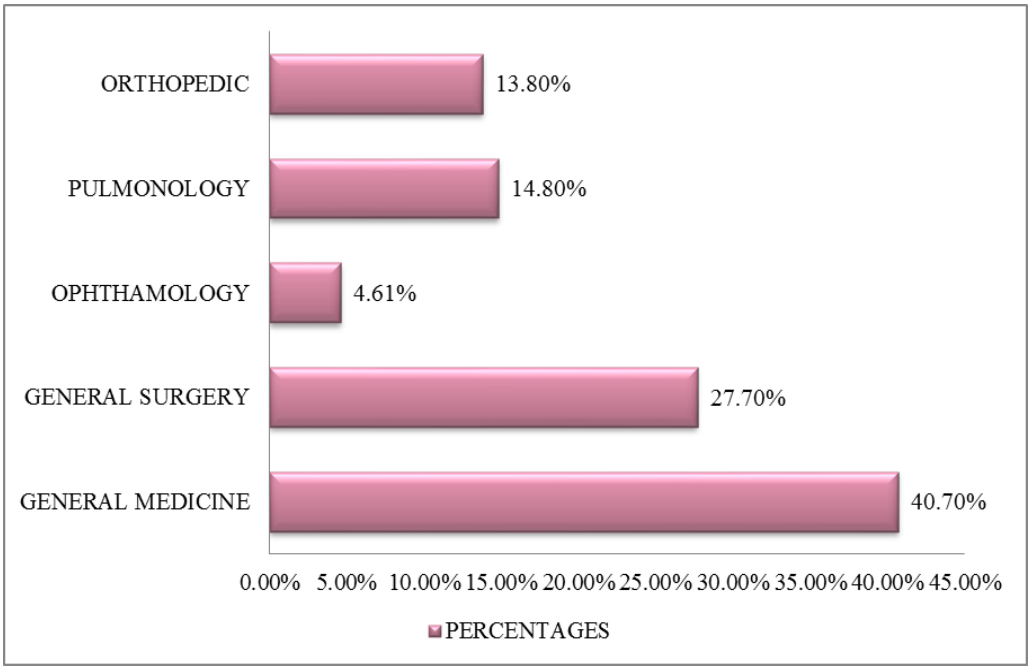

Figure 2. Graphical Representaion of Severity of Polypharmacy in Different Departments.

Table 3: Distribution of Subjects Based On Common Comorbid Conditions.

CO MORBIDITIES	NO. OF SUBJECTS	PERCENTAGE (%)
Hypertension	56	51.8%
Diabetes mellitus	32	29.6%
Thyroid	11	10.2%
others	25	23.1%

Others: patient with no co-morbid conditions.

IMPRESSION: This bar diagram represents the percentages of co-morbid patients are more with hypertension (51.8%) compared to diabetic, thyroid.

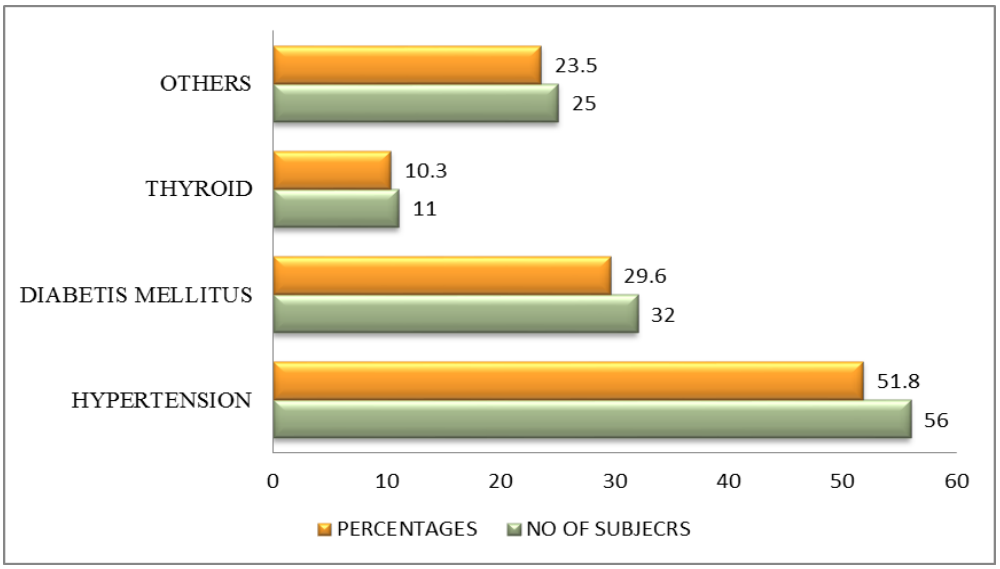

Figure 3. Graphical Representation of Comorbid Conditions.

Table 4: Evaluation of the Use of Number of Medications Based On Age Groups.

AGE GROUP	NO. OF MEDICATIONS AND THEIR PERCENTAGES							
	1-3med	%	4-6med	%	7-9med	%	>10med	%
50-59	2	5%	15	37.5%	19	47.5%	4	10%
60-69	0	0%	8	27.6%	16	55.1%	5	17.2%
70-79	0	0%	5	26.3%	6	31.5%	8	42.1%
80-89	0	0%	1	8.3%	4	33.3%	7	58.3%
>90	0	0%	0	0%	1	12.5%	7	87.5%

IMPRESSION: The above diagram represents that elderly patient of age >90 is using a greater number of medications (87.5%)

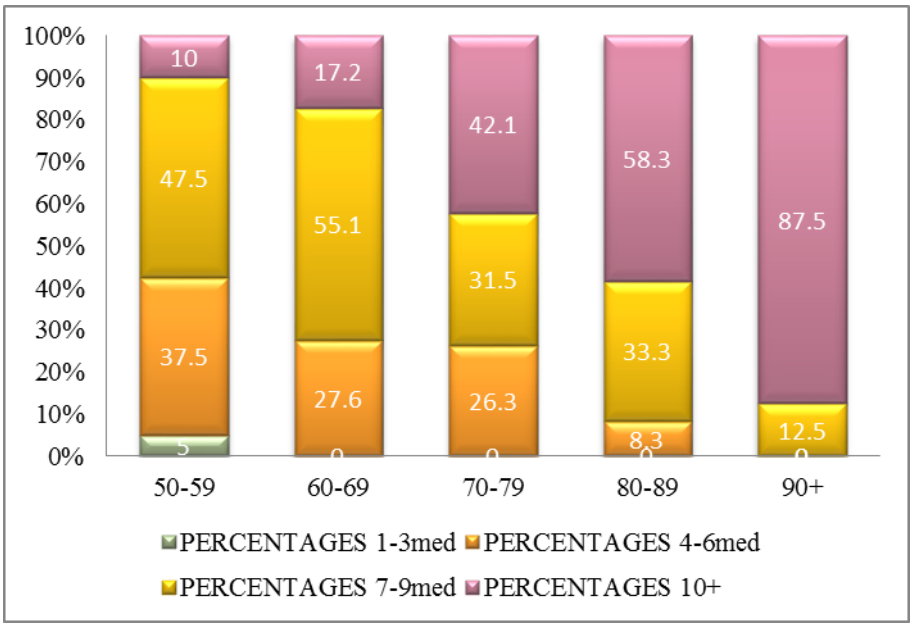

Figure 4. Graphical Representation of Number of Medications in Elderly.

Table 5: Distribution of Subjects Based On Pharmacological Class.

PHARMACOLOGICAL CLASS	NO. OF MEDICATIONS	PERCENTAGES (%)
ANTIHYPERTENSIVES	45	41.7
PROTONPUMP INHIBITORS	81	75
NSAIDS	51	47.3
ANTIBIOTICS	60	55.6
ANTIPYPRETICS	54	50
ANTIDIABETIC AGENTS	32	23.6
THYROID AGENTS	12	11.2
VITAMIN SUPPLEMETS	57	52.8
CORTICOSTEROIDS	49	45.4

IMPRESSION: The below diagram represents prescription of proton pump inhibitors (75%) are more compared to other class of drugs like antibiotics, vitamin supplements etc.

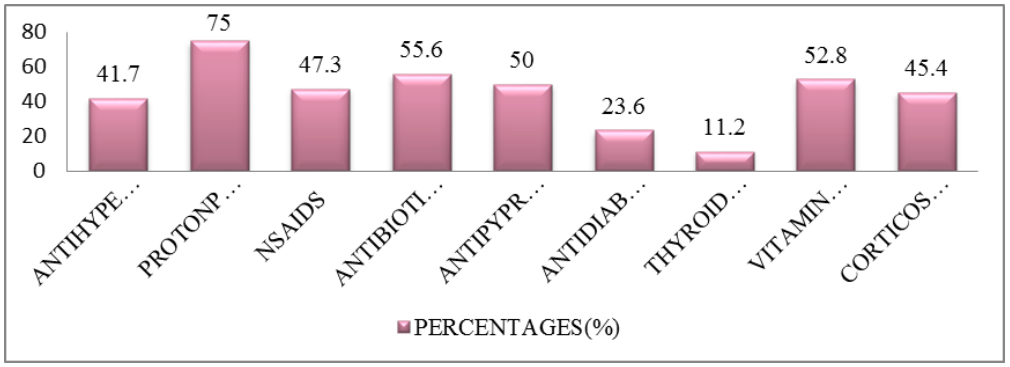

Figure 5. Graphicalrepresentation of Commonly Prescribed Pharmacological Class Drugs.

Table 6: Distribution of Subjects Based On Symptoms.

COMMON SYMPTONS	NO. OF SUBJECTS	PERCENTAGES (%)
DIARRHEA	17	15.7
CONSTIPATION	23	21.3
CONFUSION	12	11.2
DEMENTIA	16	14.8
GI DISTURBANCES	34	31.5
FALLS	9	8.3
WEAKNESS	61	56.5
BODY PAINS	42	38.9
DROWSINESS	38	35.2

IMPRESSION: The below diagram represents weakness (56.5%) is the most commonly occurred symptom among people using polypharmacy.

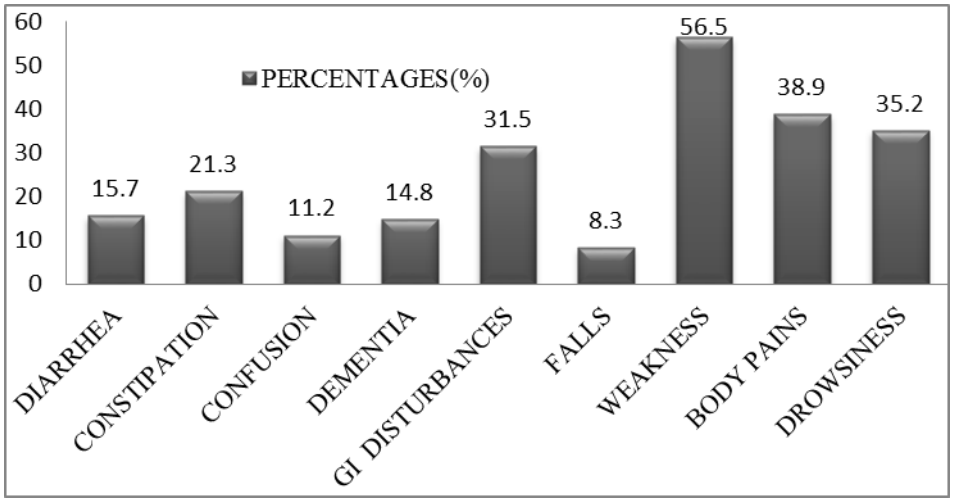

Figure 6. Graphical Representaion of Common Symptoms of Polypharmacy.

Table 7: Comparision of Adherence and Non-Adherence

COMMON PRESCRIBED DRUG TYPES	TOTAL NO OF SUBJECTS (%)	ADHERENCE (%)	NON-ADHERENCE (%)
ANTIHYPERTENSIVES	41.7%	40.0%	1.7%
ANTI DIABETIC	29.60%	25.00%	4.6%
THYROID AGENTS	11.20%	11.20%	0.0%
PPIS	75.00%	38.70%	36.3%
NSAIDS	47.30%	39.00%	8.3%
ANTIBIOTIC	55.6%	36.00%	19.6%
VITAMIN SUPPLEMENT	52.8%	25.00%	27.8%
CORTICOSTEROIDS	45.4%	18.00%	27.4%
ANTIPYRETICS	50.00%	38.00%	12.0%

Levels for Commonly Prescribed Drugs.

IMPRESSION: The below graph indicateses that patients showed more adherence to Aantihypertensivess (40%) than other medications**.**

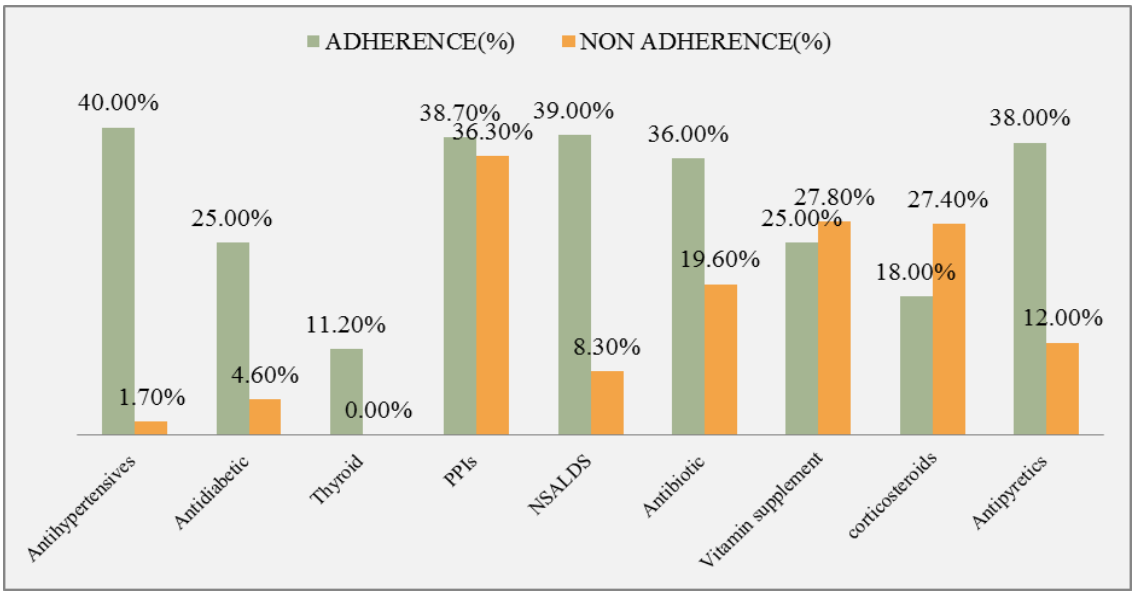

Figure 7. Graphical Representation of Medication Ahderence vs Non-Adherence.

Table 8: Factors Associated with Poor Adherence.

FACTORS	NO. OF SUBJECRS	%OF POOR ADHERENCE
FORGETFULLNESS	47	43.52
HIGH COST OF Tx	23	21.29
SIDE EFFECTS	16	14.81
FEELING WELL	13	12.0
OTHER REASONS	9	8.3

IMPRESSION: the below diagram represents forgetfulness>high cost of Tx>side effects>feeling well>other reasons.

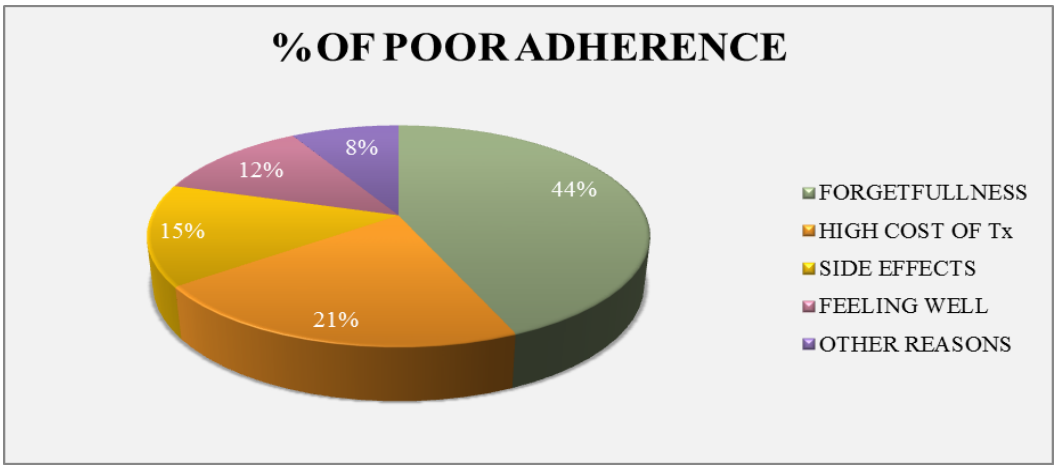

Figure 8. Graphical Representation of Poor Adherence.

DISCUSSION

According to WHO for every 9 there are 1 elderly people and they expected that it will increase to 1 in 5 people by 2050. polypharmacy is the use of more than 5 or more prescribed drugs.[4] Polypharmacy in geriatrics is defined as the area where people are at greater risk of ADRs because of pharmacokinetic and pharmacodynamics changes associated with age.[5] Globally various studies on an average shown that 2-9 medications per day are taken by elderly.[6] The prevalence of unwanted medications used by geriatric people was found to be from 11.5 to 62.5%. In this cross-sectional observational study "polypharmacy and medication adherence in elderly patients" was conducted in a tertiary care hospital among 108 patients. This study involves enquiring patients about the demographic details, signs and

symptoms, treatment regimen, comorbidities, past medical and medication history and medication adherence were collected through in-person interview and filled in a patient data collection form.[7] The analysis of the above data reveals that the severity of polypharmacy in males (59.3%) over numbered than females (40.7%). As comorbidities are the major cause of prescribing poly-pharmacy to the elderly patients the % of co morbid patients using poly-pharmacy are more with hypertension (51.8%), DM(29.6%), thyroid (10.2%). The most common type of drug classes used by geriatric patients in different departments (GM, GS, orthopedic, pulmonology, ophthalmology) are Proton pump inhibitors (75%), antibiotics (65.6%), vitamin supplement (52.8%), antipyretics (50%), NSAIDS (47.3%), corticosteroids (45.4%). Antihypertensive (41.7%), antidiabetic agents (29.6%), thyroid agents (11.2%). Elder people using polypharmacy are prone to greater risk for adverse drug reactions because of pK, pD changes associated with ageing.[7] Symptoms caused by polypharmacy are weakness, drowsiness, body pains, GI disturbances, constipation, diarrhea, falls, dementia, confusion in elderly patients. The most common symptom occurred in geriatrics using polypharmacy are weakness (56.5%). By advising drugs with multiple effects, eliminating unnecessary medications we can avoid polypharmacy. Medication adherence is defined as the patient's willingness to follow the prescriber drug schedule (HCP).[8] Due to lack of proper counselling i.e how to take medications, when to take medications and forgetfulness, high cost of drugs are the reasons for poor medication adherence. By comparing medication adherence levels in patients using poly-pharmacy most of patients are adhered to antihypertensive (40%). The barriers for medication adherence are forgetfulness, high cost of treatment, side effects, feeling well and other reasons. Out of them forgetfulness is the major barrier for poor adherence.

CONCLUSION

In conclusion, our research reveals the Prevalence of poly-pharmacy in geriatric population is high and thus exposed to its potential hazards. This study states that polypharmacy is more common in co-morbid patients& observed that number of medications was found to be a factor concerning with various clinical outcome (falls, weakness, drowsiness, GI disturbances, body pains, dementia, diarrhea, constipation) independent of the age, comorbidities and type of medications prescribed. The low medication Adherence may be a significant challenge for older patients receiving polypharmacy. We noticed that as the number of pharmaceuticals administered increases, so does non adherence, and that a large majority of patients are unaware of the purpose of their medications. Simplifying of drug regimens as well as providing better explanations of why medications are needed, providing dosing cards, medication reconciliation, eliminating duplicate medications should be targets for intervention.

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