Original Research Article

PERCEPTION ON ADVERSE DRUG REACTIONS (ADRs) OF COMMONLY USED MEDICATION AMONG NON-ALLIED HEALTH FOREIGN STUDENTS IN UNIVERSITY OF PERPETUAL HELP SYSTEM DALTA, LAS PINAS CAMPUS.

ABSTRACT

Background: Adverse drug reactions (ADRs) pose significant health challenges globally and are responsible for a considerable proportion of hospital admissions and healthcare costs. Among non-allied health foreign students at the University of Perpetual Help System DALTA (UPHSD) in Las Piñas, concerns have emerged regarding ADRs resulting from the use of commonly available over-the-counter (OTC) medications. This study investigates the perception of ADRs among non-allied health foreign students on the UPHSD Las Piñas campus, focusing on their awareness of the potential effects of commonly used medications.

Aim: The study aims to access the perception on adverse drug reaction of commonly used medication among non-allied health foreign students in UPHSD Las Pinas Campus

Methods: This descriptive study was conducted among non-allied health foreign students enrolled at UPHSD-LP. Semi-structured interviews and questionnaires were used to collect data from the participants. Chi square test was used to explore the relationship between the demographic characteristics of the students and their perceptions of ADRs.

Results: The study found that non-allied health foreign students at UPHSD Las Piñas generally lack knowledge about ADRs. Data analysis revealed a low level of awareness and reporting of ADRs among the respondents, with no significant relationship found between the students' demographic profiles and their perceptions of ADRs.

Conclusion: The study concluded that non-allied health foreign students at UPHSD Las Piñas campus have limited knowledge about ADRs, which leads to underreporting of adverse effects and improper medication use. This lack of awareness is a concern given the prevalence of ADRs and their potentially severe consequences.

Keywords: Adverse Drug Reaction, Non-allied Health, Healthcare, Medication.

Introduction

Adverse drug reactions have a major impact on public health and the quality of everyday life. Adverse drug reactions are a recognized hazard of drug therapy. All medications administered to living organisms must be safe for them. This is why a drug must undergo a clinical trial before going on sale to the public [1]. Regrettably, numerous factors hinder the conduct of these studies, and their results do not reveal all drug effects [2]. Some factors responsible for these limitations include a relatively short time of patient exposure to the drug being tested, a relatively small number of participants during the trials, multiple exclusion criteria, or the fact that clinical research is conducted under conditions that are different from the conditions of everyday practice [3]. Therefore, the monitoring of a drug does not conclude at the time of its market introduction. Although some ADRS are minor and resolved without squeal, others can cause permanent disability or even death [4]. Despite the different clinical trials, it is generally not possible to identify all safety issues associated with medication during the pre-marketing research phase. The only way to find out such occurrences is to be on active lookout for adverse events over a long-time horizon in large populations and in different host conditions [5]. The information may be useful in identifying and minimising preventable ADRS while generally enhancing the knowledge of the prescribers to deal with them more efficiently [6].

An adverse drug reaction (ADR), as defined by WHO, is an unintended and noxious response to a drug that occurs at doses normally used for the prophylaxis, diagnosis, or therapy of diseases or for the modification of physiological function [7, 8]. ADRs have medical as well as economic consequences, leading to increased patient morbidity and mortality. This has given rise to "pharmacovigilance," which is defined as the science and activities relating to the detection, assessment, understanding, and prevention of adverse effects of drugs or any other drug-related problems [8, 9]. Adverse drug reactions are the 4–6th leading cause of death in the world. Hospitalisation duration for patients experiencing adverse drug reactions is 8–12 days longer than for those who did not experience adverse drug events [10, 11].

Most of the studies in the past have explored and reported knowledge and perception toward ADRs among health care professionals, pharmacists, and medical students, but studies on awareness among patients are limited, especially those concerned with foreigners who are in a strange land [12, 13]. Awareness about the adverse drug reactions of commonly used medications is an important source of information for society, especially for foreign students [14]. Asians can use certain medications, while other races cannot [15].

This study aimed to evaluate the perception of the non-allied health foreign students in the University of Perpetual Help System DALTA Las Pinas Campus on adverse drug reactions of commonly used medications. There is a high incidence of adverse drug reactions (ADRs) associated with common medications among foreigners, likely due to their lack of knowledge about ADRs. A pre-survey on commonly used medications by non-allied health foreign students within the study area would be conducted. This would enable us to identify the adverse drug reactions (ADRs) associated with these medications. Based on the data collected from the international students, we would develop a survey to inform them about these common medications' ADRs.

METHODOLOGY

Study Design & Study administration

This study used a self-administered questionnaire to evaluate the perception of non-allied health foreign students at the University of Perpetual Help System DALTA in Las Pinas Campus on adverse drug reactions (ADRs) of commonly prescribed medications. It is a descriptive study. The researchers incorporated a quantitative approach to the study, which enabled a statistical gathering of data about the perception of ADR among non-allied health foreign students in UPHSD-LP. This study was a cross-sectional survey of foreign students in UPHSD-LP selected randomly from 8 different non-allied health colleges.

The data was collected by administering the self-made questionnaire to the various participating foreign students. The study was carefully explained to all participating foreign students, and they were assured of their anonymity and confidentiality.

Study Population and Sampling

The research population of this study are the non-allied health foreign students enrolled in UPHSD-LP Campus. There are 387 non-allied health foreign students enrolled for the 2018-2019 school year in 8 different colleges. The international student affairs office (ISA) provided the necessary numbers of foreign students. The researchers then applied the sample size formula for a finite population to determine the statistical significance of the sample size.

$$n = [z^2pq/e^2]/1+[z^2pq]/Ne^2$$

where n was the number of samples, N was the total population, e^2 was the error tolerance at 0.05, p was the probability of being chosen at 0.5, q was the probability of not being chosen at 0.5, and z was the standardised score at 1.96.

The researchers determined that a total of 193 foreign students were sampled. The foreign students participating were selected by a simple random sampling method. The inclusion criterion for their participation in this study required them to have resided in the Philippines for at least the last six months. Foreign students who had not been in the country for the past 6 months were excluded.

Data Collection

Data was collected by using a self-made administered questionnaire written in English. The questionnaire consisted of two sections. The first part includes demographic information for the participants.

The second section included questions designed to gauge respondents' views on adverse drug reactions (ADRs) associated with commonly used medications. The questionnaires were subjected to evaluation and validation prior to data gathering by professionals to check for spelling and grammar corrections or anything that may help improve the communication of the survey to the end-user.

During the survey, the purpose of the study was explained to the various participants both verbally and by a covering letter that was attached to the consent form. Participants who agreed to participate in the study were asked to complete a questionnaire and hand it back to the researchers. For those who were very busy at that moment, a questionnaire was given to them to take home, and it was collected from them the day after. The returned questionnaires were checked for completeness, consistency, and clarity before collection.

Data Analysis

The data obtained from the survey questionnaires was subjected to statistical analysis. Relative frequency, mean, and Chi-square test were used to interpret the data received from the respondents. The demographic information of respondents was analysed using frequency and percentage. A chi-square test was used to determine if there was a significant relationship between the profile of foreign student respondents and their perception of the effects of medications they experienced after taking medications for the last two months. The results were validated again by a statistician to confirm. The data were presented in a tabulated form.

Results

The statistical analysis of data and its interpretations addressed specific research questions in the study, which primarily aimed to understand the perception of adverse drug reactions (ADRs) in commonly used medications among non-allied health foreign students at the University of Perpetual Help System DALTA Las Pinas Campus.

Demographic Profile of Respondents

There were 193 non-allied health foreign students enrolled in UPHSD in Las Pinas Campus who participated in the study as respondents. The table below summarises and presents their profile in terms of age, sex, religion, nationality, and program enrolment.

Table 1

Distribution of Respondents according to Demographic profile

	Frequency (f)	Percentage (%)
Age (Years)		
18 or below	24	12.44
19 – 20	51	26.42
21 – 22	62	32.12
23 or Above	56	29.02
Total	193	100.00
Sex		
Male	169	87.56
Female	24	12.44
Total	193	100.00
Religion		
Catholic	7	3.63
Muslim	78	40.41
Others	108	55.96
Total	193	100.00
Nationality		
Nigeria	29	15.03
Angola	16	8.29

South Sudan	15	7.77
Equatorial Guinea	12	6.22
Eritrea	23	11.92
Ethiopia	10	5.18
India	69	35.75
Chad	8	4.15
Liberia	11	5.70
Total	193	100.00
Program		
AB Psychology	84	43.52
BSBA	12	6.22
CIHM	7	3.63
COMPUTER STUDIES	5	2.59
EDUCATION	6	3.11
ENGINEERING	41	21.24
MARITIME	23	11.92
AVIATION	15	7.77
Total	193	100.00

The table above reveals that the majority of respondents, aged between 21 and 22, fall into the third age group. In particular, there are 62 foreign student respondents, representing 32.12% of the sample of 193 foreign students who belong to the third age group. These respondents were mostly 21–22 years old. 56 foreign student respondents, representing 29.02% of the sample of 193 foreign student respondents, fall into the last age group, with ages ranging from 23 to above. There are 51 foreign student respondents who belong to the second age group with ages between 19 years and 20 years, and they represent 26.42% of the sample of 193 foreign student respondents. There are 24 foreign student respondents who belong to the first age group with ages between 18 years and below, and they represent 12.44% of the sample of 193 foreign student respondents.

It can also be seen in the table above that the majority of the foreign student respondents are male. In particular, there are 169 male foreign student respondents, representing 87.56% of the sample of 193

foreign student respondents. There are 24 female foreign student respondents, and they represent 12.44% of the sample of 193 foreign student respondents. This means that there is a smaller female population in the non-allied health courses.

It is shown in the table above that the religion of the majority of the foreign student-respondents belongs to religions other than Catholic and Muslim. In particular, there are 108 foreign student-respondents who belong to religions other than Catholic and Muslim, and they represent 55.96% of the sample of 193 foreign student-respondents. This is followed by 78 foreign student-respondents whose religion is Muslim, and they represent 40.41% of the sample of 193 foreign student-respondents. There are 7 foreign student respondents whose religion is Catholic, and they represent 3.63% of the sample of 193 foreign student respondents.

It can be seen in the table above that most of the foreign student respondents are from India. In particular, there are 69 foreign student respondents from India, and they represent 35.75% of the sample of 193 foreign student respondents. This is followed by 29 foreign student-respondents who are from Nigeria, and they represent 15.03% of the sample of 193 foreign student-respondents. There are 23 foreign student respondents who are from Eritrea, and they represent 11.92% of the sample of 193 foreign student respondents. There are 16 foreign student respondents who are from Angola, and they represent 8.29% of the sample of 193 foreign student respondents. There are 15 foreign student respondents who are from South Sudan, and they represent 7.77% of the sample of 193 foreign student respondents. There are 12 foreign student respondents who are from Equatorial Guinea, and they represent 6.22% of the sample of 193 foreign student respondents. There are 11 foreign student respondents from Liberia, and they represent 5.70% of the sample of 193 foreign student respondents.

It is shown in the table above that most of the foreign student respondents are taking up an AB Psychology course. In particular, there are 84 foreign student respondents who are taking up this course, and they represent 43.52% of the sample of 193 foreign student respondents. This is followed by 41 foreign student respondents who are taking a course from the College of Engineering, and they represent 21.24% of the sample of 193 foreign student respondents. There are 18 foreign student respondents who are taking a course from the College of Maritime Studies, and they represent 11.92% of the sample of 193 foreign student respondents. There are 15 foreign student respondents who are taking a course from the School of Aviation, and they represent 7.77% of the sample of 193 foreign student respondents. There are 12 foreign student respondents who are taking up BS-Business and Administration, and they represent 6.22% of the sample of 193 foreign student respondents. There are 7 foreign student respondents who are taking a course from the College of International Hospitality Management, and they represent 3.63% of the sample of 193 foreign student respondents. There are five foreign student respondents who are taking

a course from the College of Computer Studies, and they represent 2.59% of the sample of 193 foreign student respondents. This means that most of the respondents are from an AB-Psychology course.

Perception of Respondents on Adverse Drug Reactions

The table below summarises and presents the medications that have been taken by respondents for the last two months

Table 2

Medications Taken by Respondents for the Last Two Months

Medication	Frequency (f)	Percentage (%)	Rank
Paracetamol	180	93.26	1
Ambroxol	50	25.91	2.5
Multivitamins +Iron	39	20.21	5.5
Buscopan	43	22.28	4
Mefenamic Acid	50	25.91	2.5
Guaifenesin	32	16.58	7
Bioflu	31	16.06	8
Tramadol	13	6.74	9
Decogen	39	20.21	5.5

It can be seen in the table above that the medication that was taken by the greatest number of respondents for the last two months is paracetamol. In particular, 180 respondents, representing 93.26% of the sample of 193 foreign student-respondents, have taken Paracetamol in the last two months. This is followed by ambroxol and mefenamic acid that were taken for the last two months by the second-greatest number of 50 respondents, representing 25.91% of the sample of 193 foreign student-respondents. The third-highest number of respondents, comprising 43 individuals and representing 22.28% of the sample of 193 foreign student-respondents, have been taking Buscopan for the past two months.

On the other hand, only 13 respondents, representing 6.74% of the sample of 193 foreign student-respondents, reported taking Tramadol during the last two months. The second-least number of respondents, representing 16.06% of the sample of 193 foreign student-respondents, took Bioflu for the last two months. The third-least number of respondents, 32 of whom represent 16.58% of the sample of 193 foreign student-respondents, have been taking Guaifenesin for the last two months.

The table below summarises and presents the respondents' perceived effects of the medications they have been taking for the last two months.

.

Table 3

Perceived Effects of Medications Taken by Respondents for the Last Two Months

Perceived Effects	Frequency (f)	Percentage (%)	Rank
Abdominal Pain	5	2.59	7
Nausea and Vomiting	11	5.70	3
Diarrhoea	4	2.07	9
Skin Rash and Itching	2	1.04	11.5
Headache	15	7.77	1
Dry Mouth	1	0.52	13.5
Agitation	2	1.04	11.5
Chest Pain	10	5.18	4
Dark Coloured Urine	8	4.15	5
Constipation	6	3.11	6
Dizziness	4	2.07	9
Drowsiness	1	0.52	13.5
Nervousness	4	2.07	9
General Body Weakness	13	6.74	2

The table above reveals that the most common side effect of medication during the past two months among respondents is headache. Specifically, 15 respondents, accounting for 7.77% of the sample of 193 foreign students, reported experiencing headaches. The second-greatest number of 13 foreign students, representing 6.74% of the sample of 193 foreign students, reported experiencing general body weakness after taking medications for the past two months. The third-highest number of respondents, 11 out of them, representing 5.70% of the sample of 193 foreign student-respondents, reported experiencing nausea and vomiting as side effects of their medications over the past two months.

On the other hand, the least number of respondents, only one of them that represents 0.52% of the sample of 193 foreign student-respondents, perceived that he experienced drowsiness and dry mouth because of

the medication he has taken for the last two months. The second-least number of respondents, representing 1.04% of the sample of 193 foreign student-respondents, reported experiencing skin rash, itching, and agitation as effects of taking medications for the last two months. The third-least number of respondents, comprising 4 individuals and representing 2.07% of the sample of 193 foreign student-respondents, reported experiencing diarrhoea, dizziness, and nervousness as side effects of their medication use over the past two months.

Perception of Respondents on the Effects of Medication they Have Taken for the Last Two Months

The table below summarises and presents the perception of the foreign student-respondents on the effects of medications they have experienced for the medications they have taken for the last two months.

Table 4

Perception of Respondents on Effects of Medications Taken for the Last Two Months

Perception of the Effects of Medication	Frequency (f)	Percentage (%)	Rank
Side Effect	88	45.60	2
Adverse Drug Reaction (ADR)	0	0.00	3.5
Toxic Effect	0	0.00	3.5
No Idea	105	54.40	1
Total	193	100.00	

Judging from the table above, the majority of the foreign student respondents have no idea about the effects they have experienced from taking medications for the last two months. Specifically, there are 105 foreign student respondents who have no idea about the effects they have experienced from taking medications for the last two months, and they represent 54.40% of the sample of 193 foreign student respondents. This is followed by 88 foreign student respondents who perceived that the effects they have experienced for taking medications for the last two months are side effects of the medications, and they represent 45.60% of the sample of 193 foreign student respondents.

None of the 193 foreign student respondents perceived that the effects they have experienced from taking the medications for the last two months were either adverse drug reactions (ADR) or toxic effects.

Relationship between the Demographic Profile of Respondents and their Perceptions of the Effects of Medications taken for the Last Two Months

The table below summarises and presents the results of the chi-square tests used to determine whether there were significant relationships between the age, sex, religion, nationality, and program of foreign student-respondents and their perception of the effects they have experienced from taking medications for the last two months.

Table 5

Relationship between the Demographic Profile of Respondents and their Perceptions of the Effects of Medications taken for the Last Two Months

Profile	df	χ^2-value	p-value	Decision on H_o	Conclusion
Age	3	0.92	0.82	Accept H_o	Not Significant
Sex	1	0.17	0.68	Accept H_o	Not Significant
Religion	2	3.07	0.22	Accept H_o	Not Significant
Nationality	8	8.49	0.39	Accept H_o	Not Significant
Program	7	19.05	0.02	Reject H_o	Significant

Decision Criteria: Reject H_o if p-value ≤ 0.05. Otherwise, accept H_o.

Statistical tests using Chi-square tests showed that there is no significant relationship between the age, sex, religion, and nationality of foreign student-respondents and their perception of the effects they have experienced from taking medications for the last two months; however, there is a significant relationship between the program of foreign student-respondents and their perception of the effects they have experienced from taking medications for the last two month.

DISCUSSION

This study was conducted due to the need to evaluate the perception on ADRs of commonly used medications among non-allied health foreign students in UPHSD-LP. During the research, the demographic profile played an important role. Most foreigners are over the age of 18, with a higher proportion of males than females participating in non-allied health programs. The researchers also found out that most of the respondents have no knowledge of ADRs. The study also found a significant relationship between the respondents' perceptions of ADRs and the program they enrolled in. Respondents enrolled in the AB Psychology course demonstrated this. This may be due to the fact that

it’s a course taken by students as a pre-med, and they may be exposed to having little knowledge on medication effects. The study found that paracetamol was the most commonly taken medication among respondents, with a staggering 93.26% reporting its use in the past two months. This aligns with the widespread use of paracetamol globally as a first-line treatment for pain and fever. The high prevalence of paracetamol use suggests that students may be self-medicating for common ailments, which raises concerns about potential misuse or overuse without proper medical guidance.

Type A reactions, which typically account for about 80% of all ADRs, are primarily dose-related and result from the expected pharmacological effects of the medication [16]. These reactions are predictable and potentially preventable or reversible upon reduction of the dose or withdrawal of the medication [17]. Type B adverse drug reactions (ADRs) are an idiosyncratic reaction that is less common than type A reactions. They are unpredictable, more serious, and also cause many deaths [18].

The most commonly reported effect of medication was a headache, experienced by 7.77% of the respondents. This finding is consistent with the known side effects of several commonly-used medications, including paracetamol [10]. A significant number of students also reported general body weakness and nausea/vomiting, indicating that these issues are prevalent among this population. However, a small fraction of the respondents experienced the least reported effects, such as dry mouth and drowsiness. This suggests that students may underreport or overlook certain side effects while widely recognizing others.

This study's finding that respondents were aware of their medications' effects is striking. Over half of the respondents (54.40%) indicated that they had "no idea" about the effects they experienced, while 45.60% perceived these effects as side effects. None of the students identified the effects as ADRs, or toxic effects, which highlights a significant gap in knowledge. This lack of awareness could have serious implications for the students' health, as it may prevent them from recognizing and reporting potential ADRs, thus increasing the risk of adverse outcomes.

The findings imply that many of these students might not have received enough information about the possible risks of using medications. This is particularly concerning in a university setting, where students may have limited access to healthcare and rely on self-medication. The absence of ADRs or toxic effects in their perceptions indicates a need for better education on medication safety, especially among non-allied health students who may not have received formal training in this area.

The study also explored the relationship between the demographic characteristics of the respondents and their perceptions of medication effects. Interestingly, no significant relationships were found between age, sex, religion, or nationality and the perception of medication effects. This suggests that these

demographic factors do not strongly influence how students perceive the effects of medications. Regardless of these factors, the overall level of awareness and understanding of medication effects was similar across the board.

This is contrary to a study that stated that factors like patient age, use of more than one drug, and the severity of patient disease could increase patient susceptibility to ADRs [21]. A study in the emergency department of Lombardy, Italy, found out that the skin, subcutaneous tissue, gastrointestinal, respiratory, thoracic, and nervous systems were the most affected by ADRs related to patients using more than one drug [4].

Anatomically and physiologically, the male individuals differ from the females' individuals in certain respects. Gender is an important factor in the development of ADRs, and the difference in certain respects between the male and female individuals affects how they would react to medications, even though females are more vulnerable to developing ADRs compared to the males [22]. Medications are capable of causing harm, and ADRs can be seen even when taking the appropriate dosage [19]. A study carried out in the United Kingdom suggests that admissions relating to ADRs are mostly caused by diuretics, warfarin, low-dose aspirin, and other non-steroidal anti-inflammatory drugs (NSAIDS) [6]. Undergraduate medical students reported valuable and clinically relevant ADRs as compared to the physicians [23].

Medicines are like double-edged swords; they can alleviate disease but also have the potential of causing harm no matter how skillfully they are used [24]. Other than the active ingredients, excipients such as colouring agents, lubricants, preservatives, etc. have a potential for producing adverse or unwanted effects. ADRs may be unexpected, unknown, and/or rare [25, 26]. They are, in some cases, life-threatening and can be major determinants of treatment outcomes [21]. Ignoring the importance of understanding ADRs among non-allied health foreign students at UPHSD-LP may result in a recurrence of preventable drug-related hospital admissions.

As part of the educational initiative to address the identified knowledge gap, a recommendation for the use of information systems, a hospital-written policy, improved education and awareness sessions be conducted for the foreign students from the non-allied health courses, and direct patient reporting. These could be done by organising a seminar for the purpose of raising awareness for ADRs and giving out pamphlets that have drugs and possible ADRs every week to the university students. Also, the pamphlets could be pasted on every department's notice board for students' easy access [27].

Conclusion

It was seen that there is no significant relationship between the respondents' demographic profile and their perception of commonly used medications, with the exception of their program enrollment. This

study also concludes that foreign students from the non-allied health courses have no ideas about ADRs, and this was gotten from their level of perception about ADRs on the commonly used medications taken by them. There is an urgent need for educational initiatives to address this knowledge gap and to ensure that all students are equipped to safely manage their health. By improving awareness of ADRs, we can help reduce the risk of adverse outcomes and promote safer medication practices among university students.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

REFERENCES

1. Coleman, J. J., & Pontefract, S. K. (2016). Adverse drug reactions. *Clinical medicine (London, England)*, *16*(5), 481–485. https://doi.org/10.7861/clinmedicine.16-5-481
2. Carandang, R. R., Jamora, M. J., & Torres, M. E. (2015). Knowledge and attitudes on adverse drug reaction reporting of selected hospital-based health practitioners in Manila, Philippines. *International Journal of Pharmacology and Therapeutics*, 4(6), 301–307.
3. Al-Hazmi, N., & Il, N. (2013). Attitude and awareness of adverse drug reaction reporting by health professionals in seven hospitals in the Holy City of Makkah, Kingdom of Saudi Arabia. *Clinical Pharmacology & Biopharmaceutics*, 3(3). https://doi.org/10.4172/2167-0870.1000139
4. Perrone, V., Conti, V., Venegoni, M., Scotto, S., Degli Esposti, L., Sangiorgi, D., Prestini, L., Radice, S., Clementi, E., & Vighi, G. (2014). Seriousness, preventability, and burden impact of reported adverse drug reactions in Lombardy emergency departments: a retrospective 2-year

characterization. *ClinicoEconomics and outcomes research: CEOR*, *6*, 505–514. https://doi.org/10.2147/CEOR.S71301

5. Duarte, M., Fernandes, I., & Almeida, L. (2015). Community pharmacists' attitudes towards adverse drug reaction reporting and their knowledge of the new pharmacovigilance legislation in the southern region of Portugal: A mixed methods study. *Drugs & Therapy Perspectives*, 31(10), 351–358. https://doi.org/10.1007/s40267-015-0227-8
6. Pirmohamed, M., James, S., Meakin, S., Green, C., Scott, A. K., Walley, T. J., Farrar, K., Park, B. K., & Breckenridge, A. M. (2004). Adverse drug reactions as cause of admission to hospital: prospective analysis of 18 820 patients. *BMJ (Clinical research ed.)*, *329*(7456), 15–19. https://doi.org/10.1136/bmj.329.7456.15
7. Qassim, S., Metwaly, Z., Shamsain, M., & Hariri, Y. A. (2014). Reporting adverse drug reactions: Evaluation of knowledge, attitude, and practice among community pharmacists in UAE. *Journal of Pharmacovigilance*, 4(4), 17–23.
8. World Health Organization. (2002). *The importance of pharmacovigilance*. Geneva: World Health Organization.
9. Elshafie, S., Zaghloul, I., & Roberti, A. M. (2017). Pharmacovigilance in developing countries (Part I): Importance and challenges. *International Journal of Clinical Pharmacy*, 39(4), 1017–1030.
10. Sabblah, G. T., Akweonogo, P., Darko, D., Dodoo, A. N., & Sulley, A. M. (2014). Adverse drug reaction reporting by doctors in a developing country: A case study from Ghana. *Ghana Medical Journal*, 48(4), 189–193.
11. Suyagh, M., Farah, D., & Abu Farha, R. (2015). Pharmacists' knowledge, practice, and attitudes toward pharmacovigilance and adverse drug reactions reporting process. *Saudi Pharmaceutical Journal*, 23(2), 147–153.
12. Goyal, M., Bansal, M., & Jaiswal, S. (2013). To assess the attitude, knowledge, and practices of medical professionals about adverse drug reactions and their reporting in a teaching hospital. *Journal of Pharmacovigilance & Drug Safety*, 10(2), 14-22.
13. Gongadze, N., Chakvetadze, N., & Jibuti, K. (2017). Adverse drug reaction monitoring program in Georgia. *Georgian Biomedical Journal*, 1(2). Retrieved from http://www.gbj.ge/pdf/v01is02_01.pdf
14. KC, S., Subish, P., Mishra, P., & Ibrahim, M. (2013). Attitudes among healthcare professionals to the reporting of adverse drug reactions in Nepal. *BMC Clinical Pharmacology*, 14(1), 16. https://doi.org/10.1186/2050-6511-14-16
15. Burroughs, V. J., Maxey, R. W., & Levy, R. A. (2002). Racial and ethnic differences in response to medicines: towards individualised pharmaceutical treatment. *Journal of the National Medical Association*, *94*(10 Suppl), 1–26.
16. Rohilla, A., & Yadav, S. (2013). Adverse drug reactions: An overview. *International Journal of Pharmacology Research*, 3(1), 10–12.
17. Pal, S. N., Duncombe, C., Falzon, D., & Olsson, S. (2013). WHO strategy for collecting safety data in public health programmes: Complementing spontaneous reporting systems. *Drug Safety*, 36(1), 75–81.
18. Routledge P.A., O'mahony M.S., Woodhouse K.W. Adverse drug reactions in elderly patients. *BJCP.* 2003;57(2):121–126.
19. Adedeji, W. A., Odetola, A. O., & Asaolu, T. O. (2013). Attitude and practice of doctors toward adverse drug reactions (ADRs) reporting in a Nigerian tertiary health facility. *Journal of Pharmacy and Bioallied Sciences*, 11(2), 77–80.

20. Al-Arifi, M. N., Mayet, A. Y., Wajid, S., & Al-Rashed, S. A. (2015). Knowledge, attitude, and perception of physicians towards adverse drug reaction reporting at King Khalid University Hospital, Riyadh, Saudi Arabia. *Tropical Journal of Pharmaceutical Research*, 14(5), 907–911.
21. Lobo, M. G. A. de A., Pinheiro, S. M. B., Castro, J. G. D., Momenté, V. G., & Pranckevicius, M. C. S. (2013). Adverse drug reaction monitoring: Support for pharmacovigilance at a tertiary care hospital in Northern Brazil. *BMC Pharmacology and Toxicology*, 14(1). https://doi.org/10.1186/2050-6511-14-5
22. Ayub, A. (2015). Adverse drug reactions (ADRs): Factors and role of pharmacists in their prevention. *International Journal of Pharmacology Research*, 27(3), 702–706.
23. Patel, P. B., Patel, T. K., Anturlikar, S., Khatun, S., Bhabhor, P., & Saurabh, M. K. (2017). Adverse drug reactions reporting by undergraduate medical students in a tertiary care teaching hospital of India: Content and quality analysis in comparison to physician reporting. *Perspectives in Clinical Research*, 8(3), 137–144. https://doi.org/10.4103/2229-3485.210453
24. Paine, M. F. (2017). Therapeutic disasters that hastened safety testing of new drugs. *Clinical Pharmacology & Therapeutics*, 101(4), 430–434.
25. Khan, S. A., Goyal, J. P., Parmar, R., & Shah, V. (2015). A study of knowledge, attitudes, and practice of dental doctors about adverse drug reaction reporting in a teaching hospital in India. *Journal of Pharmaceutical and Biomedical Sciences*, 5(5), 259–264.
26. Liu, J., Zhou, Z., Yang, S., & Feng, B. (2015). Factors that affect adverse drug reaction reporting among hospital pharmacists in Western China. *International Journal of Clinical Pharmacy*, 37(3), 457–464.
27. Vo TH, Dang TN, Nguyen TT, Nguyen DT. An Educational Intervention To Improve Adverse Drug Reaction Reporting: An Observational Study In A Tertiary Hospital In Vietnam. Arch Pharma Pract 2020;11(3):32-7.