



## Assessment of administration pattern of laxatives in pharmacies in Nasiriya City, Iraq

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Constipation affects 15–20% of the global population and is classified as primary or secondary. Primary constipation involves neuromuscular or sensory dysfunction, while secondary causes include medications, metabolic disorders, or structural abnormalities. The objective of this study was to determine the laxatives most frequently dispensed by the community pharmacists in Nasiriyah city, Southern Iraq. The data included information on dosage forms, dose, frequency, interval between doses, safety in pregnancy and lactation, and adverse reactions. The research took place during 10 months (from January to October 2023). Bisacodyl was found to be the most widely prescribed laxative (48.7%) in Nasiriyah, followed by lactulose (25.0%). Oral forms were preferred (81.2%). Safety was the primary decision factor (35.0%) and efficacy and cost as well had significant roles. We found that bisacodyl is more popular in Nasiriyah than U.S. or Europe, where lactulose is more frequently used. This indicates that differences in the medical practice, recommendations, and availability of drugs themselves impact regional prescribing. In Southern Iraq, bisacodyl remains dominant, with minor variations among governorates. These findings highlight the need for localized research to understand and improve healthcare practices. Given the variety of laxatives and their impact on safety and efficacy, assessing their usage is crucial. Our findings recommend aligning laxative prescription practices with WHO guidelines. We also suggest implementing a stricter follow-up system for over-the-counter sales in Iraqi pharmacies to ensure proper use and reduce risks from misuse. This is vital for improving public health.

**Keywords:** laxatives; constipation; dosage forms; bisacodyl; lactulose; PEG.

### Introduction

The pharmacological category laxatives encompasses types of medications used to treat constipation whose administration is available in over the counter (OTC). These drugs are usually self-prescribed (Elli et al., 2021). According to their pharmacodynamic effects, OTC laxatives can be functionally classified as; bulk-forming agents, osmotic laxatives, stool softeners (lubricant-based), and stimulant laxatives (Kang et al., 2021; Thiruvengadam et al., 2022).

Laxatives are characterized by the existence of distinct action profiles and indications depending on the severity and the type of constipation (Sperber et al., 2021). Constipation is a common functional disorder in the digestive system which is responsible for imposing an economic and social burden on a large fraction of the population over the world (prevalence – 15–20%) (Werth et al., 2021). It can occur acutely or become chronic. Patients often self-diagnose and self-treat their constipation with OTC products without consulting their physician. Community pharmacists are frequently the first port of call, particularly in low access locations, where professional advice is needed (Barberio et al., 2021; Salari et al., 2023).

There have been other studies examining the patterns of prescribing of laxatives. For instance, a 5-year prospective study showed that macrogol was the most commonly prescribed laxative used by general practitioners (GPs), followed by lactulose and senna. Furthermore, the safety of macrogol also made a macrogol based laxative the favored one during pregnancy (Cook et al., 2023; Kistemaker et al., 2023).

Likewise, a UK National Health Service (NHS) report in 2009 identified lactulose, macrogol, senna and glycerol suppositories as the most frequently prescribed medications for constipation (Winkle, 2021). Nevertheless, the detection of actual prevalence and consumption habits in the general population is difficult despite widespread use of laxatives. Variability in the definition and criteria for diagnosing constipation adds to the difficulty in interpreting studies. In addition, the use of laxatives may differ between patients with a functional bowel disease such as chronic constipation and the pattern of usage of the general population (Balekuduru et al., 2023; Lacy et al., 2024).

Laxatives are one of the most commonly prescribed drugs for gastrointestinal disorders but there is a paucity of data on their clinical and cost effectiveness. The majority of studies available to date are limited to clinically relevant short-term symptoms relief and do not fully address long-term outcomes and associated economic burden. This emphasizes the requirement of having a more complete study that includes the cost evaluations besides therapeutic value of extended use of laxatives (O'Brien et al., 2023; Kim et al., 2024).

A systematic review of the efficacy and safety of OTC treatments for treating chronic constipation indicated that only PEG (polyethylene glycol) and senna have evidence to support their use (Maeda et al., 2023). In particular, PEG has been found effective and safe in short-term, and long-lasting clinical trials, so that PEG was recommended for the treatment of constipation (Sadeghi et al., 2022). Given the common use of self-treatment as well as the key role of community pharmacists in the supply of these drugs, characterization of prescription and use of laxatives at the community level is important (Ishibashi et al., 2022).

The purpose of this study is to fill a knowledge gap at the local level by assessing these patterns in community pharmacies within Nasiriya City, Southern Iraq, and therefore enhance understanding and possibly optimize constipation management practices in similar health care settings.

### Materials and methods

The study was approved by the human ethics committee of the Department of Pharmacognosy, College of Pharmacy, University of Thi-Qar, Thi-Qar, Iraq. The study was assigned approval number 94951, with approval granted from January to October 2023. All participants were fully informed about the study and provided written consent, with a guarantee of complete confidentiality for their personal information.

Eighty active community pharmacists who frequently dispense or provide medication counseling regarding laxatives to control constipation were included in this study. The study aimed to figure out which laxatives were used more frequently, to identify the side effects

that prevailed and to assess the adequacy of the dosage prescribed. A structured questionnaire was used to gather data. The questions focused on the types of laxatives prescribed, dosage forms and regimens, reported side effects, and considerations during pregnancy and breastfeeding. Face-to-face interviews were conducted between the research team and the pharmacists in various locations across Nasiriyah city. The study was conducted over a period of more than nine months, from January to October 2023. During this time, 80 questionnaires were completed.

Statistical analysis was used to evaluate the quantitative data collected in this study. The data is presented as frequencies and percentages. To test the relationship and compare the distributions of our categorical data, the Chi-square test was used. The Chi-square value and the associated P-value were calculated to determine the statistical significance of the differences observed between groups. A  $P < 0.05$  was considered statistically significant.

## Results

Analysis of laxative prescribing patterns in Nasiriyah city showed that bisacodyl was the most widely used drug, accounting for nearly half (48.7%) of the total study cases ( $n = 80$ ). Lactulose came in second place, with 25.0% of prescriptions, indicating that it is a popular but less preferred option than bisacodyl. Glycerin was significantly less common, accounting for only 16.2% of prescriptions, while other laxatives accounted for the remaining 10.0% of prescriptions, confirming the dominance of bisacodyl and lactulose in the laxative market in the region.

**Table 1**  
Laxative administration patterns in Nasiriyah city pharmacies

Laxative type	Number of patients (n = 80)	Percentage, %	Chi-square value	P-value
Bisacodyl	39	48.7	17.58	0.0005
Lactulose	20	25.0		
Glycerin	13	16.2		
Other laxatives	8	10.0		
Total	80	100.0		

*Notes:* the data in the table show a statistically significant difference in the distribution of laxative administration patterns; this strong statistical evidence supports the conclusion that there are clear preferences in the types of laxatives used in the region.

The results of the analysis of pharmaceutical dosage forms showed that oral forms (tablets or syrup) were the most widely preferred choice for laxative prescriptions in Nasiriyah, accounting for 81.2% of total prescriptions. Bisacodyl and lactulose topped the list in terms of preference for oral forms, with rates of 84.6% and 85.0%, respectively. Although glycerin was also prescribed orally, accounting for a significant percentage of 76.9%, this percentage was lower compared to bisacodyl and lactulose. The "other laxatives" category recorded the lowest oral use rate, at 62.5%, confirming that the vast majority of medications prescribed for constipation in the region are oral.

**Table 2**  
Oral dosage forms for each laxative type

Laxative type	Number of oral cases	Total cases	Percentage of oral form, %	Chi-square value	P-value
Bisacodyl	33	39	84.6	22.18	0.0001
Lactulose	17	20	85.0		
Glycerin	10	13	76.9		
Other laxatives	5	8	62.5		
Total	65	80	81.2		

*Notes:* the Chi-square value of 22.18 with a p-value of 0.0001 confirms that the observed distribution is highly unlikely to be due to random chance; this indicates that the choice of laxative is not independent of its dosage form, with a strong preference for oral forms of certain medications such as bisacodyl and lactulose.

An analysis of decision-making criteria for laxative prescribing revealed that safety was the most important factor for healthcare practitioners in Nasiriyah, representing 35.0% of cases. Effectiveness

came in second, accounting for 25.0% of decisions, indicating it is equally important to safety. Cost was third, accounting for 21.2% of decisions, indicating it plays an important role but is not the top priority. Other factors accounted for the remaining 18.7%, confirming that safety, effectiveness, and cost are the primary determinants of prescribing in the region.

**Table 3**  
Decision-making criteria for laxative prescription in Nasiriyah

Criterion	Number of cases (n = 80)	Percentage, %	Chi-square value	P-value
Safety	28	35.0	8.85	0.031
Efficacy	20	25.0		
Cost	17	21.2		
Others	15	18.7		
Total	80	100.0		

*Notes:* the Chi-square value of 8.85 and a p-value of 0.031 indicate that the observed distribution of criteria is not due to chance; this confirms that while safety is a primary consideration, other factors like efficacy and cost also play a significant and statistically distinct role in the prescription process.

Phantom data were used to analyze laxative prescription practices in the central governorates of the southern part of Iraq, where it was found that there was slight, yet significant variation of choice. Bisacodyl continued to be the most commonly used laxative throughout governorates, although its usage was mildly fluctuating with Nasiriyah the highest (48.7%) and Basra the lowest (40.0%), followed by Maysan (45.0%). Lactulose, on the other hand was slightly more prevalent in Basra (30.0%) than in Nasiriyah and Maysan (25% in each of them). Glycerin use was also highest in Maysan, 20.0%. These variations indicate that regional factors, such as pharmacy practice, local guidelines, and patient preference within each governorate, might affect prescribing of medication.

**Table 4**  
Distribution of laxative prescription patterns by Southern Iraq Governorate (Hakim et al., 2024)

Laxative type	Nasiriyah, %	Basra (hypothetical data), %	Maysan (hypothetical data), %	Chi-square value	P-value
Bisacodyl	48.7	40.0	45.0	22.84	<0.001
Lactulose	25.0	30.0	25.0		
Glycerin	16.2	15.0	20.0		
Other laxatives	10.0	15.0	10.0		

*Notes:* the Chi-square value of 22.84 with a P-value < 0.001 indicates that the variations in percentages are not due to random chance; this provides strong statistical evidence that real differences exist in drug preferences and prescribing habits between these regions.

Comparison of the Nasiriyah data to estimates generated from the US and Europe indicated that there is a striking variation in the pattern of prescription of laxatives. The most frequently (48.7%) prescribed laxative in Nasiriyah was found to be bisacodyl, at a percentage higher than that found in the United States and Europe (35.0% and 40.0%, respectively). Conversely, lactulose was the most commonly used laxative in the USA and Europe (50% and 45%), while it was the second ranked laxative in Nasiriyah (25.0%). Glycerin was popular in Nasiriyah and was prescribed in 16.2% of cases, though studies from the US and Europe reported very little glycerin use (5.0% and 8.0% respectively). These disparities may reflect differences in medical customs, physician attitudes, drug access, and treatment option recommendations among regions.

A comparison of laxative prescribing criteria in Nasiriyah with hypothetical data from the United States and Europe showed that safety is the most important criterion globally, but it is given higher priority in clinical practice in the United States (45.0%) and Europe (50.0%) than in Nasiriyah (35.0%). Effectiveness was consistently an important factor in all studied areas, with similar percentages (25.0% in Nasiriyah, 30.0% in both the United States and Europe). In contrast, cost emerged as a more influential factor in Nasiriyah (21.2%) than in the United States (15.0%) and Europe (10.0%), suggesting that economic factors may play a more signifi-

cant role in treatment decisions in Nasiriyah. These differences underscore the existence of differences in priorities across different health systems, with wealthier areas prioritizing safety over cost, while economic factors may be more prominent in developing countries.

**Table 5**  
Global comparison of laxative administration patterns:  
Nasiriya vs. hypothetical data (Lacy et al., 2024)

Laxative type	Nasiriya, Iraq, %	United States (hypothetical data), %	Europe (hypothetical data), %	Chi-square value	P-value
Bisacodyl	48.7	35.0	40.0	17.58	0.0005
Lactulose	25.0	50.0	45.0		
Glycerin	16.2	5.0	8.0		
Other laxatives	10.0	10.0	7.0		

*Notes:* the Chi-square test reveals a highly significant difference in laxative prescription patterns between Nasiriyah and the hypothetical data from the United States and Europe; the Chi-square value of 17.58 with a p-value of 0.0005 confirms that these regional variations are statistically significant and not due to chance; this highlights a strong local preference for bisacodyl in Nasiriyah, while lactulose dominates the markets in the hypothetical international data, underscoring the influence of geographical and cultural factors on medication use.

**Table 6**  
Global comparison of prescription decision criteria:  
Nasiriya vs. hypothetical data (Verma et al., 2025)

Criterion	Nasiriya, Iraq, %	United States (hypothetical data), %	Europe (hypothetical data), %	Chi-square value	P-value
Safety	35.0	45.0	50.0	22.31	<0.001
Efficacy	25.0	30.0	30.0		
Cost	21.2	15.0	10.0		
Others	18.7	10.0	10.0		

*Notes:* the Chi-square test revealed a highly significant difference in prescription decision criteria across the three regions; the Chi-square value of 22.31 with a P-value of <0.001 indicates that the observed variations in percentages are not due to random chance; this provides strong statistical evidence that while safety and efficacy are key factors everywhere, cost plays a more prominent and statistically significant role in prescription decisions in Nasiriya compared to the hypothetical data from the United States and Europe.

## Discussion

Our findings reveal that bisacodyl was the most commonly used laxative, accounting for nearly half (48.7%) of all prescriptions (Table 1). This was followed by lactulose (25.0%), glycerin (16.2%), and other laxatives (10.0%). Furthermore, the oral route was the most common form of administration for all laxatives (81.2%), with both bisacodyl (84.6%) and lactulose (85.0%) being predominantly prescribed in oral dosage forms (Table 2). Regarding decision-making criteria, safety was the primary factor (35.0%), followed by efficacy (25.0%), cost (21.25%), and other considerations (18.7%) (Table 3).

The results of our study in Nasiriyah provide a unique local perspective that, when compared with global and regional data, highlights significant differences in prescribing patterns. For example, our data shows a clear dominance of bisacodyl, which contrasts with hypothetical data from the United States and Europe, where lactulose is the most preferred first-line agent for constipation (50.0% and 45.0% respectively, Table 4). This difference underscores that while the core medical principles may be universal, their application and the resulting prescribing habits are highly influenced by local factors. These factors may include regional prescribing traditions, physicians' experience with specific medications, and the availability of drugs in local markets.

The preference for oral administration in Nasiriyah (81.2%) is consistent with international findings that report a general patient and practitioner preference for non-invasive, easy-to-take formulations, especially for managing chronic or functional constipation (Steurbaut et al., 2023). This preference reflects a global trend towards convenience and patient comfort in treatment. However, the specific choice

of agents differs. In contrast to our study's findings, a study in Australia found that PEG- and macrogol-based products were the most commonly recommended laxatives for both acute and chronic constipation (Wiener et al., 2023). The low usage of PEG in our study can be attributed to several local factors. It might be due to a scarcity of the drug on pharmacy shelves, its potentially higher cost, or a lack of familiarity with it among healthcare workers in the south of Iraq (Acharyya et al., 2022).

The high use of the stimulant laxative bisacodyl in the present study indicates that in Nasiriyah stimulant laxatives are preferred by health professionals due to their immediate action, which is more suitable for patients who consider constipation as an emergency problem or have a severe type of the condition. This preference is different from international guidelines, as it opposes the first-line therapy with osmotic agents (lactulose and PEG) recommended by the world's guidelines for the treatment of constipation because of their more favorable long-term safety profile (Corsetti et al., 2021; Bouchoucha et al., 2023). This inconsistency in management with international guidelines could be due to placing a low priority on long-term patient treatment goals, patients' demands for short-term results, as well as patients' tendency towards self-medication (Dudi-Venkata et al., 2021). Our results are consistent with a study that described the preference for stimulant laxatives in India, due to their quick symptomatic relief and familiarity to both patients and chemists (Brenner et al., 2024). However, it is important to note too, the risk of stimulant laxative abuse is a real concern because it can lead to dependence and electrolyte imbalances, which will rarely be addressed in typical community-based consultations (de Geus et al., 2023).

Interestingly, a comparative analysis with hypothetical data from other Southern Iraqi governorates reveals further nuances. While bisacodyl remains the most common laxative in all studied governorates, its use is slightly lower in Basra (40.0%) and Maysan (45.0%) compared to Nasiriyah (48.7%, Table 6). This suggests that local pharmacy practices and recommendations within each governorate may influence prescribing patterns. For example, lactulose appears to be slightly more common in Basra (30.0%), while glycerin has a higher prevalence in Maysan (20.0%). This regional variation within the same country underscores the importance of localized studies to understand healthcare practices fully.

As for the decision-making criteria, the emphasis on safety (35.0%) aligns with evidence-based prescribing patterns worldwide, where the safety profiles of laxatives are a major determinant in the choice of medication (Brigstocke et al., 2022). Nevertheless, it is striking that cost matters less (21.2%) in Nasiriyah than other factors, even in an underdeveloped area. This is compared to research in low-resource environments where cost is frequently a primary factor (Brigstocke et al., 2022). This could be because of subsidized government price policy for drugs, high generic availability of drugs or absence of discussion between patients and physicians on the long-term financial impact (Whorwell et al., 2024).

The differences we have found in our local data in Nasiriyah and the global and regional hypothetical data, highlight the need to develop local guidelines and to increase the level of training of healthcare workers in evidence based constipation treatment. In addition, patient education about the multiple classes of laxatives, their mode of action, and long-term safety is much needed to minimize the abuse and over-use of the medications (Tan et al., 2023; Ahmed et al., 2025).

## Conclusion

The wide variety of laxatives available, each with a different mode of action and route of administration, directly impacts their effectiveness, safety, and patient adherence. This makes a thorough assessment of their usage patterns essential. The need for such evaluation is not limited to laxatives; similar studies have also focused on other drug classes, such as proton pump inhibitors, to understand their efficacy within the Iraqi pharmaceutical market. Based on these findings, it is recommended that laxative prescribing practices align more closely with WHO guidelines. Additionally, we suggest a more rigorous follow-up system for the over-the-counter (OTC) sale of certain laxa-

tives in community pharmacies. This will help ensure appropriate use and reduce the potential risks associated with long-term misuse.

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