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A Survey on Knowledge, Attitude and Perception of Drug Interactions among Pharmacy Students in Kolkata, West Bengal

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Abstract

Background : Drug interactions constitute an important medical care problem. An important duty and responsibility of pharmacists is to prevent clinically important drug interactions or to minimize their effects if they occur. Pharmacists therefore must have the appropriate resources and knowledge base to identify and prevent a potentially serious drug interaction, and provide the necessary interventions if needed.

Objectives: A survey on knowledge, attitude and perception towards drug interactions among pharmacy students, to disseminate the importance of knowledge about drug-interactions among pharmacy students, and the attitude of pharmacy students towards drug interactions and to assess pharmacy student's perception towards drug interactions.

Methodology: A total of 515 students of various pharmacy courses studying in different years were surveyed about their knowledge, attitude, and perception on drug interactions by a questionnaire. Microsoft Excel and SPSS was used for data entry and analysis.

Results: The mean age of the study sample was found to be 22.78 ± 3.59 (Mean ± SD) and there were slightly more males than females. Within the individual questions regarding knowledge on drug interactions among pharmacy students, the maximum number of students gave positive responses to question 8 and minimum for question 12. Furthermore, students of first, second, and fourth years gave positive responses to most of the questions.

Discussion: Early detection of potential drug interactions will provide a clearer idea of the risks, improve therapeutic outcomes, minimize the drug adverse effects and treatment cost, and also assist the clinicians in designing the treatment regimen.

Keywords: Drug interactions, Pharmacy, Students, Metabolism, Healthcare

Introduction

In general, drugs include non-food chemicals that affect bodily processes. If beneficial to the body, it can be considered as a drug. On the other hand, if a drug is harmful to the body, it is considered a poison [1]. In this modern era of healthcare, a large number of these drugs are prescribed each year, and new drug-drug

interactions are occasionally reported [2]. As a result, it is no longer realistic for physicians to rely solely on memory to avoid possible drug interactions, pharmacokinetics, or pharmacological properties, which in turn alters the net effect of one or both drugs [3,4]. There are certain other factors that contribute towards increased incidence of Drug Drug Interactions (DDI), including the number of drugs prescribed, the age of the patient, and the presence of comorbidities in the patient [5]. 10-20% Side effects are caused as a result of harmful DDIs and requires hospitalization. Elderly patients are particularly susceptible to DDIs as they age, slow down their metabolism, and increase the number of prescribed medications [6].

To avoid these DDIs, clinical pharmacists need to make a big contribution towards optimization of drug regimen and advice the patients to seek medical advice. Clinical pharmacists are responsible for reviewing medicines and, more importantly, advising patients. Therefore, pharmacist knowledge of DDIs is important for proper patient education, improved treatment efficacy, and avoidance of serious side effects [7]. When taking numerous medications at once, there is a higher chance of an interaction where one drug may have an impact on another. The predictable treatment outcomes may be impacted by DDIs either favourably or unfavourably. A bad outcome could worsen a patient's condition or increase healthcare costs [8].

Polypharmacy is a term that has been used in healthcare for decades.

Polypharmacy is a necessary evil, said Martin Duerden, General Physician and author of the King's Fund report (Polypharmacy and Medicines Optimisation: Making It Safe and Sound). It was always frowned upon in the past, but now we agree that it must be part of modern medicine [9]. But we must try to make sure that we use multiple treatments in the most effective and least harmful way. In traditional use, this meant the simultaneous use of several drugs in the same patient. Polypharmacy generally refers to the use of multiple medications, including prescription, over-the-counter, and complementary medications. However, polytherapy may be unavoidable because polypharmacy has become the standard of care for most chronic diseases [10]. Prevalence of chronic diseases for which one or more drugs may be indicated. The type and dose of drugs, not the number of drugs, determine important clinical outcomes [11].

Polypharmacy can occur when other drugs are prescribed to treat the side effects of other drugs. This is called a "recipe set". Currently, 44% of men and 57% of women over 65 take five or more medications per week; about 12% of both men and women take 10 or more medications per week. These substances include both prescription and over-the-counter preparations, such as vitamins and minerals and herbal products [12]. Consequences of polypharmacy: The major consequences of polypharmacy are -

1. Adverse drug events
2. Drug-drug interactions
3. Potential duplication of therapy
4. Increased costs
5. Decreased adherence to the drug regimen
6. •Emergency department visits, hospitalizations, additional medical or surgical interventions

Drug-drug interactions (DDIs) provide an essential means of understanding, predicting and avoiding adverse drug reactions (ADRs). The total number of ADRs reported more than 90% are associated with dose-dependent pharmacokinetic and pharmacodynamic events; these are potentially avoidable with appropriate dose adjustment or simply by following contraindication of the drugs concerned [13].

Methodology

A Prospective survey-based study was carried out in the department of pharmacy to study the knowledge, attitude and perception of drug interactions among pharmacy students. A Google form was shared and circulated among the department to get the required data. All pharmacy students of Pharm. D, B. Pharm, D. Pharm and M. Pharm (all running branches) were included in the study. 550 questionnaires were sent, out of which 35 failed to respond, so we got a total of 515 responses. In this study sampling was done through the Convenience Sampling Method.

A pre-tested semi structured questionnaire was sent using Google forms to the participants. The questionnaire included a description of the study and obtained the informed consent from the participant. The survey utilized a validated, self-administered questionnaire developed through an extensive literature review and consultations with experts,

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mentors, and colleagues. The survey form was developed using Google Forms.

The questionnaire was distributed across several online platforms, including WhatsApp, Instagram, and LinkedIn. Analysis of the data was done using Microsoft Excel and Google forms. Confidentiality of the responses and identity was assured. Ethical approval was approved for this study.

Results

A total of 515 students of various pharmacy courses (Pharm. D, B. Pharm, D. Pharm and M. Pharm) studying in different years were surveyed about their knowledge, attitude, and perception on drug interactions.

From Table 1, it is evident that most of the respondents belonged to the age group of 19 to 21 (N=184, 35.72%), followed by 22 to 24 (N=138, 26.79%). While the number of respondents (N=42, 8.15%) were 18 years or below of age.

Table 2 provides a detailed information of the percentage response to the questions regarding the knowledge on drug interactions among pharmacy students

Table 3 talks about the percentage response to the questions regarding their attitude and perception on drug interactions.

The mean age of the study sample was found to be 22.78 ± 3.59 (Mean ± SD). There were slightly more males than females, with males accounting for 52.03% (N=268) of the total sample.

Within all the courses, the majority of the students were studying B Pharm (N=147, 27.96%) while the least number was from Pharm D (PB) (N=14, 2.71%). Out of that most of them belonged to second year (N=124, 24.07%) and only a few were studying in sixth year (N=30, 5.82%).

Within the individual questions regarding knowledge on drug interactions among pharmacy students, the maximum number of students gave positive responses to question 8, “Can drug interactions lead to side effects?” (N= 512, 99.41%). While, for question 12 “What would you do if you experience severe effect of drug interactions?” the least number of students gave a positive response (N=50, 9.70%). For question 2, “What do you think drug interactions means?”, Most of the students (N=368, 71.45%) answered, “Combination of a medication with the substances that alter the medications effect on the body”, while the least number of students (N=2, 0.38%) answered “side effects”.

Similarly, within the questions regarding attitude and perception of pharmacy students on drug interactions, 495 (96.11%) students agreed to statement 8, “There is lack of awareness among general public regarding drug interactions” which was the maximum percentage. While, statement 1 “When two drugs interact each other, it always creates a “helpful” side effect was the one that was least agreed upon (N=192, 37.28%).

Discussion

There were 515 students from various pharmacy courses who attended the survey of which 48% were female and remaining 52% were male candidates. A majority of above 95% students knew about the drug interactions. Many students were aware of the drug interactions and were willing to learn more about the particular topic. Almost all of them agreed to the fact that there was a lack of knowledge about drug interactions among general public.

Makkouni et al, in their Twenty-five (73.5%) studies reported the overall incidence of potential DDIs in the study population (prescription or patient). Nine studies (26.5%) have not reported the overall incidence of DDIs. Among the studies performed in outpatient settings, nine studies assessed the overall incidence of potential DDIs in prescriptions in the population for all types of drugs. The median incidence of potential DDIs in prescriptions of these studies was 8.5% (Interquartile Range (IQR): 8.4-10.1). The other outpatient studies focused on the incidence of potential DDIs in cardiovascular drugs (DDIs percentage = 50%), non-steroidal anti-inflammatory drugs (NSAIDs) (DDIs percentage = 49%), antidepressant drugs (DDIs percentage =22%), dental drugs (DDIs percentage =27%), and elderly people (DDIs percentage =10% and 14%) [14].

515 students from various pharmacy programmes participated in the survey, with 48% of the participants being female and 52% being male. Over 95% of people were aware of medication interactions. The medication interactions were a topic that many students were interested in learning more about. The

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majority of them concurred that the general people lacked awareness about drug interactions.

In our prospective survey study , the poll were attended by 515 students from different pharmacy programmes, with 48% of the female participants being female and 52% being male. Over 95% of students were aware of the connections between drugs. The medication interactions were a topic that many students were already familiar with and were interested in learning more about. Nearly everyone of them concurred that the general public was ignorant of drug interactions.

Limitation of the study includes sample size as it is considerably less even though it's a prospective survey where as in the reference articles tried to include wide range of studies which probably may yield more accurate results and conclusion.

Conclusion

This survey study helped to assess the level of knowledge and awareness of pharmacy students and identify the correlations of demographic data including course and year of study with the level of knowledge and awareness of drug interactions. It can also aid in instilling the importance of drug interactions in pharmacy students. An important duty and responsibility of pharmacists is to prevent clinically important drug interactions or to minimize their effects if they occur. Pharmacists therefore must have the appropriate resources and knowledge base to identify, judge the clinical relevance, and follow up a potentially serious drug interaction. Drug-interaction information is required on different levels of drug therapy.

Early detection of potential drug interactions will provide a clearer idea of the risks, improve therapeutic outcomes, minimize the drug adverse effects and treatment cost, and also assist the clinicians in designing the treatment regimen. It is a big role of clinical pharmacists to detect and prevent undesirable interactions and provide necessary interventions in case of any adverse events. They are also responsible for reviewing medicines and more importantly advising patients. Therefore, Pharmacist's knowledge of drug interactions is extremely crucial for proper patient education, improved treatment efficacy, and avoidance of serious side effects.

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Table 1: Age distribution of the respondents in the study

Age wise distribution of subjects Age in Years	Number of respondents	Percentage
<18	42	8.15%
19-21	184	35.72%
22-24	138	26.79%
25-27	79	15.33%
>28	72	13.98%

Table 2: Knowledge on drug interactions among pharmacy students Questions

Knowledge on drug interactions among pharmacy students Questions	Frequency (Percentage)
1. Do you know about the term drug interactions?	491 (95.33%)
2. What do you think drug interactions means? Side effects.	2 (0.38%)
Drug abuse.	42 (8.15%)
Combination of a medication with the substances that alter the medications effect on the body.	368 (71.45%)
All of the above.	103 (20.00%)
3. Can drug interactions lead to side effects?	512 (99.41%)
4. Is it necessary to know about drug interactions?	507 (98.44%)
5. Do you think drug interactions can cause serious causality?	501 (97.28%)
6. Does the drug interactions depends on various factors like drug dosage, age, gender and other comorbidity.	493 (95.72%)
7. A drug food interactions happens when a drug interacts with a substance in a food or beverages.	498 (96.69%)

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8. OTC and prescription drug don't interact with herbal remedies and supplements.	142 (27.57%)
9. Can drug interaction cause direct effect on the patient's disease severity and mortality.	492 (95.53%)
10. Are there any specific food and beverages that are needed to be avoided while taking some specific drugs?	345 (66.99%)
11. Can consuming alcohol while taking a drug leads to potential drug interactions?	498 (96.69%)
12. What would you do if you experience severe effect of drug interactions?	50 (9.70%)
13. Is it necessary to check the drug interactions while prescribing?	505 (98.05%)
14. Are you willing to learn more about drug interactions?	506 (98.25%)

Table 3: Attitude and Perception on Drug Interactions among Pharmacy Students. Statements

Attitude and Perception on Drug Interactions among Pharmacy Students. Statements	**Frequency (Percentage)**		
	Agree	Disagree	**Uncertain**
1. When two drugs interact each other, it always creates a "helpful" side effects.	192 (37.28%)	200 (38.83%)	123 (23.88%)
2. If you use the same pharmacy for all of your prescriptions to make drug interactions less likely.	395 (76.69%)	56 (10.87%)	64 (12.42%)
3. Consulting your healthcare provider before starting the medication/ therapy can aid in the prevention of drug interactions.	488 (94.75%)	14 (2.71%)	13 (2.52%)

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4. Drug interactions are more prone to occur during pregnancy and breast feeding.	324 (62.91%)	19 (3.68%)	172 (33.39%)
5. Older people are at more risk for drug interactions.	472 (91.65%)	21 (4.07%)	22 (4.27%)
6. Herbal drugs do not cause drug interactions because they are natural.	270 (52.42%)	187 (36.31%)	58 (11.26%)
7. If you are taking more number of drugs the chances of drug interactions are high.	485 (94.17%)	16 (3.10%)	14 (2.71%)
8. There is lack of awareness among general public regarding drug interactions.	495 (96.11%)	11 (2.13%)	9 (1.74%)
9. Drug interactions is still a neglected public health issues.	468 (90.87%)	19 (3.68%)	28 (5.43%)
10. Government should established new schemes and educational programs to spread awareness about the potential threats cause by drug interactions.	492 (95.53%)	9 (1.74%)	15 (2.91%)

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