



Original Article

Polypharmacy and Willingness to Deprescribe Among Elderly with Chronic Diseases

Lim Jia Hao^a, Marhanis Salihah Omar^{a*}, Noorlaili Tohit^b^a Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia, ^b Department of Family Medicine, UKM Medical Center, Jalan Yaacob Latif Bandar Tun Razak Cheras, 56000, Kuala Lumpur, Malaysia

ARTICLE INFO

Article history:

Received 11 December 2017

Received in revised form

30 March 2018

Accepted 16 May 2018

Available online 19 June 2018

Keywords:

medication,
aged,
chronic disease,
polypharmacy

SUMMARY

Background: Elderly are mostly affected by polypharmacy induced adverse drug events as they are vulnerable due to numerous comorbidities. Deprescribing is a series of medicine ceasing process introduced to solve the problem arisen from polypharmacy. This study aimed to investigate the attitudes, beliefs and experiences towards polypharmacy among elderly with chronic diseases and their willingness to be deprescribed.

Methods: A cross-sectional study was conducted among elderly patients in a tertiary hospital in Malaysia from August 2017 to October 2017 using a researcher assisted and validated questionnaire.

Results: A total number of 222 elderly patients were included in this study. 45.5% (n = 101) of the participants agreed that they were taking a large number of medicines (95% CI = 38.89%–52.10%). 56.3% (n = 125) of the participants had the desire to reduce their number of medications (95% CI = 49.73%–62.88%). Majority of them (n = 185, 83.33%) agreed to involve themselves in deprescribing process if permitted by their health care provider. 86.9% (n = 193) of the participants tended to not be afraid of deprescribing of their regular medications after a series of investigations by their health care provider (95% CI = 81%–89%).

Conclusion: Majority of the elderly would like to participate in deprescribing process. Major factors that will affect patients' willingness to deprescribe were physicians' time and support as well as possible future benefits of their regular medications.

Copyright © 2018, Taiwan Society of Geriatric Emergency & Critical Care Medicine. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Due to the decline in mortality rate and aging, the coexistence of two or more chronic condition is common in older people.¹ There is a significant growth of chronic diseases such as asthma, mental health, cardiovascular diseases, diabetes and cancer in aged population with cardiovascular disease constituting the major cause of death worldwide despite the fall in overall cardiovascular death. Among elderly, approximately 92% of them tended to have at least one chronic disease such as heart disease, diabetes mellitus, stroke and cancer.² These chronic diseases cause almost two-third of all deaths each year. Elderly are more likely to be taking multiple medication due to higher rates of chronic illness among them. It leads to the administration of more medication than are clinically indicated, representing unnecessary drug use among older patients.

While the term polypharmacy has evolved over time, polypharmacy was numerically defined as five or more medications

daily.³ Polypharmacy increases the risk of adverse drug events such as confusion, falls and functional decline. As elderly are experiencing changes in physiology, social and physical circumstances, they are more vulnerable toward the unwanted effects due to polypharmacy.⁴ Nonetheless, it was reported that 20%–65% of elderly were taking at least one potentially inappropriate medication.^{5,6}

There are guidelines and algorithms in guiding prescribers to initiate new medications safely and effectively. However, there is a corresponding lack of guidance regarding the safe and effective ways or steps in ceasing inappropriate medications.⁷ The term of “deprescribing” was introduced to describe the process of stopping the unwanted potentially inappropriate medications in order to improve the safety and efficacy of medication regimens.⁸ Deprescribing process includes the review of each medications; identification of potentially inappropriate medications that able to be ceased, reduced or substituted with another more suitable medication; deciding the deprescribing plan tailored to the individual; and provision monitoring and support.^{9,10} The efficacy and safety of deprescribing was recently reported to be well tolerated and associated with improved clinical outcomes, in comparison with outcomes of elderly patient who conventionally adhere to all medications.¹¹

* Corresponding author.

E-mail address: marhanis@ukm.edu.my (M.S. Omar).

Deprescribing is a fairly new concept in worldwide health care system. As the current healthcare services are emphasising patient-centred healthcare, by knowing their opinion towards polypharmacy that they currently experiencing, a better and satisfying healthcare service can be provided for older patient. Therefore, this study was aimed to investigate the attitudes, beliefs and experiences towards polypharmacy among elderly patients with chronic diseases and their willingness to be deprescribed.

2. Methods

A cross-sectional study was conducted among patients who were 65 years old or above from a medical center in Kuala Lumpur Malaysia from August 2017 to October 2017 upon their informed consent. Participants were recruited based on the all the following criteria: elderly who aged 65 years old or above, been diagnosed with at least one chronic disease and were taking at least five medications daily. The definition of chronic disease used in this study is in accordance to the World Health Organization classification.¹² Participants who unable to complete the questionnaire or participants with terminal illness were excluded from this study. This study was approved by the university Human Research Ethics Committee.

A set of validated instruments was utilized, consisting of Patient's Attitudes towards Deprescribing Questionnaire (PATD).¹³ The PATD questionnaire contains 15 questions on the attitudes and beliefs of patients regarding the number of medications that they are taking and how they would feel about cessation of one or more of their medications. The first ten questions were meant to measure the responses on a 5-point Likert scale and the last five are multiple-choice questions.

All data analyses were performed using Statistical Package for Social Science (SPSS) version 22.0 (IBM Corp. NY). Participant demographic, type of chronic disease, number of medicines and current health status were presented in descriptive manner. Normality of the numeric data such as age and number of medicines were tested by using Kolmogorov-Smirnov test and Shapiro-Wilk test. For Patient's Attitudes Towards Deprescribing (PATD) Questionnaire, the percentage of agreement with each of the first 10 questions of PATD were reported by combining those who agree or strongly agreed, and corresponding 95% confidence intervals (CIs) were calculated. Spearman-rank correlation was used to analyse the correlation between number of medicines, patient's general health condition and their responses toward PATD. The Spearman-rank correlation was also used in analysing the correlation between age or number of medications and responses within PATD. Results with type I error with the p-value less than 0.05 was considered to be statistically significant.

3. Results

In this study, 234 patients were recruited as participants in this study. 12 patients were excluded as they did not able to complete the questionnaire, resulting in 222 participants who successfully answered all sections of the questionnaire (Table 1). The median (interquartile, IQR) age was 70 (6) with most falling within 67–73 years old. The median (IQR) number of medications was 6 (2) with most falling within 5–7 types of medicine. Remarkably, participant's perceived general health condition declines as the number of medicines increases ($P < 0.01$).

Table 2 shows the responses toward question 1 to 10 of the questionnaire while Table 3 shows the responses toward question 11 to 15 of the questionnaire. 45.5% ($n = 101$) of participants believed that they were taking a large number of medications, 60.4% ($n = 134$) of participants felt comfortable with their number

Table 1
Participant demographics ($N = 222$).

Demographic Characteristics	Frequency (n, %)	Median (IQR)
Age group		
65–69	89 (40.1)	70 (67–73)
70–74	79 (35.6)	
75–79	36 (16.2)	
80 or older	18 (8.1)	
Gender		
Male	94 (42.3)	
Female	128 (57.7)	
Ethnicity		
Malay	76 (34.2)	
Chinese	124 (55.9)	
Indian	20 (9.0)	
Others	2 (0.9)	
Highest education level		
Primary education	85 (38.3)	
Secondary education	98 (44.1)	
Pre-University	13 (5.9)	
University/College	24 (10.8)	
Others	2 (0.9)	
Employment status		
Full time	0 (0)	
Part time	14 (6.3)	
Not working	203 (91.4)	
Retirees	5 (2.3)	
Diagnosis		
Diabetes mellitus	122 (55.0)	
Asthma	7 (3.2)	
Emphysema or COPD	2 (0.9)	
Hypertension	200 (90.1)	
Heart disease	38 (17.1)	
Arthritis or other rheumatic disease	55 (24.8)	
Hypercholesterolemia	171 (77.0)	
Number of medications		
Five	90 (40.5)	6 (5–7)
Six	48 (21.6)	
Seven	42 (18.9)	
Eight and above	42 (19.0)	
Perceived general health status		
Poor	24 (10.8)	
Fair	67 (30.2)	
Good	114 (51.4)	
Very good	16 (7.2)	
Excellent	1 (0.5)	

IQR = interquartile range.

SD = standard deviation.

of medications and 79.7% ($n = 177$) agreed that their medications were necessary to them.

On the other hand, 56.3% ($n = 125$) of participants would like to reduce the number of medications that they were currently taking and 83.3% ($n = 185$) of participants would be willing to stop one or more of their current medications if their physician said it was possible to do so. Besides, there were 12.2% ($n = 27$) of participants believe that they might be taking one or more medications that were no longer needed by them, 81.1% ($n = 180$) of participants agreed that they had good understanding of the reasons they were prescribed each of their medications. Furthermore, 34.7% ($n = 77$) of participants agreed that having to pay for fewer medications would play in role in their willingness to stop one or more of their medications and 40.1% ($n = 89$) of participants believed one or more of their medications were giving them side effects.

A significant relationship between age and agreement with 4 questions from PATD was noted in this study. Age of participant was negatively correlated with 3 questions from PATD, namely "If my doctor said it was possible, I would be willing to stop one or more of my regular medications." (Spearman's rho (ρ) = -0.127 , $p < 0.05$), "I would like to reduce the number of medications that I am taking." ($\rho = -0.141$, $p < 0.05$) and "I have good understanding of the reasons I was prescribed each of my medications." ($\rho = -0.144$, $p < 0.05$).

Table 2
Results from questions 1 to 10 of the patients' attitudes towards deprescribing (PATD) questionnaire.

Question	Strongly agree %	Agree %	Unsure %	Disagree %	Strongly disagree %
1 I feel that I am taking a large number of medications.	18.0	27.5	9.5	43.7	1.4
2 I am comfortable with the number of medications that I am taking	10.8	49.5	9.0	23.0	7.7
3 I believe that all my medications are necessary	17.1	62.6	16.2	4.1	0
4 If my doctor said it was possible, I would be willing to stop one or more of my regular medications.	44.6	38.7	14.0	2.7	0
5 I would like to reduce the number of medications that I am taking	22.1	34.2	21.6	22.1	0
6 I feel that I may be taking one or more medications that I no longer need.	0.5	11.7	19.4	54.5	14.0
7 I would accept taking more medications for my health conditions.	0	10.4	14.0	34.2	41.4
8 I have a good understanding of the reasons I was prescribed each of my medications.	15.3	65.8	16.2	2.7	0
9 Having to pay for fewer medications would play a role in my willingness to stop one or more of my medications.	4.7	29.5	9.7	53.0	3.1
10 I believe one or more of my medications is giving me side effects.	4.5	30.2	9.0	52.3	4.1

Willingness to deprescribe was positively correlated with feeling of taking a large number of medications ($\rho = 0.48, p < 0.01$), desire to reduce the number of medications ($\rho = 0.705, p < 0.01$), feeling of taking medicines that are no longer needed ($\rho = 0.35, p < 0.01$), having to pay for fewer medication ($\rho = 0.15, p < 0.05$) and believe their medicines are causing side effects ($\rho = 0.28, p < 0.01$) but negatively correlated with comfortability with the number of medications ($\rho = -0.45, p < 0.01$), believe of necessity of medications ($\rho = -0.28, p < 0.01$) and willingness to take more medications ($\rho = -0.34, p < 0.01$). There is no correlation found between participants' willingness to deprescribe with the understanding of the reasons of prescribed medications. Neither number of medicines nor patient's general health condition has significant relationship with the age.

Interestingly, it was found that comfortability with the number of medications was positively associated with the belief of

medications necessity ($\rho = 0.34, p < 0.01$), willingness to take more medications ($\rho = 0.34, p < 0.01$) and having good understanding of the reasons of prescribed medications ($\rho = 0.20, p < 0.01$). However, it was negatively correlated with feeling of taking large number of medicines ($\rho = -0.77, p < 0.01$), desire to deprescribe ($\rho = -0.51, p < 0.01$), feeling of taking no longer-needed medications ($\rho = -0.43, p < 0.01$) and belief of medication side effects ($\rho = -0.37, p < 0.01$).

On the contrary, desire to stop medications was positively related with feeling of taking large number of medications ($\rho = 0.55, p < 0.01$), feeling of taking no longer-needed medications ($\rho = 0.46, p < 0.01$), having to pay for fewer medication ($\rho = 0.19, p < 0.01$) and believe of side effects from medications ($\rho = 0.29, p < 0.01$) but negatively correlated with belief of necessity of medications ($\rho = -0.39, p < 0.01$) and willingness to take more medications ($\rho = -0.34, p < 0.01$).

Table 3
Results from questions 11 to 15 of the PATD questionnaire.

Question	Percentage (%)	
Have you ever tried to stop a regular medication?	No	77.9
	Yes and was able to remain off the medication	7.7
	Yes but had to restart the medication	8.1
	Yes but had to start a different medication	4.1
	Unsure	2.3
How many different tablets or capsule per day would you consider to be a lot?	5–9	73.4
	10–14	25.2
	15–20	1.4
	>20	0
	Other	0
What is the maximum number of tablets or capsules that you would be comfortable taking per day (pictorial response)?	4	67.6
	8	28.8
	12	2.7
	16	0.5
	20	0.5
How comfortable would you be if a pharmacist was involved in stopping one or more of your regular medications and provided the follow-up (informing your doctor of the progress)?	Comfortable	69.8
	Unsure	23.4
	Uncomfortable	6.8
If one of your regular medications was stopped, what follow-up would you like?	Face-to-face appointment	86.0
	No planned follow-up needed	4.1
	Telephone call(s)	8.6
	Written information sent in the mail	0
	Written information sent by e-mail	0.5
Other	0.9	

4. Discussion

Polypharmacy and potentially inappropriate medications have been associated with many negative health outcomes, leading to the introduction of deprescribing in recent years. In our current study, it was found that majority of the older patients willing to reduce their number of medications if their doctor thought it was suitable, in concordance with what had been reported previously.⁶ Another study demonstrated that up to 82% of elderly willing to participate in medication cessation through shared decision making between the patients and health care providers.¹⁴ Nevertheless, several studies involving medication ceasing of specific drug among elderly showed different acceptance toward medication ceasing. Lower participants acceptance or success rate in stopping medication was observed when antiepileptic, anti-parkinson and analgesics were involved.¹⁵ On the other hand, a better acceptance of participants and success rate of medication ceasing were observed when come to antihypertensive and antithrombotic agents.¹⁶

Our study also alludes to the importance of establishing trust in medications as the more they believe that their regular medications were giving them side effects, the more the willingness and desire to reduce their number of medications. Besides, elderly who understood the indications of their medication also prefer to reduce their medications as well. This likely reflected the dilemma that elderly encountered between understanding of the importance to take medications to maintain their health and unfavourable in taking medicines.¹⁷ Hence, assessment regarding potentially inappropriate medications should be done on those who were comfortable with their current number of medications and medication optimisation through deprescribing should be considered if appropriate.

There are literature found out that polypharmacy was closely related with increasing risk of falling and adverse drug reactions.¹⁸ Moreover, there was study proposed that many elderly were having

bad experiences toward polypharmacy.⁶ Through this study, we discovered that majority of elderly were not having a good experience towards polypharmacy as almost half of elderly claimed that they were having a large number of medications. Among them, majority were feeling uncomfortable with their current number of medications. In addition, majority of them selected a visual option of the minimum number of capsules or tablets that they would be comfortable to take every day. This further proved that they were having bad experiences towards polypharmacy. Nevertheless, feeling comfortable towards current number of medications did not represent their willingness to maintain their number of medicines as a study explored that majority elderly still wanted to reduce their number of medications although they claimed that they were comfortable with their current number of medications.¹⁹ Determining a significant factor was important in aiding the development of protocol or guideline to facilitate deprescribing. In general, majority of elderly claimed that time and support given by their health care practitioner were crucial in affecting their choice in joining medicine cessation. According to other study, it was suggested that this factor is an enabler for patient to have their medication deprescribed. Fears toward consequences of medication cessation was one of the major barriers that affect patient's choice to have their medication deprescribed.^{20,21} Surprisingly, majority of elderly in our current study seemed not be reluctant towards medication cessation if proper investigation had been done by their health care practitioner. This might be due to perceived benefit of deprescribing outweighed the perceived barrier of deprescribing as suggested in one qualitative study.²² Furthermore, majority of elderly in our current study chose to have face-to-face sessions with their health care practitioner as their preferred method of reviewing their medications if they had their regular medicine deprescribed.

It was proven to be an enabler of deprescribing that was agreed by patients as well as general practitioners.¹⁴ Other than fear for side effects, it was suggested that experiencing side effects from their regular medications would trigger their desire and willingness to have their regular medications deprescribed.^{23,24} This is comparable with our finding which showed a positive relationship between belief of side effects from medications and desire as well as willingness to reduce their number of medications. Nevertheless, deprescribing is further complicated in elderly with comorbidities due to age-related changes in pharmacokinetics and pharmacodynamics.²⁵ One control trial had suggested that only half of elderly able to discontinue targeted medicines from their regular medicines.¹⁶ This differences most likely was due to medication classes and their potential to cause withdrawal effects after cessation.²⁶ Further research into deprescribing is needed especially in planning of the deprescribing process for elderly as well as efficacy and safety of dose reduction or medication cessation among elderly.

5. Conclusion and suggestions

Our results showed that majority of elderly willing to have their regular medication deprescribed. Majority of them had poor experience towards polypharmacy as most of them agreed that they were taking a large number of medications and did not feel comfortable with their number of medications. The main factor that may affect elderly willingness to deprescribe were time and supports given by their physician. Nevertheless, the willingness to deprescribe was likely to be different based on the medication class and the indication of that medication and this was not covered in the scope of this study. Lack of in-depth exploration of the factor of participants was another limitation of this study as only quantitative and descriptive study was done on the factors affecting older people's willingness to deprescribe.

Declarations of interest

None.

Acknowledgment

We thank Dr Emily Reeve for her permission to use Patient's Attitudes towards Deprescribing Questionnaire in this study.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ijge.2018.05.006>.

References

- Salive ME. Multimorbidity in older adults. *Epidemiol Rev.* 2013;35(1):75–83.
- Verschoor CP, Johnstone J, Millar J, et al. Alterations to the frequency and function of peripheral blood monocytes and associations with chronic disease in the advanced-age, frail elderly. *PLoS One.* 2014;9(8):e104522.
- Masnoon N, Shakib S, Kalisch-Ellet L, et al. What is polypharmacy? A systematic review of definitions. *BMC Geriatr.* 2017;17:230.
- Slabaugh SL, Maio V, Templin M, et al. Prevalence and risk of polypharmacy among the elderly in an outpatient setting. *Drugs Aging.* 2010;27(12):1019–1028.
- Hanlon JT, Schmader KE, Boulton C, et al. Use of inappropriate prescription drugs by older people. *J Am Geriatr Soc.* 2002;50(1):26–34.
- Liu GG, Christensen DB. The continuing challenge of inappropriate prescribing in the elderly: an update of the evidence. *J Am Pharm Assoc (Wash).* 2002;42(6):847–857.
- Reeve E, Wiese MD, Hendrix I, et al. People's attitudes, beliefs, and experiences regarding polypharmacy and willingness to deprescribe. *J Am Geriatr Soc.* 2013;61(9):1508–1514.
- Woodward MC. Deprescribing: achieving better health outcomes for elderly through reducing medications. *J Pharm Pract.* 2003;33(4):323–328.
- Bain KT, Holmes HM, Beers MH, et al. Discontinuing medications: a novel approach for revising the prescribing stage of the medication-use process. *J Am Geriatr Soc.* 2008;56(10):1946–1952.
- Le Couteur D, Gnjidic D, McLachlan AJ. Deprescribing. *Aust Prescr.* 2011;34(6):182–185.
- Garfinkel D. Poly-de-prescribing to treat polypharmacy: efficacy and safety. *Ther Adv Drug Saf.* 2018;9(1):25–43.
- Bernell S, Howard SW. Use your words carefully: what is a chronic disease? *Front Public Health.* 2016;4:159.
- Reeve E, Shakib S, Hendrix I, et al. Development and validation of the patients' attitudes towards deprescribing (Patd) questionnaire. *Int J Clin Pharm.* 2013;35(1):51–56.
- Garfinkel D, Mangin D. Feasibility study of a systematic approach for discontinuation of multiple medications in older adults: addressing polypharmacy. *Arch Med Wewn.* 2010;170(18):1648–1654.
- Farrell B, Richardson L, Raman-Wilms L, et al. Self-efficacy for deprescribing: a survey for health care professionals using evidence-based deprescribing guidelines. *Res Social Adm Pharm.* 2017;14(1):18–25.
- Potter K, Flicker L, Page A, et al. Deprescribing in frail elderly: a randomised controlled trial. *PLoS One.* 2016;11(3):e0149984.
- Sand AM, Harris J, Rosland JH. Living with advanced cancer and short life expectancy: patients' experiences with managing medication. *J Palliat Care.* 2009;25(2):85.
- Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. *Am J Geriatr Pharmacother.* 2007;5(4):345–351.
- Reeve E, Turner JP. Patients' Perspectives on the brave new word 'deprescribing'. *Int J Pharm Pract.* 2015;23(1):90–91.
- Bourgeois J, Elseviers M, Azermai M, et al. Barriers to discontinuation of chronic benzodiazepine use in nursing home residents: Perceptions of general practitioners and nurses. *Eur Geriatr Med.* 2014;5(3):181–187.
- Reeve E, To J, Hendrix I, et al. Patient barriers to and enablers of deprescribing: a systematic review. *Drugs Aging.* 2013;30(10):793–807.
- Schuling J, Gebben H, Veehof LJG, et al. Deprescribing medication in very elderly patients with multimorbidity: the view of Dutch GPs. a qualitative study. *BMC Fam Pract.* 2012;13(1):56.
- Barter G, Cormack M. The long-term use of benzodiazepines: patients' views, accounts and experiences. *Fam Pract.* 1996;13(6):491–497.
- Straand J, Sandvik H. Stopping long-term drug therapy in general practice. How well do physicians and patients agree? *Fam Pract.* 2001;18(6):597–601.
- Cullinan S, Hansen CR, Byrne S, et al. Challenges of deprescribing in the multimorbid patient. *Eur J Hosp Pharm.* 2017;24(1):43–46.
- Sirdifield C, Chipchase SY, Owen S, et al. A systematic review and meta-synthesis of patients' experiences and perceptions of seeking and using benzodiazepines and z-drugs: towards safer prescribing. *Patient.* 2017;10(1):1–15.