Ministry Of Higher Education & Scientific Research

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Graduation project

Assessment for the Risk Factors of Polypharmacy in Elderly Patients in Iraq

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿ يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ ﴾

سورة المجادلة آية ١١

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Dedication

الحمد لله وكفى والصلاة على الحبيب المصطفى وأهله ومن وفى، أما بعد : الحمد لله الذي وفقنا لتثمين هذه الخطوة في مسيرتنا الدراسية بمذكرتنا هذه ثمرة الجهد والنجاح بفضله تعالى مُهداةٍ إلى

الدماء الطاهرة التي بها صمدت بلادنا … شهدائنا الملائكة

اللواتي دعواتهن نجاة ورضاهن رحمة … أمهاتنا

الذين امسكوا بأيدينا في دروب الحياة … آبائنا

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ABSTRACT

Background: Polypharmacy is the use of multiple medicines to prevent or treat medical conditions. It is commonly defined as the concurrent use of five of more medicines by the same person. polypharmacy can be classified as appropriate polypharmacy when the patient can take a combination of medications, which are clinically indicated on account of patient condition and clinical evidence, and Inappropriate polypharmacy which occurs when patients use or are prescribed more medicines than are clinically indicated. There are many Causes for polypharmacy in elderly as use many drugs to treatment and control their chronic condition as hypertension, diabetes, and cardiovascular diseases in addition to use OTC drugs and use of herbal medicines all that have high potential to increase adverse effects and drug drug reaction. ***Aim***: To evaluate the number of medicines use among elderly who lived in Basra city and to identify people at risk of harm from polypharmacy. ***Method***: This study included 375 subjects age range was from 60_80 years who lived in Basra city and consumed chronically prescribed medications. Data were collected using online questionnaire and presented as numbers, percentages, and averages. ***Results***: The most commonly used drugs included those used to treat cardiovascular, diabetes mellitus and antihyperlipidemic. The items included those on the source of taking the drugs in which the higher percentage (306,81.6%) taking the drugs by Doctor and Pharmacist Guidance while (51,13.6%) on self-medications and (18,4.8%) taking their drugs based on Friend Advice. ***Conclusion*** Physician, pharmacists, and health care providers can be an influential factor in tackling this challenge through proper diagnosis, prescription, patient education and follow-up.

Keywords: **polypharmacy, aging, multimorbidity, hypertension, geriatric, inappropriate medicines, elderly.**

INTRODUCTION

In Arab countries the number of elderly is increasing due to the improvement in health care services as well as the eradication of most of the infectious diseases that were causing early death [1]. The World Health Organization (WHO) [2] defines older adult population as "individuals who are aged 60 years old or over" WHO, 2002[2].

There has been significant growth in the older population in recent years, proportional to the total population growth worldwide [3]. The reasons for this increase include the longer life expectancy (which was about 42 years in 1950, increased to 74 years by 2010, and is predicted to be 82 years by 2050) due to advanced health care and medical technology, changes to healthy lifestyles[4], more awareness and education[4], good hygiene[4], immunization against life-threatening infections by vaccination programs[4], access to moving away from smoking and unhealthy food[5], and improvements in safety at home and work, and due to decrease in fertility rates among younger groups[5].

Polypharmacy is the use of multiple medicines to prevent or treat medical conditions [6]. It is commonly defined as the concurrent use of five of more medicines by the same person. This definition is used by WHO and the Organizations for Economic Co-operation and Development [7]. Medicines include prescription, as well as over-the-counter and complementary medicines [8]. Polypharmacy can be classified as appropriate and inappropriate [9]. appropriate polypharmacy, the patient can take a combination of medications[2], which are clinically indicated on account of patient condition and clinical evidence [10].

 Inappropriate polypharmacy, on the other hand, occurs when patients use or are prescribed more medicines than are clinically indicated [11]. One of the potential causes of inappropriate polypharmacy is inappropriate prescribing which refers to mis prescribing, overprescribing and under prescribing [12]. Mis prescribing involves an incorrect dose, frequency, administration route or duration of treatment, or the use of medications that are likely to cause clinically significant drug–drug or drug–disease interactions[13] while low-risk alternatives exist [13]. Overprescribing involves prescribing medications for which no clear clinical indication exists [14]. Both misprescribing and overprescribing[15] are common causes of inappropriate polypharmacy [15].

Polypharmacy is associated with an increased risk of adverse drug reactions, interactions with other medicines and increased likelihood of not taking medicines as prescribed [16]. Errors associated with prescribing and monitoring medicines are more likely in older people, and the likelihood increases with the number of medicines taken [17].

The more medicines prescribed, the more complex medicine regimens become [18], which increases the risk of errors such as taking the wrong medicine or dose, missing a dose or taking it at the wrong time [19]. Polypharmacy is also associated with harms including delirium and falls, hospitalization, reduced quality of life and premature morbidity and mortality [20].

Aging interposes physiological changes including declining clearance and metabolism [21] that contribute to drug accumulation [22]. Adjusting doses of medications in patients with declining clearance such as antibiotics, digoxin, anticoagulants, and hypoglycemic crucial [23]. Laboratory-reported kidney clearance [24] estimates should be systematically incorporated within pre- scribing systems to optimize medication safety, avoiding toxicity [25].

Aging-related changes in individual pharmacodynamics results in heightened sensitivities [26] to several as opioids, benzodiazepine, and drugs with anticholinergic properties[26], resulting in toxicity [27].

There are many Causes for polypharmacy in elderly [28] due to their chronic condition [29] which make them taking multiple medications is within guidelines for treatment of hypertension, diabetes, and heart failure for achievement of treatment goals [30].

Additional patient comorbidities translate to concomitant medications [31], which may result in a "prescribing cascade." This occurs with medications being added to treat or prevent side effects of other medications [32].

The use of herbal medicines is widespread and often taken in combination with conventional medicines to treat diseases [33] Health care providers should ask their patients if they use traditional and complementary medicines or remedies [34] and include these products in the medication review, as these will contribute to the polypharmacy burden [35]

Examples of medicines considered potentially inappropriate in older people include [36]

• Medicines that cause sedation, dizziness and confusion, such as opioids, antipsychotics, anticholinergics, antidepressants and medicines for anxiety – these can increase the risk of confusion, falls or delirium [37]

• Long-acting non-steroidal anti-inflammatory drugs – these are associated with increased risk of kidney failure, gastrointestinal bleeding and cardiac effects in older people [38]
• Medicines that are removed from the body by the kidneys – reduced kidney function in older people can allow these to accumulate in the body and cause toxicity [39].

There are several studies conducted in Baghdad and Kirkuk with little information because they were based mainly on one nursing home or an individual census of the elderly in small groups, but the results clearly indicated the presence of multiple medications due to the living and social reality [40].

The most commonly reported barriers to appropriate prescribing are related to family practitioners' lack of training in PIM. Additionally, other organizational characteristics such as a lack of time, limited answer options on insurance formularies, and communication difficulties with other doctors and patients may play a role. The aim of this study is to assess and evaluate the polypharmacy use by elderly patients having multimorbidity in Basra, Iraq.

METHOD

Methodology and Study design

This study is a questionnaire-based descriptive study, carried out from November 2022 to April 2023, the data collected from 375 individuals (141 males and 234 females), average of age (≥60).

Data collection: In recent study tool was validated questionnaire including clinical and demographic variables were recorded: age, sex, level of education, relevant medical history, Data about drugs use; including the name of medication, dose, frequency, duration, and indication, health status (either healthy or have chronic disease), drug history, name of the drugs, number of drugs use which classified as:

- No poly pharmacy: <2 drugs use
- Minor poly pharmacy :2-3 drugs use
- Moderate poly pharmacy: 4-5 drugs use
- Major poly pharmacy: > 6 drugs use

the source of taking the drugs (described by doctor, pharmacists, friends or on self-medications), Drug Rhythm (weather patients used it regularly and when stopped it after feeling better or worse) distribution of prescribed drug systematically such as:

(Cardiovascular system, respiratory system, central nervous system, genitourinary system, gastrointestinal system, etc.). Expire Drug Ensurence. And weather have side effect or not the ethics committee of college of pharmacy university of Basrah approved the protocol.

Statistical analysis the questionnaire link is posted among Facebook Telegram, WhatsApp groups, thereafter the members who click the link is directed to the Google forms. To minimize the missing data, the participants is requested to fill all the items in the online questionnaire or else could not proceed to the next page. On completion of the questionnaire, the participant is directed to clicks the submit option and finally the online questionnaire will send to the drive.

RESULT

Table1. provides summary demographic information. Of the 375 subjects, the age range was from 60-80; mean age was 66.37 years. Among the subjects, there were 234 (62.4.6%) female participants and 141 (37.6%) males. The majority of patients were educated 189(50.4%) had BA and 99(26.4%) had completed the secondary school. 171(45.6%) of the participants were healthy, while 204 (54.4%) were with chronic diseases, and 120 (32%) of the participants showed a degree of poly pharmacy while 255(68%) had no poly pharmacy using.

Variable	Participant (n=375)	
	N	**(%)**
Age Mean Range	66.37 (60-80)	
Sex Male Female	141 234	37.6% 62.4%
Education Level Illitrate Primary school Intermediate school Secondary school BA High Education	27 18 21 99 189 21	7.2% 4.8% 5.6% 26.4% 50.4% 5.6%
Poly Pharmacy No Poly Pharmacy Poly Pharmacy	255 120	68 % 32 %
Health Status Healthy Chronic Diseases	171 204	45.6% 54.4%

Table 1. Demographic data (n=375)

Table (2) compared the demographic data between Poly pharmacy user and no poly pharmacy user. Between participant groups, there were statistically significant differences in the mean of age with p value (less than 0.001) the higher mean age was found among poly pharmacy user 69.58

Years and 64.86 for no poly pharmacy user. Also, the majority of the Polypharmacy user 114 (95%) were unhealthy with different comorbid illness while (90 (35.3%) of the no poly pharmacy user had chronic diseases the p value of the differences was (less than 0.001). there was no statistically significant gender-based and educational status differences between Poly pharmacy usage groups.

| Variable	No Poly Pharmacy (n=255)		Poly Pharmacy (n=120)		X^2; P-value
	N	**(%)**	**N**	**(%)**	
Age Number Mean Range	255 64.86 (60-80)	68 %	120 69.58 (60-80)	32 %	< 0.001
Sex Male Female	90 165	35.3% 64.7%	51 69	42.5% 57.5%	0.179
Education Level Illitrate Primary school Intermediate school Secondary school BA High Education	15 12 15 66 138 9	5.9% 4.7% 5.9% 25.9% 54.1% 3.5%	12 6 6 33 51 12	10% 5% 5% 27.5% 42.5% 10%	0.064
Health Status Healthy Chronic Diseases	165 90	64.7% 35.3%	6 114	5 % 95 %	< 0.001

Table 2. Comparisons of demographic data and Health Status of participants

Table (3). A total of 357 participants. Of those a total of 120 (32%) had some form of polypharmacy,87 (23.2%) with minor polypharmacy (using 2-3drugs), 12(3.2%) with moderate polypharmacy (using 4-5 drugs), and 21 (5.6%) with major polypharmacy (using more than 6 drugs).

| Variable	Participant (n=375)	
	N	(%)
No Poly Pharmacy	255	68%
Poly Pharmacy Minor Poly Pharmacy Moderate Poly Pharmacy Major Poly Pharmacy	87 12 21	23.2% 3.2% 5.6%

Table 3. Degree of polypharmacy among the participants

Figure (1). Presents the health status and the chronic diseases among the Polypharmacy user. The most common chronic diseases were hypertension (69, 57.5%), Diabetes mellitus (57,47.5%), Hyperlipidemia (42,35%) coronary heart disease (42,35%), Chronic low back pain (30,25%), Respiratory diseases (27,22.5%), chronic gastritis (15, 12.5%), Skin and tissue disease (12,10%), atherosclerosis (9,7.5%) and there were (18,15%)0f other disease (peptic ulcer, joint disease, hypertension, Irritable Bowel Disease, Osteoporosis, Migraine , Renal Failure, Hyperthyroidism and neurological disorders)
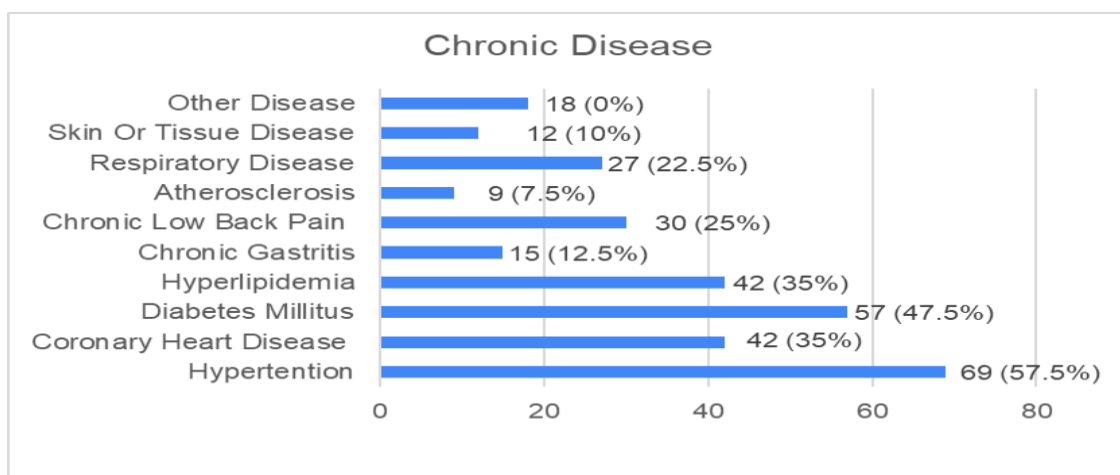
Figure (1). Distribution of chronic diseases

Figure (2). The most commonly used prescription drugs were: cardiovascular drugs (treatments of heart failure, antianginal drug, antiarrhythmic drugs and antithrombotic drugs) (162), antidiabetic (92), statin and antihyperlipidemic (33), CNS drugs (24), steroids (21), herbs, vitamins and supplements (21), pain relieve drugs (15), antimicrobial drugs (9) gastrointestinal drugs (6) and urinary truct infections drugs (3).
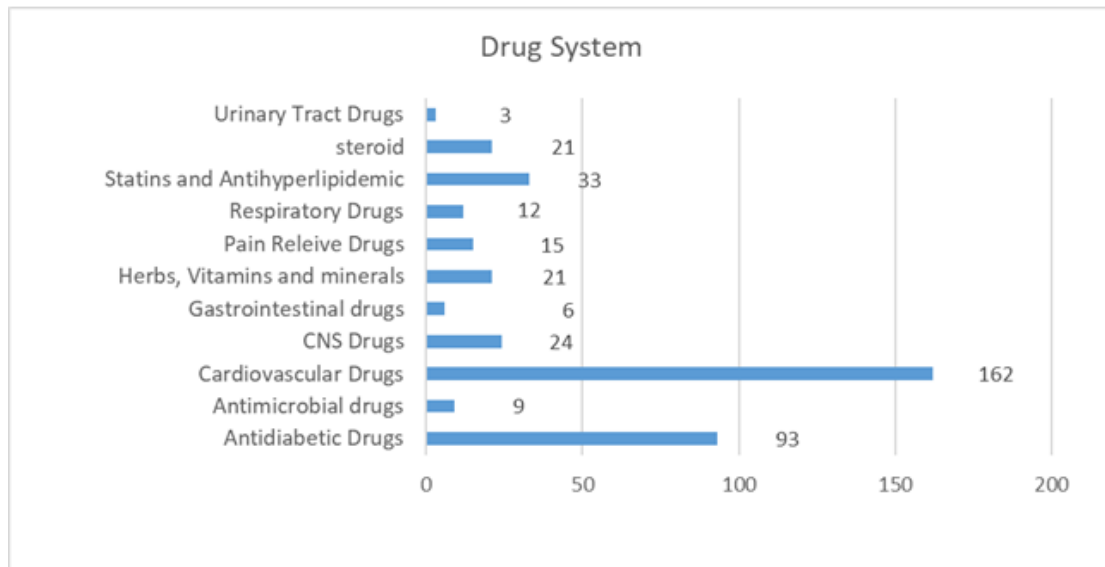
Figure (2). Distribution of drugs taken by the patients

Table 4. showed the medication knowledge among the participants. The items included those on the source of taking the drugs in which the higher percentage (306,81.6%) taking the drugs by Doctor and Pharmacist Guidance while (51,13.6%) on self-medications and (18,4.8%) taking their drugs based on Friend Advice.

Also, on rhythm of drug use (198,52,8%) were taking the drug regularly, (168,44.8%) were stop taking your medicine when you feel better and (9,2.4%) stop taking your medicine when you feel worse. (333,88.8%) of the participants were ensuring the expire date of their drugs while (42,11.2%) were not. Whereas about drug side effects (162,43.2%) have no side effects after use the drugs and (213,56.8%) have no side effects.

Variable	Participant (n=375)	
	N	(%)
How Take Drug		
By Doctor and Pharmacist Guidance	306	81.6%
Friend Advice	18	4.8%
Self-Medications	51	13.6%
Drug Rythm		
regularly	198	52.8%
stop taking your medicine when you feel better	168	44.8%
stop taking your medicine when you feel worse	9	2.4%
Expire Drug Ensurence		
Yes	333	88.8%
No	42	11.2%
Side Effect		
No Side Effect	213	56.8%
Have Side Effect	162	43.2%

Table 4. Medication knowledge among oldest patients

Table 5. Patients who exhibited a degree of polypharmacy had a documented high-risk medication prescribed. aspirin for cardiovascular uses was the most frequently ordered medication (27,37.5%), followed by Steroids (24,33.3%), pain medications (15,20.8%) and CNS medications (6,8.3%).

Drugs that should be avoided by elderly people	Drug (n=72)	
	N	(%)
Pain Relieve Drugs: NSAIDs Tramadol	15	20.8%
CNS Drugs: Duloxetine Clidinium	6	8.3%
Cardiovascular Drugs: Asprin	27	37.5%
Steroid: beclomethasone inhaler betamethasone Budesonide Dexamethasone fluticasone hydrocortisone	24	33.3%

Table 5. Rates of high-risk medication prescribing among elderly patients

DISCUSSION

Our study aimed to assess the drug usage patterns of a group of elderly patients in Basra who were taking chronically drugs. Inappropriate polypharmacy may occur at any age, but given the unique circumstances of older adults, it is more common in this age group [41]

The mean number of medications was low compared with other studies, because this study was conducted in a general in online page and most response was to age between 30-40 yrs.

Despite this, there are great numbers of participants over the age of 60, which indicated that there is aging and comorbidities increase of polypharmacy in the elderly. Diseases highly prevalent in the elderly, such AS CVD, CKD, DM, RDS and musculoskeletal disorders, are significantly correlated with polypharmacy. Most of these diseases require multiple drugs for treatment or prophylaxis. Patients with diabetes, hypertension, heart failure, and osteoarthritis require a minimum of eight different drugs [42]. Geriatric medicine physicians are familiar to managing multiple chronic conditions on a regular basis, multimorbidity is a very common, highly relevant concept for specialists working with old people [43].

In this study, a total number of 130 elderly people including 37.7% females and 62.3% males. The mean age of the participants was (66.37) and the mean number of chronic illnesses was (54.4%). most of them have chronic disease (about 53.1%) hypertension and diabetes mellitus were found in our study to be the most common disease in all study sample patients (n: 130, 100%). This study shows that the rate of multimorbidity was common (n: 120, 32%) in patients aged 60 to 70 years which is in agreement with a study in Baghdad for the year 2019 [40]. The highest daily frequency of polypharmacy was 12(3.2%) drugs per day   21(5.6) respectively, these results are in concordance with the results of a study in 2019 who stated that at least 45.9% from 65–79-year age group and 61.8% from the 80–94-year age group were prescribed 5 or more drugs [45].

In addition to higher prevalence of chronic diseases,[46] the aged population is at risk of multimorbidities.[47] To treat these multiple concurrent diseases, older patients often use multiple medications. On the other hand, due to age-related physiological changes in the aged

population, the impact of medications can vary, and responses to medication may be different and less predictable than other age groups.[48] Therefore, medication-related problems among older adults are much more serious and should be addressed more vigilantly.[49].

Other factors that can contribute to the development of inappropriate polypharmacy among older adults include use of PIM,[24] self-medication,[50] multiple therapeutic regimens and prescriptions by multiple physic [51] Therefore, although patients, physicians and pharmacists are all likely to have key roles in its development and prevention,[52] physicians' prescriptions are the main contributing factor (except in self-medication), and thus, physicians' role deserves a closer examination[52].

The results of this study showed similarities with studies in Iraq and other countries Egypt, Saudi Arabia and Iran.

RECOMMENDATION

We recommend and offer some guidelines to organize Prescribed medicines in older patients

• Implement interventions to identify people at risk of harm from polypharmacy, such as frail people and those with several chronic conditions, to prompt the timely review of their medicines; this could include increased monitoring of polypharmacy

• Raise awareness among consumers and clinicians about harms associated with multiple medicines use, and about lifestyle changes that can reduce the need for some medicines

• Support older people to keep an up-to-date medicines list

• Include information about deprescribing in medicines product information.

CONCLUSION

In this study, we confirmed that significant portion of the older Iraqi patient population has a high prevalence of polypharmacy with high consumption of aspirin as cardiovascular uses NSAIDS, hypertension and diabetic drug, Statin, Steroids, etc.

This study showed that there were a wide range of patients who consumed prescribed medications to treat chronic diseases and a significant number who consumed medications based on the advice of a friend or self-medication.

Furthermore, clinics in Basra tend to be overcrowded and visit fees can be low; in this setting, Time is limited for each patient and physician and leads to poor communication ‹With the possibility of a wrong diagnosis by physician or forgetting the patient to describe his condition accurately Physician, pharmacists, and health care providers can be an influential factor in tackling this challenge through proper diagnosis, prescription, patient education and follow-up.

REFERENCE

1. Salwa Al Suwiadi.2013, Care-Services-Old-Middle-East-Populations.pdf. http://www.adidubai2013.org/files/pres/Salwa-AlSuwaidi-Health.

2. Williams P, Rush DR. Geriatric polypharmacy. Hosp Pract. 1986;21:9–20

3. World Health Organization. Medication safety in polypharmacy [Internet]. Geneva: WHO; 2019 [accessed Jul 2020]. Available from: who.int/publications/i/item/medication-safety-in-polypharmacy-technical-report

4. Morgan TK, Williamson M, Pirotta M, Stewart K, Myers SP, Barnes J. A national census of medicines use: a 24-hour snapshot of Australians aged 50 years and older. Med J Aust 2012 Jan 16;196(1):50–3

5. groups (Bloom et al., 2010, Bureau, 2013, United Nations, 2015, United Nations Population Division, P. D. o. t. D. o. E. a. S. A. o. t. U. N. S., 2002, United Nations. Department of Economic and Social Affairs, P. D., 2012, Who, 2015)

6. Sarkar S. Geriatric Poly-Pharmacy: A Growing Epidemic. How to Prevent It? Br J Med Med Res 2017;21:1–11. 10.9734/BJMMR/2017/32944

7. Fick DM, Cooper JW, Wade WE, et al.. Updating the Beers criteria for potentially inappropriate medication use in older adults: results of a US consensus panel of experts. Arch Intern Med 2003;163:2716–24. 10.1001/archinte.163.22.2716

8. Nolan L, O'Malley K. Prescribing for the elderly: Part 1.Sensitivity of the elderly to adverse drug reactions. J Am Geriatr Soc. 1998;36:142–9.

9. Lamy PP. adverse drug effects. Clin Geriatr Med. 1990;6:293–307.

10. Montamat SC, Cusack B. Overcoming problems with polypharmacy and drug misuse in the elderly. Clin Geriatr Med. 1992;8:143–58

11. Williams P, Rush DR. Geriatric polypharmacy. Hosp Pract. 1986;21:9–20.

12. Roenke KL, Pinholt EM. Reducing polypharmacy in the elderly. J Am Geriatr Soc. 1990;38:31–6.

13. Gomez ER, Demoly P. Epidemiology of hypersensitivity drug reactions. Curr Opin Allergy Clin Immunol. 2005;5:309–16.

14. Chumney EC, Robinson LC. The effects of pharmacist interventions on patients with polypharmacy. Pharm Pract. 2006;4:103–9.

15. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. Am J Geriatr Pharmacother 2007 Dec;5(4):345–51.

16. Fried TR, O'Leary J, Towle V, Goldstein MK, Trentalange M, Martin DK. Health outcomes associated with polypharmacy in community-dwelling older adults: a systematic review. J Am Geriatr Soc 2014 Dec;62(12):2261–72.

17. Steinman MA, Rosenthal GE, Landefeld CS, Bertenthal D, Sen S, Kaboli PJ. Conflicts and concordance between measures of medication prescribing quality. Med Care. 2007;45:95–9.

18. Veehof L, Stewart R, Haaijer-Ruskamp F, Jong BM. The development of polypharmacy. A Longitudinal study. Fam Pract. 2000;17:261–7.

19. Schaefer K, Maerkedahl H, Birk HO, Henriksen LO. Polypharmacy in general practice. Dan Med Bull. 2010;57:A4165.

20. .Potter K, Flicker L, Page A, Etherton-Beer C. Deprescribing in frail older people: a randomised controlled trial. PLoS One 2016;11(3):e0149984.

21. .Ramaswamy R, Maio V, Diamond JJ, et al.. Potentially inappropriate prescribing in elderly: assessing doctor knowledge, confidence and barriers. J Eval Clin Pract 2011;17:1153–9. 10.1111/j.1365-2753.2010.01494

22. Sharifi H, Hasanloei MA, Mahmoudi J. Polypharmacy-induced drug-drug interactions; threats to patient safety. Drug Res 2014;64:633–7. 10.1055/s-0033-1363965

23. Colley CA, Lucas LM. Polypharmacy. J Gen Intern Med 1993;8:278–83. 10.1007/BF02600099

24. Cheraghali AM, Solemani F, Behmanesh Y, et al.. Physicians' Attitude Toward Injectable Medicines. Journal of Pharmacology and Toxicology 2006;1:33–9

25. .Schoonover H. Corbett C.F. Weeks D.L. Willson M.N. Setter S.M.Predicting potential postdischarge adverse drug events and 30-day unplanned hospital readmissions from medication regimen

complexity
J Patient Saf. 2014; 10: 186-191

26. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today 2004;24:105–12. 10.1016/j.nedt.2003.10.001

27. .Alagiakrishnan K. Wilson P. Sadowski C.A. Physicians' use of computerized clinical decision supports to improve medication management in the elderly: the Seniors Medication Alert and Review Technology intervention. Aging. 2016; 11: 73-81

28. .Bista D, Palaian S, Shankar PR, Prabhu MM, Paudel R, Mishra P. Understanding the essentials of drug interactions: A potential need for safe and effective use of drugs. Kathmandu Univ Med J (KUMJ) 2006;4:421–30

29. .Ahmad A, Hugtenburg J, Welschen LM, Dekker JM, Nijpels G. Effect of medication review and cognitive behavior treatment by community pharmacists of patients discharged from the hospital on drug related problems and compliance: Design of a randomized controlled trial. BMC Public Health. 2010;10:133

30. .Rochon PA, Gurwitz JH. Optimising drug treatment for elderly people: The prescribing cascade. BMJ. 1997;315(7115):1096–9. [PMC free article] [PubMed] [Google Scholar]

31. Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. Expert Opin Drug Saf 2014;13:57–65. 10.1517/14740338.2013.827660

32. .Piggott KL, Mehta N, Wong CL, Rochon PA. Using a clinical process map to identify prescribing cascades in your patient. BMJ 2020;368:m261.

33. .The importance of pharmacovigilance: Safety monitoring of medicinal products. Geneva: World Health Organization; 2002 (http://apps.who.int/iris/bitstream/handle/10665/4 2493/a75646.pdf?sequence=1, accessed 22 March 2019).

34. Casalino LP, Crosson FJ, Satisfaction P. and Physician Well-Being: Should Anyone Care? Professions and Professionalism 2015;5:1–12.

35. Duerden M, Avery T, Payne R. Polypharmacy and medicines optimization: Making it safe and sound. London: The King's Fund; 2013 (https://www.kingsfund.org.uk/sites/default/files/fi

eld/field_publication_file/polypharmacy-and- medicines-optimisation-kingsfund-nov13.pdf, accessed 22 March 2019).

36. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. J Am Geriatr Soc   201 Apr;67(4):674–94

37. Dugdale DC, Epstein R, Pantilat SZ. Time and the patient-physician relationship. J Gen Intern Med 1999;14(S1):S34–40. 10.1046/j.1525-1497.1999.00263.

38. Hutchinson L, Marks T, Pittilo M. The physician assistant: would the US model meet the needs of the NHS? BMJ 2001;323:1244–7. 10.1136/bmj.323.7323.1244

39. Azoulay L, Zargarzadeh A, Salahshouri Z, et al.. Inappropriate medication prescribing in community-dwelling elderly people living in Iran. Eur J Clin Pharmacol 2005;61:913–9. 10.1007/s00228-005-0036-4

40. Al-Kitab Journal for Pure Science, 2019, 3(2): 52-61 ISSN: 2617-1260 (Print), 2617-8141(Online) www.kjps.isnra.org

41. Ben-Harush A, Shiovitz-Ezra S, Doron I, et al.. Ageism among physicians, nurses, and social workers: findings from a qualitative study. Eur J Ageing 2017;14:39–48. 10.1007/s10433-016-0389-9

42. Kilgore C. Multidrug Screening Kits. Community medicine post-acute and long-term care medicine. 2018; 19:14

43. Alison J. Yarnal L. Avan A. Sayer. Andrew ClegG. Kenneth Rockwood. Stuart Parker. John V. Hindle. New horizons in multimorbidity in older adults. Age and Ageing 2017; 46: 882– .888

44. Marina Guisado-Clavero, Concepción Violán, TomàsLópez-Jimenez, AlbertRoso- LlorachMariona Pons-Vigués, Miguel Angel Muñoz, and Quintí Foguet-Boreu2, Medication patterns in older adults withmultimorbidity: a cluster analysis of primarycare patients. BMC .Family Practice (2019) 20:82

45. Fulton MM, Allen ER. Polypharmacy in the elderly: a literature review. J Am Acad Nurse Pract 2005:17:123- 32. 10.1111/j.1041-2972.2005.0020

46. Patterson SM, Hughes C. Kerse N, et al... Interventions to improve the appropriate use of polypharmacy for older people: The Cochrane Library. 2012.

47. Gnjidic D, Hilmer SN, Blyth FM, et al.. Polypharmacy cutoff and outcomes: five or more medicines were used to identify community-dwelling older men at risk of different adverse outcomes. J Clin Epidemiol 2012;65:989–95. 10.1016/j.jclinepi.2012.02.018

48. Bushardt RL, Massey EB, Simpson TW, et al.. Polypharmacy: misleading, but manageable. Clin Interv Aging 2008;3:383–9. 10.2147/CIA.S2468

49. Hayes BD, Klein-Schwartz W, Barrueto F. Polypharmacy and the geriatric patient. Clin Geriatr Med 2007;23:371–90. 10.1016/j.cger.2007.01.002

50. Patterson SM, Hughes C, Kerse N, et al.. Interventions to improve the appropriate use of polypharmacy for older people: The Cochrane Library, 2012.

51. Bushardt RL, Massey EB, Simpson TW, et al.. Polypharmacy: misleading, but manageable. Clin Interv Aging 2008;3:383–9. 10.2147/CIA.S2468

52. Rambhade S, Chakarborty A, Shrivastava A, et al.. A survey on polypharmacy and use of inappropriate medications. Toxicol Int 2012;19:68 10.4103/0971-6580.94506 .

THANK YOU