Original Research Article

A Community Based Study on the Consequence of Polypharmacy in the Quality of Life among Geriatric Population

Preetha G[1], Sachin Manoj[1], Ansu Thomas[1], Deena John[1], A. R. Shabaraya[2]

[1]Student, Department of Pharmacy Practice, Srinivas College of Pharmacy, Mangalore, Karnataka, India - 574143
[2]Professor & Head, Department of Pharmacy Practice, Srinivas College of Pharmacy, Mangalore, Karnataka, India - 574143

Corresponding Author: Preetha G

ABSTRACT

Polypharmacy is defined by the World health organization as "the administration of the many drugs at an equivalent time or the administration of an excessive number of drugs". Polypharmacy is frequent among elderly as they often suffer from chronic diseases with concomitant pathologies. Polypharmacy is related to adverse outcomes including mortality, falls, adverse drug reactions, increased length of stay in hospital and readmission to hospital soon after discharge. The risk of adverse effects and harm increases with increasing numbers of medications. It is associated with decreased quality of life, self-rated health, mobility and functional ability as well as increases in hospitalizations, physiological distress, use of health care resources, mortality and costs. The study was prospective and observational and was conducted between the geriatric population in Mangalore. A total of 150 subjects were included in this study and the case reports were analyzed. Patient demographic details, patient drug chart and the medication-related quality of life (MRQoL) of the patients were analyzed. The subjects were selected according to the selection criteria and included individuals aged 60 years and above under a drug therapy with five or more drugs in numbers. Out of the identified subjects, 79 were male (52.7%) and 71 were female (47.3%). Out of this 150 subjects with polypharmacy, 44 individuals (22.7%) had major drug interactions. Patient safety is the most important aspect of health care system since the medicine can cure illness and at the same time harm the patient if not appropriately used. Clinical pharmacist can play a key role in promoting better medication use, ensuring that patients receive appropriate pharmacotherapy thus helps in minimizing the risk of unfavorable outcomes of pharmaco-therapy.

Keywords: Polypharmacy, Quality of Life, Geriatrics, Drug Interactions, Clinical Pharmacist.

INTRODUCTION

A drug is important to prevent, cure and alleviate symptoms to improve patient's quality of life. The complex drug regimen leads to side effects, drug interactions and complicates the overall health of patient.

Geriatrics has been defined as the chronological age of 65 years old or elder, while those from 65 through 74 years old are referred to as early elderly and those over 75 years old as late elderly [1].

Polypharmacy is defined by the world health organization as "the administration of excessive number of drugs or the administration of many drugs at the same time". Polypharmacy is common, resultant phenomena with duplicate or interacting medications[2]. Inappropriate drug therapy can result in poor outcomes for the patients which is true for elderly patients due to overall poor health status. It leads to substantial morbidity and mortality,

increased healthcare expenditure, which in turn affects the overall health and quality of life of patient and society. It is frequent among elderly as they often suffer from chronic diseases with concomitant pathologies requiring multiple medications. It is estimated that elderly people are four times greater odds due to drug-related problems than those less than 65 years of age. It represents a well-known risk factor as regards patient's health due to drug-drug interactions, hospitalizations and poor patient health. Due to age related pharmacokinetic and pharmacodynamics changes geriatric populations are more at risk when compared to the other age groups.
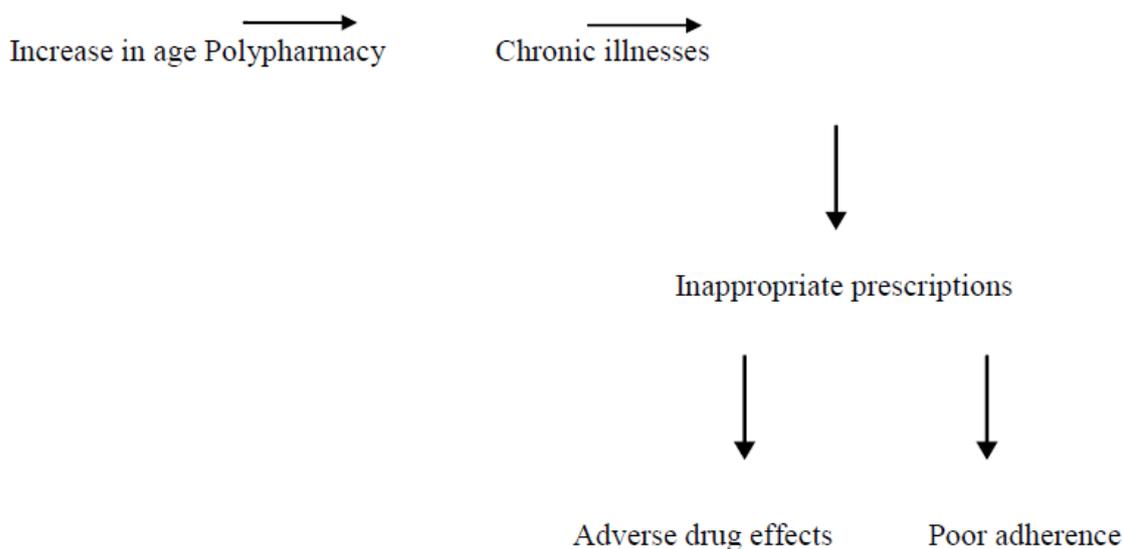
Increase in age Polypharmacy ⟶ Chronic illnesses ⟶ Inappropriate prescriptions ⟶ Adverse drug effects, Poor adherence

Figure 1: Conceptual Framework

The reasons why polypharmacy may be problematic may be that the treatments are not evidence-based, or the risk of harm from treatments is likely to outweigh benefit, or where one or more of the following apply [4];

- The drug combination is hazardous because of interactions.
- The overall demands of medicine taking, or pill burden are unacceptable to the patient.
- These demands make it difficult to achieve clinically beneficial outcome.

Appropriate polypharmacy is prescribing for an individual for complex conditions or for multiple conditions in circumstances where medicines used have been optimised and medicines are prescribed according to best evidence. The overall intent for the combination of medicines prescribed should be to maintain good quality of life, improve longevity and minimize harm from drugs.

The Beers criteria is the most widely-cited criteria used to assess inappropriate drug prescribing [36]. It is a list of medications considered inappropriate for older patients, either because of ineffectiveness or high risk for adverse events (AE).

According to World Health Organization, quality of life is defined as "The individual's perception of their position in life in context of their culture and value systems in which they live and in relation to their goals" [3].

Health-related quality of life includes areas such as physical health, psychological state, level of independence of the person, person relationship, belief in a particular context or the natural environment, social support and perceived social support.

The quality of life of elderly is decreased due to loneliness, impaired sexual activity and chronic metabolic disorders that can result in emotional disturbances. Several

factors including heredity, lifestyle, healthy diet, avoiding smoking, alcohol intake and physical activity can effect upon the longevity of life. Life satisfaction represents an indicator of quality of life, a selected part of it, since it focuses on moral, cognitive and affective aspects, on task administered independently is related to life expectancy. On the contrary, quality of life is more closely linked to factors strictly related to health [2]. Chronic diseases such as diabetes mellitus, coronary heart diseases, osteoporosis and cerebrovascular are most common diseases in elderly people. These disturbances that cause medical, social and psychological problems can decrease physical functions and quality of elderly in the community as well as obviously increasing the burden of diseases.

Many of the adverse health outcomes, particularly those concerning quality of life, are subjective and thus difficult to measure. Subjective outcome measures used in polypharmacy research have been based on the geriatric medication-related quality of life (MRQoL). Considering the vulnerability of elderly people and importance of healthy status in geriatric population, Medication-related quality of life (MRQoL) scale was aimed to assess the quality of life in geriatric population.

Drug-Drug interactions are said to occur when the pharmacological activity of one drug is altered by the concomitant use of another drug. Pharmacokinetic drug interactions can cause serious adverse events, and therefore the evaluation of a replacement molecular entity's drug-drug interaction potential is an integral a part of drug development and regulatory review [13]. Alteration of enzyme and/or transporter activities involved within the absorption, distribution, metabolism, excretion of molecular entities by other concomitant drugs may cause change in exposure resulting in an altered response (safety or efficacy). Although drug-drug interactions constitute only a little proportion of adverse drug reactions, they're important because they're often predictable and thus avoidable and manageable.

There are number of strategies that can be adopted to decrease the risk of potential clinical problems. The number of drugs prescribed for each individual should be limited as few as is necessary. The use of drugs should be reviewed regularly and unnecessary agents withdrawn if possible, with subsequent monitoring. Patients should be encouraged to engage in a communication by alerting physicians, pharmacists and other health care professionals to symptoms that occur when new drugs are introduced.

Potentially Inappropriate Medications (PIMs), still be prescribed and used as first-line treatment for the foremost vulnerable elderly adults, despite evidence of poor outcomes from the utilization of PIM in older adults [11,14]. AGS BEERS criteria ® is employed for improving the choice of prescribed drugs by clinicians and patients, evaluating patterns of drug use within populations, educating clinicians and patients on proper drug usage and evaluating health outcome, quality of care and utilization data. The goal of Beers Criteria is to improve care of older adults by reducing their exposure to potentially inappropriate medications. These criteria should be viewed as a guideline for identifying medications for which the risks of their use in older adults outweigh the benefits. The medications that have a high risk of toxicity in older adults and limited effectiveness should be avoided in favor of an alternative safer medication or a non-drug approach. Thoughtful application of the standards will leave closer monitoring of drug use, application of real time prescribing and interventions for better patient outcomes. Regular updates of these criteria will allow for evidence for the medications on the list to be assessed routinely, making it more relevant and sensitive to patient outcomes, with a goal of evaluating and managing drug use in geriatrics while considering the dynamic complexities of the health care system.

Clinical pharmacist can play a key role in promoting better medication use, ensuring that the patient receives potentially appropriate medications, thus helps in minimizing the risk of unfavorable outcomes of pharmacotherapy. Pharmacists are increasingly responsible for managing patient's medication regimen by providing comprehensive medication reviews and education services for both patients and physicians. Pharmacist intervention enables the patient to understand why they are using their medications and how they work, as this can increase their involvement in their own healthcare and encourage them to learn about their condition and take charge of their disease. Pharmacist interventions have been shown to improve patient's medication knowledge as well as other important factors. Pharmacist have the potential to possess an outsized effect in combating polypharmacy related problems through a spread of interventions like reducing the amount of medicines taken, preventing drug-drug interaction related problems and improving quality of life of the patient.

MATERIALS AND METHODS

4.1 STUDY SITE: A Prospective observational study was carried out in Geriatric Community, Mangalore.

4.2 STUDY DESIGN: Community based Prospective and Observational Study

4.3 STUDY PERIOD: The study was conducted for a duration of 6 months from September 2019 to February 2020.

4.4 ETHICAL CLEARANCE: The study protocol was approved by the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Sciences and Research Centre, Mukka, Mangalore. (Reference number 2019/10/28/5)

4.5 STUDY CRITERIA:
INCLUSION CRITERIA
- All subjects above 60 years of age.
- Patients with either gender male & female.
- Subjects prescribed with five or more drugs.
- Subjects who are willing to participate in the study.

EXCLUSION CRITERIA
- Patients in coma are excluded.
- Patients having psychiatric disorders are excluded.
- Patients having minor injuries are excluded.

4.6 SOURCE OF DATA: Study data was taken from the subject's medical files which includes past medical history, current medications and interviewed on the assessment of Quality of Life using Medication Related Quality Of Life Scale (MRQOL).
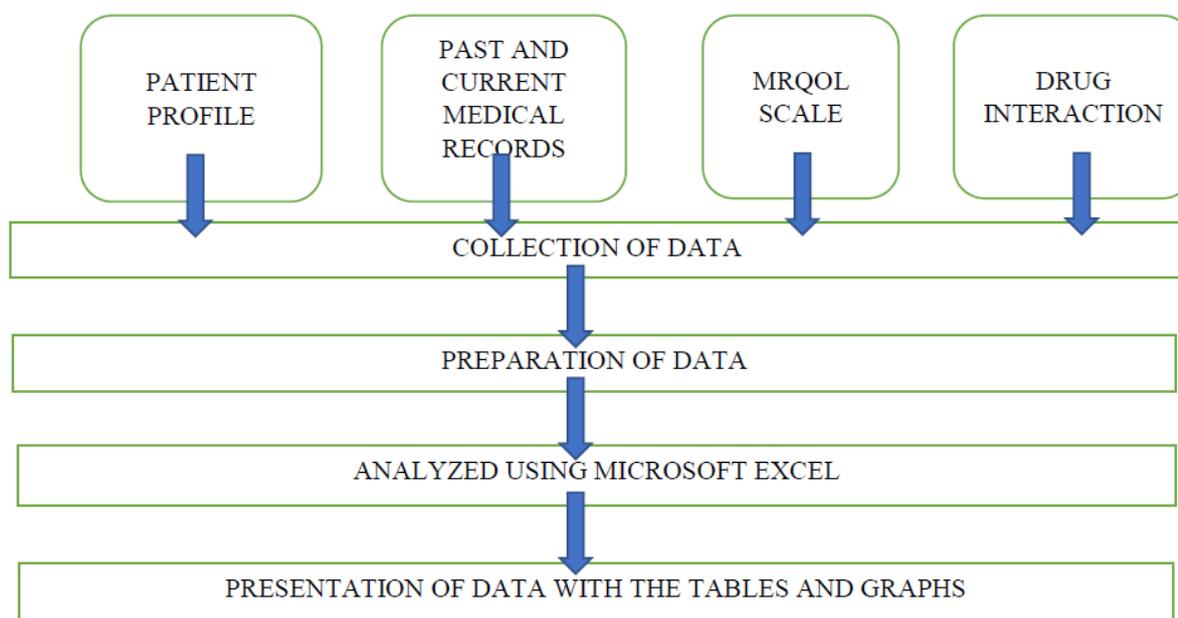
4.7 SAMPLING METHOD: Medical records of the subjects has been collected, and were questioned them using the data collection form which includes the list of drugs that they take, questionnaire on quality of life and the pharmacist interventions. The drug interactions in the prescriptions were noted and recorded. A total of 150 subject's prescriptions were collected and were found to have drug interactions.

4.8 STUDY METHOD: Medical records, past medical history, current medications prescribed by doctors and other health care professionals were taken up for the study. Data of subjects were collected using a structured data collection tool to document demographic details, past and current medical records, medication related quality assessment scale to study the effects on the quality of life of geriatrics. Required pharmacist interventions were given to find out the improvement on the quality of life of the subjects subjected to the study. All the data were kept confidential.

4.9 DATA ANALYSIS: Data were collected and analyzed using the Microsoft Excel and the following results were represented graphically. Inappropriateness of medications was analyzed using Beer's

Criteria. Qualities of life in geriatrics were measured using MRQOL scale.

4.10 OPERATION MODALITY

| PATIENT PROFILE | PAST AND CURRENT MEDICAL RECORDS | MRQOL SCALE | DRUG INTERACTION |

COLLECTION OF DATA

PREPARATION OF DATA

ANALYZED USING MICROSOFT EXCEL

PRESENTATION OF DATA WITH THE TABLES AND GRAPHS

RESULTS

The healthcare setting was randomly selected and data collected during September 2019- March 2020 to minimize chances of selection bias. Demographic, socio-economic, health characteristics, clinical indications and past/current medication history were explored, understood, surveyed and documented. Demography evaluated gender, age and civil status. Prescriptions were seen for medical datasets. Health-related characteristics included self-reported health, health service utilization, health risks and co-morbidities including chronic diseases.

By using individual response-based data, the consequences of dispensed polypharmacy drugs were surveyed among 150 geriatrics who responded to a pre-planned, formatted questionnaire framework regarding their life quality as impacted by clinically-dispensed prescription drugs. The processing of individual data was anonymous based on discreet interviews such that the benefits and risks of polypharmacy can be evaluated at individual level only on case-by-case documentation of altered life quality.

The results derived herein formed basis of recommendation to combine and balance different clinical guidelines and to achieve an appropriately better drug therapy for geriatrics with multiple diseases, problems, discomfort, risks and threats with age progression.

Overall description of inferred data from this quantitative, observational, cross-sectional age grouped, prospective study is reported here.

5.1 DEMOGRAPHIC DETAILS OF THE STUDY POPULATION
5.1.1 AGE GROUP RESULTS

This purposeful confidentiality-bound dataset covered whole population of the earmarked, study-recruited, elderly patient pool (60 years – 94 years representing feeble, sick and dependent as sampled predictor lot), for each age group and observed values in numbers. Having undergone interviewer-administered verbal questionnaire (as principal data collection tool), totally 150 responses (eligible files) were registered (post-verification for completeness and accuracy) for observation period as estimated sampled population size

and relevant information entered into data collection form. The registry showed 11 (13.92%) male subjects in 60-65 age groups; 51 (64.55%) male subjects in 66-75 age groups and 17 (21.55%) male subjects in more than 75 age groups, whereas 12 (16.90%) female subjects in 60-65 age groups; 39 (54.92%) female subjects in 66-75 age groups; and 20 (28.15%) female subjects in more than 75 age groups were found.

Table 1: Depicting the age group results in 150 subjects

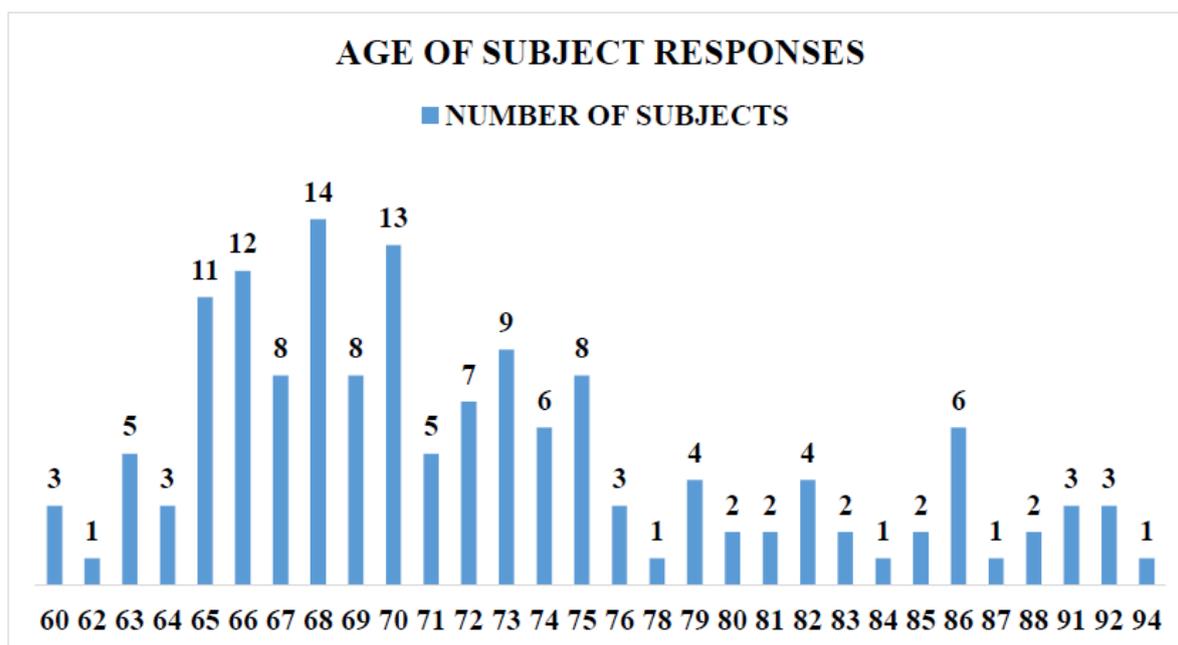| GENDER	AGE GROUP	NUMBER OF SUBJECTS	% OF MALES OR FEMALES	% OF TOTAL SAMPLING POPULATION
MALE		79		52.60
	60-65	11	13.92	
	66-75	51	64.55	
	>75	17	21.5	
FEMALE		71		47.30
	60-65	12	16.90	
	66-75	39	54.92	
	>75	20	28.15	

Figure 2: Age responses of 150 subjects

5.1.2 GENDER OF PATIENTS
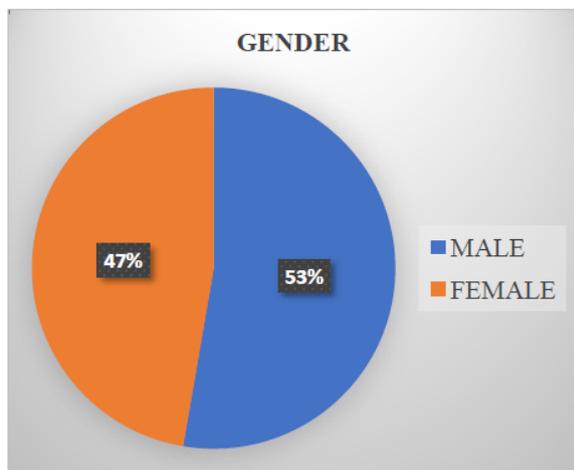

Figure 3: Depicting gender of patients

Table 2: demographic details and characteristics of patients

DETAILS	CHARACTERISTICS	NUMBER
GENDER	Male	79 (52.7%)
	Female	71 (47.3%)
AGE	Chronological age	23 (15.33%)
	Early elderly	90 (60%)
	Late elderly	37 (24.67%)
NUMBER OF DRUGS PRESCRIBED	5-10	138 (92%)
	>10	12 (8%)

Depicting patient gender, recorded samples showed 47.3% females and 52.6% male population out of 150 responses. The largest proportions of patients were males, outnumbering females by a mere multiplication factor of 1.112. The highest membered age group was 32 patients in 66-70 age range of male cohort, followed by 23

patients in 66-70 age range of female cohort. The proportion of patients in all age groups for both genders above 76 years old were uni-digit. A uniform pattern of patient sample resembled in both gender categories for all age groups. Males showed similarity in sampling numbers for 76-80 and 81-85 age groups. Females showed similarity in count for 80-85 and 91-94 age groups.

5.2 RESPONSES OF SUBJECTS

The maximized receipt of responses was at age of 68, 70, 66 and 65 being 14, 13, 12 and 11 responses respectively. Next in order were at ages of 72, 74 being 7 and 6 responses respectively. 69 and 69 age received 8 responses each. 63 and 71 age received 5 responses each. 60, 64, 76, 91 and 92 received 3 responses each.
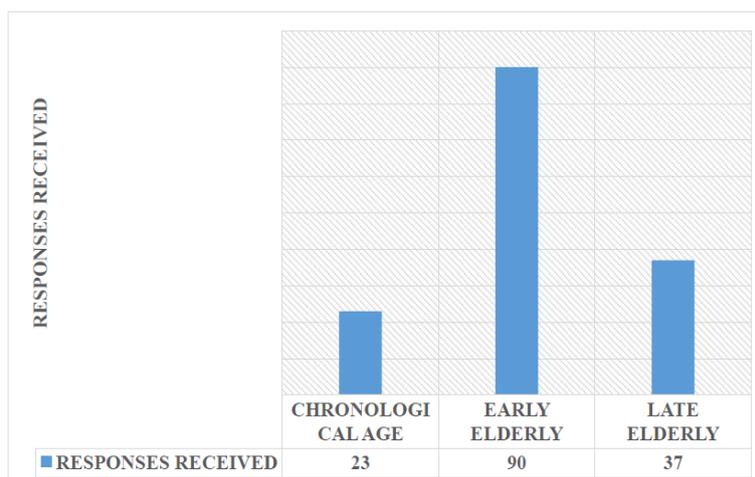

RESPONSES RECEIVED	CHRONOLOGICAL AGE	EARLY ELDERLY	LATE ELDERLY
RESPONSES RECEIVED	23	90	37

Figure 4: Age-Wise Responses Of Subjects

The study was carried out in a total number of 150 geriatric patients, the information available from each patient was recorded. Out of 150 patients, 79 were males and 71 were females. In this study, subjects with chronological age where 23 in number while those from 65-75 years old referred to as early elderly where 90 in number and from 75 years and above were referred to as late elderly where 37 in number. Among 150 patients, number of drugs prescribed with lesser than or equal to 10 was 138 and more than 10 was 12.

5.3 INCIDENCE OF POLYPHARMACY

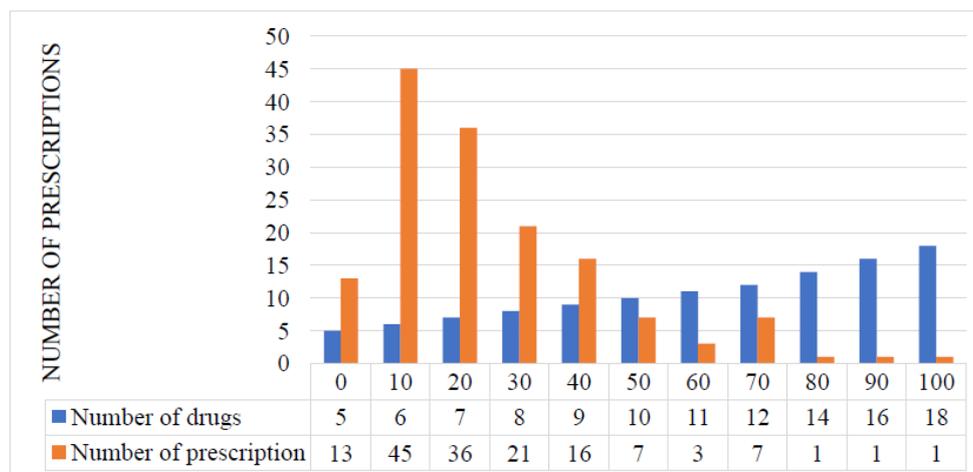|	0	10	20	30	40	50	60	70	80	90	100
Number of drugs	5	6	7	8	9	10	11	12	14	16	18
Number of prescription	13	45	36	21	16	7	3	7	1	1	1

Figure 5: Depicting Incidence Of Polypharmacy

About the incidence of polypharmacy among cases studied, indicative threshold index of overload was marked above 10 drugs. Among the 150

patients, initial categorization was upon number of drugs profile prescribed with 5 to 10 was 138 (92% percentile of patient pool administered) and more than 10 was 12 (8% percentile fraction of patient pool administered). The 10-count drug-application was a blind median point, where severity of drugs or drug classes or frequency employed was willfully considered immaterial for the preliminary meaningful screening divide of the polypharmacy patient group studied.

5.4 MORBIDITY PROFILING
5.4.1 AGE-WISE CHARACTERISATION OF MORBIDITY PROFILING

Among 150 geriatric patients, the consequences of polypharmacy in the quality of life were most commonly observed in patients with comorbidities. The morbidities were listed out irrespective of gender and ageing as a driving factor, clinically morbid conditions tabulated, irrespective of any priority to chronic disorders. As we appraised disease burden at every age level from 60 years until 94 years., age group 60 – 65 showed prominence of arthritis, fistula, cysts, abscess, cholesterol, hypothyroidism and ischemic stroke conditions. 66-75 age group witnessed a composition of harm from Peripheral neuropathy, Pulmonary edema & Tuberculosis (TB), Perianal abscess, Gangrene, Diabetes Mellitus (DM), Hypertension (HTN), CHRONIC Kidney Disease (CKD), Parkinson's, Bronchitis, Nephropathy, Hyperlipidism, Osteoarthritis, Urinary Tract Infection (UTI), Ischemic Heart Disease (IHD), Bronchopneumonia, Wheezing, severe Non-Proliferative Diabetic Retinopathy (NPDR), chest pain, vertigo etc. and more than 75 age group had several additional severe disorders of like viral fever, Bronchial asthma, Hernia, cerebellar disorders, Right Hemiparesis, chronic pancreatitis, confusions, Pulmonary TB, dementia, Chronic Obstructive Pulmonary Disease (COPD), unorganized abscess, Asthma, cough, seizures, kidney diseases, T2DM, Diabetic Kidney Disease (DKD), Acute Coronary Syndrome (ACS), hypoglycemia, thrombosis and general parkinsonism.
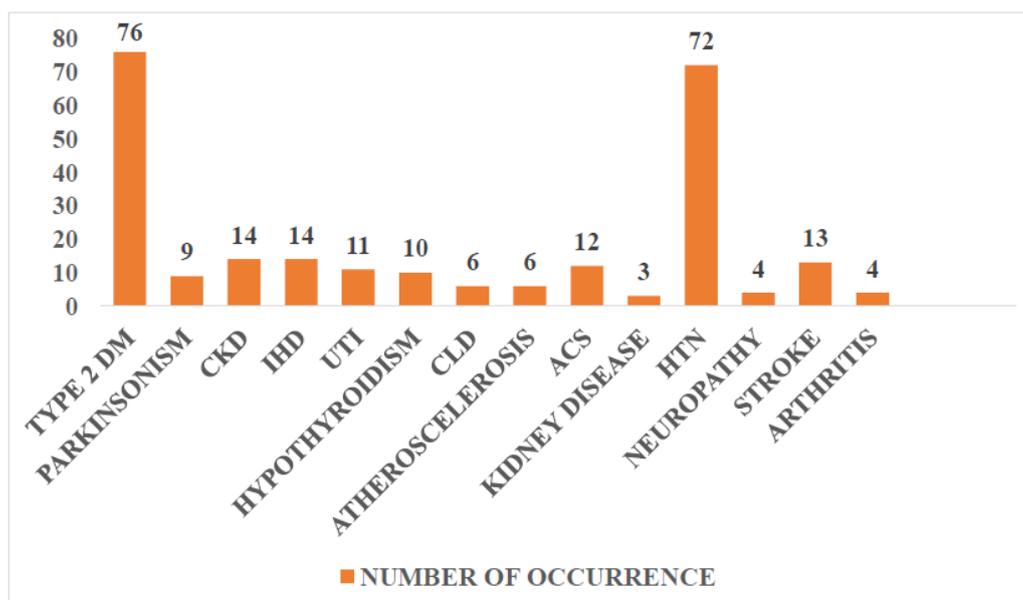
5.4.2 INCIDENCE OF DISEASES

Figure 6: Most Relevant Diseases In 150 Subjects

Clinical relevance of all health impairments and diagnosed complications of the patients sampled were comprehensively list-charted and the

percentage occurrence of a single disease occurrence within the cohort study was computed and tabulated. Geriatric syndromes were exclusively accounted for. Potential major relevance in a vast number of cases were Diabetes mellitus 50.66%; Hypertension 48%; Chronic kidney disease and Ischemic Heart disease 9.3% each; Urinary Tract Infection 7.3%; Hypothyroidism 6.6%; Chronic Liver Disease & Atherosclerosis 4% each; Coronary Artery Disease 3.33%; Arthritic, Cholesterol issues, Peripheral Neuropathy 2.66% each; A cluster of diseases viz., Bronchial Asthma, Acute Coronary syndrome, Dyslipidemia, Hemorrhoid, Left ventricular dysfunction, kidney disease, fistula, cough (2 % cases per ailment).

This retrospective cohort study table pertains on a validated scale within limits of percentage prevalence and demonstration of a clinical ailment per case head. Major prevalence was metabolic disease i.e. Diabetes, which was seen in 76 patients followed by hypertension which is seen in 72 patients, followed by cardiovascular diseases, then kidney diseases and ischemic problems of heart. Subsequent order of incidence was Urinary Tract Infection (UTI) and then Hypothyroidism, Chronic Liver

Disease & Atherosclerosis; Coronary Artery Disease, Arthritic, Cholesterol issues, Peripheral Neuropathy and Parkinson's Disease correspondingly decreasing percentile order.

5.5 BEER'S CRITERIA

The Beers criteria are the most widely-cited criteria used to assess inappropriate drug prescribing32. It is a list of medications considered inappropriate for older patients, either because of ineffectiveness or high risk for adverse events (AE).

Older patients being at higher risk of adverse interactions due to various factors like polypharmacy, co-morbidities and age-related physiological changes that may cause variable effect on pharmacokinetic and pharmacodynamics properties of therapeutic drugs. With a view of adverse interaction risks outweighing beneficial therapeutic outcomes, Beer's criteria for potentially inappropriate medication use in older adults was exercised and functionalized to list out excessive therapeutic agents, minimize therapeutic regimen and resulting optimize patient compliance towards a sustainably prescribed therapy.
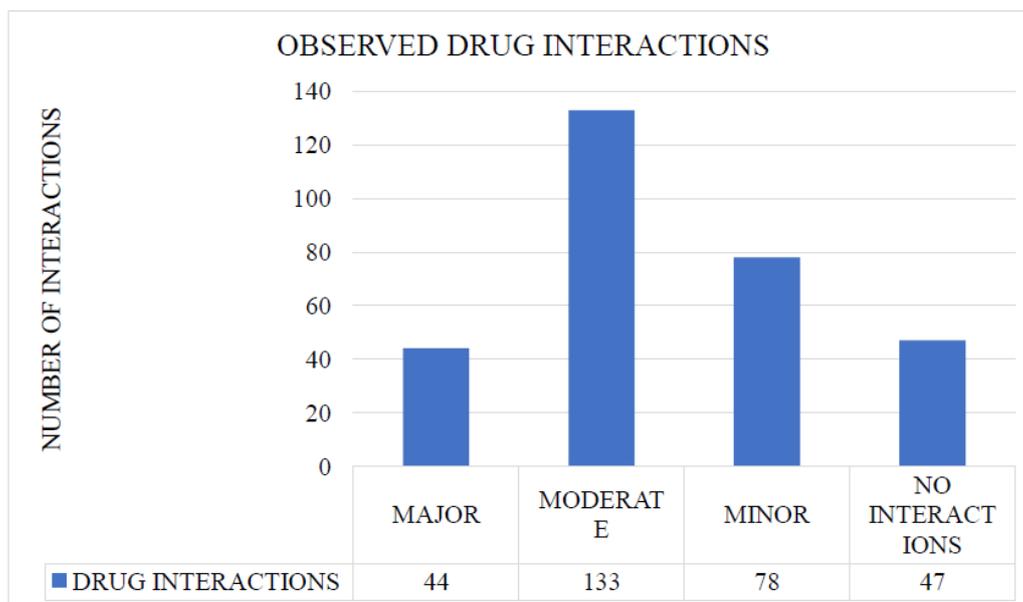

OBSERVED DRUG INTERACTIONS

	MAJOR	MODERATE	MINOR	NO INTERACTIONS
DRUG INTERACTIONS	44	133	78	47

Figure 7: Number Of Drug Interactions Found In 150 Subjects

In above figure, out of 150 prescriptions total number of interactions

was found to be 196. The drug interactions were classified as major, moderate, minor

and no interactions. Out of 196 interactions 44 major interactions, 133 moderate interactions and 78 minor interactions were found. Percentage wise, 22.7% of major interactions, 68% of moderate interactions and 40% of minor interactions were found.

The most commonly observed major drug interactions among our study population were Clopidogrel +Aspirin, Aspirin +Atorvastatin, Clopidogrel +PPIs, Risperidone +Quetiapine, Glimepiride, and Warfarin.

TABLE 3: POTENTIALLY INAPPROPRIATE MEDICATIONS AS MENTIONED IN BEERS CRITERIA 2019 FOR GERIATRIC POPULATION

SI. NO	DRUG	DISEASE	BEERS CRITERIA GUIDELINES
1.	Quetiapine and Risperidone	Anxiety	Causes cerebrovascular stroke. Indicated only for schizophrenia and bipolar disorders.
2.	Proton pump inhibitors	Hypertension	>8 weeks causes fracture risk. Indicated only with oral corticosteroids or chronic NSAID use.
3.	Diclofenac	Back pain	Causes GI bleeding for >75 yrs. Indicated only with PPI, anti-coagulants and anti-platelets.
4.	Aspirin	Parkinsonism	>325mg/dl in parkinsonism exacerbates ulcer, GI bleeding.
5.	Trihexyphenidyl	Parkinsonism	Not recommended to treat extrapyramidal symptoms with anti-psychotics.
6.	Prazosin	Hypertensive crisis	Should not be used as anti-hypertensives as first line agent in geriatrics.
7.	Warfarin + Aspirin	Stroke	Increases risk of bleeding.
8.	Glimepiride	Diabetes Mellitus	Causes severe prolonged hypoglycemia in geriatrics.
9.	Clonidine	Hypertension	Should not be given as first line agent in HTN. Causes orthostatic hypotension and bradycardia.
10.	Amitriptyline + Anti-depressants	Depression	Anti-cholinergic. Causes sedation.
11.	Dabigatran	Stroke	Increased risk of GI bleeding with warfarin or other oral anticoagulants in patients >75yrs.
12.	Dextromethorp-han	Cough with expectoration	Limited efficacy in patients with symptoms of dementia.
13	Clonazepam	Parkinsonism	Increased risk of cognitive impairment, delirium, fall, fracture. Indicated only in seizure disorder, BZD withdrawal, anxiety.

The current study tabulated above considered representation samples as selective descriptive study for elevated number of prescribed drugs of the order of >10 medications per case with chronic illness burden. This study scientifically explored association of patient (case) characteristic (age, frailty, health and weakness) with probable medication interactions with prolonged continuity of prescribed drugs and did not attempt to address and discern cause-and-effect-relationship between them. There are involved many regular drugs and PRN (pro re nata; as required) too. For geriatric patients pertaining to drug-dose reconciliation during combination therapies and universally accepting geriatric patients as older, complex, multi morbid cohort, their heterogeneity of drug response in the elderly is inevitable and well-understood. Restricted pharmacotherapy in geriatric more unwell patients demands stringent monitoring of clinical health status indicators (with progressing age-dependent changes in drug disposition and sensitivity) for achievement of well-defined therapeutic goals and comfort quality of general life routine. Assessing time burden of polypharmacy drug deployment, a successful co-operative daily routine care between geriatrics and clinical pharmacists with drug reconciliation services (integral part of practice pathways of clinical pharmacy care) is well-evident from this study tabulation.

5.6 MEDICATION-RELATED QUALITY OF LIFE SCALE

The assessment of the consequences of polypharmacy in the quality of life of the Geriatrics was measured using Medication Related Quality of Life Scale (MRQOL). The following questions will reflect the quality of life because of taking multiple medications.

The response includes a six-point psychometric Rensis Likert scale whose results were obtained as shown below:
➢ 1 = None of the time

- ➢ 2 = Very rarely
- ➢ 3 = Rarely
- ➢ 4 = Occasionally,
- ➢ 5 = Frequently,
- ➢ 6 = All of the time.

FROM COMPONENTS OF ROLE OFLIMITATIONS IN OUR STUDY QUESTIONS;
- "Cut down the amount of time you spent on work or daily activities", showed results of average 81.4%.
- "Accomplish the work less than you would like", showed results of 76.7%.

- "Were limited in the work or other daily activities", showed average result of 76%.
- "Took extra effort or had difficulty performing the work or daily activities", showed results of an average of about 82.7%.
- "Interfered with your social activities with family or friends", showed results of an average of about 52%.
- "Interfered with your recreational activities, such as exercise or watching TV", showed results of an average of about 56%.


FIGURE 8: TOOK EXTRA EFFORT OR HAD DIFFICULTY IN PERFORMING THE WORK OR DAILY ACTIVITIES?
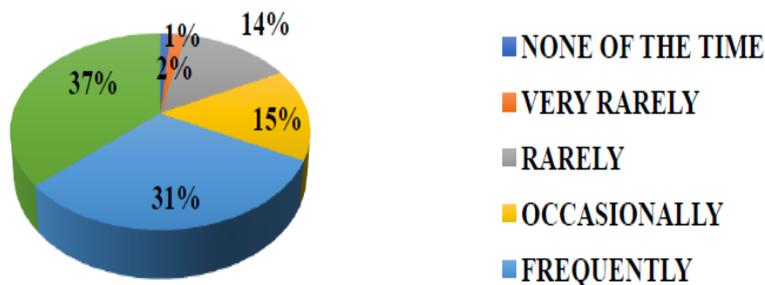
FROM THE COMPONENTS OF SELF CONTROL IN OUR STUDY QUESTIONS;
- "Felt frustrated or downhearted", showed results of an average of about 76.6%.
- "Thought of yourself as a burden to others", showed results of an average of about 64%.

- "Worried about disappointing others", showed results of an average of about 60%.
- "Had to cancel scheduled appointments or meetings", showed results of an average of about 46.7%.
- "Didn't do work or other activities as a result of medication problems", showed results of an average of about 66.7%.

FIGURE 9: THOUGHT OF YOURSELF AS A BURDEN TO OTHERS?
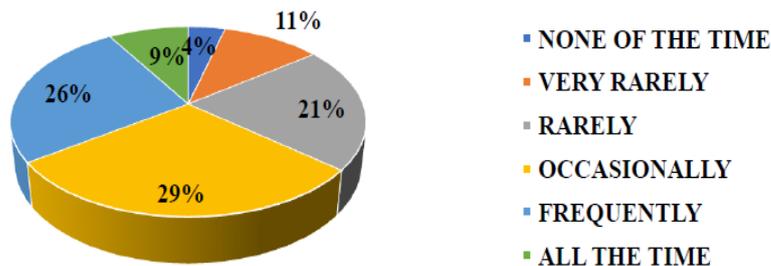
FROM COMPONENTS OF VITALITY:

- "Had difficulty focusing on the task at hand or daily activities", showed results of an average of about 73.9%.
- "Had difficulty performing the work or daily activities as a result of feeling worn out", showed results of an average of about 64.6%.
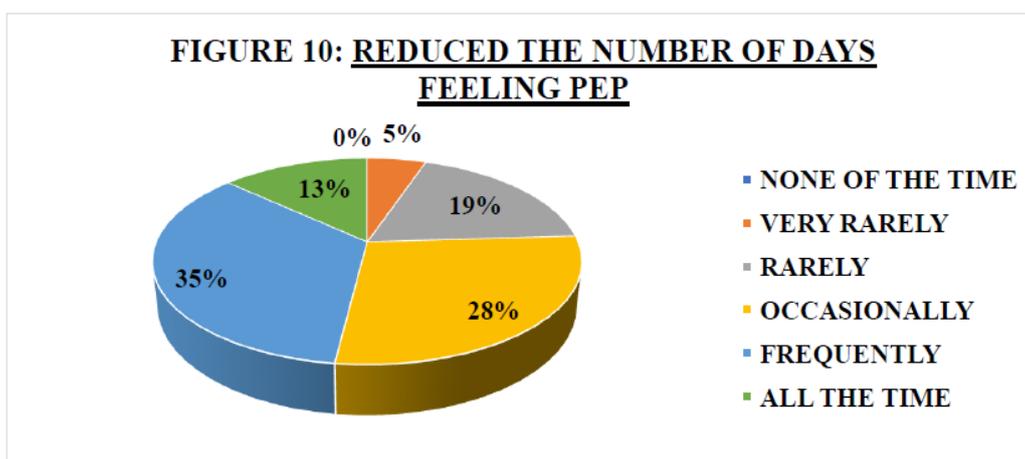- "Reduced the number of days feeling full of pep," showed results of an average of about 76%.
- "Reduced the number of days feeling full of pep," showed results of an average of about 76%.

FIGURE 10: REDUCED THE NUMBER OF DAYS FEELING PEP

TABLE 4: MEDICATION RELATED QUALITY ASSESSMENT SCALE

DOMAINS	QUESTIONS	RESPONSE					
		1	2	3	4	5	6
A. Role limitations due to medication	1. Cut down the amount of time you spent on work or daily activities	3 (2%)	7 (4.7%)	18 (12%)	24 (16%)	49 (32.7%)	49 (32.7%)
	2. Accomplish the work less than you would like	1 (0.7%)	12 (8%)	22 (14.7%)	27 (18%)	42 (28%)	46 (30.7%)
	3. Were limited in the work or other daily activities	1 (0.7%)	1o (6.7%)	25 (16.7%)	31 (2o.7%)	33 (22%)	50 (33.3%)
	4. Took extra effort or had difficulty performing the work or daily activities	2 (1.3%)	3 (2%)	21 (14%)	23 (15.3%)	46 (30.7%)	55 (36.7%)
	5. Interfered with your social activities with family or friends	6 (4%)	42 (28%)	24 (16%)	26 (17.3%)	40 (26.7%)	12 (8%)
	6. Interfered with your recreational activities, such as exercise or watching TV	8 (5.3%)	41 (27.3%)	26 (17.3%)	27 (18%)	31 (20.7%)	17 (11.3%)
B. Self-control	7. Felt frustrated or downhearted	-	10 (6.7%)	25 (16.7%)	41 (27.3%)	57 (38%)	17 (11.3%)
	8. Thought of yourself as a burden to others	6 (4%)	16 (10.7%	32 (21.3%)	44 (29.3%)	39 (26%)	13 (8.7%)
	9. Worried about disappointing others	8 (5.3%)	19 (12.7%)	33 (22%)	42 (28%)	35 (23.3%)	13 (8.7%)
	10. Had to cancel scheduled appointments or meetings	10 (6.7%)	27 (18%)	43 (28.7%)	42 (28%)	22 (14.7%)	6 (4%)
	11. Didn't do work or other activities as a result of medication problems	5 (3.3%)	20 (13.3%)	25 (16.7%)	31 (20.7%)	45 (30%)	24 (16%)
C. Vitality	12. Had difficulty focusing on the task at hand or daily activities	2 (1.3%)	15 (10.1%)	22 (14.8%)	36 (24.2%)	46 (30.9%)	28 (18.8%)

DISCUSSION

Polypharmacy are common in geriatric patients and can result in patient morbidity and mortality and can cause a negative impact on their quality of life. More the number of drugs and polypharmacy, more will be the number of clinical or pharmacological risk factors significantly contributing to the risk in patient's life.

The more drugs a patient is exposed to, the more likely they are to be prescribed inappropriately [15] (Steinman, 2006). One of the causes for an increase in the number of prescription drugs are new medication that are prescribed to treat a side effect that has been misdiagnosed as a new illness. According to Fick et al (2003), potentially inappropriate medications in the elderly include those with sedative or anticholinergic effects and long acting non-steroidal anti-inflammatory drugs (NSAIDs) [16]. This was also observed in this study, with pain medications (NSAIDS) being the most inappropriately prescribed medicines, followed by anticholinergics, central nervous system drugs and cardiovascular system drugs.

On the other hand, adding more medications can be beneficial when a patient has been found to be genuinely having multiple chronic conditions, each with its appropriate medicines and also taking considerations that there are no drug-drug interactions.

Awareness of polypharmacy is needed so as to promote routine evaluation of medicines for efficacy, reduce adverse drug reactions (ADRs) and make medical practitioners aware of the principles of geriatric medicine.

Polypharmacy is linked with age, morbidity, and poor self-reported health. Studies done thus far assessed polypharmacy in people older than 60 and its related poor Health-Related Quality of Life (HRQOL). In the present study, majority of older patients with polypharmacy, 85% reported poor medication related quality of life. This does validate, verify and approve the study conducted by Hsu-Min Tseng et al [5] wherein they had observed about 75.3% subjects with poor quality of life.

MRQoL scale determines the overall effect of polypharmacy on QoL, which is a result of the interaction between endogenous factors (such as polypharmacy) and an individual's health status [5,6] To reflect the patients, view of QoL relevant to polypharmacy, the face validity of the MRQoLS-v1.0 was ensured by deriving the items from qualitative interviews which was seen in the work carried out by Hsu-Min Tseng et al and Henok Getachew Tegegn et al.

They used it to validate the measure in a hospital-based population of patients with polypharmacy [6]. The Medication-Related Quality of Life Scale version 1.0 (MRQoLS-v1.0) included 14 items developed on the idea of interviews with elderly patients with polypharmacy, defined as taking five or more medications simultaneously. This scale was tested in 219 outpatients (99 with polypharmacy and 120 without polypharmacy) [6] wherein our community-based study included 150 subjects all of which exhibited polypharmacy.

The 14 items of the instrument represent the aspects with the greatest effect on the well-being of patients with polypharmacy. The scale met the psychometric criteria, including internal consistency reliability, multiple dimensions of the scale, construct and known-group validity. Of the MRQoLS-v1.0 subscales, internal consistency reliability was generally high for group level comparisons. The convergent validity with the psychological distress and discriminant validity with medication adherence suggested that the construct of the scale was well-targeted at the QoL end-of-the-outcome spectrum, as defined by subjective well-being (SWB). [29,30] Compared with patients without polypharmacy, those with polypharmacy had significantly higher levels of limitations and ill-being on the scales. This difference is a growing evidence of known-group validity, also endorsed in the study conducted by Diener E et al and Taylor E et al who also had suggested the same idea and utilized qualitatively the MRQoL scale.

From components of role limitations in our study questions; "Accomplish the work less than you would like" showed results of 76.7% and "Were limited in the work or other daily activities," showed

average results of 76% which may be defined as a frailty in another study which tried to assess the cut points of polypharmacy and outcomes. "Took extra effort or had difficulty performing the work or daily activities" showed results of an average of about 82.7% also defined as a disability in the same study and our results were mostly consistent and strengthening the study conducted by Montiel Luque A et al on Medication-Related Factors on the health-related Quality of Life of patients 65years and older with polypharmacy [17]. In addition to this, the outcome regarding role limitation was also comparable with the result of another study done by Rosso AL et al. [19] which took polypharmacy as geriatric syndromes and it resulted in disability in older women. The components of role limitations discussed above were assessed in another study 20 as functional ability and consistent with our results. In another study, most components of role limitations were described as a physical component summary that is associated with daily living activities, and polypharmacy could impair the daily living activities which was also certified earlier by the study done by Henderson SA et al. [21]

In the self-control dimension, our study resulted in 60% of the respondents claiming that they frequently or always worry about disappointing others and about 64% subjects thought themselves as being burden to others. This substantiated the results obtained by Hsu-Min Tseng et al who in their study claimed 61% and 63.3% frequently or all of the time thought of themselves as a burden to others.[6] As described by many patients, this was because most of them had no source of income, and were supported by a family. Regarding self-control dimension of MRQoL, problems related to anxiety-like disappointing others and feeling of a burden to others is pervasive among most participants in the current study [5].

A feeling of anxiety symptoms such as worrying about disappointing others was found prevailing in the current study unlike the study done by Henderson J A et al. [21]

Around 76% of our subjects stated that they had very few days wherein they feel full of pep and energy. This was consistent with the study conducted by Hsu-Min Tseng et al whose study on Quality of life among older patients showed the vitality dimension, the majority of the participants (64.7%) stated that they had very few days with the feeling of full energy. On now, most patients complain lack of hope by thinking that their medical condition is getting worse which has resulted in using many medications.

Similar observations were stated by National Institute of Mental health that Loss of energy in daily activity is one of the typical sign of low feeling of oneself, [18] which could be influenced by medication-related factors as shown in the study conducted by Montiel Luque A et al.[17] In the vitality dimension, this study has also reported a consistently ratified finding that most patients felt they could spend very few numbers of days with full of energy.

It is important to take into consideration that it may not be appropriate to simply reduce the number of drugs a patient is taking as opposed to optimizing the drug therapy, as all of the drugs prescribed may be necessary and appropriate for the patients. This idea is supported by the study conducted by Jameson J et al whose study was on the impact of pharmacotherapy consultation on the cost and outcome of the medical therapy [22] and Shaughnessy et al whose study was on common drug interaction on elderly. [23] It is also important to note that the optimization of therapy may include switching a patient to a more appropriate drug, so the number of drugs will not decrease, but the instance of polypharmacy certainly will. [22,23] Pharmacist interventions are able to target high risk patients for therapy alterations to prevent health risks.

The American Geriatrics Society (AGS) Beers Criteria® (AGS Beers Criteria®) for Potentially Inappropriate

Medication (PIM) use in older adults are widely employed by clinicians, educators, researchers, healthcare administrators, and regulators. Since 2011, the AGS has been the steward of the criteria and has produced updates on a 3-year cycle that began in 2012.[24,25] This was confirmed based on The American Society Beers Criteria of 2012 and 2015 versions. The AGS Beers Criteria® are a particular list of PIMs that are typically best avoided by older adults in most circumstances or under specific situations, like in certain diseases or conditions.

Polypharmacy is one of the strongest factors increasing the risks of drug–drug interactions, drug–disease interactions, and inappropriate dosing. Polypharmacy may have negative impacts on patients and the health care system. The practice is also associated with the development of various geriatric syndromes, functional decline, and increased health care costs. This was consistent with the study concluded by Patterson S.M et al.[26] In quantitative terms, poly-medication is defined as various drugs simultaneously taken by a patient.

Our study used The Beers Criteria, a panel-produced list of medications considered inappropriate for older patients, either because of ineffectiveness or high risk for adverse events.

Medications designated in one among three categories: people who should be avoided (e.g., barbiturates, chlorpropamide); people who are potentially inappropriate in older adults with particular health conditions or syndromes; and those that should be used with utmost caution.

Beer's criteria for potentially inappropriate medication use in older adults was exercised and functionalized to list out the excessive therapeutic agents, minimize the therapeutic regimen and resulting optimize patient compliance towards a sustainably prescribed therapy by the American Geriatric Society.

The Beers criteria don't preclude practitioners from prescribing any of the drugs on the list, but it's a superb tool to assist guide practitioners in selecting the simplest and safest medications for their older adult patients.[24]

Our study on analysis of Potentially Inappropriate Medications, the most likely factor associated with PIMs use in this study was polypharmacy.[14] This was also established in the study carried out by Tariq M. Alhawassi et al wherein they found that 80% of this study population used more than five medications. The higher rate of polypharmacy use in our study population can be attributed to the higher rate of multiple chronic conditions may need to take many medications to control their chronic conditions or to prevent complications associated with certain chronic conditions. Several studies have reported an increased risk of PIMs with polypharmacy where one study showed that PIMs use was two times higher among older patients with polypharmacy.[31,32]

In this study, the presence of certain chronic conditions in older patients predicted the increased chance of PIMs use including diabetes, IHD, HF, CKD, cancer, osteoarthritis, osteoporosis, and anxiety14 which was exactly the same observation affirmed by Tariq M Alhawassi et al on their study on Prevalence of potentially inappropriate medications use among older adults and risk factors using the 2015 American Geriatrics Society Beers criteria.

Multiple studies by Viera de Lima et al have demonstrated a significant association between PIMs use and cardiovascular diseases, diabetes, osteoporosis and increase number of chronic diseases.[33] Our study showed similarly attested results when every subjects prescription was analyzed using Beers Criteria 2019.

The limitation was that we were not able to capture the use and failure of other drugs prior to the prescribing of PIMS given the nature of the study design. However, this study still are often considered novel because the study was designed using the newest Beers criteria which also considered one among the foremost utilized criteria for

identifying PIMs among older adults in clinical setting and therefore the latest two update of Beers criteria were supported by American Geriatric Society which improved the standard of the standards by application of an evidence-based approach. [34]

CONCLUSION

Clinical pharmacist can play a key role in promoting better medication use, ensuring that patients receive appropriate pharmacotherapy thus helping in minimizing the risk of unfavorable outcomes of pharmacotherapy. It is certain that the geriatric population can suffer from an extended set of problems whilst treated with a drug therapy with polypharmacy. This in turn adversely affects the quality of life of the individual. Based on the MRQoL scale, the quality of life among geriatric population was assessed, and the results were found out. The review of patient's drug therapy can help in identifying various complications that the patient faces. In the study, it was found out that 44(22.7%) of the patients had major drug interactions. Based on the study criteria, the problems of the geriatric patients with polypharmacy regarding the quality of life were identified. A clinical pharmacist study was carried out based on the medication- related quality of life of the geriatric population who had polypharmacy. There was a good response from the health sector as well as the public population regarding the study which was aimed at finding at what level the quality of life of a geriatric population stand. There is a clear chance that a collaborative effort of the physician and the pharmacist can lead to an increase in the quality of life of not only the geriatric population, but the community as a whole.

The present studies highlighted that the clinical pharmacist can be helpful in the identification of the medication-related problems and thus provide categorical intervention.

Thereby, the study concludes that involvement of clinical pharmacist services in patient care can significantly help to identify, resolve, and prevent the medication related problems, and thereby significantly increase the quality of life in the geriatric population with polypharmacy.

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