Journal of
Clinical and Pharmaceutical Research
RESEARCH ARTICLE OPEN ACCESS

A Study on the Assessment of Knowledge and Awareness towards Drug-Food Interactions among Pharmacy Students

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ARTICLE INFO

Article History:
Received: 02.08.2022
Revised: 15.09.2022
Accepted: 09.10.2022

Keywords :
Drug-Food Interaction
Drug action
Pharmacy

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ABSTRACT

Aim: To evaluate the knowledge and awareness towards the drug-food interactions among the Indian pharmacy students.

Materials and Methods: A total of 132 pharmacy students were participated in this study by filling the knowledge and awareness questionnaire. In this study the questionnaire was divided into 2 categories that include the evaluation of knowledge and awareness. The knowledge of study participants were graded into good (8-10) moderate (5-7) and poor ($\geq$ 4).

Results: A total of 132 pharmacy students were participated in the study and among the 43 (32.6%) were found to be males and 89 (67.4%) were found to be females. In this study, 43.2% of the study participants were having good knowledge 53.8% of the study participants were having moderate knowledge and the remianing 3% of the study participants were having poor knowledge about drug-food interactions. About 71 (53.3%) of the study participants had the awareness regarding the usage of the hand book on software programme in order to check the drug interactions before taking them. About 130 (98.5%) of the study participants, felt that the doctors and the pharmacists should update their knowledge about the drug interactions.

Conclusion: Pharmacy students should have enough knowledge in the aspect of drug-food interactions as they are directly or indirectly involving in the pharmaceutical care plan of the patients once they become professionals. They should take the responsibility in creating the awareness regarding the drug-food interactions among the patients and should work efficiently in providing the better patient care.

Introduction

In a diseased patient, food causes harm to the body when it reacts with drugs administered concomitantly. The reaction between the drug and food results in a drug food interaction. Due to various reasons like acute and chronic disease treatment, drugs became a part of our life that includes both prescribed and OTC medication [1]. When taken with the proper precautions and instructions provided by the prescribers, the complete benefits from the medications may occur eventually [2]. Drug-Food interaction is a situation where a food affects the drug activity. The effects can be increased drug activity or decreased drug activity or sometimes a new drug effect that could not be occurred if that food is not consumed [3].

In the pharmaceutical field, the drug food interactions play a significant role as they greatly impact the drug-compliance. The pharmacokinetic parameters of the drug may greatly impacted and the alterations in the absorption, distribution, metabolism and elimination rates might be observed because of the interaction of the food with the drug involved [4,5].

According to various studies, the incidence of drug interactions range from 3-30%. Gender, age, co-morbid conditions and polypharmacy are some of the factors that influence the drug-food interaction. The knowledge and awareness towards the drug-food interactions will definitely impact the healthcare professionals for preventing them [6,7]. Hence, in this study we made an attempt to evaluate the knowledge and awareness towards the drug-food interactions among the Indian pharmacy students.

Materials and Methods

This was a prospective study conducted among the Indian pharmacy students by using the knowledge and awareness questionnaire which was circulated by means of Google forms to various pharmacy colleges located in Andhra Pradesh, India. Students from various pharmacy colleges with both the gender of all age groups were included in this study. Students who were studying the first & second years of B.Pharm & Pharm.D and the students who were studying in other than the pharmacy colleges were excluded.

A total of 132 pharmacy students were participated in this study by filling the knowledge and awareness questionnaire. A link was generated for the questionnaire which was prepared in the format of Google forms and this link was circulated among the social media groups in order to get the responses from all the study participants. Responses from the study participants were analyzed and proper interpretations of the study were done. In this study, the questionnaire was divided into 2 categories that include the evaluation of knowledge and awareness. The knowledge of study participants were graded into good (8-10) moderate (5-7) and poor ($\leq$ 4) [8].

Results & Discussion

A total of 132 pharmacy students were participated in the study and among the 43 (32.6%) were found to be males and 89 (67.4%) were found to be females. Table 1 represents the age wise categorization of the study participants among the 132 study participants 54 (40.9%) were of 18-20 years age group 74 (56.1%) were of 21-23 years age group and the remaining 4 (3%) were of $\geq$24 years of age. Majority of the students were in the age group 21-23 years in this study.

Table 1: Age wise categorization of the study participants

Age	Male (%)	Female (%)	Total (%)
18-20 years	18 (41.9)	36 (40.5)	54 (40.9)
21-23 years	23 (53.5)	51 (57.3)	74 (56.1)
>23 years	2 (4.6)	2 (2.2)	4 (3.0)
Total	**43 (100)**	**89 (100)**	**132 (100)**

Table 2 represents the responses of the questionnaire that assess the knowledge of the study participants about Drug-Food Interactions. About 98 (78.4%) of the study participants responded that they had the knowledge about Drug-Food interactions, 126 (95.4%) of the study participants responded that it is necessary to know about the Drug-Food Interactions. About 124 (93.9%) of the study participants responded that they were aware of the food that can speed up or slow down the action of a drug. About 118 (89.4) of the study participants responded that the impact of drug interaction depends on various factors like drug, dosage, persons age and health status. About 104 (78.8%) of the study participants responded that the Drug-Food interactions can leads to serious side effects. About 107 (81.1%) of the study participants thought that the drug food interactions could be fatal. About 11 (8.3%) of the study participants responded that all the drugs can be taken with food. About 14 (10.6%) of the study participants responded that all the drugs can be taken on empty stomach that produce better effects. About 24 (18.2%) of the study participants responded that the acidic food and beverages such as tea, coffee and citrus juices can be taken along with antibiotics. About 106 (80.4%) of the study participants responded that they had knowledge regarding the timing of food intake relative to drugs.

Table 2: Assessment of the knowledge of the study participants about Drug-Food Interactions

S.No	Question	Yes (%)	No (%)	Total (%)
1.	Do you have knowledge about drug-food interaction?	98 (74.2)	34 (25.8)	132 (100)
2.	It is necessary to know about the Drug-Food Interaction?	126 (95.4)	6 (4.6)	132 (100)
3.	Do you know that food can speed up or slow down the action of a drug?	124 (93.9)	8 (6.1)	132 (100)
4.	Is the Impact of Drug-Food Interaction depending on a various factor like drug dosage, person's age & health status?	118 (89.4)	14 (10.6)	132 (100)
5.	Drug-Food Interaction can lead to serious side effects?	104 (78.8)	28 (21.2)	132 (100)
6.	Do you think Drug-Food Interaction can be Fatal?	107 (81.1)	25 (18.9)	132 (100)
7.	All drugs can be taken with food?	11 (8.3)	121 (91.7)	132 (100)
8.	All the drugs can be taken on an empty stomach to produce better effects	14 (10.6)	118 (89.4)	132 (100)
9.	Acidic food and beverages such as tea, coffee and citrus juices can be taken along with antibiotics?	24 (18.2)	108 (81.8)	132 (100)
10.	Do you have knowledge of timing of food intake relative to drugs	106 (80.4)	26 (19.6)	132 (100)

Table 3 represents the grading of the knowledge of the study participants based on the responses. A total of 57 (43.2%) of the study participants were having good knowledge about Drug-Food interactions. About 71 (53.8%) of the study participants were having moderate about Drug-Food Interactions and 4 (3%) of the study participants were having poor knowledge about Drug-Food Interactions.

Table 3: Grading of the knowledge of the study participants based on the responses

Grade	Male (%)	Female (%)	Total (%)
Good	11 (25.6)	46 (51.7)	57 (43.2)
Moderate	30 (69.8)	41 (46.1)	71 (53.8)
Poor	2 (4.6)	2 (2.2)	4 (3)
Total	**43 (100)**	**89 (100)**	**132 (100)**

Table 4 represents the responses of the questionnaire to assess the awareness of the study participants about Drug-food Interactions. About 71 (53.3%) of the study participants had the awareness regarding the usage of the hand book on software programme in order to check the drug interactions before taking them.

Table 4: Responses of the questionnaire regarding the assessment of the knowledge of the study participants about Drug- Food Interactions

S.no	Question	Yes (%)	No (%)	Total (%)
1	Have you ever used a handbook or software program to check drug interaction before taking drugs?	71 (53.8%)	61 (46.2%)	132 (100)
2	Is it important that doctors and pharmacists update their knowledge about drug interaction	130 (98.5%)	2 (1.5%)	132 (100)
3	Do you have knowledge of interaction of food with anti hypertensives and anti retro viral drugs	87 (65.9%)	45 (34.1%)	132 (100)
4	Allopathic and ayurvedic medicines interact with each other	99 (75.0%)	33 (25.0%)	132 (100)
5	Over the counter (OTC) and prescription medicines do not interact with food?	65 (49.2%)	67 (50.8%)	132 (100)
6	Do you think that food combinations can affect the efficacy of medications?	117 (88.7%)	15 (11.3%)	132 (100)
7	Is it better to avoid taking milk & dairy products, iron–rich food and supplements with certain antibiotics?	97 (73.5%)	35 (26.5%)	132 (100)

About 130 (98.5%) of the study participants, felt that the doctors and the pharmacists should update their knowledge about the drug interactions.

About 87 (65.9%) of the study participants had the awareness regarding the interaction of food with antihypertensives and antiretroviral drugs. About 99 (75%) of the study participants were aware about the allopathic and ayurvedic medicines interact with each other. About 65 (49.2%) of the study participants were thinking that over the counter and prescription medicines do not interact with the food. About 117 (88.7%) of the study participants thought that the food combinations effect the efficacy of the medications. About 97 (73.5%) of the study participants felt that it is better to avoid taking the milk and dairy products, iron rich food and supplements with certain antibiotics.

Conclusion

About 43.2% of the study participants were having good knowledge, 53.8% of the study participants were having moderate knowledge and the remaining 3% of the study participants were having poor knowledge about drug-food interactions in this study. Pharmacy students should have enough knowledge in the aspect of drug-food interactions as they are directly or indirectly involving in the pharmaceutical care plan of the patients once they become professionals. They should take the responsibility in creating the awareness regarding the drug-food interactions among the patients and should work efficiently in providing the better patient care.

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