

Insights of Community Pharmacists on Melatonin Supplements: A Survey about Knowledge, Attitudes, and Safety Perceptions

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 <https://doi.org/10.60988/p.v38i3.313>

KEYWORDS:

Melatonin; community pharmacists; knowledge; Attitudes; Insomnia

ARTICLE INFO:

Received: March 5, 2026

Revised: March 23, 2026

Accepted: May 6, 2026

Available on line: October 18, 2026

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ABSTRACT

Introduction: Melatonin is well known to be a key component in the regulation of circadian rhythms and induction of sleep. **Objective:** The purpose of the study was to evaluate dispensing habits and knowledge of Iraqi pharmacists working in the community about melatonin supplements. **Methodology:** The study involved 200 licensed pharmacists practicing in various regions across Iraq. Data was collected through a structured Google Forms questionnaire. The questioner designed to gather both quantitative and qualitative information. The pharmacists' attitudes toward the safety and efficacy of melatonin supplements, as well as adverse drug reactions and drug-drug interactions, were evaluated together with their knowledge of melatonin. **Results:** a significant proportion of pharmacists prescribing melatonin (83.5%, $P < 0.01$). The primary indications for melatonin use were insomnia (67.5%) and to improve sleep quality (32.5%). About half (56.25%) of study pharmacists were aware about the interaction of melatonin with other drugs ($P = 0.049$). More people (72%) were aware of the detrimental impacts of melatonin ($p < 0.01$), and 73% of pharmacists agreed or strongly agreed that a patient's past medical history must be taken into account before melatonin is prescribed or dispensed. Most pharmacists believed that melatonin is effective in adult (73.5%) and paediatric sleep disorders (60%), however, only 54% agreed that melatonin is safe in general. **Conclusion:** This study reveals that while melatonin is widely perceived as effective. Its accessibility through over-the-counter self medication raises concerns about unsupervised use and potential misuse. Pharmacists are highly involved in counselling of patients especially on sleep hygiene and side effects. Nevertheless, they have gaps in their knowledge regarding melatonin interactions, which may affect their safe advice, particularly in their interactions with other drugs.

1. Introduction

Melatonin is an indoleamine hormone mainly synthesized and secreted by the pineal gland in brain¹. It is commonly known that melatonin is essential for controlling circadian rhythms and promoting the onset of sleep². Melatonin is well-recognized for its role in sleep; however, it has also been associated with a variety of physiological processes, including antioxidant defense, immune modulation, blood pressure, and reproduction³. Melatonin, primarily secreted and synthesized by the pineal gland. Melatonin serves as a critical signal of darkness, relaying information about the light-dark cycle to the body's internal timekeeper, the suprachiasmatic nucleus (SCN). This aids in aligning several physiological functions, such as sleep-wake cycles, hormone secretion, and body temperature, along the 24-hour environment⁴. During the evening, melatonin becomes elevated leading to sleepiness and sleep onset. It does it by binding melatonin receptors on the SCN and other brain areas and affecting the action of sleep-related neurotransmitters and brainwave activity⁵. Currently, it is available in many countries as a medication used in the treatment of circadian sleep disorders, jet lag, and shift work sleep disorder, and also as a dietary aid. Unlike some prescription sleep aids, melatonin is not addictive, as it does not cause physiologic dependence⁶. It is considered a dietary supplement and available as a prescription-only medicine in some countries, including Australia and the USA, and as an over-the-counter medicine in others, including the USA and Canada^{7,8}. Over-the-counter melatonin dosages vary from 0.3 mg to a maximum amount of 10 mg, however they usually fall between 0.3 and 3 mg⁹. The use of melatonin supplements has gained popularity in recent years, particularly for addressing sleep-related issues. In this age of ubiquitous social media, recommendations from colleagues and friends on social media platforms such as Facebook, Instagram, Twitter, and WhatsApp have a greater influence on users' purchasing decisions¹⁰⁻¹². The purpose of this study was to evaluate Iraqi com-

munity pharmacists' awareness about melatonin supplements and their distribution behaviours. Identify melatonin adverse medication reactions and describe the typical melatonin supplement forms that community pharmacists have reported.

2. Methodology

2.1. Study Design and Participants

From July to September 2024, a cross-sectional survey was carried out to assess the dispensing practices and knowledge of pharmacists in Iraq regarding melatonin. Data was collected through a structured Google Forms questionnaire, designed to gather both quantitative and qualitative information.

2.2. Ethical approval

The proposal of this study was examined and approved by Ethical committee of the college of pharmacy, Mustansiriyah University. Before accessing the survey items, an electronic consent was provided to Participants. All community pharmacists volunteers were required to provide explicit consent by selecting the 'I agree' option to proceed to the questionnaire. To ensure confidentiality, no personal data were collected and all data underwent anonymization.

2.3. Participants and selection criteria

The study involved 200 licensed pharmacists practicing in various regions across Iraq.

For all participants to be included in this study, must have a valid license in pharmacy. They also should be actively practicing for at least six months in community pharmacies. A total of 216 pharmacists were invited to fill the questionnaire, only 200 of them completed the survey.

2.4. Questionnaire

To collect all possible questions, a questionnaire

was established after an exhaustive search of PubMed for published articles, followed by a detailed discussion and validation by a panel of experts in the field of study. A pilot study was carried out with 15 pharmacists that were not involved in the study and the Cronbach's alpha coefficient was 0.82 for sections of knowledge and attitudes, which indicate a good reliability.

The questionnaire was divided into a number of sections. The first part analysed the demographic data of pharmacists and their expert. The next sections assessed the knowledge of pharmacists on the melatonin such as their attitude towards its efficacy, safety, adverse drug reactions and drug-drug interactions. Dispensing practices as well as the strength and dosage form of melatonin were also discussed in the survey. Moreover, the survey checked the pharmacist counselling strategies on use of melatonin. The obtained data analysed to reveal the knowledge and practice of pharmacists regarding melatonin.

2.5. Statistical Analysis:

In order to determine the effect of various variables in the study parameters, Statistical Packages of social sciences (SPSS) version 2019 software was used. To compare group means, the Least Significant Difference (LSD) test and T-test were used. Further, chi-square test was done to test significant variation in proportions. Frequency distributions resulting from this were normalized by dividing each frequency with the total sample size of 200, after each number is multiplied by the relative weightings of strong (5), agree (4), neutral (3), disagree (2), and strongly disagree (1) using the rank/likert scale and relative importance.

3. Results

The demographic characteristics of the participating pharmacists are presented in Table 1. The p-values compared to hypothesis of equal distribution, no significance differences were observed between genders, while for pharmacists education

there was a significant difference ($P=0.0001$).

Table 2 reports a significant proportion of pharmacists prescribing melatonin (83.5%), indicating their active role in melatonin access. Melatonin supplements are most commonly purchased through patient self-medication over-the-counter (59.22%), followed by pharmacist recommendations (32.15%). The primary indications for melatonin use were insomnia (67.5%) and to improve sleep quality (32.5%). The 5mg dose was the most frequently dispensed dose of melatonin (54%), with other doses including 1mg (20.5%), 3mg (19.5%). The most common dosage form of melatonin supplements reported was gelatine (69.30%).

Table 3 presents the pharmacists' knowledge and experience regarding the drug-drug interaction and adverse drug reactions of melatonin supplements. 56.25% of study pharmacists were aware about the interaction of melatonin with other drugs while 43.75% were not. A larger number (72%) were aware about melatonin adverse effects. Overall, only 25.5% of pharmacists reported observing adverse drug reactions (ADRs) in the past three months.

Table 4 demonstrates the points of view of community pharmacists regarding the efficacy and safety of using melatonin supplements to treat sleep disorders. Seventy-three percent of pharmacists agreed or strongly agreed that a patient's past medical history must be taken into account before melatonin is prescribed or dispensed. Most pharmacists believed that melatonin is effective in adult (73.5%) and paediatric sleep disorders (60%), however, only 54% agreed that melatonin is safe in general. A notable proportion of pharmacists (37%) agreed that melatonin supplements have been misused.

Table 5 shows the prevalence of melatonin-related pharmacist counseling techniques. Most pharmacists reported providing patients with additional information, such as information about consumer medications (167 out of 200), effects

Table 1. Demographic Characteristics of Participants

Variable	Mean	N	(%)	P value
Age	26.85 ±5.33			
Gender				
Male		90	45%	0.1573 NS
Female		110	55%	
Pharmacist educations				
Pharm BSc		No	%	0.0001 **
Master of Science:		168	84 %	
PhD:		15	7.5%	
Higher diploma:		6	3%	
		11	5.5%	
Practical experience in pharmacy (years)	4.12 ±4.87			

** (P≤0.01), NS: Non-Significant.

on driving ability (169 out of 200), additional sleep hygiene techniques (192 out of 200), and counselling on melatonin administration time was also frequently reported (191 out of 200).

4. Discussion

The rising incidence of sleep disorders and the growing recognition of the significance of sleep for general health and well-being have led to the rise in popularity of melatonin supplements in Iraq and many other parts of the world. As such, customers frequently approach community pharmacists seeking advice on melatonin supplements. This research emphasizes the significance of healthcare professionals, particularly pharmacists, in ensuring the proper administration of Melatonin supplements. The results indicate the need to have pharmacists be interested in the specific educational programs that would help them to improve their awareness of melatonin supplements and their respective advantages.

The current research participants had a mean age of 26.85 ±5.33 indicating that the current pharmacists in Iraq are up to date with recent

melatonin guidelines. The mean experience of the participants was 4 years, which implies a relatively young group of pharmacists without much experience but up-to-date knowledge.

The level of awareness and knowledge of the community pharmacists about melatonin supplements and their dispensing habits in Iraq are all important variables that can influence the health of the population. There were challenges and concerns linked with clinical pharmacology education among the community pharmacists with the need of significant improvement and education in the field¹³.

Regarding the factors affecting the pharmaceutical knowledge of community pharmacists, which needs significant strengthening and training.

The majority (83.5%) of participants reported prescribing melatonin supplements, highlighting pharmacists' active role in melatonin recommendation. Over-the- Counter (OTC) purchase was the most frequent method (59.22%), Indicating easy access but raising misuse concerns. Another study by Tobaiqy et al was also frequently mentioned the patient self-medication¹⁴.

The primary Indication for melatonin uses in

Table 2. The dispensing patterns, indications, and common forms of melatonin supplements reported by community pharmacists.

Variable	Frequency (%)
prescribing melatonin by the pharmacist:	83.5%
Melatonin supplements most commonly purchased according to the following:	
Physicians' prescription	8.63%
Pharmacists' recommendation	32.15%
Patient self-medication OTC	59.22%
causes of melatonin indications:	
Insomnia	67.5%
Better sleep quality	32.5%
dispensed dose of melatonin supplement by community pharmacist:	
1 mg	20.5%
3 mg	19.5%
5 mg	54%
10 mg	6%
dosage forms reported by community pharmacist:	
gummies	69.30%
tablets	18.26%
capsules	10.37%
syrup	2.07%

this study was insomnia (67.5%), aligning with the Common perception of melatonin as a sleep aid. Another indication mentioned was better sleep quality (32.5%). Similarly, another study reported that the most frequent reason of sleep disorder was insomnia.¹⁴ The present study showed the common dose of melatonin prescribed was 5mg (%54) suggesting a typical dosage recommendation among Iraqi pharmacists. Clinical evaluations suggest that melatonin dosages ranging from 1 to 6 mg can help older persons with their sleep issues.^{15,16}

Further research discovered that dosages ranging from 0.5 to 5 mg were equally efficacious¹³. Larger melatonin dosages, however, could result

in more drowsiness. Daily doses of melatonin in clinical trials varied from 0.15 mg to 12 mg ^{17,18}

Community pharmacists need to be aware of the potential interactions between melatonin and other medications or health conditions. Inadequate knowledge in this area may result in the dispensing of melatonin to patients who should not use it due to contraindications or potential adverse reactions. Therefore, community pharmacists need to proactively educate themselves on the potential interactions of melatonin with other medications and conditions to ensure safe and appropriate dispensing practices¹⁴

This sub-majority awareness is concerning and could lead to inappropriate recommendations on

Table 3. Knowledge about drug-drug interaction and adverse drug reactions of melatonin supplements reported by community pharmacists.

Question	Response	P value
Are you aware the drug–drug interactions of melatonin supplements?	Yes: 56.25% No: 43.75%	0.0492 *
Are you aware the adverse drug reactions of melatonin supplements?	Yes: 72% No: 28%	0.0001 **
Have you observed any adverse drug reactions (ADRs) associated with the use of melatonin supplements in the last three months?	Yes: 25.5% No: 74.5%	0.0001 **

Table 4. Community Pharmacists' attitudes toward safety and effectiveness of Melatonin

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Mean±SD	Rank
Should take past medical history before melatonin dispensing	32%	41%	20.5%	5%	1.5%	3.97±0.42	1
Melatonin is effective for adult sleep disorders	17.5%	56%	21%	4%	1.5%	3.84 ±0.37	3
Melatonin is effective for pediatric sleep disorders	12.5%	47.5%	27%	11%	2%	3.58 ±0.39	4
Melatonin is safe in general	8%	46%	30%	15%	1%	3.45± 0.27	5
Melatonin supplements have been misused	37%	32.5%	21.5%	7.5%	1.5%	3.96 ±0.41	2
L.S.D (T test)	--	--	--	--	--	0.446 *	--

* (P≤0.05).

concomitant medications. A larger number (72%) were aware about melatonin adverse effects. On-about half of this study pharmacists (56.25%) were aware about the interaction of melatonin

with other drugs.

About quarter of study community pharmacist (25.5%) reported adverse reactions with melatonin use. In Comparison, a study by Tobaiqy et al.

Table 5. Frequency of pharmacist counselling strategies in relation to melatonin use

counselling strategies	Number of Survey Respondents	P value
Provide additional information (e.g., consumer medicines information)	Yes: 167 No: 33	0.0001 **
Counsel on the effects on driving ability	Yes: 169 No: 31	0.0001 **
Counsel on additional sleep hygiene techniques	Yes: 192 No: 8	0.0001 **
Melatonin administration time	Yes: 191 No: 9	0.0001 **

** ($P \leq 0.01$).

reported the adverse effect in (7.7%) melatonin consumers¹⁴, which could be due to possible underreporting or larger patient sample.

A research study carried out in Jordan identified lapses in the knowledge and awareness levels of community pharmacists on melatonin supplement. Pharmacists showed a poor level of knowledge of the proper indications, dosage and possible side effects, which may result in inappropriate dispensing and the inadequacy in counselling and hence undermined the safety and effectiveness of melatonin supplementation¹³.

Most of the participants stated that melatonin is suitable in management of sleep disturbance in both adults and children, hence the generally accepted notion that it is safe and effective. In terms of safety, research conducted by Besag suggests that almost half of the participants approved the idea that melatonin is equally safe in the short term¹⁹. The majority of the pharmacists, who participated in this study, understood that the use of melatonin supplements was abused, which was associated with the incorrect self-prescription. Community pharmacists can reduce overuse by educating and advising patients on how to consume over the counter drugs, including melatonin. Also, pharmacists are expected to watch possible drug interactions and provide patients with recommendations regarding usage of OTC and prescription drugs at the same time^{17,20,21}.

The programs of continuing education and training are also very important to strengthen the knowledge and awareness of melatonin supplements among pharmacists. Engaging in these programs would help the pharmacists keep up with the most recent research, guidelines, and recommendations on melatonin. Furthermore, the programs provide pharmacists with the required apparel to effectively discuss with patients who are requesting melatonin supplements, hence, offer the right information, tips, and counselling²². There are many limitations that were addressed during this study, as for cross sectional study can't establish causality and small number of participants limited the generalisability of the findings to all pharmacists in Iraq, so a future longitudinal studies with larger, randomised samples are recommended.

5. Conclusion

The current study proved that melatonin is generally considered to be effective, especially in the standard administration of 5 mg. However, its availability as over-the-counter self-medication is also a cause of concern in terms of both unsupervised use and misuse. Pharmacists being mostly early-career workers with a median age of 26 years report a considerable activity in patient counselling, particularly on sleep hygiene and ad-

verse effect profiles. Nevertheless, some gaps in knowledge persist when it comes to the interaction of melatonin since only 56.25% awareness is achieved and this could lead to compromising the safety of recommendation especially when melatonin is used co-concomitantly with other medications.

Though most pharmacists agree with the ef-

fectiveness of melatonin for sleep disorders, the opinion on its safety is mixed. This explains why there is a need to balance access with holistic education. Finally, the current study is in support of a collaborative approach, which incorporates pharmacist proficiency, patient education, and ongoing investigative research to see that melatonin could be a safe and efficient tool in sleep control.

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