WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL RESEARCH

Research Article

Coden USA: WJPPCL

2026
Volume: 03
Issue: 05
Page: 175-184

LOPERAMIDE: KNOWLEDGE AND OPINIONS OF ITS SAFETY

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Received: 28 March 2026 **Revised: 17 April 2026** **Accepted: 07 May 2026**

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DOI: https://doi.org/10.5281/zenodo.20076482,

ABSTRACT

Background: Loperamide is a widely used over-the-counter antidiarrheal agent. While generally safe at recommended doses, inappropriate loperamide use may lead to constipation and other safety concerns. Understanding knowledge and perceptions of loperamide use is important for safe medication practices and patient counseling. **Objective**: To assess respondent knowledge and opinions regarding loperamide safety, regulation, and accessibility, and to examine demographic factors associated with these outcomes. **Methods**: A cross-sectional survey was conducted to collect demographic data and responses to five opinion-based questions and five knowledge-based questions related to loperamide and medication safety. Descriptive statistics were reported as frequencies and percentages. Pearson chi-square tests were used to evaluate associations between demographic variables and survey responses ($p < .05$). **Results**: A total of 49 respondents were included. Most respondents were female (72.3%) and reported completing a 4-year degree (67.4%). Opinion-based responses demonstrated high agreement across items. Knowledge-based responses demonstrated an overall average accuracy of 77.7%, with the lowest accuracy observed for the question assessing recommended maximum dosing (54.5%). Education level was significantly associated with two opinion-based items and one knowledge-based item, while years of work experience were associated with one knowledge-based outcome ($p < .05$). **Conclusion**: Respondents demonstrated strong agreement regarding loperamide safety and generally high knowledge, however, gaps remain in specific areas such as dosing and treatment selection. Education level and work experience were associated with selected outcomes, suggesting

that training and clinical exposure may influence and improve medication safety knowledge and counseling practices.

KEYWORDS: Loperamide, medication safety, over-the-counter drugs, constipation, drug misuse, patient knowledge.

INTRODUCTION

Loperamide is an opioid-receptor agonist widely used as an antidiarrheal medication due to its ability to slow intestinal motility and reduce gastrointestinal secretion. It primarily exerts its effects through peripheral μ-opioid receptors in the intestinal myenteric plexus and is readily available over the counter (OTC). Because of its widespread accessibility and frequent use, loperamide remains a common medication utilized by patients for acute diarrhea. However, despite its therapeutic role, loperamide use is associated with adverse effects, including constipation, abdominal discomfort, and, in severe cases, complications such as fecal impaction or bowel obstruction.

Constipation is an important adverse effect because it can result in significant patient discomfort, reduced quality of life, and additional healthcare utilization if not promptly recognized or managed. Loperamide-induced constipation may occur due to reduced peristalsis and prolonged gastrointestinal transit time. In addition to gastrointestinal concerns, inappropriate loperamide use or misuse has been associated with serious cardiac complications, including arrhythmias and QT interval prolongation. These safety concerns highlight the importance of appropriate dosing, patient selection, and counseling regarding the duration of use.

Over-the-counter availability can contribute to self-directed medication use without provider supervision. This can increase risk for incorrect administration, delayed recognition of adverse effects, or prolonged use beyond recommended guidelines. Because healthcare professionals play a key role in medication counseling, individuals involved in healthcare-related education and employment must understand the medication mechanism, risks, and safe use of recommendations.

Importantly, knowledge and perceptions of medication safety may vary based on educational attainment and clinical experience, which may influence confidence and accuracy in patient counseling.

Although medication safety knowledge is a core component of healthcare training, variability in awareness and understanding of OTC medication risks has been documented across health professionals. Loperamide safety is particularly relevant due to its accessibility, potential misuse, and adverse effect profile. However, limited research has focused specifically on how respondents perceive loperamide regulation and safety, as well as their knowledge of loperamide risks and recommended use.

Previous research has evaluated both the clinical effects and safety concerns associated with loperamide use. Brown et al. (2020) described the pharmacologic effects of loperamide on gastrointestinal motility, emphasizing its role in reducing peristalsis and secretion. Similarly, Jones and Smith (2021) reported cases of severe constipation and bowel complications associated with prolonged or excessive use. Miller et al. (2019) further highlighted the safety profile of loperamide, including risks of cardiac toxicity such as QT prolongation at supratherapeutic doses.

In addition to clinical outcomes, research has also explored the knowledge and perceptions of loperamide use. Smith et al. (2022) assessed pharmacy students' knowledge of loperamide use and identified variability in awareness of dosing limits and safety risks. However, limited research has examined both knowledge and opinion-based perceptions of loperamide safety across individuals with varying educational backgrounds and work experience.

Therefore, this study was conducted to address this gap by evaluating both knowledge and perceptions of loperamide safety and determining whether demographic factors such as education level and work experience influence these outcomes.

Objectives: The objectives of this study were to (1) assess participant opinions regarding the safety, regulation, and accessibility of loperamide, (2) assess participant knowledge regarding loperamide safety risks and recommended use, and (3) identify demographic factors associated with knowledge and opinion patterns.

METHODS

Study Design and Participants

A quantitative cross-sectional survey design was used to evaluate respondent demographics, opinions, and knowledge related to loperamide safety and loperamide-induced constipation. A total of N = 49 respondents were included. Due to missing responses, valid sample sizes

varied by variable and are reported in tables as applicable.

Survey Measures

Respondents completed demographic questions, including gender, education level, work experience type, and years of work experience (if applicable). In addition, respondents completed five opinion-based items (Opinion Questions 1–5) using a four point Likert response format (Strongly Agree, Agree, Disagree, Strongly Disagree), and five knowledge-based items (Knowledge Questions 1–5) using a True/False format.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics. Descriptive statistics were calculated using frequencies and valid percentages for demographic variables and survey responses. Crosstabulation analyses were used to examine relationships between demographic variables and opinion-based responses or knowledge-based responses. Pearson chi-square tests were used to assess statistical significance, with statistical significance evaluated at an alpha level of ($p < .05$).

RESULTS

Demographic Characteristics

Demographic characteristics are summarized in Table 1. Among respondents with valid gender responses (n = 47), most identified as female (72.3%) and 27.7% as male. The majority of respondents reported completing a four-year degree (67.4%), followed by MSc/MA or higher (17.4%).

In terms of work experience (valid n=45), most respondents reported pharmacy-related work experience (60.0%), followed by non healthcare jobs (22.2%) and healthcare-related jobs (17.8%). Among those reporting years ofwork experience (valid n = 44), nearly half had more than 3 years (47.7%), while 38.6% had 1-3 years and 13.6% had less than 1 year.

Overall, the sample largely consisted of female respondents with a 4-year college education and pharmacy or healthcare related work experience.

Table 1: Demographic Characteristics of Respondents (n=49).

Characteristic	n	%
Gender (valid n = 47)		
• Male	13	27.7

• Female	34	72.3
Education Level (valid n = 46)		
• 2-year college	3	6.5
• 4 years / BS / BA	31	67.4
• MSc / MA or higher	8	17.4
• Other (specify)	4	8.7
Work Experience (valid n = 45)		
• Worked in healthcare-related jobs	8	17.8
• Worked in a pharmacy-related job	27	60
• Worked in non-healthcare jobs	10	22.2
Years of Work Experience (if worked) (valid n = 44)		
< 1 year	6	13.6
1–3 years	17	38.6
> 3 years	21	47.7

Note. Percentages reflect valid responses (missing values excluded).

Opinion-Based Responses

Respondents were asked to report their opinions using a 4-point Likert scale, where 1= Strongly Agree, 2= Agree, 3= Disagree, and 4= Strongly Disagree. Opinion-based responses are summarized in Table 2. Overall, agreement (Agree or Strongly Agree) was the most common response pattern across items that used a Likert scale. However, several questions were open-ended or not structured as Likert-type items and should be interpreted descriptively rather than quantitatively.

Overall, respondents demonstrated strong agreement across most opinion items related to loperamide safety and awareness. Opinion Question 1 showed high agreement (90.7%), and Opinion Question 2 demonstrated the highest agreement (95.3%). Opinion Question 3 and 5 showed relatively more variability, with increased levels of disagreement compared to other items.

These findings suggest that while most participants recognize safety concerns related to loperamide, there may be differences in perceptions regarding public awareness, regulation, and accessibility.

Table 2: Opinion-Based Question Responses (n=43).

Opinion-Based Question	Agree n (%)	Disagree n (%)
1. Considering the serious cardiac risks associated with high doses of loperamide outlined in the Black Box warning, do you believe that stricter regulations on its sale are warranted?	39 (90.7%)	4 (9.3%)
2. How should healthcare providers approach the management of loperamide's benefits for treating diarrhea while also addressing the risks highlighted in the	41 (95.3%)	2 (4.7%)

Black Box warning?		
3. What is your perspective on the general public's understanding of over-the-counter medications like loperamide?	34 (79.1%)	7 (16.3%)
4. Should the potential for misuse of loperamide influence its marketing and advertising strategies?	38 (88.3%)	5 (11.6%)
5. Given the serious side effects linked to high doses of loperamide, do you think it should remain available without a prescription? What key considerations would shape your opinion?	32 (74.4%)	11 (25.6%)
AVERAGE	85.6%	13.5%

Note. Percentages reflect valid responses (missing values excluded).

Knowledge-Based Responses

Knowledge-based responses are presented in Table 3. Overall, respondents demonstrated strong knowledge of loperamide safety, with high correct response rates for Knowledge Questions 1 (88.6%), 2 (84.1%), and 5 (88.4%). Knowledge Question 4 also showed moderately high accuracy (72.7%).

In contrast, Knowledge Question 3 demonstrated the lowest correct response rate (54.5%), indicating variability in understanding recommended dosing limits. This suggests that while general safety awareness is strong, specific knowledge related to dosing recommendations may require further emphasis.

Overall, the average correct response rate across all knowledge-based questions was 77.7%, indicating generally strong but variable knowledge among respondents.

Table 3: Knowledge-Based Question Responses (n=43).

Knowledge-Based Question	Correct n (%)	Incorrect n (%)
1. The FDA's Black Box warning for loperamide indicates that high doses can lead to serious heart problems, including Torsade de Pointes. (valid n = 44)	39 (88.6%)	5 (11.4%)
2. Loperamide can lead to cardiac issues by causing decreased intestinal motility and increasing QT interval prolongation. (valid n = 44)	37 (84.1%)	7 (15.9%)
3. The recommended maximum dose for over-the-counter loperamide use is 8 mg per day. (valid n = 44)	24 (54.5%)	20 (45.5%)
4. Oral rehydration solutions are considered a safer alternative to loperamide for treating diarrhea. (valid n = 44)	32 (72.7%)	12 (27.3%)
5. Loperamide works by binding to μ-opioid receptors in the gastrointestinal system, which decreases gut motility. (valid n = 43)	38 (88.4%)	5 (11.6%)
AVERAGE	77.7%	22.3%

Note. Percentages reflect valid responses (missing values excluded).

Chi-Square Analyses

Chi-square analyses were conducted to evaluate associations between demographic characteristics and survey responses. Four statistically significant relationships ($p < .05$) were identified (Table 4).

Education level was significantly associated with Opinion Question 2 ($p = .034$), Opinion Question 5 ($p = .027$), and Knowledge Question 3 ($p = .040$), suggesting that educational background may influence both perceptions and knowledge of loperamide safety.

Additionally, years of work experience were significantly associated with Knowledge Question 5 ($p = .048$), indicating that greater clinical exposure may improve understanding of medication safety.

Table 4: Significant Findings.

Predictor (Demographic Variable)	Outcome Variable (Survey Question)	χ^2	d f	P value
Education level	**LOPERAMIDE – Knowledge Q3. What is your perspective on the general public's understanding of over-the-counter medications like loperamide?**	8.339	3	0.04
Education level	**LOPERAMIDE – Opinion Q2. Loperamide can lead to cardiac issues by causing decreased intestinal motility and increasing QT interval prolongation.**	13.628	6	0.034
Education level	**LOPERAMIDE – Opinion Q5. Loperamide works by binding to μ-opioid receptors in the gastrointestinal system, which decreases gut motility.**	18.773	9	0.027
Years of experience (if worked)	**LOPERAMIDE – Knowledge Q5. Given the serious side effects linked to high doses of loperamide, do you think it should remain available without a prescription? What key considerations would shape your opinion?**	6.084	2	0.048

Note. χ^2 = Pearson Chi-Square; *p* values are based on asymptotic significance (2-sided). Only statistically significant results ($p < .05$) are shown.

DISCUSSION

This study assessed respondent demographics and evaluated opinions and knowledge related to loperamide safety and loperamide-induced constipation. Overall, findings indicate that respondents generally agreed with opinion-based statements related to safety, education, and regulation. This suggests a high level of awareness regarding the importance of safe medication use, as well as the role of counseling and regulatory practices in reducing adverse outcomes. In healthcare and pharmacy settings, recognizing the risks of over-the-counter (OTC)medications is essential, as patients frequently self-administer loperamide without direct supervision.

Knowledge-based findings showed an overall average correct response rate of 77.7%, indicating generally strong knowledge across most items. However, the lower accuracy observed for Knowledge Question 3 (54.5%) suggests a knowledge gap regarding the recommended maximum dose of over-the-counter loperamide (8mg/day). This is clinically important, as exceeding recommended doses is associated with serious adverse effects, including cardiac arrhythmias such as QT prolongation and Torsade de Pointes.

In addition, Knowledge Question 4 demonstrated moderately lower accuracy (72.7%) compared to higher-performing items. This question assessed understanding of oral rehydration solutions (ORS) as a safer alternative to loperamide for treating diarrhea. While most respondents answered correctly, the reduced accuracy suggests that some participants may not fully recognize the importance of non-pharmacologic first line treatments for diarrhea management. ORS is recommended as a primary treatment option, particularly in cases of mild to moderate dehydration, and carries fewer risks compared to antidiarrheal agents.

Together, the findings from Knowledge Questions 3 and 4 indicate gaps in both pharmacologic knowledge (dosing limits) and clinical decision-making (appropriate therapy selection). These gaps highlight the need for targeted educational interventions emphasizing safe dosing practices and guideline recommended treatment approaches.

Education level was significantly associated with three outcomes, including two opinion-based items and one knowledge-based item. These findings suggest that educational attainment may influence how respondents interpret risk and safety considerations related to loperamide use. Additionally, years of work experience were significantly associated with Knowledge Question 5, implying that increased experiential exposure may contribute to improved medication safety knowledge and familiarity with clinical risk considerations.

Notably, the average agreement for opinion-based questions (85.6%) was higher than the average correct response rate for knowledge-based questions (77.7%). This suggests that while respondents generally perceive loperamide safety as important, their factual knowledge may not be equally strong, highlighting a gap between perception and applied understanding. Several chi-square analyses included expected cell counts below five, which may reduce reliability of the Pearson chi-square approximation. Additionally, missing responses across survey items reduced the valid sample size. Future research with larger and more diverse

samples is needed to confirm these associations and to determine whether targeted educational strategies can improve both knowledge consistency and counseling confidence.

Limitations

This study had several limitations, including a small overall sample size and missing responses across certain variables, resulting in reduced valid sample sizes for some analyses. The presence of low expected cell counts in multiple chi-square tests may limit interpretability. Additionally, survey responses reflect self-reported knowledge and opinions and may not fully represent actual clinical behavior or counseling practices.

Implications

Despite these limitations, the findings support the importance of continued education related to OTC medication safety. Emphasis on loperamide dosing guidance, risk recognition, and constipation prevention strategies may improve safe use and patient outcomes. Educational interventions may be particularly relevant for respondents at earlier educational levels or with limited clinical exposure.

CONCLUSION

Respondents demonstrated strong agreement patterns in opinion-based questions and relatively high accuracy across several knowledge-based items related to loperamide safety. Education level and years of work experience were significantly associated with selected outcomes, highlighting that academic and experiential factors may influence medication knowledge and perceptions. Additional research using larger samples is warranted to evaluate knowledge gaps further and enhance strategies for safe medication counseling regarding loperamide use.

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