

## **Attitude of Chronic Disease Patients regarding Polypharmacy and their Willingness to Deprescribe in Quetta, Pakistan**

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### **Abstract**

The current study was designed to assess patient's attitude towards deprescribing in Quetta, Pakistan. A Cross sectional study was conducted to assess patient's attitude towards deprescribing. Data was collected from Government hospitals namely Bolan medical Complex and Sandeman Provincial Hospital and from community pharmacy from January to October 2015. Patients were interviewed, asked and guided to fill the Patient Attitude towards deprescribing questionnaire. Total 207 patients participated in current study. Participants' responses and attitudes toward Deprescribing were analyzed, SPSS 20 was used for Descriptive analysis to demonstrate patients' demographics and inferential statistics were performed. Results showed

that majority of respondents 162 (78.3%) were between 28-67 years. One hundred and eighty respondents (87%) were married. Majority of respondents were educated 133 (64.25%), Sixty (29%) were private servant with majority (n=50, 24.2%) having monthly income more than Pk. Rs. 30000. Around 54.6% patients showed positive attitude toward deprescribing, whereas, total number of daily medications, and discount on medication did not influence willingness to deprescribing the medication. The study concluded that patient had positive attitude toward deprescribing, older people had more tendency towards it. Patients should be educated continuously so that they can build trust prescription medicines prescribed by physician.

## Keywords

Polypharmacy, deprescribing, Pakistan, Chronic illness

## 1. Introduction

Polypharmacy does not have a single full-fledged, generally accepted and appropriate definition rather it's either defined in terms of cutoff points of number of medications taken and prescribed and/or unnecessary overuse of medications and/or in terms of timings of administration of medications. In view of all these criteria polypharmacy is defined as the prescription and simultaneous or concomitant use of multiple drugs, ranging from two to ten, than is clinically indicated representing unnecessary overuse of medications (Junius-Walker et al., 2007, Masoodi, 2008, Nobili et al., 2011a, Nobili et al., 2011b, Gnjjidic et al., 2012a, Holmes and Sachs, 2017).

Several studies have demonstrated different predictors for polypharmacy, the most significant among them are multiple prescribers (Hajjar et al., 2007, Masoodi, 2008, Bushardt et al., 2008), aging (Veehof et al., 2000, Junius-Walker et al., 2007, Hajjar et al., 2007, Bushardt et al., 2008), chronic multi-morbidities (Veehof et al., 2000, Junius-Walker et al., 2007, Masoodi,

2008, Bushardt et al., 2008) and multiple dispensing pharmacies (Junius-Walker et al., 2007, Gnjjidic et al., 2012a). The associated risks with polypharmacy was determined by several studies and the major risks stated by those studies are adverse drug reactions (ADRs) (Hajjar et al., 2007, Masoodi, 2008, Nobili et al., 2011a, Gnjjidic et al., 2012a), non-adherence (Nobili et al., 2011a, Bushardt et al., 2008), geriatric syndromes (Gnjjidic et al., 2012a, Hajjar et al., 2007, Larson et al., 1987, Ruby et al., 2005), increased hospital admissions (Masoodi, 2008, Gnjjidic et al., 2012a, Lin et al., 2008), increased risk of mortality (Hajjar et al., 2007) and frailty (Gnjjidic et al., 2012a).

Approaches, having mixed results, for handling unnecessary medication use or reducing polypharmacy evaluated in certain reviews were educational interventions for physicians, computerized support system at prescribing and pharmacist level, pharmacist led medication reviews, multidisciplinary teamwork in providing geriatric medicine services, visual tools such as charts and grid tools for checking medication regimen and lastly a new and missing but more effective approach used is deprescribing (Hanlon et al., 1996, Muir et al., 2001, Chumney and Robinson, 2006, Kaur et al., 2009, Gnjjidic et

al., 2012b, Thompson and Farrell, 2013, Reeve et al., 2014a, Farrell et al., 2017).

Occurrence of adverse drug events, ineffective treatment, falls or cognitive disability or any other known risk of polypharmacy have paved the way for using a new approach called deprescribing (Le Couteur et al., 2011). Deprescribing, defined in a broader view as, a systematic, evidence-based and complex process of identifying and withdrawing or cessation of inappropriate medication of which harmful risks outweigh the benefits for an individual patient care (Le Couteur et al., 2011, Reeve et al., 2014a, Reeve et al., 2014b, Scott et al., 2015). Deprescribing is a patient-centered approach that not only involves the cessation of any inappropriate drug but rather it includes the initiation of an alternative drug therapy, tapering of dose or changing or adding an appropriate drug (Scott et al., 2015).

Existing body of evidence concerning the impact of deprescribing have shown varied results i.e. it not only improves certain outcomes but also not associated with withdrawal symptoms and in some trials it provides no harm to the patients (Gnjidic et al., 2012b, Scott et al., 2015) while trials showed no significant difference in

hospitalizations, mortality or practice of consultation rates through deprescribing (Gnjidic et al., 2012b). In view of some previous articles the success of deprescribing trials relies mainly upon patient and physicians acceptance of deprescribing and their ultimate participation in the process (Garfinkel and Mangin, 2010). However patient acceptance of deprescribing process may vary from country to country because of cultural background (Reeve et al., 2014b). This study aims to determine patients' belief regarding polypharmacy and their willingness to deprescribe any of their regular medications.

## **2. Methodology**

### **2.1 Study Design, Setting and Sampling**

A questionnaire based, cross sectional study was conducted from January to October 2015. Registered patients from two public hospitals which are tertiary care institutes (Sandmen Provisional Hospital and Bolan Medical Complex Hospital) of Quetta city, Pakistan and different community pharmacies were included for the study.

Patients diagnosed with any chronic illnesses, aging 18 or above, taking two or more regular prescription drugs were

included in the study. Patients diagnosed with chronic disease but having only one medication for treatment. Patients, who did not know Urdu language and had cognitive impairment, were excluded from the study.

## 2.2 Ethical Considerations

This study was performed according to National Bioethics Committee Pakistan's guidelines ([www.pmr.org.pk/erc\\_guidelines.htm](http://www.pmr.org.pk/erc_guidelines.htm), 2011). The Joint Clinical Research Committee (for Sandmen Provisional Hospital) approved the study protocol (No. DOPP/RO45/2015). According to the standards written consent was taken from patients before data collection. Patients were ensured about the confidentiality of their answers and their right to leave the survey at any time.

## 2.3 Study Instrument

Patients' attitude towards deprescribing PATD, a pre-validated questionnaire, (Reeve et al., 2013a) was used to determine attitude regarding polypharmacy and deprescribing from patients visiting two public hospitals in Quetta, Pakistan. It's a 15-item questionnaire using a Likert scale to investigate patients' beliefs about the number of medications prescribed to them and their comfortability about them and

when they would feel about deprescribing their one or more regular medications.

Each question has its own scoring of attitude. Positive attitude for negative questions will be Strongly Disagree and disagree carrying a score of 5 and 4, respectively and for positive questions it will include strongly agree and agree carrying a score of 5 and 4, respectively. Similarly for negative questions Strongly Disagree, Disagree and Unsure carries a score of 1, 2 & 3, respectively.

The English version was translated into Urdu by using standard forward-backward-forward translating method (Behling and Law, 2000, Braun and Harkness, 2005). The Urdu version of questionnaire underwent validation process by experts from Department of Urdu and Department of Pharmacy Practice, University of Balochistan, Quetta, Pakistan. The questionnaire was then made available for data collection.

## 2.4 Data Collection

The investigator itself administered the questionnaire to patients and also obtained additional information such as age, gender, number of medications used by them and

their number of conditions and monthly income.

## 2.5 Data Analysis

Coded data was entered in SPSS version 20 (SPSS, 2011). Descriptive statistics were used to demonstrate the characteristics of the study population and questionnaire response.

## 3.Results

### 3.1 Demographic Characteristics

Two hundred and seven patients completely filled the questionnaire. Demographic profile of study participants including frequencies is shown in (Table 1). The table illustrates that majority of the participants were male 113 (54.6%) and belonged to Pashtun ethnic group 70 (33.8%). Participants were aged 18-77 with almost 1 medical condition mostly 66 (31.9%) and taking 4-6 medications 87 (42%).

**Table 1 Demographic Characteristics of Participants**

Character	Frequency (n=207)	Percentage %
<b>Age</b>		
18-27	22	10.6
28-37	32	15.5

38-47	44	21.3
48-57	47	22.7
58 years and more	62	29.9
<b>Gender</b>		
Male	113	54.6
Female	94	45.4
<b>Marital Status</b>		
Married	180	87
Unmarried	27	13
<b>Ethnicity</b>		
Pakhtoon	70	33.8
Baloch	60	29.0
Punjabi	51	26.4
Sindhi	19	4.3
Others	17	8.2
<b>Education level</b>		
Uneducated	74	35.7
Religious education	18	8.7
Primary	35	16.9
Matriculation	14	6.8
Intermediate	17	8.2
Graduate	14	6.8
Post graduate	35	16.9
<b>Occupation</b>		
Unemployed	81	39.1
Student	9	4.3
civil servant	25	12.1
Private service	60	29.0

employee	22	10.6
Self employed	10	4.8
Others		
<b>Monthly</b>		
<b>Income</b>	50	24.2
<b>(Pak Rs.)</b>	39	18.8
No income	41	19.8
5,000- 10,000	27	13.0
10,001- 20,000	50	24.2
20,001-30,000		
>30,000		
<b>No. of Medical</b>		
<b>Condition</b>	66	31.9
1	62	30.0
2	51	24.6
3	25	12.1
4	3	1.4
5		
<b>Number of</b>		
<b>Medications</b>	74	35.7
1-3	87	42.0
4-6	40	19.3
7-9	6	2.9
10-12		

medications and 37.2% (n=77) of them felt comfortable with the number of medications they are taking. Even though 45.4% (n=94) did believe that their medications are necessary but they would be willing to stop one or more of their regular medications if possible. Sixty four percent (n=134) of the patients desired to reduce the number of medications they were taking at present and 32% (n=67) felt they are taking medication which they no longer need. As shown in (Table 3), 38.6% (n=80) of patients tried to stop their regular medication with doctor's knowledge but only 12.1% (n=25) were able to remain off the medication while remaining (10.6%, n=22) had to start a new medication or restart a medication. Sixty seven percent (n=140) of the patients were comfortable with taking 1-2 numbers of capsules or tablets per day. Majority of the patients (51.7%, n=107) felt uncomfortable in pharmacist-led deprescribing process along with their doctor.

### 3.2 Responses to the PATD Questionnaire

Study participants' responses are demonstrated in (Tables 2 and 3). Thirty two percent (n=68) of patients strongly agreed that they are taking a large number of

**Table 2 Results from questions 1 to 10 of PATD Questionnaire**

Question	Strongly Agree n (%)	Agree n (%)	Unsure n (%)	Disagree n (%)	Strongly Disagree n (%)
1. I feel that I am taking a large number of medications	68(32.9)	42(20.3)	12(5.8)	60(29.0)	25(12.1)
2. I am comfortable with the number of medications that I am taking	38(18.4)	77(37.2)	17(8.2)	46(22.2)	29(14)
3. I believe that all my medications are necessary	72(34.8)	94(45.4)	23(11.1)	18(8.7)	0
4. If my doctor said it was possible, I would be willing to stop one or more of my regular medications	72(34.8)	94(45.4)	11(5.3)	24(11.6)	06(2.9)
5. I would like to reduce the number of medications that I am taking	80(38.6)	54(26.1)	16(7.7)	42(20.3)	15(7.2)
6. I feel that I may be taking one or more medications that I no longer need	12(5.8)	20(9.7)	49(23.7)	87(42.0)	39(18.8)
7. I would accept taking more medications for my health conditions	46(22.2)	70(33.8)	24(11.6)	45(21.7)	22(10.6)
8. I have a good understanding of the reasons I was prescribed each of my medications	24(11.6)	52(25.1)	42(20.3)	61(29.5)	28(13.5)
9. Having to pay for fewer medications would play a role in my willingness to stop one or more of my medications	48(23.2)	59(28.5)	26(12.6)	47(22.7)	27(13)

10	I believe one or more of my medications is giving me side effects	45(21.7)	54(26.1)	44(21.3)	41(19.8)	23(11.1)
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**Table 3 Results from Questions from 11 to 15 of the PATD Questionnaire**

Questions		Answers	n (%)
11	Have you ever tried to stop a regular medication?	No	127 (61.4)
		Yes and was able to remain off the medication	25 (12.1)
		Yes but had to restart medication	33 (15.9)
		Yes but had to start a different medication	22 (10.6)
12	How many different tablets or capsules per day would you consider to be a lot?	1-2	140 (67.6)
		3-4	56 (27.1)
		5 or more	11 (5.3)
13	What is the maximum number of tablets or capsules that you would be comfortable taking per day?	1-2	171 (82.6)
		3-4	18 (8.7)
		5 or more	18 (8.7)
14	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	32 (15.5)
		Unsure	68 (32.9)
		Uncomfortable	107 (51.7)
15	If one of your regular medications was stopped, what follow-up would you like?	Face-to-face appointment	116 (56.0)
		No planned follow-up needed	89 (43.0)
		Telephone calls	2 (1.0)



#### 4. Discussion

The present study has found the mixed patients 'attitude towards polypharmacy and deprescribing. The positive attitude of the patients regarding polypharmacy was revealed by the large number of participants considering 2-4 medicines a lot and their comfortability for taking less number of tablets or capsules which is in accordance to the findings from the previous studies (Galazzi et al., 2016, Reeve et al., 2013). It has also been observed that their opinion about number of medications overall was different from number of medications they were taking. Their comfortability was also different in both aspects. Similar to the previous studies (Reeve et al., 2013, Qi et al., 2015, Farrell et al., 2017) most of the patients had an opinion that although they were taking a large number of medications but they were also comfortable with the number of medications they were taking. It is not known that the medications they were taking were all prescribed by their physician or how many of the medication they were using on their own (self-medication). But if their self-medication practice is neglected then their positive attitude towards their comfortability with the medications' number was maybe due to their satisfaction towards

their treatment strategy and their trust for their physician (Reeve et al., 2013, Qi et al., 2015, Farrell et al., 2017).

Their trust for their physician was also indicated by their positive attitude about their willingness to stop medications if their respective physician told them to do so. The previous studies results (Qi et al., 2015, Reeve et al., 2013, Garfinkel and Mangin, 2010), when compared, have also demonstrated the patients willingness towards medication cessation if their physician feels it to be appropriate. But there has been a study where the patients' willingness or in other words acceptance for deprescribing was quite low and this may also be due to many reasons.

Regarding their attitude towards the side effects of medications they stated a positive attitude which means that they may be facing some side effects from their medications and the like results were also obtained from the study conducted on patients taking statins (Qi et al., 2015) on the contrary opposite results were obtained from another study conducted on generally all patients with chronic diseases (Reeve et al., 2013). It is justified that patients with

chronic diseases and polypharmacy can have side effects from their medications but there is always a need to relate statistically this attitude or their problem of side effects with their willingness of deprescribing medications.

One most important point which should never be neglected is the patients' view point about the cost of the medications they were prescribed. This is a positive attitude that if they have had to spend less money on their medications they would definitely willing to go for deprescribing process (Reeve et al., 2017). Although the subjects of this study were visiting public hospitals and most of the medications they were given free if only admitted in hospital otherwise they have to pay for their medications without any insurance facility provided. So it's a very important issue to look over by the health professionals (Stange, 2017).

The most overwhelming bothersome response shown by the study subjects was their un-comfortability with the pharmacist performing deprescribing process for them. This negativity towards pharmacist was mainly due to their unawareness about the role and importance of importance of pharmacist in health system (Pruskowski and Handler, 2017). They seemed to be

unaware of the fact that if pharmacists start their involvement in the prescribing process the negative impact of treatment and medications can be reduced and patient's adherence towards less number of medications can also be increased and patients' HRQoL can also be improved (Krzyzaniak et al., 2018).

## 5. Conclusion

The study participants although being comfortable with the number of their medications they were willing to accept deprescribing if their health care provider, especially physician not pharmacists, feels appropriate. But still there is a need to educate the patients about their medications so that they can understand which medication they are using is inappropriately prescribed and this education can be and should be disseminated by the pharmacists as per their role. The education about medication if provided by the pharmacist would enhance the pharmacist importance and would build the trust among patients for pharmacists.

## Disclaimer

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### Competing interests

Authors have declared that no competing interests exist.

### References

Behling O & Law KS (2000). *Translating Questionnaires and other Research Instruments: Problems and Solutions*, Sage.

Braun M & Harkness JA (2005). Text and Context: Challenges to Comparability in Survey Questions. *Methodological Aspects in Cross-National Research*, 95-107.

Bushardt RL, Massey EB, Simpson T W, Ariail JC & Simpson KN (2008). Polypharmacy: Misleading, but Manageable. *Clin Interv Aging*, 3:383.

Chumney EC & Robinson LC (2006). The Effects of Pharmacist Interventions on Patients with Polypharmacy. *J Pharm Pract*, 4: 103.

Farrell B, Pottie K, Thompson W, Boghossian T, Pizzola, L, Rashid FJ, Rojas-Fernandez C, Walsh K, Welch V & Moayyedi P (2017). Deprescribing Proton Pump Inhibitors: Evidence-Based Clinical Practice Guideline. *Can Fam Physician*, 63:354-364.

Galazzi A, Lusignani M, Chiarelli MT, Mannucci PM, Franchi C, Tettamanti M,

Reeve E & Nobili A (2016). Attitudes towards Polypharmacy and Medication Withdrawal among Older Inpatients in Italy. *Int J Clin Pharm*, 38:454-461.

Garfinkel D & Mangin D (2010). Feasibility Study of A Systematic Approach for Discontinuation of Multiple Medications in Older Adults: Addressing Polypharmacy. *Arch Intern Med*, 170: 1648-1654.

Gnjidic D, Hilmer SN, Blyth FM, Naganathan V, Waite L, Seibel MJ, McLachlan AJ, Cumming RG, Handelsman DJ & Le Couteur DG (2012a). 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*, 65:989-995.

Gnjidic D, Le Couteur DG, Kouladjian L & Hilmer SN (2012b). Deprescribing Trials: Methods to Reduce Polypharmacy and the Impact on Prescribing and Clinical Outcomes. *Clin Geriatr Med*, 28: 237-253.

Hajjar ER, Cafiero AC & Hanlon JT (2007). Polypharmacy in Elderly Patients. *The Am J Geriatr Pharmacother*, 5: 345-351.

Hanlon JT, Weinberger M, Samsa GP, Schmader KE, Uttech KM, Lewis IK, Cowper PA, Landsman PB, Cohen HJ & Feussner JR (1996). A Randomized, Controlled Trial of a Clinical Pharmacist Intervention to Improve Inappropriate Prescribing in Elderly Outpatients with Polypharmacy. *Am J Med*, 100: 428-437.

Holmes HM & Sachs GA (2017). Meaningful Deprescribing in the Nursing Home. *Ann Intern Med*, 167: 671-672.

Junius-Walker U, Theile G & Hummers-Pradier E (2007). Prevalence and Predictors

of Polypharmacy among Older Primary Care Patients in Germany. *J Fam Pract*, 24: 14-19.

Kaur S, Mitchell G, Vitetta L & Roberts MS (2009). Interventions that can Reduce Inappropriate Prescribing in the Elderly. *Drugs Aging*, 26:1013-1028.

Krzyzaniak N, Singh S & Bajorek B (2018). Physicians' Perspectives on Defining Older Adult Patients and Making Appropriate Prescribing Decisions. *Drugs Ther Perspect*, 34:174-185.

Larson EB, Kukull WA, Buchner D & Reifler BV (1987). Adverse Drug Reactions associated with Global Cognitive Impairment in Elderly Persons. *Ann Intern Med*, 107:169-173.

Le Couteur D, Banks E, Gnjidic D & McLachlan A (2011). Deprescribing. *Aust Prescr*, 34.

Lin HY, Liao CC, Cheng SH, Wang PC & Hsueh YS (2008). Association of Potentially Inappropriate Medication Use with Adverse Outcomes in Ambulatory Elderly Patients with Chronic Diseases. *Drugs Aging*, 25:49-59.

Masoodi NA (2008). Polypharmacy: To Err Is Human, to Correct Divine Polypharmacy: to Err is Human, To Correct Divine. *Br J Med Pract*, 1: 6-9.

Muir AJ, Sanders LL, Wilkinson WE & Schmader K (2001). Reducing Medication Regimen Complexity: A Controlled Trial. *J Gen Intern Med*, 16: 77-82.

Nobili A, Garattini S & Mannucci PM (2011a). Multiple Diseases and Polypharmacy in the Elderly: Challenges for the Internist of the Third Millennium. *JOC*, 1: 28-44.

Nobili A, Licata G, Salerno F, Pasina L, Tettamanti M, Franchi C, De Vittorio L, Marengoni A, Corrao S & Iorio A (2011b). Polypharmacy, Length of Hospital Stay, and In-Hospital Mortality among Elderly Patients in Internal Medicine Wards. The Reposit Study. *Eur J Clin Pharmacol*, 67: 507-519.

Pruskowski J & Handler S (2017). The Discussion to Ensure the Patient-Centered, Health-Focused, Prognosis-Appropriate, and Rational Medication Regimen (De-Pharm) Quality Improvement Project—Rational Deprescribing in Residents with Life-Limiting Illness (Fr420a). *J Pain Symptom Manage*, 53:359-360.

Qi K, Reeve E, Hilmer SN, Pearson SA, Matthews S & Gnjidic D (2015). Older Peoples' Attitudes regarding Polypharmacy, Statin Use and Willingness to have Statins Deprescribed in Australia. *Int J Clin Pharm*, 37: 949-957.

Reeve E, Shakib S, Hendrix I, Roberts MS & Wiese MD (2013a). Development and Validation of the Patients' Attitudes towards Deprescribing (Patd) Questionnaire. *Int J Clin Pharm*, 35: 51-56.

Reeve E, Shakib S, Hendrix I, Roberts MS & Wiese MD (2014a). The Benefits and Harms of Deprescribing. *Med J Aust*, 201: 386-389.

Reeve E, Shakib S, Hendrix I, Roberts MS & Wiese MD (2014b). Review of Deprescribing Processes and Development of an Evidence-Based, Patient-Centred Deprescribing Process. *Br J Clin Pharmacol*, 78: 738-747.

Reeve E, Thompson W & Farrell B (2017). Deprescribing: A Narrative Review of the Evidence and Practical Recommendations

for Recognizing Opportunities and taking Action. *Eur J Case Rep Intern Med*, 38: 3-11.

Reeve E, Wiese MD, Hendrix I, Roberts MS & Shakib S (2013b). People's Attitudes, Beliefs, and Experiences Regarding Polypharmacy and Willingness to Deprescribe. *J Am Geriatr Soc*, 61: 1508-1514.

Ruby CM, Hanlon JT, Fillenbaum GG, Pieper CF, Branch LG & Bump RC (2005). Medication Use and Control of Urination among Community-Dwelling Older Adults. *J Aging Health*, 17: 661-674.

Scott IA, Hilmer SN, Reeve E, Potter K, Le Couteur D, Rigby D, Gnjdic D, Del Mar C B, Roughead EE & Page A (2015). Reducing Inappropriate Polypharmacy: The Process of Deprescribing. *JAMA Intern Med*, 175: 827-834.

SPSS I (2011). IBM SPSS Statistics Base 20. *Chicago, Il.*

Stange KC (2017). In This Issue: Trends, Prescribing, Deprescribing. *Ann Fam Med*.

Thompson W & Farrell B (2013). Deprescribing: What is it and what does the Evidence tell us? *Can J Hosp Pharm*, 66.

Veehof L, Stewart R, Haaijer-Ruskamp F & Meyboom-De Jong B (2000). The Development of Polypharmacy. A Longitudinal Study. *J Fam Pract*, 17: 261-267.

[Www.Pmrc.Org.Pk/Erc Guidelines.Htm](http://www.pmr.org.pk/erc_guidelines.htm). 2011. *National Bioethics Committee Pakistan* [Online]. Ethical Research Committee Guideline. Available: [Http://Www.Pmrc.Org.Pk/Erc Guidelines.Htm](http://www.pmr.org.pk/erc_guidelines.htm). [10th May, 2018].