UNIVERSITI PUTRA MALAYSIA

PREVALENCE AND PREDICTORS OF POTENTIALLY INAPPROPRIATE
MEDICATIONS AMONG ELDERLY PATIENTS ATTENDING
GOVERNMENT PRIMARY CARE CLINICS

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By

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Elderly patient may become victims of potentially inappropriate medication (PIM) when their drug interactions and effect of the drug on other underlying diseases are not being properly investigated during follow ups with medical officers. PIM has been defined as medication which are not suitable for patients based on age, laboratory findings, and medical history which may lead to further complication of health. Issues on double prescriptions from clinics and hospitals, lack of communication among doctors in both facilities, patient understanding and adherence to medication to regimes, unavailability of drugs prescribed by specialists at primary care and cost are important factors which could contribute to PIM. Aim of the study is determine prevalence and predictors of PIM among elderly patients attending government primary care clinics in Seremban district. Elderly patients aged 60 and above attending health clinics in Seremban district were recruited in this cross sectional study by using random sampling method. Elderly patients' sociodemographic and clinical characteristics were obtained from patients' prescriptions and medical database as patients present at pharmacy to collect medication. Prescribed medications were analysed by using Screening Tool of Older Persons' Potentially Inappropriate Prescription (STOPP) criteria and were identified as PIM if the medication were included in STOPP with similar description. STOPP is a screening tool to measure incidences of PIM based on physiological system. Sociodemographic data and clinical characteristics association with PIM were studied to determine predictors of PIM. Data analysis was conducted by using IBM Statistical Package for Social Sciences Software (SPSS) version 22. Chi square method was used to determine the association among variables. The confidence interval was set at 95% and level of significance as $p < 0.05$. Simple logistic regression was applied to determine the crude odd ratio and variables with $p < 0.25$ were entered into multivariate logistic regression model to determine predictors for PIM. Majority of elderly patients had two types of illnesses (50.4%). Most patients were taking five medication for their illnesses (24.1%). Elderly patients aged above 70 were

more likely to have PIM (AOR=1.721, 95% CI 1.316-1.974) compared to patients below the age of 70. Patients who were taking more than five prescribed medication were more likely to have PIM (AOR=1.628, 95% CI 1.152 to 1.850) compared to patients taking less than 5 prescribed medication. Patient with more than three number of illnesses were more likely to have PIM compared to patients with less than three number of illnesses. Patients with endocrine disease, renal disease and urogenital disease were more likely to have PIM in their regime compared to patients without the disease. Predictors of PIM based on this study were age (>70 years) number of prescribed medication (>5), number of illnesses (>3), endocrine disease, renal disease and urogenital disease. Prevalence of PIM is found to be high, 37% based on STOPP criteria. The finding of the study can be used as a baseline study on PIM among elderly in Malaysia primary care setting. By identifying PIM, many health related issues and medication errors among elderly patients can be reduced and resolved.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

PREVALENS DAN PERAMAL UBAT YANG TIDAK SESUAI DI KALANGAN PESAKIT WARGA TUA YANG MENDAPAT RAWATAN DI FASILITI PRIMER KERAJAAN

Oleh

HEMAH DEVI A/P CHANDRA SEJARA RAO

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Pesakit warga tua mungkin menjadi mangsa ubat yang mungkin tidak sesuai
akibat interaksi ubat-ubat dan kesan ubatan pada penyakit yang sudah sedia
ada tetapi tidak disiasat dengan sewajarnya semasa konsultasi bersama doktor.
Ubat yang tidak sesuai telah ditakrifkan sebagai ubatan yang tidak sesuai diberi
kepada pesakit berdasarkan umur, penemuan makmal, dan sejarah perubatan
yang boleh membawa kepada komplikasi kesihatan. Isu berkaitan preskripsi
berulang dari klinik dan hospital, kurang komunikasi antara doktor di kedua-dua
fasiliti, pemahaman dan pematuhan pesakit kepada ubat, ketidaksediaan ubat
pakar di fasiliti primer dan kos adalah antara faktor penyumbang kepada
penggunaan ubat tidak sesuai. Objektif kajian adalah menentukan prevalens
dan peramal ubat tidak sesuai di kalangan pesakit tua yang datang ke klinik
primer kerajaan di daerah Seremban. Ciri-ciri sosiodemografi dan klinikal telah
diperolehi daripada preskripsi pesakit dan pangkalan data perubatan semasa
pesakit ke farmasi untuk mendapatkan ubat. Ubat yang diberikan kepada
pesakit warga tua dianalisa dengan menggunakan kriteria saringan untuk
preskripsi pesakit warga tua (STOPP). Ubatan dikenal pasti sebagai ubat tidak
sesuai, jika ubat tersebut dinyatakan dalam kriteria STOPP dengan penerangan
yang sama. STOPP adalah alat saringan untuk mengukur penggunaan ubat
tidak sesuai berdasarkan sistem fisiologi. STOPP mengandungi kriteria ubat
tidak sesuai untuk warga tua, interaksi ubat, ubatan yang mendatangkan risiko
jatuh dan pengunaan ubat polifarmasi. Data sosiodemografi dan klinikal dikaji
dengan ubatan yang tidak sesuai untuk menentukan peramal. Analisis data telah
dijalankan dengan menggunakan IBM Pakej Statistik untuk Sains Sosial
Software (SPSS) versi 22. Kaedah Chi square telah digunakan untuk
menentukan perkaitan antara pembolehubah. Keputusan telah dinyatakan
sebagai nisbah ods dengan 95% selang yakin. Nilai p kurang daripada 0.05
dianggap statistik yang signifikan. Kaedah regresi logistik mudah dan multivarian
model regresi logistik digunakan untuk menentukan peramal untuk ubatan yang
tidak sesuai. Tujuh ratus sembilan puluh dua pesakit telah dipilih secara rawak

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dari enam klinik primer kerajaan untuk menyertai kajian ini. Majoriti pesakit adalah daripada kumpulan umur 60-64 (36.9%). Majoriti pesakit tua mempunyai dua jenis penyakit (50.4%). Kebanyakan pesakit mengambil 5 ubat untuk penyakit mereka (24.1%). Pesakit warga tua lebih daripada 70 umur, adalah lebih berkemungkinan untuk mempunyai ubatan tidak sesuai (AOR=1.721, 95% CI 1.316-1.974) berbanding dengan pesakit yang berumur kurang daripada 70. Pesakit yang mengambil lebih daripada lima ubat adalah lebih cenderung untuk mempunyai ubatan tidak sesuai (AOR=1.628, 95% CI 1.152-1.850) berbanding pesakit yang mengambil kurang dari lima jenis ubat. Pesakit yang menghidapi penyakit endokrin, buah pinggang dan urogenital lebih berkemungkinan untuk mendapat ubat tidak sesuai berbanding pesakit yang tidak menmpunyai penyakit tersebut. Peramal ubatan tidak sesuai berdasarkan kajian ini ialah umur (>70), bilangan ubat yang ditetapkan (>5), bilangan penyakit (>3), penyakit endokrin, penyakit buah pinggang dan penyakit urogenital. Prevalens pengunaan ubat yang tidak sesuai dalam kajian ini adalah tinggi, 37% berdasarkan kriteria STOPP. Penemuan dalam kajian ini boleh digunakan sebagai kajian dasar untuk menentukan penggunaan ubatan tidak sesuai di kalangan warga tua di Malaysia. Pelbagai isu kesihatan dan penyalahgunaan ubat di kalangan warga tua dapat dikurangkan dan diselesaikan dengan mengenalpasti pengunaan ubat tidak sesuai ini.

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LIST OF ABBREVIATIONS

PIM	Potentially Inappropriate Medication
PCP	Primary Care Physicians
STOPP	Screening Tool of Older Persons' Prescriptions
PPI	Proton Pump Inhibitor
UPM	Universiti Putra Malaysia
SPSS	Statistical Package for Social Sciences Software
NMRR	National Medical Research Register
DOS	Department of Statistics
LPPKN	National Population and Family Development Board
ADE	Adverse drug event
DRP	Drug-related problems
SSRI	Serotonin re-uptake inhibitors
TCA	Tricyclic antidepressants
ACE	Angiotensin
JSTOR	Journal Storage
T2DM	Type 2 Diabetes Mellitus
NSAID	Non-Steroidal Anti Inflammatory
OTC	Over The Counter
MOH	Ministry of Health

PIM	Potentially Inappropriate Medication
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CHAPTER 1

INTRODUCTION

This chapter provides an overview of the background of potentially inappropriate medication (PIM), elderly patient, problem statement, study objectives and significant of the study.

1.1 Background

Malaysia is reaching to the status of an ageing country. By the year 2035, about 14% of Malaysian population will be elderly, aged 60 years and above (Minhat & Amin, 2012). With a growing older population, uses of prescription medication is projected to incline as chronic conditions, such as diabetes, hypertension, mental illness, and many more which require more intensive therapy. Many developed countries have accepted 65 as the age for the definition of elderly (World Health Organization, 2013) while in Malaysia it is taken as 60 years and older. These group of elderly patients often suffer from age related pharmacodynamics and pharmacokinetic issues with their medications.

PIM has been defined as the use of medication with risk greater than benefit, inappropriate dosing duration, prescriptions that lead to clinically significant drug–drug and drug–disease interactions, and the under-use of potentially beneficial medications (Al-Aqqad, Chen, Shafie, Hassali, & Tangiisuran, 2014). The study reported, elderly patients were prescribed with more medications than younger patients. These high level of medications may lead to increased risk of inappropriate medications in their regime. PIM among elderly patients are associated with negative healthcare outcomes such as adverse drug events, drug related morbidity, hospitalization mortality, and unnecessary health care utilisation (Lau et al., 2010). Inappropriate medication occurs frequently in nursing homes residents due to the high prevalence of frailty, multiple comorbidities, and functional restrictions (Aparasu & Mort, 2000).

Primary care services in Malaysia include private general practices, government primary care clinics in the community, and government primary care clinics within teaching hospitals. Primary health care services is currently responding to the changes of patient demography, such as increasing numbers of youth and adults and shift the burden of disease from infectious to non-communicable, chronic diseases (Jaafar, Noh, Muttalib, Othman, & Healy, 2013). It is essential for Malaysia to develop a health policy on chronic disease especially for ageing population. The changes in treating elderly patients, such as with updated guideline on acute and chronic diseases and drug management based on age will make vast improvements on current and future ageing population.

1.2 Problem Statement

At primary care, patients will be regionalized and health care practitioners could provide regular check-ups and close monitoring of their health conditions. PIM incidences may occur widely in primary care settings as patients tend to have follow ups in both primary care clinics and specialists in hospitals. Issues on double prescriptions from clinics and hospitals, lack of communication among doctors in both facilities, patient understanding and adherence to medication to regimes, unavailability of drugs prescribed by specialists at primary care (Ismail, Jamsiah, Amin, Ali, & Munizam, 2019) and cost are important factors which could contribute to PIM.

This study will explore the prevalence and predictors of PIM in government primary care clinics in Seremban district. Prevalence of PIM definition may differ between countries due to the differences in clinical practices and patient characteristics. Thus, there is a need for research on existing globally used screening tool and development of screening tools to identify PIM in Malaysia by considering the clinical guidelines and population characteristics of Malaysia. Identifying the factors associated with PIM at primary care clinics is an essential step in our health care system to address the problem of PIM especially among elderly patients.

1.3 Significant of Study

The study provides the prevalence and predictors of PIM. By identifying PIM and finding the outcome, frequent hospitalization can be prevented which will reduce the financial and manpower burden on the health care system. PIM among elderly also will lead to many health issues such as adverse drug events which are one of the major challenge faced by health care system. By assessing PIM using a screening tool, elderly patient's quality of life will be improved as there will be extra caution taken when prescribing medication. The results can determine whether existing guidelines such as STOPP are adequate or urge to develop a more extensive guideline which could caters for ageing population in our country for a better health. It also gives an opportunity for new guidelines and measures to be developed.

Knowing the needs of the patients are vital for the planning of actions that aim to adequately meet their needs and provide the best level of comfort, which may contribute to decrease in PIM.

1.4 Study Objective

1.4.1 General Objective

To determine the prevalence and the predictors of potentially inappropriate medication (PIM) among elderly patients attending government primary care clinics in Seremban district.

1.4.2 Specific Objectives

i. To determine prevalence of PIM of elderly patients attending government primary care clinics.
ii. To determine the sociodemographic characteristics (age, gender and ethnicity) of elderly patients attending government primary care clinics.
iii. To determine clinical characteristics (number of illnesses, number of prescribed medication and type of illnesses) of elderly patients attending government primary care clinics.
iv. To determine the type of medication identified as PIM based on the STOPP among elderly patients attending government primary care clinics.
v. To determine the association between sociodemographic characteristics of elderly patients attending government primary care clinics with PIM.
vi. To determine the association between clinical characteristics of elderly patients attending government primary care clinics with PIM.
vii. To determine the predictors of PIM based on the STOPP criteria among elderly patients attending government primary care clinics.

1.5 Hypothesis

i. There is significant association between sociodemographic characteristics (age, gender and ethnicity) of elderly patients attending government primary care clinics with PIM.
ii. There is significant association between clinical characteristics (number of illnesses, number of prescribed medication and type of illnesses) of elderly patients attending government primary care clinics with PIM.

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