



Assessment of Healthcare Providers' Knowledge, Attitude, Practice and Barriers Towards Deprescribing in Saudi Arabia

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Article Info:

DOI: 10.22399/ijcesen.5120

Received : 01 February 2025

Accepted : 28 February 2025

Keywords

Deprescribing,
Polypharmacy,
Deprescribing awareness,
Inappropriate medication use

Abstract:

In this study we aimed to assess the healthcare providers' knowledge, attitude, practice and barriers towards deprescribing within Saudi Arabia hospitals. A quantitative study that utilized an electronic questionnaire to survey the information from healthcare providers, which distributed through WhatsApp, X platform and emails from April to December 2023. The data analyzed using the Statistical Package for Social Sciences version 22. The study included 385 participants 63% of them were men. Among them, the pharmacists make up 67%, while the physicians only 33%. Approximately 63% of them were aware about deprescribing and around 89% considered that deprescribing was helpful in decreasing medication burden, healthcare system cost, improving treatment outcomes and quality of life. The majority of participants 60% they had never practiced deprescribing. The most frequently reported barriers for deprescribing practicing were lack of knowledge and tools 62%, lack of organizational support 61% and time constraint 51%. There is a good awareness level between physicians and pharmacists in Saudi Arabia among deprescribing and its importance as an essential part of prescribing processes as well as it is one of the tools that addressing the polypharmacy complications and improving the overall treatment outcomes.

1. Background:

The number of prescribed medications among individual patients increases as they age. This phenomenon is called "polypharmacy," which refers to the routine use of multiple medications by one patient, including prescribed medications, over the counter (OTC) medications, and dietary supplements. Polypharmacy is considered as a

significant medication safety and public health challenge (Balkhi et al., 2021). The risk of medication errors, nonadherence, harmful drug interactions, hospitalization and mortality significantly increase with polypharmacy, especially among elderly patients (Frazier, 2005; Dequito et al., 2011).

One of the methods that used for addressing excessive medication use and polypharmacy is

referred to as "deprescribing" (Thompson and Farrell, 2013). Deprescribing is the process of tapering, discontinuing, or withdrawing drugs under the guidance of a healthcare professional with the goal of managing polypharmacy and improving outcomes (Reeve et al., 2015). It involves a thorough examination of a patient's medication regimen, with a systematic reduction or cessation of medications associated with adverse effects, paying special attention to high-risk medications. The overarching objectives of deprescribing encompass reducing the overall medication burden, lowering risk of geriatric conditions like falls and cognitive decline, and improving general health outcomes, including hospitalization and mortality rates. Ultimately, the primary goal is to enhance the patient's quality of life (Reeve, 2020).

In accordance with various studies, the deprescribing process unfolds through multiple steps, all with a patient-centered focus (Scott et al., 2015; Reeve, 2020). These steps include: (1) comprehensive review of the patient's entire medication list; (2) identification of inappropriate medications, taking into account both potential benefits and harms; (3) prioritization of medications for discontinuation; (4) implementation of a discontinuation plan and initiation of the withdrawal process; (5) close monitoring of patients to assess improvements or provide support; and (6) documentation of the outcomes achieved.

According to recent international researches, one out of every five prescriptions given to elderly patients in primary care is inappropriate, and nearly 50% of elderly patients take one or more unnecessary medications (Opondo et al., 2012; Maher, Hanlon and Hajjar, 2014). Furthermore, a systematic review conducted on inappropriate medication use (IMU) among the elderly found that the prevalence of IMU ranged from 11.5% to 62.5%. According to a study of the Medical Expenditure Panel Survey in the United States, the total estimated healthcare expenditures related to the use of potentially inappropriate medications (PIMs) was approximately \$7.2 billion (Zhan et al., 2001; Guaraldo et al., 2011).

The high prevalence of IMU and their important predictors is a significant challenge in clinical practice, requiring a programmed medication monitoring system. Despite the availability of guidelines that guide the prescribers to begin safe and effective therapies, there is insufficient knowledge regarding the cessation, reduction, or suspension of inappropriate medication (Garfinkel and Mangin, 2010; Reeve et al., 2013).

In Saudi Arabia, a study by *Al-Rasheed et al.* conducted in 2022 at King Saud Medical City,

involving 15 physicians, sought to investigate the knowledge of family medicine physicians and identify the perceived barriers that hinder their engagement in deprescribing for older patients. The findings revealed that family medicine physicians lacked sufficient knowledge and education about deprescribing. Several factors contributing to this included patients' resistance to deprescribing and time constraints for reviewing patient medications (Alrasheed et al., 2018).

Another study conducted in 2021 at King Khalid University Hospital, involving 105 patients, aimed to identify elderly inpatients' attitudes toward deprescribing. The study concluded that inpatient elderly patients are open to deprescribing and recommended that the healthcare system should provide, support and cooperate with physicians, pharmacists and other caregivers to simplify the process for them (Alshammari et al., 2021).

Additionally, a study by *Bawazeer et al.* conducted in 2022 with a sample size of 80 patients concluded that the deprescribing is a safe and effective intervention to reduce PIMs in elderly patients. Healthcare providers must have a deeper understanding of deprescribing evidence-based guidelines, and patients should be empowered to participate in the decision-making process that prioritizes their preferences and concerns (Bawazeer et al., 2022).

While a few studies in Saudi Arabia have focused on individual aspects of deprescribing, there is a need for a comprehensive assessment of healthcare providers' knowledge, attitudes, practices, and barriers towards deprescribing within Saudi Arabian hospitals. This study intends to address this gap in understanding.

2. Methodology:

2.1 Study design and setting:

A quantitative study was designed and conducted using an electronic, online-based google form questionnaire, which was distributed through WhatsApp, X platform and emails.

2.2 . Study Population:

The targeted sample comprised pharmacists and physicians working in both governmental or private hospitals in Saudi Arabia.

2.3 . Statistical Analysis:

The amid sample size was calculated using a sample size calculator website (Sample Size Calculator, 2008) based on the total number of

physicians and pharmacists in Saudi Arabia obtained from the Ministry of Health 2022 annual statistical book (Ministry of Health - Statistical Yearbook, 2022). Data were collected, cleaned, coded and analyzed descriptively using the Statistical Package for Social Sciences (SPSS) version 22. Categorical variables were reported as numbers and percentages. Differences between groups of variables were analyzed using descriptive statistics.

3. Results:

3.1 Socio-demographic characteristics of participants:

The total number of the participants was 385, with 63% (244) of them being men. 43% (166) had ages ranging from 25-30 years old. Among them, pharmacists made up 67% (258) of the group, while physicians made up only 33% (127). 87% (334) were Saudi citizens, and 13% (51) were not. 50% (194) of the participants had experience from 0-5 years, and 15% (56) had experience exceeding 15 years. 24% (92) were employed by private hospitals, and 76% (293) worked in governmental hospitals. The majority of participants, 38% (148) were from the western region, while the lowest percentage 7% were from the northern region. (Table.1)

3.2 . Healthcare providers' Knowledge towards deprescribing:

Among the 385 participants, most were aware of deprescribing, with 63% (242) indicating familiarity and the remaining 37% (143) lacking awareness. A notable proportion 54% (209) believed deprescribing was suitable for those dealing with polypharmacy, while 46% (176) thought it was better suited for individuals aged 65 years or older. Additionally, the majority expressed support for medication deprescription under various circumstances, including when it poses no harm 55% (212), when potential harm outweighs benefits 51% (197), when medications prove ineffective 56% (214), and when adverse drug reactions occur 53% (203). Concerning eligible medication classes for deprescribing, 43% (165) favored Proton Pump Inhibitors (PPIs) and Benzodiazepines (BDZ), 42% (161) considered Antipsychotic medication, and 40% (155) identified Sedative Antihistamines. Furthermore, 44% (169) emphasized the importance of effective communication and collaboration among health professionals, with 40% (152) supporting the involvement of a standardized multidisciplinary team. The study revealed a lack of

deprescribing guidelines in 70% (270) of institutions, driving the demand for additional guidance, particularly among 50% (191) of respondents. Only 20% (76) felt confident in their knowledge to deprescribe, while 37% (141) lacked confidence, and 44% (168) remained uncertain about their readiness to deprescribe. (Table.2)

3.3 . Healthcare providers' Attitude towards deprescribing:

According to the current study, around 89% (345) of the participants considered deprescribing helpful in decreasing medication burden, healthcare system costs, drug-drug interactions, and improving patients' adherence, overall treatment outcomes, and quality of life. The majority of participants 86% (329) had no concern regarding the need for standardized guidelines and a multidisciplinary drug review team for deprescribing. Additionally, 87% (336) of the participants agreed that pharmacist-led medication review has essential importance in deprescribing. However, 58% (224) of them disagreed with the idea that physicians are solely responsible for deprescribing. More crucially, real discussions regarding the pros and cons of deprescribing with patients, as well as providing deprescribing training for healthcare providers, were other areas where participants strongly agreed. Overall, 77% (298) of the participants agreed that deprescribing benefits rather than harm patients and it is an important part of good prescribing, according to 86% (330) of them. (Table.3)

3.4. Healthcare Providers' Practice participation among Deprescribing:

Only 40% (155) of the participants reported practicing deprescribing, while the majority, 60% (230), had never practiced it. Patients with chronic diseases were the primary targeted population for deprescribing, according to 61% (234) of the participants, followed by elderly patients and patients with renal impairment, reported by 58% (222) and 45% (172) respectively. 45% (174) of them followed withdrawal approach after Identifying potentially inappropriate medications, while 32% (122) preferred either tapering down or dose reduction approach. Additionally, the majority of participants 65% (249) monitored and supported their patients after deprescribing; however, regrettably, a considerable percentage 53% (202) did not document the outcomes following deprescribing. Concerning the classes of medication often deprescribed, PPIs and sedative antihistamines were the most common at 31% (120)

and 29% (113), respectively. Despite 35% (136) of the study participants practicing deprescribing at least once weekly, unfortunately, 42% (163) of them sometimes faced problems since they had started deprescribing. (Table 4)

3.5. Barriers to conducting Deprescribing:

In this study, healthcare providers noted that a lack of knowledge and tools 62% (237), lack of organizational support 61% (235) and time constraints 51% (195) were the most frequently reported barriers to deprescribing practice. Additionally, shortages of staff, lack of skills, patient reluctance with senior physicians for deprescribing medications they had prescribed, and fear of withdrawal symptoms were also reported by 46% (175), 42% (160), 36% (140) and 34% (130) respondents, respectively. (Table.5)

4. Discussion:

Based on our research goal, this study aimed to focus on the knowledge, attitudes and practice of healthcare providers towards deprescribing in Saudi Arabia. The majority of our participants, 63%, had heard about the deprescribing and its importance. However, approximately 80% of them believed they were unsure or did not have sufficient information on how to handle deprescribing. A published study in 2023 in Nigeria reported that 80% of physicians are familiar with the term of "deprescribing" and there is a strong correlation between their understanding of the term and the steps involved in deprescribing (Akande-Sholabi, Ajilore and Ilori, 2023). Another qualitative study in Saudi Arabia indicated that the majority of family medicine physicians were unaware of the term deprescribing (Alrasheed *et al.*, 2018), which contrasts with our findings in this study.

According to the findings of different studies (Baqir *et al.*, 2017; Rochon *et al.*, 2021; Alemayehu Gadisa *et al.*, 2022), deprescribing is crucial and important for those on polypharmacy, especially elderly patients. Additionally, we reported in our study that deprescribing is not only helpful for elderly patients with polypharmacy but also for patients with a limited life expectancy, renal impairment, and chronic diseases. The hope is to decrease medication-related problems, burden of potentially PMIs, and improve the quality of life. More guidelines are deemed necessary, as indicated by 70% of healthcare providers who either did not read or did not have access to any deprescribing guidelines within their organization. As mentioned in other published researches, there was a significant association between knowledge of

specific deprescribing tools and awareness of deprescribing, as well as previous training on deprescribing. Therefore, more training and availability of guidelines are required to facilitate the deprescribing process and enhance the clinical outcome (Bawazeer *et al.*, 2022; Akande-Sholabi, Ajilore and Ilori, 2023).

Various global studies have explored the significance of deprescribing in improving healthcare outcomes, addressing concerns such as medication burden, drug-drug interactions, and treatment costs (Baqir *et al.*, 2017; Cullinan *et al.*, 2017; Nadarajan *et al.*, 2018). In our current study, the majority of respondents also recognized the importance of deprescribing in reducing medication burden, managing drug interactions, controlling healthcare system costs, and enhancing patient adherence and overall quality of life. Notably, over three-fourths 77% of healthcare providers in our study perceived deprescribing as more beneficial than harmful to patients. An earlier study further highlighted the generally safe and effective nature of deprescribing (Linsky and Zimmerman, 2018).

However, divergent opinions emerge regarding the responsibility for medication deprescribing. A significant 58% of respondents disagree with the idea that physicians are solely responsible for deprescribing decisions, challenging the evolving understanding of deprescribing as a collaborative and multidisciplinary effort. In contrast, 22% agree that physicians bear exclusive responsibility, emphasizing a nuanced perspective on this responsibility.

The unanimous agreement among our study participants underscores the consensus on the pivotal role of training and education in equipping healthcare providers to integrate deprescribing practices into patient care strategies. Additionally, 86% of respondents in the survey recognize the crucial role of deprescribing in good prescribing practices, indicating a shared understanding of the dynamic and patient-centered nature of prescribing. Opinions on the potential non-preventable harms of deprescribing vary, with 36% expressing concerns, 31% advocating for judicious execution, and 33% remaining neutral. The results highlight the need for individualized and patient-centered deprescribing approaches, considering specific clinical contexts. Studies conducted by Linsky and Zimmerman support the generally safe and effective nature of deprescribing (Linsky and Zimmerman, 2018). Furthermore, our study participants stress the importance of a multidisciplinary approach and evidence-based guidelines for effective deprescribing. Emphasis is placed on pharmacist-led medication reviews and the integration of nurse suggestions, aligning with

findings from studies conducted by Kua, Mak, and others. These studies highlight the significance of teamwork among doctors, pharmacists, and nurses in deprescribing, with a focus on improving communication and developing aligned care management plans (Frank and Weir, 2014; Alrasheed et al., 2018; Peterson et al., 2018; Kua, Mak and Lee, 2019; Paque et al., 2019).

The survey results also emphasize the necessity of discussing the pros and cons of deprescribing with patients before implementation, with 87% of respondents in agreement. This underscores the growing emphasis on transparent communication, shared decision-making, and a patient-centered approach in healthcare. The minimal 1% disagreement and 12% neutral responses suggest a minority with differing perspectives or individuals seeking more information, highlighting the importance of involving patients in informed decision-making and collaborative healthcare practices. Numerous studies have highlighted and supported these findings (Alfahmi, Curtain and Salahudeen, 2023; Alrawiai, 2023).

Patients with chronic diseases, regardless of whether they are elderly or fall under any other medical classification (e.g., patients with renal impairment, palliative care patients, or patients with limited life expectancy), were the primary target population for deprescribing according to our findings. In contrast, previous research revealed that older individuals have dominated discussions and research around deprescribing due to the significant prevalence of polypharmacy in this population. Almost half of elderly patients use one or more medications that are not medically required (Maher, Hanlon and Hajjar, 2014). In Saudi Arabia, polypharmacy is common among adult patients, especially those who are older than 60 years (Balkhi et al., 2021).

Despite the majority of the participants not ever practicing the deprescribing, PPIs, sedative antihistamines, BDZs and antihypertensive medications were the favored classes of medication for deprescribing by healthcare providers according to the current study respectively. Unlike this study, the previous studies have identified several classes of medications as high priorities for evidence-based deprescribing. For example, in an Ethiopian study and another study conducted in Singapore, both studies showed that PPIs and antihypertensive medications were the favored classes for deprescribing (Nadarajan et al., 2018; Alemayehu Gadisa et al., 2022).

Similarly, our current study reported that 35% of participants were undertaking deprescribing at least once weekly. However, 60% of them did not practice it, or maybe they performed it, but not as

deprescribing. Deprescribing is an essential part of good prescribing, using deprescribing guidelines consistently, as required according to the responses of 85.5% of participants. This is confirmed and supported by a study conducted by Alrawiai (Alrawiai, 2023). Therefore, it is essential to comprehend the enablers and challenges necessary for developing the right processes that lead to successful uptake of deprescribing in a healthcare system.

Lack of deprescribing knowledge and tools, lack of organizational support, and time constraints due to workload were among the top barriers identified in our current study. Additionally, patients' resistance along with staff shortages were also reported as barriers of deprescribing. Similarly, numerous experts have documented interconnected impediments to deprescribing, such as lack of knowledge, low awareness due to a general lack of confidence in deprescribing due to insufficient training, poor communication between multiple prescribers, lack of guidelines detailing the process of deprescribing, and time constraints (Reeve et al., 2013; Ailabouni et al., 2016; Alrawiai, 2023).

5. Study Strengths and limitations:

This is the first local study surveying the perceptions of both physicians and pharmacists working in both private or governmental hospitals, including educational hospitals, regarding deprescribing knowledge, attitude, and practice in Saudi Arabia. This study aimed to understand the challenges faced by physicians and pharmacists towards deprescribing and to facilitate the development of strategies to address them.

Despite its contribution, this study has limitations that should be addressed in further researches, including an over-reliance on self-reported practices, a small sample size due to the low response rate which may result in an increase in participation bias. Furthermore, as actual practices may differ from what was reported, more research is needed to explore attitudes and practices in order to develop further strategies for deprescribing.

6. Conclusion:

There is a good awareness level among physicians and pharmacists in Saudi Arabia regarding deprescribing and its importance as an essential part of prescribing process. It is also recognized as a tool for addressing polypharmacy complications and improving overall treatment outcomes. This study highlights the indispensable necessity for promoting and developing training and educational programs to equip healthcare providers with the

skills to integrate deprescribing practices into patient care strategies. Moreover, the development of specialized, evidence-based guidelines on deprescribing would enable healthcare providers to

deprescribe medications more effectively. Further research is required to evaluate the challenges associated with guidelines implementation and how to improve it.

Table.1 Socio-demographic characteristics of participants: N=385

Variables	Frequency	Percentage
Gender:		
Male	244	63%
Female	141	37%
Total	385	100%
Age Group:		
25-30	166	43%
31-35	118	31%
36-40	42	11%
>40	59	15%
Total	385	100%
Nationality:		
Saudi	334	87%
Non-Saudi	51	13%
Total	385	100%
Specialty:		
Physician	127	33%
Pharmacist	258	67%
Total	385	100%
Years of experience:		
0-5 years	194	50%
6-10 years	100	26%
11-15 years	35	9%
>15 years	56	15%
Total	385	100%
Type of Healthcare Institution:		
Governmental Hospital	293	76%
Private Hospital	92	24%
Total	385	100%
Region:		

Central	81	21%
Eastern	30	8%
Western	148	38%
Norther	28	7%
Southern	98	26%
Total	385	100%

Table.2 Healthcare providers' Knowledge towards deprescribing:

Variable	Answer	Frequency	Percentage
Did you ever hear about “deprescribing” potentially an inappropriate medication for patients?	Yes	242	63%
	No	143	37%
If you know about “deprescribing”, for which category of patients is appropriate? When stopping the medication will not harm the patients	Patients aged 65 years old or more.	176	46%
	Patients receiving regular medication for their chronic cases.	148	38%
	Patients receiving polypharmacy medication.	209	54%
	Limited life expectancy Patients.	84	22%
	Renal Impairment Patients.	128	33%
	I don't Know.	101	26%
Which of the following classes of medication candidate of potential “deprescribing”?	Proton Pump Inhibitors (PPIs)	165	43%
	Cardiovascular medication	145	38%
	Antihyperglycemic medication	138	36%
	Benzodiazepines (BDZ)	166	43%
	Antipsychotic medication	161	42%
	Sedative Antihistamine	155	40%
	Anticholinergic medication	104	27%
	Vitamins and other Supplement	119	31%
	I don't Know	52	14%
When to “deprescribe” medication?	When stopping the medication will not harm the patients	212	55%
	When medication's potential harms out weight its benefits	197	51%
	When one or more medication not effective for the patients	214	56%
	When the patient suffered from the adverse drug reactions	203	53%
	When the patient or their caregivers are ready to do so	73	19%

	I don't Know	48	13%
Did you know the tools needed for "deprescribing"?	Involvement of standardized multidisciplinary team in medication review	152	40%
	Effective communication and collaboration among all health professionals involved in patient care.	169	44%
	Skills for systematically reviewing patient's medications.	138	36%
	Effective communication and collaboration between healthcare providers and patients.	154	40%
	Use evidence based deprescribing guidelines.	143	37%
	I don't know.	126	33%
Did you read or you have in your institution any guideline for "deprescribing"?	Yes	115	30%
	No	270	70%
If yes, did you acknowledge that more "deprescribing" guidelines are needed? (optional question)	Yes	191	50%
	No	47	12%
Did you think you have sufficient information/knowledge to "deprescribe" the medication?	Yes	76	20%
	No	141	37%
	Not Sure	168	44%

Table.3 Healthcare Providers' Attitudes among Deprescribing:

Variable	Agree N (~%)	Disagree N (~%)	Neutral N (~%)	Total N (%)
Did you think deprescribing is helpful in decreasing medication burden?	345 (89%)	2 (1%)	38 (10%)	385 (100%)
Did you think deprescribing is helpful in decreasing the cost of the health care system?	342 (89%)	4 (1%)	39 (10%)	385 (100%)
Did you think "deprescribing" is helpful in decreasing drug-drug interactions?	344 (89%)	2 (1%)	39 (10%)	385 (100%)
Did you think "deprescribing" is helpful in improving patient's quality of life?	324 (84%)	2 (1%)	59 (15%)	385 (100%)
Did you think "deprescribing" is helpful in increasing patient adherence?	323 (84%)	4 (1%)	58 (15%)	385 (100%)
Did you think "deprescribing" is helpful in improving overall treatment outcomes?	321 (84%)	5 (1%)	59 (15%)	385 (100%)
"Deprescribing" can cause non-preventable harm to the patient	140 (36%)	118 (31%)	127 (33%)	385 (100%)
Establish standardized multidisciplinary team for medication review helps for effective "deprescribing"	329 (86%)	5 (1%)	51 (13%)	385 (100%)
Using "deprescribing" guidelines, consistently required	329 (86%)	4 (1%)	52 (13.5%)	385 (100%)
Pharmacist led medication review has a paramount importance	336 (87%)	7 (2%)	42 (11%)	385 (100%)
Physicians are the only ones responsible for medication "deprescribing"	82 (21%)	224 (58%)	79 (21%)	385 (100%)

It is necessary to discuss pros and cons of “deprescribing” with the patients.	335 (87%)	5 (1%)	45 (12%)	385 (100%)
It is essential to give training to healthcare providers about “deprescribing”	347 (90%)	3 (1%)	35 (9%)	385 (100%)
“Deprescribing” is an essential part of good prescribing	330 (86%)	9 (2%)	46 (12%)	385 (100%)
Overall, "deprescribing" does benefit than does harm the patients.	298 (77%)	8 (2%)	79 (21%)	385 (100%)

Table.4 Healthcare Providers' Practice participation among Deprescribing:

Did you ever practice “deprescribing”?		
	Frequency	Percentage
Yes	155	40%
No	230	60%
Total	385	100%
Which patients were your target for “deprescribing”?		
Patients with chronic diseases	234	61%
Elderly patients	222	58%
Palliative care patients	98	26%
Patients with renal impairment	172	45%
Patients with limited life expectancy	83	22%
I don't Know	82	21%
Which approaches do you mostly follow for “deprescribing”?		
Tapering down slowly	122	32%
Dose reduction	122	32%
Identify potentially inappropriate medication for “deprescribing”	174	45%
I don't Know	136	35%
Do you monitor and support the patient after “deprescribing”?		
Yes	249	65%
NO	136	35%
Total	385	100%
Do you document the outcome after “deprescribing” process?		
Yes	183	48%
NO	202	53%
Total	385	100%
Which class of medication do you often “deprescribe”?		
Proton Pump Inhibitors (PPIs)	120	31%

Antihypertensive medication	85	22%
Lipids lowering medication	74	19%
Antihyperglycemic medication	83	22%
Benzodiazepines (BDZ)	97	25%
Antidepressants medication	86	22%
Antipsychotic medication	76	20%
Sedative Antihistamine	113	29%
Anticholinergic medication	59	15%
Vitamins and other Supplement	79	21%
I don't Know (in case if you did not practice the deprescribing)	136	35%
How often do you “deprescribe” the medication?		
Daily	38	10%
at least once weekly	136	35%
I don't Know (in case if you did not practice the deprescribing)	150	39%
Never	61	16%
Total	385	100%
How often do you face problems/complications after “deprescribing”?		
Always	35	9%
I don't Know (in case if you did not practice the deprescribing)	153	40%
Never	34	9%
Sometimes	163	42%
Total	385	100%

Table.5 Barriers to conducting Deprescribing:

Which of the following items, you consider as a barrier to conducting “Deprescribing”?		
	Frequency	Percentage
Lack of Time	195	51%
Lack of Support	235	61%
Lack of knowledge and tools (exp: Risk-Benefits information, guidelines ...etc.)	237	62%
Shortage of Staffs	175	46%
Lack of Skills	160	42%
Patient Reluctance	140	36%
Fear of withdrawal symptoms	130	34%

Author Statements:

- **Ethical approval:** The conducted research is not related to either human or animal use.
- **Conflict of interest:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper
- **Acknowledgement:** The authors declare that they have nobody or no-company to acknowledge.
- **Author contributions:** All authors contributed to the study conception and design. Material preparation was performed by Nouf Hameed Alotibi, data collection was performed by all authors, and data analysis was performed by Wafi Fawzan Albalawi. The first draft of the manuscript was written by all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.
- **Funding information:** The authors declare that there is no funding to be acknowledged.
- **Data availability statement:** The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.
- **Use of AI Tools:** The author(s) declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

References

1. Ailabouni, N.J. *et al.* (2016) ‘Challenges and Enablers of Deprescribing: A General Practitioner Perspective’, *PLOS ONE*, 11(4), p. e0151066. Available at: <https://doi.org/10.1371/JOURNAL.PONE.0151066>.
2. Akande-Sholabi, W., Ajilore, C.O. and Ilori, T. (2023) ‘Evaluation of physicians’ knowledge of deprescribing, deprescribing tools and assessment of factors affecting deprescribing process’, *BMC Primary Care*, 24(1), pp. 1–9. Available at: <https://doi.org/10.1186/S12875-023-01990-1/FIGURES/2>.
3. Alemayehu Gadisa, D. *et al.* (2022) ‘Assessment of Knowledge, Attitude and Practice of Primary Health Care Providers towards Deprescribing in Ethiopia’. Available at: <https://doi.org/10.21203/RS.3.RS-1573716/V2>.
4. Alfahmi, A.A., Curtain, C.M. and Salahudeen, M.S. (2023) ‘Assessment of Knowledge, Attitude and Practices of the Hospital and Community Pharmacists in Saudi Arabia (Jeddah) towards Inappropriate Medication Use in Older Adults’, *International Journal of Environmental Research*

and Public Health 2023, Vol. 20, Page 1635, 20(2), p. 1635. Available at: <https://doi.org/10.3390/IJERPH20021635>.

5. Alrasheed, M.M. *et al.* (2018) ‘Knowledge and willingness of physicians about deprescribing among older patients: A qualitative study’, *Clinical Interventions in Aging*, 13, pp. 1401–1408. Available at: <https://doi.org/10.2147/CIA.S165588>.
6. Alrawiai, S. (2023) ‘Deprescribing, shared decision-making, and older people: perspectives in primary care’, *Journal of Pharmaceutical Policy and Practice*, 16(1), pp. 1–6. Available at: <https://doi.org/10.1186/S40545-023-00671-9/METRICS>.
7. Alshammari, S.A. *et al.* (2021) ‘Patients’ attitude towards deprescribing among elderly inpatients with polypharmacy at tertiary academic hospital: A cross-sectional study’, (116), p. 25. Available at: <https://www.researchgate.net/publication/357604991> (Accessed: 26 January 2024).
8. Balkhi, B. *et al.* (2021) ‘Prevalence and factors associated with polypharmacy use among adult patients in Saudi Arabia’, *Journal of Patient Safety*, 17(8), pp. E1119–E1124. Available at: <https://doi.org/10.1097/PTS.0000000000000439>.
9. Baqir, W. *et al.* (2017) ‘Impact of medication review, within a shared decision-making framework, on deprescribing in people living in care homes’, *European Journal of Hospital Pharmacy*, 24(1), p. 30. Available at: <https://doi.org/10.1136/EJHPHARM-2016-000900>.
10. Bawazeer, G. *et al.* (2022) ‘Impact of Specialized Clinics on Medications Deprescribing in Older Adults: A Pilot Study in Ambulatory Care Clinics in a Teaching Hospital’, *Saudi Pharmaceutical Journal: SPJ*, 30(7), p. 1027. Available at: <https://doi.org/10.1016/J.JSPS.2022.04.012>.
11. Cullinan, S. *et al.* (2017) ‘Challenges of deprescribing in the multimorbid patient’, *European Journal of Hospital Pharmacy*, 24(1), p. 43. Available at: <https://doi.org/10.1136/EJHPHARM-2016-000921>.
12. Dequito, A.B. *et al.* (2011) ‘Preventable and non-preventable adverse drug events in hospitalized patients: A prospective chart review in the Netherlands’, *Drug Safety*, 34(11), pp. 1089–1100. Available at: <https://doi.org/10.2165/11592030-000000000-00000/METRICS>.
13. Frank, C. and Weir, E. (2014) ‘Deprescribing for older patients’, *CMAJ*, 186(18), pp. 1369–1376. Available at: <https://doi.org/10.1503/CMAJ.131873>.
14. Frazier, S.C. (2005) ‘Health Outcomes and Polypharmacy in Elderly Individuals’, *Journal of Gerontological Nursing*, 31(9), pp. 4–9. Available at: <https://doi.org/10.3928/0098-9134-20050901-04>.
15. Garfinkel, D. and Mangin, D. (2010) ‘Feasibility Study of a Systematic Approach for Discontinuation of Multiple Medications in Older Adults: Addressing Polypharmacy’, *Archives of Internal Medicine*, 170(18), pp. 1648–1654. Available at:

- <https://doi.org/10.1001/ARCHINTERNMED.2010.355>.
16. Guaraldo, L. *et al.* (2011) 'Inappropriate medication use among the elderly: A systematic review of administrative databases', *BMC Geriatrics*, 11(1), pp. 1–10. Available at: <https://doi.org/10.1186/1471-2318-11-79/TABLES/2>.
 17. Kua, C.H., Mak, V.S.L. and Lee, S.W.H. (2019) 'Perspectives of health professionals towards deprescribing practice in Asian nursing homes: a qualitative interview study', *BMJ Open*, 9(10). Available at: <https://doi.org/10.1136/BMJOPEN-2019-030106>.
 18. Linsky, A. and Zimmerman, K.M. (2018) 'Provider and System-Level Barriers to Deprescribing: Interconnected Problems and Solutions', *Public Policy & Aging Report*, 28(4), pp. 129–133. Available at: <https://doi.org/10.1093/PPAR/PRY030>.
 19. Maher, R.L., Hanlon, J. and Hajjar, E.R. (2014) 'Clinical consequences of polypharmacy in elderly', *Expert Opinion on Drug Safety*, 13(1), pp. 57–65. Available at: <https://doi.org/10.1517/14740338.2013.827660>.
 20. Maple Tech. International LLC (no date) *Sample Size Calculator*. Available at: <https://www.calculator.net/sample-size-calculator.html?type=1&cl=95&ci=5&pp=50&ps=139372&x=35&y=23> (Accessed: 26 January 2024).
 21. Ministry of Health - Statistical Yearbook (2022) *Statistical Yearbook - Statistical Yearbook, Ministry of Health*. Available at: <https://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx> (Accessed: 26 January 2024).
 22. Nadarajan, K. *et al.* (2018) 'The attitudes and beliefs of doctors towards deprescribing medications', *Proceedings of Singapore Healthcare*, 27(1), pp. 41–48. Available at: https://doi.org/10.1177/2010105817719711/ASSET/IMAGES/LARGE/10.1177_2010105817719711-FIG6.JPEG.
 23. Opondo, D. *et al.* (2012) 'Inappropriateness of Medication Prescriptions to Elderly Patients in the Primary Care Setting: A Systematic Review', *PLOS ONE*, 7(8), p. e43617. Available at: <https://doi.org/10.1371/JOURNAL.PONE.0043617>.
 24. Paque, K. *et al.* (2019) 'Barriers and enablers to deprescribing in people with a life-limiting disease: A systematic review', *Palliative Medicine*, 33(1), pp. 37–48. Available at: https://doi.org/10.1177/0269216318801124/ASSET/IMAGES/LARGE/10.1177_0269216318801124-FIG1.JPEG.
 25. Peterson, G.M. *et al.* (2018) 'Practice pharmacists and the opportunity to support general practitioners in deprescribing in the older person'. Available at: <https://doi.org/10.1002/jppr.1427>.
 26. Reeve, E. *et al.* (2013) 'People's Attitudes, Beliefs, and Experiences Regarding Polypharmacy and Willingness to Deprescribe', *Journal of the American Geriatrics Society*, 61(9), pp. 1508–1514. Available at: <https://doi.org/10.1111/JGS.12418>.
 27. Reeve, E. *et al.* (2015) 'A systematic review of the emerging definition of "deprescribing" with network analysis: implications for future research and clinical practice.', *British Journal of Clinical Pharmacology*, 80(6), pp. 1254–1268. Available at: <https://doi.org/10.1111/BCP.12732>.
 28. Reeve, E. (2020) 'Deprescribing tools: a review of the types of tools available to aid deprescribing in clinical practice', *Journal of Pharmacy Practice and Research*, 50(1), pp. 98–107. Available at: <https://doi.org/10.1002/JPPR.1626>.
 29. Rochon, P.A. *et al.* (2021) 'Polypharmacy, inappropriate prescribing, and deprescribing in older people: through a sex and gender lens', *The Lancet. Healthy longevity*, 2(5), pp. e290–e300. Available at: [https://doi.org/10.1016/S2666-7568\(21\)00054-4](https://doi.org/10.1016/S2666-7568(21)00054-4).
 30. Scott, I.A. *et al.* (2015) 'Reducing Inappropriate Polypharmacy: The Process of Deprescribing', *JAMA Internal Medicine*, 175(5), pp. 827–834. Available at: <https://doi.org/10.1001/JAMAINTERNMED.2015.0324>.
 31. Thompson, W. and Farrell, B. (2013) 'Deprescribing: What Is It and What Does the Evidence Tell Us?', *The Canadian Journal of Hospital Pharmacy*, 66(3), p. 201. Available at: <https://doi.org/10.4212/CJHP.V66I3.1261>.
 32. Zhan, C. *et al.* (2001) 'Potentially Inappropriate Medication Use in the Community-Dwelling Elderly: Findings From the 1996 Medical Expenditure Panel Survey', *JAMA*, 286(22), pp. 2823–2829. Available at: <https://doi.org/10.1001/JAMA.286.22.2823>.