# Prevalence of potentially Inappropriate Prescription among Elderly in Geriatric Homes

*Thesis*

Submitted for Partial Fulfillment of Master Degree
In Geriatric and Gerontology

*By*

**Alaa Ibrahim Fawky Saeed**
(M.B.,B.Ch.)
Resident of Geriatrics, Specialized Internal Medical Hospital
Faculty of Medicine, Mansoura University

*Supervised by*

**Prof. Dr. Moatassem Salah Amer**
Professor of Geriatrics and Gerontology
Faculty of Medicine - Ain Shams University

**Dr. Rania Mohamed El Akkad**
Associate professor of Geriatrics and Gerontology
Faculty of Medicine - Ain shams University

Faculty of Medicine
Ain Shams University
2018

# List of Contents

# List of Abbreviations

**ACE** .....Angiotensin-Converting-Enzyme

**ADEs**.....Adverse Drug Events

**ADL** .....Activities of Daily Living

**ADR**.....Adverse Drug Reactions

**AF**.....Atrial Fibrillation

**AGS** .....American Geriatrics Society

**BMI**.....Body Mass Index

**CGA**.....Comprehensive Geriatric Assessment

**CIRS-G** .....Cumulative Illness Rating Scale for Geriatrics

**CMS**.....Centers for Medicare & Medicaid Services

**CNS** .....Central Nervous System

**COPD**.....Chronic Obstructive Pulmonary Disease

**COPE**.....Computer Prescriber Order Entry

**CrCl**.....Creatinine Clearance

**CVS** .....Cardio Vascular System

**EP**.....Electronic Prescribing

**FEV** .....Forced Expiratory Volume

**GDS** .....Geriatric Depression Scale

**GFR**.....Glomerular Filtration Rate

**GIT** .....Gastro Intestinal Tract

**GP**.....General Practitioner

**HF** .....Heart Failure

**HTN** .....Hypertension

**IADL** .....Instrumental Activities of Daily Living

**IHD** .....Ischemic Heart Disease

**IMS** .....Intercontinental Marketing Services

**IMU** .....Inappropriate Medication Use

**IPET** .....Improved Prescribing in the Elderly Tool

**MAI** .....Medication Appropriateness Index

**MMSE** .....Mini-Mental State Examination

**MNA** .....Mini-Nutritional Assessment

**MR** .....Medication Reconcilliation

**NORGEP** .....Norwegian General Practice

**NORGEP** .....Swedish National Board of Health and Welfare criteria and Norwegian General Practice

**NSAIDs** .....Non-Steroidal Anti-inflammatory Drugs

**OA** .....Osteoartheritis

**PAI** .....Prescribing Appropriateness Index

**PIPs** .....Potentially Inappropriate Prescriptions

**PPI** .....Proton Pump Inhibitor

**SD** .....Standard Deviation

**SHIM** .....Structured History Taking of Medication Use

**SIADH** .....Syndrome of Inappropriate Antidiuretic Hormone Secretion

**START** .....Screening Tool to Alert doctors to Right Treatment criteria

**STOPP** .....Screening Tool of Older Person's Prescriptions criteria

**STRIP** .....Systematic Tool to Reduce IP

**Ti**.....Therapeutic Index

**TUG** .....Timed Up and Go

**Vd**.....Volume of Distribution

# List of Tables

# List of Figures

## ABSTRACT

**Background:** Appropriate prescribing of medications in elderly especially with advancing age is a major clinical and economic issue. Therefore, health care and appropriate use of medications with advancing age is one of the major challenges facing health care systems. Potentially inappropriate prescriptions (PIP) are defined by the presence of a risk of prescribed drugs that overweighs their benefit. Especially, when there are safer alternatives and include misuse of medications, prescription of drugs with significant drug–drug or drug– disease interactions and the negligence of beneficial medications.

**Aim of the Study:** To assess the association between potentially inappropriate prescription and health outcome among a sample of Egyptian elderly patients in geriatric homes in Cairo.

**Methods:** A cross-sectional study. A random sample of 120 geriatric home residents in Cairo. Demographic data were collected and comprehensive geriatric assessment was done for each participant including history taking, clinical examination, psychological, mental, functional, risk of falls and nutritional assessment. Assessment of potentially inappropriate prescription using STOPP criteria.

**Results:** The present study showed that among the 120 participants; the prevalence of PIP using STOPP criteria was 27(22.5%) of them were taking one or more PIP, 24 (20%) were taking one PIP and 3 (2.5%) were taking 2 PIP, 12 (44.4%) of the studied participants having visual impairment were using PIP regarding STOPP criteria; 7 (25.9%) of the studied participants having hearing impairment were using PIP as detected by STOPP criteria, so there was significant relation between PIP and patients who had visual and hearing impairments, there was a significant relation between PIP among the studied group using STOPP criteria regarding functional assessment (Instrumental activity of daily living (IADL) with p-value equal (0.031), and there was no significant relation with cognitive, psychological, risk of falls and nutritional assessment and there was no significant relation with other health outcome.

**Conclusion:** Potentially inappropriate prescription using STOPP criteria was found to be statistically significant with hearing, visual impairment and regarding functional assessment (IADL) only. No significant association with other health outcome.



**Keywords:** Potentially Inappropriate Prescription (PIP), Health outcome, Elderly, Geriatric homes.

# INTRODUCTION

Elderly persons are more susceptible to the adverse medication outcomes because of the age related changes in drug pharmacokinetics and pharmacodynamics and their complex drug regimens. The risk of polypharmacy and complex medication regimens rise especially with the increased prevalence of chronic multimorbidity and symptoms in elderly ***(Moore et al., 2014).***

Appropriate prescribing of medication in the elderly and especially in the very elderly is a major clinical and economic issue. The group of the oldest old people (85 years and over) is increasing and will increase even more in the coming years. Therefore, health care and appropriate use of medications in the elderly is one of the major challenges facing health care systems ***(Rechel et al., 2013).***

There is often significant multimorbidity and high mortality in this age group ***(Formiga et al., 2013).***

This is due to the lack of high quality evidence on the benefits and safety of treatments for major chronic diseases in this age group ***(Muller et al., 2014).***

Therefore, the most clinical practice guidelines for major chronic diseases do not include clear recommendations for the very elderly and to treat patients

in clinical practice, an individualized approach that incorporates a comprehensive geriatric assessment is recommended ***(Hughes et al., 2013).***

Potentially inappropriate prescriptions (PIP) are defined by the presence of a risk of prescribed drugs that overweighs their benefit, especially, when there are safer alternatives. PIP include misuse of medications, prescription of drugs with significant drug–drug or drug–disease interactions and the negligence of beneficial medications ***(Page et al., 2010).***

Inappropriate prescribing can be defined as prescribing medication that does not agree with accepted medical standards, has greater potential to harm than to benefit the patient in regular doses regardless of patient diagnoses or conditions, have contraindication for specific conditions, have potentially harmful drug-drug interactions, or are therapeutically duplicative to other medications ***(Midlov et al., 2009).***

Medications are considered as potentially inappropriate for use in elderly people when the risk of harmful effects exceeds their expected benefit for the patient or when a safer, better tolerated or more effective alternative drug is available ***(Spinewin et al., 2007).***

Inappropriate medication prescribing for elderly patients has become one of the major issues for family physicians who manage most of the chronic diseases ***(Bajcar et al., 2010).***

Nursing home residents are particularly vulnerable to potentially inappropriate prescribing (PIP) as they are more fragile, receive therapy from multiple health care workers and are often prescribed a high number of medications ***(Loganathan et al., 2011).***

It makes prescribing in this setting a challenging task and very complex issue ***(O'Sullivan et al., 2013).***

The risk of an adverse drug reaction increases with every new drug added to the treatment regimen. The risk of a patient having a clinically serious adverse drug reaction is estimated at 4 per 100 prescriptions; of these patients, 1 in1000 will die from the reaction. Up to 140,000 deaths per year may be due to adverse drug reactions ***(Darryl et al., 2004).***

For geriatric population, there is strong evidence of a sizable and consistent negative effect of inappropriate drug use on patients' health status ***(Fu et al., 2005; Midlov et al., 2009)*** and an associated increase in use of outpatient services and more rapid hospitalization ***(Suzanne et al., 2006).***

For elderly patients, the burden of everyday medications is generally an underappreciated issue and polypharmacy is important to consider as a quality of life issue ***(Huang, 2007).***

Prescribing for older people is especially daunting because they require complex regimens for multiple chronic conditions. Moreover, to minimize adverse drug reactions, practitioners must consider age-related changes in drug pharmacokinetics and pharmacodynamic when selecting from the thousands of chemical entities available ***(Hanlon et al., 2001).***

Several studies have examined the prevalence of inappropriate medication use (IMU) in elderly. That showed a clear variation in assessments of IMU prevalence. Among assessments generated by applying several criteria, prevalence of IMU among community-dwelling elderly ranged from 11.5% to 62.5% ***(Guaraldo et al., 2011).***

Prevalence of PIP is higher in nursing home settings ***(Aparasu et al., 2000).*** A study conducted in South Africa, reported that the prevalence of PIP using Beers criteria was significantly higher (2.1 %) among nursing home residents as compared to community-dwelling elderly ***(Chetty et al., 2004).***