Wah Academia Journal of Health and Nutrition

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Original Article

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Awareness of Food and Drug Interactions Among Staff Nurses: A Cross-Sectional Study at Fatima Memorial Hospital, Lahore

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Article Information

Received 9 Jan 2026

Accepted 9 Mar 2026

Available online 30 Mar 2026

Keywords: Food–drug interactions, Staff Nurses, therapeutic failure

Abstract

Background: Food–drug interactions (FDIs) significantly influence drug effectiveness and patient safety by altering drug absorption, metabolism, distribution, or excretion, potentially resulting in therapeutic failure or adverse drug reactions. Nurses, as primary medication administrators, must possess adequate knowledge of FDIs to ensure safe and effective patient care. **Objective:** To assess the level of awareness regarding food–drug interactions among staff nurses working in a clinical setting. Methods: A cross-sectional descriptive study was conducted at Fatima Memorial Hospital, Lahore. A total of 115 registered nurses were selected through convenient sampling. Data were collected using a structured questionnaire comprising demographic variables and knowledge-related items on FDIs, including general awareness, drug–drug interactions, and timing of drug administration. Data were analyzed using SPSS version 21.0 with descriptive statistics and Pearson correlation tests. **Results:** The findings showed that 68% of nurses had moderate awareness, 12% demonstrated good awareness, and 20% had poor knowledge of FDIs. The mean awareness score was 17.68 ± 2.98, with a mean percentage score of 57.05%. No significant association was found between awareness level and demographic variables such as education and professional experience. **Conclusion:** Most nurses demonstrated only moderate awareness of food–drug interactions, with notable knowledge gaps in drug-specific interactions and timing of administration. Targeted educational interventions are recommended to enhance nurses' knowledge and promote safer, evidence-based medication practices, ultimately improving patient outcomes and reducing adverse effects.

Introduction

A food–drug interaction occurs when a drug and a food or nutrient have a physical, chemical, or physiological relationship [5]. Food can directly affect the pharmacokinetics of a drug (such as absorption and excretion) as well as its pharmacodynamics (mechanism of drug action) [3]. According to the Food and Drug Administration (FDA), a food–drug interaction is an event in which a food influences a drug's activity; for example, the effects may be increased or decreased, or a new effect may occur that would not happen if the food were not consumed [16]. Many factors related to both food composition and medication characteristics influence how food affects the effectiveness of a drug [20].

The interaction between an administered drug and food components may lead to either an increase or decrease in drug efficacy [13]. Food–drug interactions include clinically significant effects such as altered absorption, modified metabolism, increased side effects, or reduced therapeutic action [12]. Adverse drug reactions are a major cause of hospital readmissions and can contribute to mortality in both developing and developed countries, placing a heavy burden on healthcare systems [1]. Registered nurses play an important role in preventing food–drug interactions in patients. Preventing such events requires adequate knowledge and understanding of food–drug interactions [2]. The degree of interaction depends on the physical and chemical nature of the drug, its formulation, the type of meal, and the time interval between eating and dosing [18]. A better understanding of food–drug interactions among nurses can significantly reduce their incidence and improve the quality of healthcare delivery [7]. To anticipate and avoid these interactions, it is essential to understand how different foods and beverages affect drug absorption, distribution, metabolism, and excretion. Greater professional awareness and education in this area help ensure safer and more effective patient care.

https://doi.org/10.63954/kqvvgn36

Methodology: A descriptive cross-sectional design was used among registered nurses at Fatima Memorial Hospital, with a convenience sample of 115 nurses calculated using Slovin's formula. Eligible participants included licensed registered nurses with at least one year of experience and direct patient monitoring roles, while those unwilling or previously involved in similar studies were excluded. Data were collected using an adapted, validated questionnaire covering demographics and knowledge of food–drug interactions and drug–food timing, with 34 scored items; pilot testing showed good reliability (α = 0.85). Printed anonymous questionnaires were distributed after informed consent, requiring about 8–10 minutes to complete. Data were analyzed in SPSS v21 using Pearson correlation to assess relationships between demographics and awareness scores. Ethical approval was obtained, confidentiality was maintained, and participation was voluntary with minimal risk.

Results

Table 1: Demographic Characteristics of Nurses (N=115).		
Gender	**n**	**%**
Male	17	14.8
Female	98	85.2
Age		
<25	37	32.2
26-35	64	55.7
36-45	10	8.7
>45	4	3.5
Highest education level		
Diploma holder	14	12.2
Undergraduate degree	44	38.3
Postgraduate degree	57	49.6
Years of Experience		
<5 years	74	64.3
5-10	26	22.6
11-15	8	7.0
>15	7	6.1

Table 1 shows the demographic profile of the nurses in which a huge proportion of the females 98 (85.2%) while only 17(14.87%) were males. Most of the respondents 64 (55.7%) falls within the age group of 25 to 35 years. Education level of the majority of the nurses 57(49.6%) were postgraduate degrees. Working experience of most the participants 74 (64.3 %,) was <5 years.

Table 2: Percentage categories of the awareness level of Nurses regarding Food- Drug Interaction	
Awareness status	**Percentage**
Good Awareness level	> 75%
Moderate Awareness level	50-75%
Poor Awareness level	< 50%

The overall Awareness level regarding food drug interaction was categorized using bloom cutoff value in which >75% show Good Awareness level, 50-75% show Moderate Awareness level and < 50% show Poor Awareness level of nurses regarding food drug interaction as shown in the table 2.

Table 4: Bivariate correlation between highest education level and years of experience with Awareness Score.				
	Awareness Score			
	N	**Mean± SD**	**Pearson correlation**	**p- value**
Highest education Level	115	2.37 0.69	0.019	0.839
Level of experience	115	1.54 0.87	0.040	0.675
Correlation is significant at the 0.01 level (2-tailed).				

A Pearson correlation analysis was performed to check the correlation between highest education level and years of experience with Awareness score. There was no correlation found between highest education level and Level of experience with Awareness score ($p<0.05$) as shown in the table 4.

Table 5: Awareness of nurses regarding Food-Drug Interaction (FDI)			
Sr #	**Statement**	**n**	**%**
1	**Food-Drug Interaction (FDI) includes drug interactions with**		
	Diet	9	7.8
	Iron/Vitamin Supplements	22	19.1
	Alcohol & Fruit juice	2	1.7
	All of these	82	71.3
2	**Food can speed up/slow down drug actions**		
	Yes	108	93.9
	No	7	6.1
3	**Foods most commonly interfere with drug at**		
	Absorption	105	91.3
	Distribution	2	1.7
	Metabolism	7	6.1
	Excretion	1	0.9

Table 5 shows the awareness of nurses regarding Food-Drug Interaction (FDI) in which an overwhelming proportion of nurses 82 (71.3%) were aware that FDI interact with all food including diet, iron/vitamin and fruit juices. Moreover, 108 (93.9%) nurses accepted that food can modify the speed of action of a drug. Similarly, 105 (91.3%) nurses agreed that absorption was the most common interaction between food and drug.

Table 6: FDI Knowledge at Individual Drug Level	
Drug / Interaction Topic	**Yes %**
Fluoroquinolones–milk/iron	85.2
Linezolid–aged cheese/liver	78.3
Acidic foods with antibiotics	42.6
Tetracycline–dairy	74.8
Itraconazole after meals	57.4
Fatty diet–HCTZ/albendazole	71.3
Fiber–digoxin	35.7
Garlic–antihypertensives	82.6
Lisinopril–bananas	40.0
Carvedilol empty stomach	31.3

Spironolactone–K foods	71.3
Cranberry–warfarin	39.1
Warfarin–green vegetables	81.7
NSAIDs–caffeine foods	21.7
Caffeine–theophylline	80.0
L-thyroxine–goitrogenic foods	63.5
Grapefruit–drug interaction	74.8
Diet–levodopa	40.9
Fatty meals–esomeprazole	34.8
Tube feeding–L-thyroxine	64.3
Tube feeding–phenytoin	59.1
Alendronate empty stomach	60.9

Table 6 shows that nurses demonstrated good Awareness of key drug-food interactions, with 85.2% aware of avoiding dairy with fluoroquinolones and 74.8% with tetracycline. Similarly, 82.6% recognized that garlic enhances the effects of antihypertensive drugs. However, Awareness gaps were evident, and just 57.4% knew itraconazole should be taken after meals and 59.1% knew that Protein and fat-rich meals does not enhance levodopa absorption. Misconceptions were also noted regarding cranberry juice and warfarin interactions, and the interaction between acidic foods and antibiotics.

Table 7: FDI Knowledge – Drug Administration Timing

Drug / Statement	Majority Response
Lansoprazole	Before meal – 97.4%
Glipizide / Rifafour	Before meal – 53%
NSAIDs / Steroids	After meal – 86.1%
Rivaroxaban (≥15 mg)	After meal – 60.9%
Levothyroxine	Before meal – 81.7%
Metformin / Gliclazide MR	After meal – 53.9%
Genvoya	After meal – 73%
Furosemide	After meal – 77.4%
Cinacalcet	After meal – 58.3%

Table 7 shows that most nurses correctly identified the appropriate timing for drugs like lansoprazole (97.4% before meals) and levothyroxine (81.7% before meals). However, significant gaps were observed for drugs such as furosemide, where only 22.6% knew it should be taken before meals. Mixed responses were also seen for metformin and gliclazide, Glipizide and Rifafour indicating inconsistent Awareness of administration timing.

Discussion: The discussion interprets and contextualizes the study findings by relating them to existing evidence and explaining their practical implications. The present study evaluated nurses' knowledge and awareness of food–drug interactions (FDIs) in a healthcare setting. Because nurses are directly involved in medication administration and patient education, their ability to recognize FDIs is essential for patient safety and optimal therapeutic outcomes. The study examined general knowledge, awareness of specific drug interactions, and understanding of the correct timing of medication administration.

The findings indicate that nurses demonstrated a moderate overall level of knowledge. Most participants scored within the mid-range, while only a small proportion showed a high level of knowledge. This pattern is consistent with several previous studies conducted in critical care and public hospital settings that also reported moderate awareness among nurses [14]. However, some tertiary-care studies have reported higher knowledge levels [17]. These variations may be explained by differences in academic preparation, institutional focus on pharmacology training, access to updated clinical guidelines, and the availability of continuing professional education programs [10].

Encouragingly, most nurses in this study understood that food can alter drug action. This agrees with earlier research showing that the majority of nurses are aware of the general concept of food–drug interactions. Nevertheless, other studies suggest that although nurses often recognize the concept, fewer are able to explain the specific mechanisms involved [9]. This indicates that conceptual awareness may be present, but deeper pharmacological understanding is still limited [8].

With regard to drug-specific knowledge, participants showed a reasonable understanding of itraconazole administration, which aligns with findings from several hospital-based studies. However, some international studies have reported substantially higher correct response rates for drug-specific items, suggesting that structured drug education, formulary exposure, and prescribing trends may influence knowledge levels [6].

The study also revealed inconsistencies in knowledge about the correct timing of medication administration in relation to meals. Only a minority of nurses correctly identified the timing for certain medications, while knowledge was better for more commonly emphasized drugs. Similar inconsistencies have been observed in other settings, where nurses performed better on frequently used medications but showed gaps with less commonly discussed ones [19]. More consistent knowledge reported in some institutions may be linked to regular in-service education and formal medication safety training [4]. Correlation analysis showed no significant association between awareness scores and either education level or years of professional experience. This suggests that experience alone does not guarantee better knowledge of FDIs. While some previous studies report similar findings, others have found a positive relationship between higher

https://doi.org/10.63954/kqvvgn36

education and awareness [11]. Such differences may be due to variation in study populations, professional roles, institutional training culture, sample size, and measurement tools [15].

Conclusion: The study highlights that while nurses possess a moderate level of awareness regarding food-drug interactions, significant gaps remain in their understanding of specific interactions and appropriate medication administration timing. The absence of a significant correlation between awareness and either education level or clinical experience suggests that formal qualifications and work tenure alone are not sufficient to ensure competency in this area. These findings underscore the need for structured, continuous education and practical training on FDIs within nursing curricula and professional development programs. Addressing these gaps is essential to enhance patient safety, optimize pharmacological outcomes, and support nurses in delivering evidence-based care.

Conflict of Interest: NIL

Funding Sources: NIL

References

[1] Agbaza-Mogbojuri B, Onwubuyah AO. Understanding the public health burden of hospital readmissions in resource-limited health systems. Int J Biol Pharm Sci Arch. 2023;5(1):97–109.

[2] Beirão S, Costa JG, Ferreira-Pêgo C. Assessing knowledge and awareness of food and drug interactions among nutrition sciences students: Implications for education and clinical practice. Nutr Health. 2025;31(3):995–1002.

[3] Cheng L, Wong H. Food effects on oral drug absorption: Application of physiologically-based pharmacokinetic modeling as a predictive tool. Pharmaceutics. 2020;12(7):672.

[4] Chiumia F, Dzabala N, Ndalama A, Sambakunsi C, Raguenaud ME, Merle C, et al. Impact of in-service training on the knowledge, attitude, and practice of pharmacovigilance in Malawi: A cross-sectional mixed methods study. Malawi Med J. 2024;36(3):163.

[5] D'Alessandro C, Benedetti A, Di Paolo A, Giannese D, Cupisti A. Interactions between food and drugs, and nutritional status in renal patients: A narrative review. Nutrients. 2022;14(1):212.

[6] Dean EB, Feng J, Maini L. Stocking under the influence: Spillovers from commercial drug coverage to Medicare utilization. SSRN [Preprint]. 2023.

[7] Degefu N, Getachew M, Amare F. Knowledge of drug–food interactions among healthcare professionals working in public hospitals in Ethiopia. J Multidiscip Healthc. 2022:2635–2645.

[8] Elajez R, Alkhawaja R, Kehyayan V, Shukaili KA, Swallmeh E. Knowledge, attitudes, and awareness of food and drug interactions among nurses on general medical wards: A cross-sectional study. SAGE Open Nurs. 2024; 10:23779608241280847.

[9] Lewis CC, Boyd MR, Walsh-Bailey C, Lyon AR, Beidas R, Mittman B, et al. A systematic review of empirical studies examining mechanisms of implementation in health. Implement Sci. 2020;15(1):21.

[10] Magwenya RH, Ross AJ, Ngatiane LS. Continuing professional development in the last decade—a scoping review. J Adult Contin Educ. 2023;29(2):408–437.

[11] Manolis EN, Manoli EN. Raising awareness of the sustainable development goals through ecological projects in higher education. J Clean Prod. 2021; 279:123614.

[12] RangaPriya M. Impact of drug–drug and drug-food interactions in pharmacotherapy. Int J. 2024;7(4):849.

[13] Stielow M, Witczyńska A, Kubryń N, Fijałkowski Ł, Nowaczyk J, Nowaczyk A. The bioavailability of drugs—the current state of knowledge. Molecules. 2023;28(24):8038.

[14] Sweity EM, Salahat AM, Sada AA, Aswad A, Zabin LM, Zyoud SH. Knowledge, attitude, practice and perceived barriers of nurses working in intensive care unit on pain management of critically ill patients: A cross-sectional study. BMC Nurs. 2022;21(1):202.

[15] Tabassum S, Siddiqui IH, Bhawani D, Zaman M. The role of training in shaping institutional culture and staff attitudes in higher education. Int J Soc Sci Entrep. 2024;4(4):81–107.

[16] Vuong M, González Aragón C, Montarroyos SS. Common food and drug interactions. Pediatr Rev. 2023;44(2):68–80.

[17] Walia A, Sharma KK, Garg R, Das S. A descriptive study to assess the knowledge, attitude, practices, perceived barriers, and support regarding palliative care and end-of-life care among critical care nurses of tertiary care medical institute. Indian J Palliat Care. 2020;26(4):479.

[18] Wang Z, Xu W, Liu D, Li X, Liu S, Wu X, et al. Impact of food physical properties on oral drug absorption: A comprehensive review. Drug Des Devel Ther. 2025:267–280.

[19] Yin C, He X, Shen K, Mu X, Tang F. Knowledge and behavior in rational drug use among college students in Zunyi City. Risk Manag Healthc Policy. 2022:121–131.

[20] Zhang P. Influence of foods and nutrition on the gut microbiome and implications for intestinal health. Int J Mol Sci. 2022;23(17):9588.

Declarations:

Authors' Contribution:

- All Authors Conceptualization, data collection, interpretation, drafting of the manuscript and intellectual revisions
- The authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed

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