

Assessment of Knowledge and Attitude of Adverse Drug Reactions among Healthcare Professionals in Bangladesh

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A thesis submitted to the Department of Pharmacy in partial fulfillment of the
requirements for the degree of
Bachelor of Pharmacy (Hons)

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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Ethics Statement

This study does not involve any kind of animal or human trial.

Abstract

Adverse Drug Reactions have increased significantly in people and many new drugs have come to the market in last two decades. This has not only the economic consequences but also it causes a number of morbidity and mortality. In Bangladesh, some incidences happened related to drug problem and it took many lives. Spontaneous reporting of Adverse Drug Reactions can primarily control this situation. Therefore, the role of healthcare professionals is immeasurable. However, a large number of healthcare professionals is not aware of Adverse Drug Reactions and Pharmacovigilance especially the nurses. It was seen in this study that 13.3% of nurses do not know about ADRs and 93.3% of them have not reported an ADR. Furthermore, many of the healthcare professionals in this study did not show positive attitude towards pharmacovigilance. If proper pharmacovigilance practice cannot be started, the whole nation will face serious economic and health related problem.

Keywords: Adverse Drug Reactions; Pharmacovigilance; Health Care Professionals; Knowledge; Attitude.

Dedication

Dedicated to my parents and to my supervisor Mohammad Kawsar Sharif Siam.

Acknowledgement

I want to start by thanking the almighty God, my source of knowledge, strength, and wisdom and for His mercy, blessing as well. All the appreciation to Him for blessing me with strength, patience and assistance that was very much necessary to complete my project. I am thankful to some individuals to support me continuously and without their support and guidance this project would be very tough to complete.

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List of Acronyms

ADRs	Adverse Drug Reactions
ADRM	Adverse Drug Reaction Monitoring
CV	Cardiovascular
DGDA	Directorate General of Drug Administration
HCPs	Health Care Professionals
KAP	Knowledge, Attitude and Practices
PEM	Prescription Event Monitoring
PV	Pharmacovigilance
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

Chapter 1

Introduction

1.1 Adverse Drug Reactions (ADRs)

Safety and potency are leading concerns of a drug. Although drugs and medicines are used to treat as well as prevention of diseases sometimes these may contradict and cause Adverse Drug Reactions (ADRs). Adverse Drug Reactions (ADRs) can be defined as- “any reaction to a drug that is poisonous and takes place at doses are intended to use for diagnosis, prophylaxis as well as treatment of diseases” (Nahar, Khan, Banu, Khan, & Hossain, 2017). The term ADRs is similar to the terms “Toxic Effect” and “Side Effect”. A toxic effect can be defined as “one that is usually occurred from an exaggeration of therapeutic effects and it usually does not occur at normal dose” on the other hand side effects usually arise from different mechanism to toxic effects and may or may not be dose related (Edwards & Aronson, 2000). These days ADRs have already become a major issue and causes a number of deaths and morbidity. It is also thought to be a source of economic burden to health areas (Patton & Borshoff, 2018). Approximately 0.1 million people died in US due to ADRs and which became sixth leading cause of death in the country after cardiovascular diseases, stroke and cancer. In last two decades ADRs in people have been increased significantly and many new drugs have come to the market within this time. It has been seen that poor knowledge of the physicians about new drugs as well as misuse of drugs by patients are two major factors of ADRs development (Ajayi, Sun, & Perry, 2000). Researchers found that the annual expenditure of hospitalization rose by \$300 million in Canada only and approximately 20% of adult are admitted to the hospital due to complications related to medicines (Lexchin, 1991). Another study showed that about 5% patients get admitted into hospitals due to ADRs and fatality rate is 0.19 million each year throughout Europe (Bouvy, De Bruin, & Koopmanschap, 2015). Any class of drug can be

responsible for ADRs but many studies showed that antibiotics are more responsible to cause an ADR compared to other drugs (Shamna et al., 2014). However, ADRs always do not seem to be caused by one reason only. There are several factors that can cause ADRs including patient factor, medication, community and healthcare professionals (AlShammari & Almoslem, 2018). Depending on the severity of ADRs and for safety issue some drugs have already been withdrawn from the market. For example, Rofecoxib was withdrawn as it causes cardiovascular (CV) problems. About 84 million people all over the world received rofecoxib prescription but on 30th September 2004, it was removed from global market due to its complications in CV (Barry, Koshman, & Pearson, 2014). Another drug named valsartan is an antihypertensive drug has been banned in 23 countries including Bangladesh because researchers found a carcinogenic agent called NDMA (N-Nitrosodimethylamine) as impurity in the Active Pharmaceutical Ingredients manufactured by a Chinese company called Zhejiang Huahai Pharmaceutical Ltd (Khan, n.d.).

ADRs are of different types and they are classified based on the reactions or side effects they create. They are basically: Type A and Type B. Type A reactions are intrinsic and Type B reactions are idiosyncratic type reactions. Type B reactions cannot be clarified by drug dose or pharmacologic responses (Iasella, Johnson, & Dunn, 2017). On the other hand, Type A reactions are typically dose dependent as well as easy to predict and which are most often time recognized prior to the marketing of a medicine. Moreover, these types of reactions are reversible if the dose is reduced or the drug is withdrawn. Type A responses may arise from the medication's main pharmacology. For instance, Warfarin's anticipated clinical intervention is a decline in the ability of blood to coagulate, however increased bleeding has become the exaggeration of this action (Kaufman, 2016). Type B reactions produce the effects that are other than pharmacologically mediated. Therefore, it is very difficult to distinguish whether the drug reactions are due to genetically or due to dose dependency (Phillips, 2016).

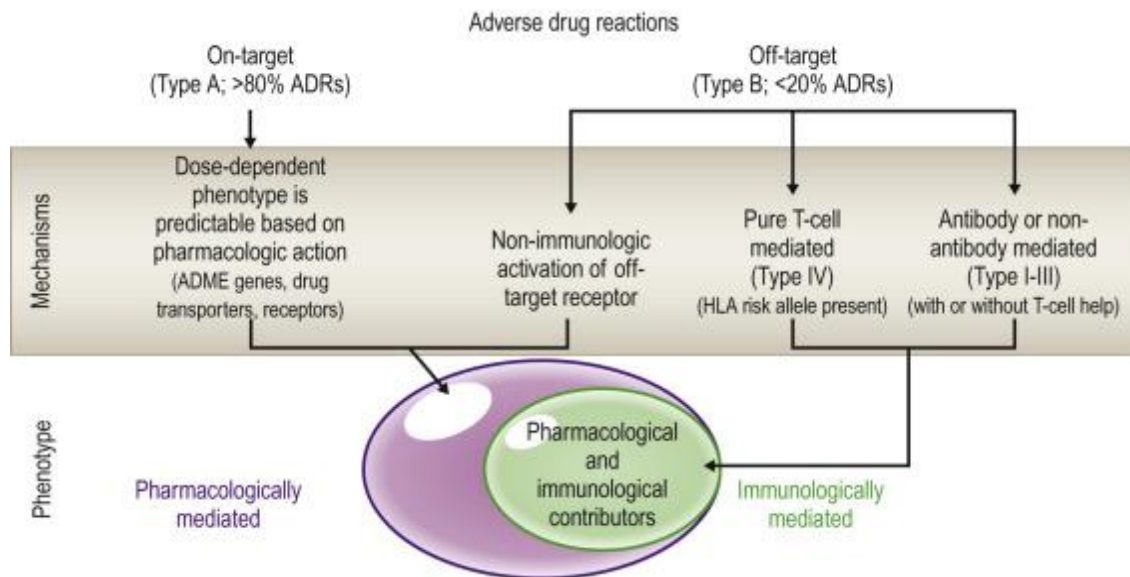


Figure 1: Classification of ADRs. They are classified based on their on target vs. off target reactions

1.2 Pharmacovigilance

The history of medicine largely differs to the history of Pharmacovigilance (PV) and it is fairly recent. However, PV was developed gradually many years after the medicine was developed. Chloroform was the very first instance of potential problem which really resulted to a coordinated and justified view of PV found by Eugène Soubeiran in France in 1831. After the discovery of chloroform it was initially used as obstetrical anesthetic but in the following years when the use of chloroform rose more it was found fatal with having syncope characteristic (Caron, Rochoy, Gaboriau, & Gautier, 2016). After this many incidences were occurred due to drugs, many of them were noticed. Many countries developed laws, regulatory agencies as well to monitor PV after these incidences (Fornasier, Francescon, Leone, & Baldo, 2018). The chronologic historiography of PV is given in the next page (Figure 2).

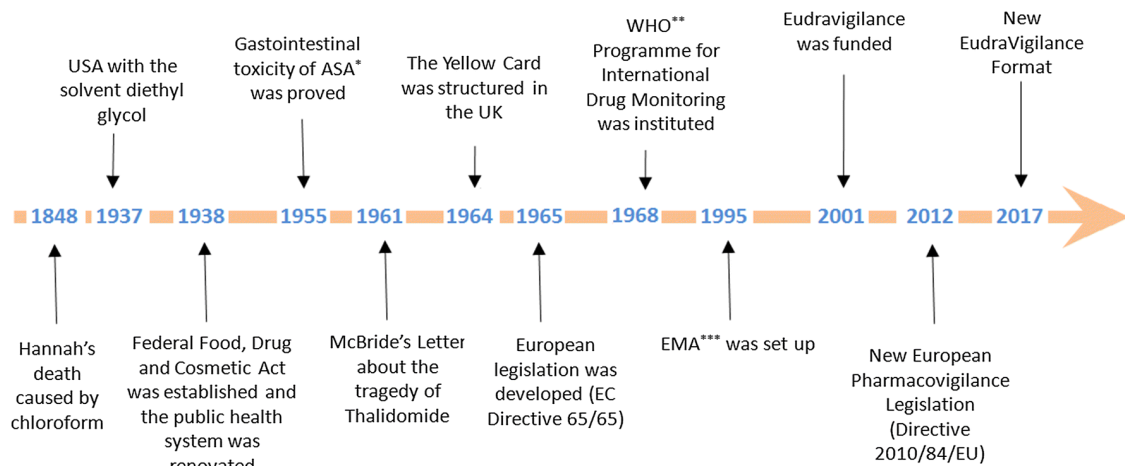


Fig 2: Chronologic historiography of PV. *ASA: acetylsalicylic acid *WHO: World Health Organization: *EMA: European Medicines Agency

PV is defined as World Health Organization (WHO) as, “the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem” (Martin, Hanssens, & Paudyal, 2018). Pharmacovigilance (PV) came from the Greek word “Pharmakon” which means “drug” and from the Latin word “Vigilare” which means “to Keep Watch.” Therefore the meaning of PV becomes to watch the action of a drug (Todar et al., 2017). PV plays a key role in maintaining that physician and patient everyone has sufficient data to decide on a medication for therapy. However although the study and practice of PV have been started in most of the developed and developing countries, still now ADRs are one of the major reason of death in some countries (Jeetu & Anusha, 2010).

PV ensures the safety and potency of a drug. The main goals of PV include reporting of serious ADRs, monitoring the marketed drugs, determining the hazards of medicines, illumination of factors that are predisposal and so on (Talbot & Nilsson, 1998). Several potential safety concerns can be identified by modern PV schemes although there has been significant space for adjustment in tasks and techniques. These schemes include continuous reporting of ADRs and mechanism of new drugs thus identifying the new, life threatening and rare ADRs (Inácio, Cavaco, & Airaksinen, 2017). Many policies have already been put into practice, such as topics

relating to drug evaluations in college and post-graduate programs, as well as the increase in pharmaceutical period have also been applied to support the compliance to suitable procedures in healthcare practitioners for PV (Varallo, Planeta, & Mastroianni, 2017). Bio-pharmaceutical medicines show certain properties and difficulties those are encountered during PV (Giezen, Mantel-Teeuwisse, & Leufkens, 2009).

1.3 Importance of Pharmacovigilance in Bangladesh

The study of Pharmacovigilance (PV) is very important for each country to maintain safety issues as well as decent healthcare program. Although Bangladesh is a developing country, according to Directorate General of Drug Administration (DGDA) Bangladesh exports medicines to about 30 different countries. Therefore, PV plays a key role in maintaining the safety of exported and local marketed drugs (Jahan, Hossain, Hossain, & Amran, 2017).

The license or approval of every new drug highly depends on the effectiveness of the product as well as secure outcome from clinical study. Initially, there are significantly fewer participants in clinical studies compared to people subjected to any fresh therapeutic product once the drug is marketed. Therefore, many serious and rare ADRs cannot be found while the clinical trial is done due to small number of volunteers (Kumar, 2017). However, PV is the practice of gathering, tracking, investigating, analyzing and reviewing data from healthcare supplier and individuals on the harmful effects of pharmaceutical products, genetic products, herbs, blood products and so on in order to determine the potential risks of medicaments and also to limit damage to people (Suke, Kosta, & Negi, 2015). A proper work on PV helps to regular study on all types of ADRs. Moreover, PV helps to design appropriate treatment plans that are needed when an ADR is noticed thus patient becomes more aware of that particular drug (van Eekeren et al., 2018). PV is essential as there are limitations in the pre-marketing studies for some reasons for instance, small duration, small number of volunteers and due to some rare types of ADRs (Sportiello et al., 2016). The practice of PV generally

involves evaluating the prescriptions or Over the Counter (OTC) drugs, monitoring newly marketed drugs as well as types of reactions drugs produce (Toklu & Mensah, 2016).

In a developing country like Bangladesh, PV can play a vital role to ensure the safety of drugs. Prescription event monitoring (PEM) is a system to collect data from clinical analysis and the prescribers are required to report ADRs events which are no drug related. PEM is very useful and simple method to gather information or hypothesis about PV. Many countries have already developed different type of reporting system, reporting form as well. For instance, in the United States the “Medwatch” is the spontaneous system of reporting of ADRs whereas in UK it is “Yellow Card System” (Helali, Iqbal, Islam, & Haque, 2014). Reporting of ADRs can be done in Bangladesh through the Directorate General of Drug Administration (DGDA) website either by online fill up or by e-mailing to DGDA. PV enables to monitor and prevent the health hazards and difficulties presented by enhancing accessibility and export in substandard and counterfeit products. PV helps to identify medicinal products those have already lost their efficacy. It also plays a significant role in the identification of drug errors in order to reduce the number of such mistakes and their impacts on patients. PV can also be used for monitoring and reviewing drug efficacy and providing proof to support modifications in therapy protocols (Welfare, n.d.). Furthermore, major number of people in Bangladesh is illiterate, live below poverty and they have very small idea on their health safety. Therefore, to avoid many serious health hazards PV is very important (Saha, Paul, Rahim, & Hosen, 2015).

1.4 Current Scenario of Pharmacovigilance among Healthcare

Professionals in Bangladesh

A good and regular Pharmacovigilance (PV) study ensures proper healthcare facilities therefore, study on PV assures the safety of drug as well as medication errors. In Bangladesh,

PV was started in 1996 at DGDA with the guidance under WHO. After that Adverse Drug Reaction Monitoring (ADRM) cell was developed and a few measures had been taken to create consciousness as well as communication. But due to poor funding, support, legislation and knowledge it became inert. After getting support and funding from USAID the ADRM cell was re-established in 2013 at DGDA. Since then the cell was functioning as National Center for PV in our country. Now DGDA receives the reports of ADRs from thirty-two government and privately-owned hospitals as well as from thirty different local pharmaceuticals. Since 2014 to 2017 in this three years a total of fifteen hundred and seventy seven reports were received at DGDA (A. Hossain, n.d.). A cross sectional study was done in three divisions (Dhaka, Khulna and Rajshahi) from 2015 to 2018 in fifteen hospitals which are of different types and it was found that leading problem of DGDA was to spread knowledge among the HCPs because of poor manpower (A. M. A. Hossain, 2018). Another study was done in Military Hospital in Dhaka throughout 2015 and found fifty patients with having severe cutaneous ADRs which were of various types like, Steven Johnson Syndrome, Toxic Epidermal Necrolysis (Chowdhury, Hoque, Khan, & Khan, 2016). According to a study, there were only nineteen documents that are related to ADRs as well as PV in Bangladesh since 1971 to 2014 in different journals and from them major number of studies was done after 2010. This say that there are very few studies done on ADRs and PV till now in Bangladesh although during this time many ADRs related cases were found (Umar & Haque, 2015). Bangladesh is a developing country with 160 million of population and sometimes ADRs need hospitalization. For this reason, ADRs largely led to major financial losses. A study was done in 2011 and it was found that from thirty patients suffering from ADRs fifteen were hospitalized and other fourteen took medications for treatment and other one person died. Thus ADRs hampering the quality of life and financial loss (N Nahar, A Karim, PC Paul, 2011). A survey was done on randomly 160 patients at Out Patient Department of Skin in between 2007 and 2008 and 19 patients were

found with ADRs to various drugs which are of 66 drugs. About 36% of reactions were mild and others were severe. This study primarily noticed that study of ADRs and PV is very necessary in Bangladesh (Begum et al., 2012).

These studies say that in Bangladesh the proper practice of PV has not started yet. Most of the HCPs are not interested to report and ADR as well as people are not aware of ADRs.

1.5 Challenges of Pharmacovigilance Study in Bangladesh

In a developing country like Bangladesh a proper study and practice on PV is hard to achieve as most the people are not aware of drug safety. Various types of diseases, a large number of patients in the hospital, small number of HCP personnel, shortage of resources and funds these may hamper the good PV practice. The developing nations bear the largest of burden on diseases worldwide that raises the pressure of the overwhelmed system. Moreover, poor monitoring of results of PV and exposure of medications that are causing ADRs calls for attention on drug safety in developing countries (Elshafie, Zaghoul, & Roberti, 2018). Engagement of patients to PV is very essential for a good PV practice. Patients are not clarified with the value of reports and therefore, where in last few years several numbers of ADRs identified, the number of reports is very low compared to that. A reason can be, patient generated reporting system is not practiced in Bangladesh. Moreover, PV system also need to provide the HCPs and patients with helpful, implementable data about the medicine (Dal Pan, 2014). Tendency to irrational prescribing can lead to one of the challenges of PV. Several newly marketed drugs and also the second line drugs that are found expensive by the patients for this reason they find the alternatives and that may lead to ADRs but due to lack of knowledge those are not reported generally. Representatives who always push the physicians with bribes and the physicians stick to principle to prescribe rationally. A large portion of patients take decision by their own to select the medicine, amount, source. This may lead to poor PV practice. A poor funding to share the information about drug and to educate people is

one of the main challenges to ensure proper PV. In the certain parts of the country the purchase of drugs is handled by private sectors as well as sometimes purchase of drugs and prescription are become combined process. This is the negative effect of commercialization that increases the pressure on the patients and finally leads to misuse of drugs. Furthermore, reporting of ADRs is not mandatory in Bangladesh and regular audit is not done (Mohiuddin, 2019).

1.6 Economic Impact of Adverse Drug Reaction

Adverse Drug Reactions (ADRs) have many serious consequences in the healthy life and one of the most common impacts of ADRs includes economic loss due to it. The effects and the management of ADRs is challenging and according to a study the yearly cost due to ADRs rises up to 30.1 billion USD. The major reasons behind this loss is because of increased number of hospitalization, increased hospital stay, medication purchase and in many cases medical research (Sultana, Cutroneo, & Trifirò, 2013). Another study says that majority of ADRs were due to the anti-cancer drugs, anti-rheumatoid drugs and due to antibiotics and mean expenditure for the treatment of each ADR is observed to be about 2000 USD in USA, around 2000 Euro in the Europe and lastly, approximately 150 USD around the Indian region (Bhat, D, & Udupa, 2016). In Bangladesh where most of the people are poor, ADRs cause a huge loss to the person, his or her family as well as to the whole nation. Though due to ADRs all of the patients do not need hospitalization it increases the cost on medications. Many nations around the world budget 15 to 20% of total hospital expenditures to handle the drug related complications. The ADRs and other related type of problems like, communicable diseases cause social as well as economic problem to the whole nation especially in developing countries (Russom, Centre, & Abdulmumini, 2019). In Canada a survey was done on the economic burden of ADRs and it was observed that ADR the mean cost of hospital stays became 7529 CAD for each person and the cost for every time physician visit was 235 CAD for each patient and the annual cost raised by 13.6 million CAD in the year of 2007 only (Wu, Bell, & Wodchis, 2012).

Although the proper study of PV has not started in Bangladesh, continuous reporting and managing the ADR it is badly needed. Otherwise the nation will face an economic burden due to ADRs.

Chapter 2

Methodology

2.1 Research Design

The study was designed for assessment of knowledge and attitude on ADRs among the HealthCare Professionals (HCPs) who are currently working in different types of hospitals (like, Government Hospital, Specialized Hospital, Private Diagnostic Center and Upazila Health Complex) and also in industries (Pharmacists). The main objective of this survey was gathered form the assessment and by the evaluation of many article papers from many different popular journals. For example, PubMed, Academia, The Lancet, Journal of American Medical Association (JAMA), Science Direct and so on. The rationale to choose this topic was to find out the present scenario on ADRs among the HCPs in our country, make them aware on ADRs and the reporting system and to know about their opinion towards ADRs. Although in many countries many studies have already been done on ADRs based on Knowledge, Attitude and Practice among the HCPs, in Bangladesh there have been very few studies done on KAP. This survey was operated in seven hospitals which are of four different types. Three of them were in Dhaka, two of them were in district level (in Tangail) and two of them were Upazila Health Complexes. Two of them were medical colleges- Dhaka Medical College; Sheikh Hasina Medical College, Tangail. Two diagnostic centers- BDM Diagnostic Center, Mohammadpur, Dhaka; Sonia Diagnostic Center, Tangail. One specialized hospital- National Institute of Cancer Research and Hospital, Dhaka and two Upazila health complexes in two different Upazilas (Bhuapur, Kalihati) in Tangail.

2.2 Determination of Sample Size

This study was done with the sample size of one hundred and thirty in total. This sample size can represent the absolute situation as appropriate sample size may draw the actual scenario of

PV practice in our country. However, no data was found regarding the sample size to assess the depth of Knowledge and attitude on ADRs among HCPs. All the questionnaires given to HCPs were tested firstly. The figure below represents on how the research was designed:

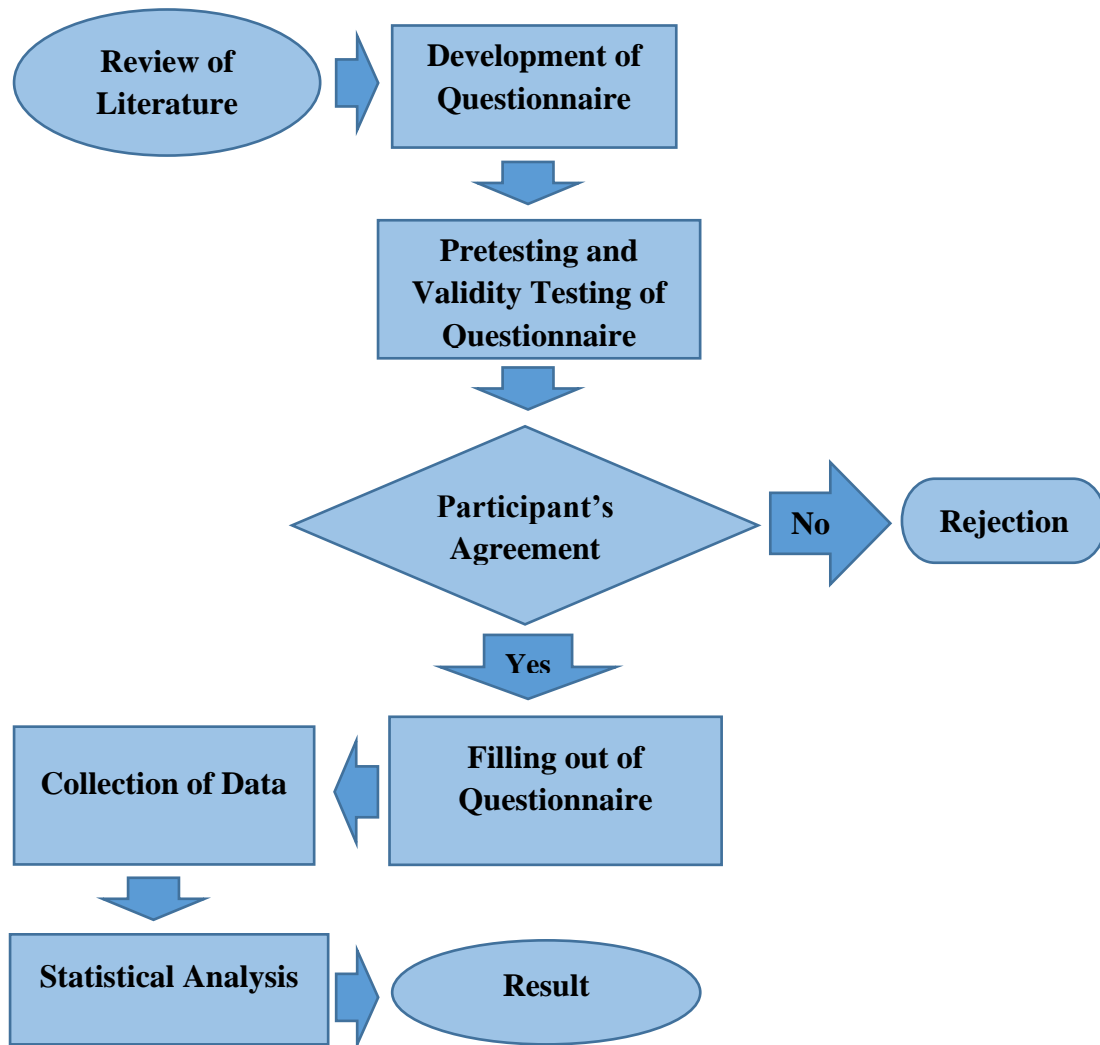


Figure 3: Research Design in a Flow Diagram

2.3 Ethical Permission

All the HCPs supported this study and helped to gather information. Therefore, it was an important part of the study to take ethical permission which ensured the safety as well as rights of the HCPs. To fulfill the ethical requirements authorization of hospitals had been confirmed.

A permission letter was given to the Head of each hospital. After getting the permission from the Head the survey was done.

2.4 Development of Questionnaire

The questionnaire was designed by doing study on literary work which helped to achieve the aim and objective of this study and ensured adequate assessment of PV practice. The survey had been configured to be sufficiently powerful so that it could be able to grab information from the respondents. In this study the questionnaires were in such a way that only if the respondents were familiar with the term ADRs and PV. Prior starting the survey the authenticity of this study was ensured and the final review was done by an expert who has a vast knowledge and has experience to work in this area. In the very first part of the questionnaire respondent's demographic information like name, age, gender, occupation, nationality was asked. Then basic information about ADRs and PV were included. After that in part three the questions related to attitude on ADRs were included. All the questions were very simple to understand and straight. In the last part four questions were kept to know the views of HCPs.

2.4.1 Pretesting, Validity Testing and Finalizing of Questionnaire

Pretesting of a questionnaire assures that whether there is any mistake in the questions or not that can hamper the aim and purpose of the study. A credible, legitimate and valid questionnaire in a broad sense is very essential to complete and response to all the questions easily. After that the validity testing is done. Testing of questionnaire for validity is essential in order to prevent analytical mistakes. The simpler questionnaire will make it less difficult for the respondents to answer in this study. Therefore, two individuals were chosen for testing of the questionnaire. One of them was a nurse and another one was a pharmacist. Both of them found the questionnaire very easy to complete and they were able to answer all of the questions within three minutes. Furthermore, testing for authenticity was performed to assure that somehow the

study material is sufficiently cautious to collect all data and properly suited to the study's objectives. Prior to start the survey an instruction on validity testing was taken from an expert and all the questions were set in such a way that gave the strength to the aim of the study.

2.4.2 Collection of Data and Completion of Survey

Information was collected from the respondents who met the preconditions of this research for example, age, occupation (Physician, Nurse, and Pharmacist), nationality etc. The survey was finished with One Hundred and Thirty respondents who are currently working in the hospitals or in the industries.

2.5 Statistical methods Used for Data Analysis

The statistical analysis of data of this study was done by Statistical Package for Social Sciences (SPSS) programming. Version 23.0 was used to examine the data as a portion of the research. At the beginning, all the data were included on the information page of SPSS. After that, cleaning of data was done. To measure the inferential statistics this statistical package was used. A total number of 130 samples were entered in the SPSS data sheet. Then in the variable table the information as well as questions was provided as insight. Once the entire samples were entered distinct statistical findings were calculated by using SPSS to obtain the analytical part of the survey.

The statistical set had been used to compute statistics for description and to compare the means. For example: metric factors, average as well as standard deviations which were used as informative measures, while independent t-tests were used for correlations when it appeared that the data was normally dispersed (e.g. respondent age). Using ostensible data (e.g. frequencies), the Pearson's Chi-square (χ^2) test was used.

Chapter 3

Result

3.1 Demographic Information

The demographic information (type of hospital, occupation and gender) of respondent HCPs (Physician, Nurse, and Pharmacist) is shown in the table 1. A total of 130 HCPs responded to the questionnaire and they are working in both government and private hospitals except the pharmacist as the practice of pharmacists in the hospitals has not started yet. They work in different pharmaceutical companies. The study was done in 7 different hospitals among them 5 (71.428%) were government hospitals and 2 (28.57%) were privately owned hospitals. There was a total of 68 (52.3%) physicians, 30 (23.1%) nurses and 32 (24.6%) pharmacist responded to the study and among them 64 (49.2%) were male and 66 (50.8%) were female.

Table 1: Demographic Information

Variable	N (%)
Type of Hospital	
Government	5 (71.428)
Private	2 (28.571)
Occupation	
Physician	68 (52.3)
Nurse	30 (23.1)
Pharmacist	32 (24.6)
Gender	
Male	64 (49.2)
Female	66 (50.8)

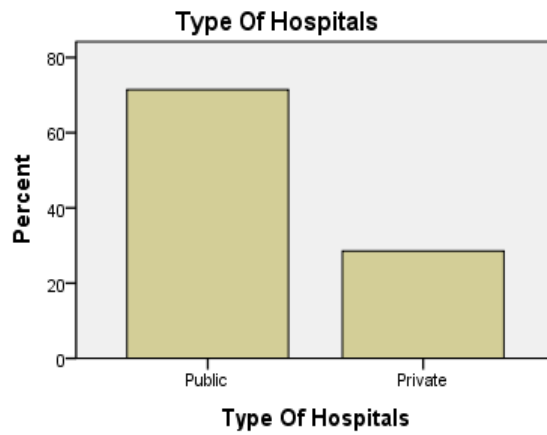


Figure 4: Type of hospitals

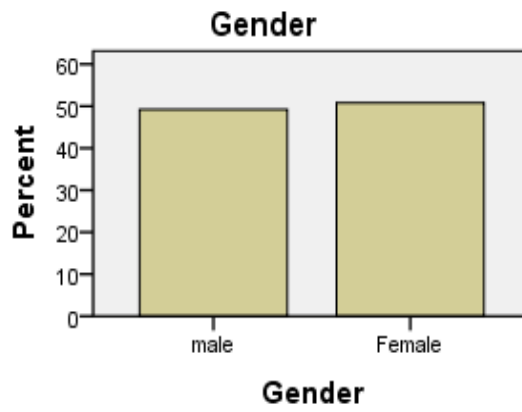


Figure 5: Gender of HCPs

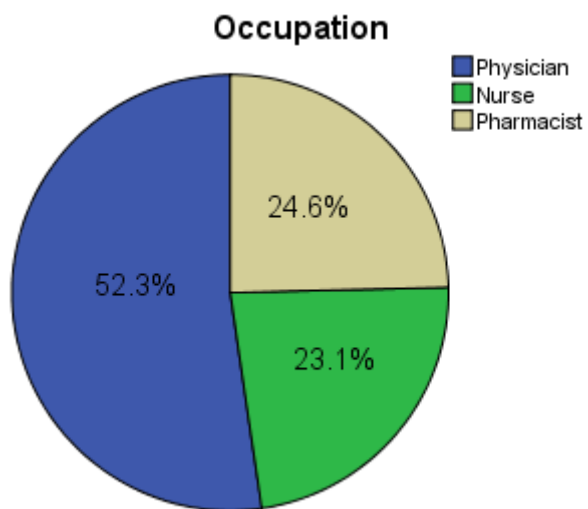


Figure 6: Occupation of HCPs

Another table (Table 2) shows more information of demography (average age and average experience in years) of the HCPs. The mean age of the physicians is 25.27 years, nurses 25.7 years and the pharmacists 25.125 years. Moreover, Physicians have average 2.06 years of experience, nurses 3.26 years and lastly, the pharmacists have 3.35 years of experience.

Table 2: Average age and experience of HCPs

Variable	Average Years
Age	
Physician	25.27
Nurse	25.7
Pharmacist	25.125
Experience	
Physician	2.06
Nurse	3.26
Pharmacist	3.35

3.2 Assessment of Knowledge among Healthcare Professionals

Table 3 shows the knowledge of HCPs towards ADRs. They are asked seven different questions that are closely ended (Yes, No). All of the physicians and pharmacists know about ADRs but 4 (13.3%) nurses do not know about ADRs. After that, 54.4% physicians identified ADRs in patients where 23.3% nurses did so and 10 (31.2%) pharmacist have identified ADRs. Only 41.2% physician have seen standardized ADR reporting form where 6.6% nurses seen that and 21.9% pharmacists have seen ADR reporting form. 70.6% physicians said there is an ADR reporting center in Bangladesh where 33.3% nurses said yes and 21.9% pharmacists said so. Moreover, 19.1% physicians reported an ADR in contrast 6.7% nurses did report and 12.5% pharmacists reported as ADR. 27 (39.7%) out of 68 physicians know where the international ADR monitoring center is located. On the other hand, 90% nurses and 71.2% pharmacists do not know that where the international center for ADR monitoring is located. Lastly, 41.2%

physicians, 6.7% nurses and 40.6% pharmacists know about drug that has been banned due to ADRs.

Table 3: Knowledge of HCPs towards ADRs

Variable	Occupation	Yes N (%)	No N (%)
Do you know about Adverse Drug Reactions?	Physician	68 (100)	0 (0)
	Nurse	26 (86.6)	4 (13.3)
	Pharmacist	32 (100)	0 (0)
Have you ever identified ADR in patient?	Physician	37 (54.4)	31 (45.6)
	Nurse	7 (23.3)	23 (76.7)
	Pharmacist	10 (31.2)	22 (68.5)
Have you ever seen standardized ADR reporting form?	Physician	28 (41.2)	40 (58.8)
	Nurse	2 (6.6)	28 (93.3)
	Pharmacist	7 (21.9)	25 (78.1)
Is there any ADR reporting center in your knowledge in Bangladesh?	Physician	48 (70.6)	20 (29.4)
	Nurse	10 (33.3)	20 (66.7)
	Pharmacist	21 (65.6)	11 (34.4)
Have you ever reported an ADR?	Physician	13 (19.1)	55 (80.1)
	Nurse	2 (6.7)	28 (93.3)
	Pharmacist	4 (12.5)	28 (87.5)
Do you know where the international center for ADR monitoring is located?	Physician	27 (39.7)	41 (60.3)
	Nurse	3 (10)	27 (90)
	Pharmacist	9 (28.1)	23 (71.2)
Are you aware of any drug that has been banned due to ADR?	Physician	28 (41.2)	40 (58.8)
	Nurse	2 (6.7)	28 (93.3)
	Pharmacist	13 (40.6)	29 (59.4)

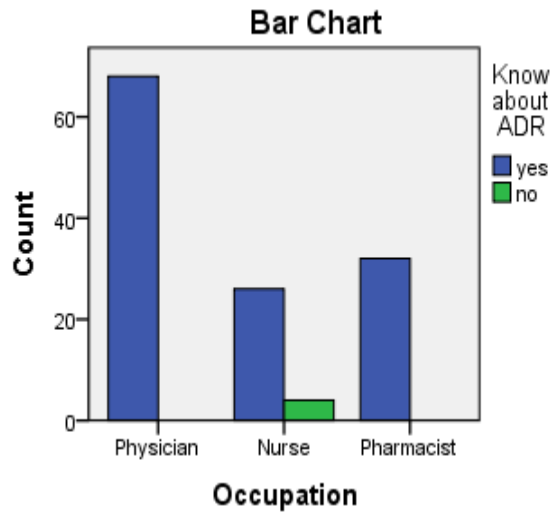


Figure 7: HCPs who Know about ADR

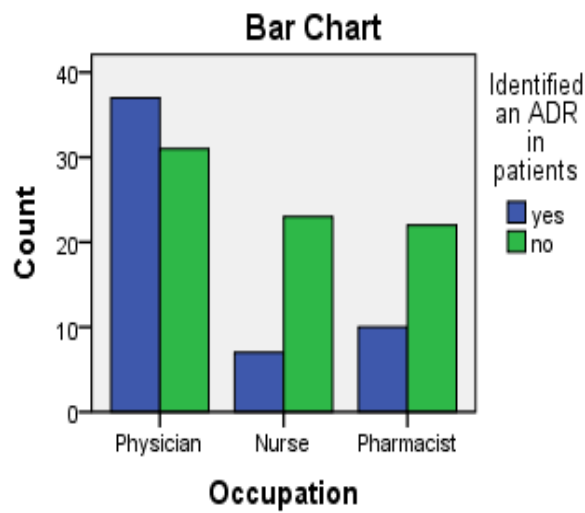


Figure 8: HCPs who Identified ADR in patients

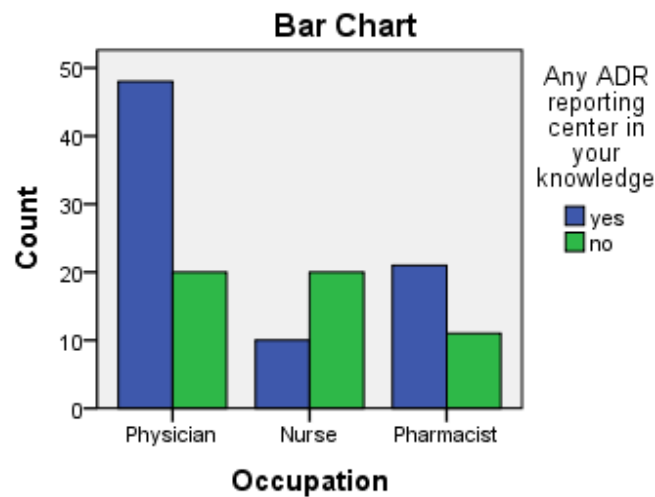


Figure 9: HCPs who know ADR reporting center in Bangladesh

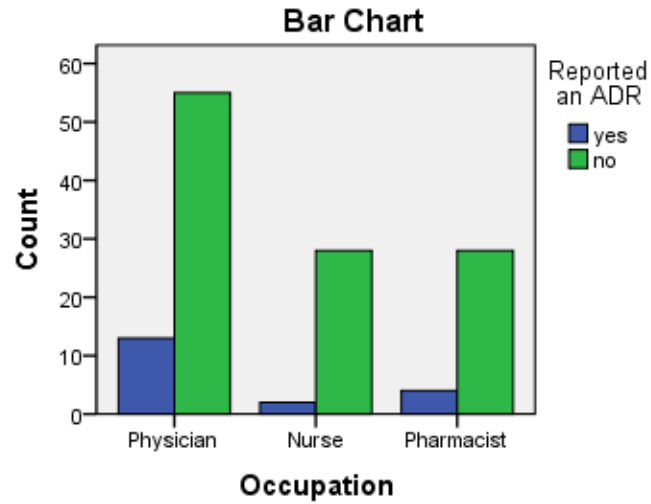


Figure 10: HCPs who reported an ADR

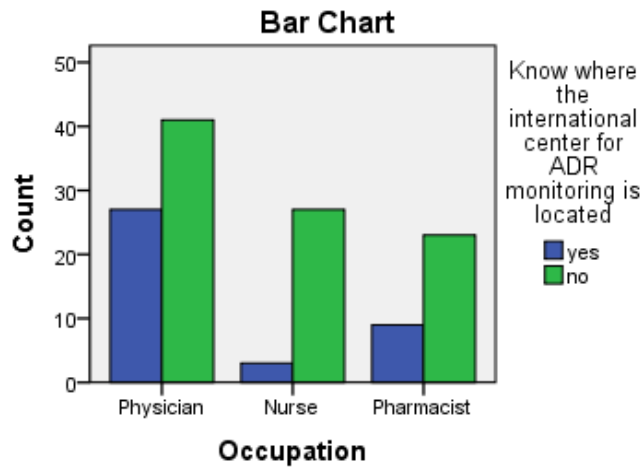


Figure 11: Know where the international center for ADR monitoring is located

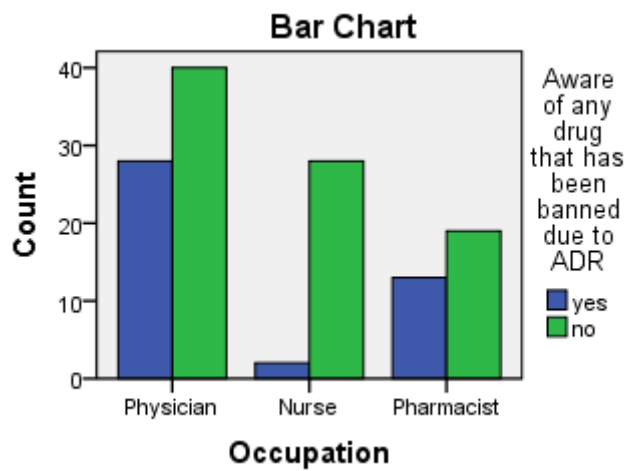


Figure 12: HCPs know any drug that has been banned due to ADR

3.3 Assessment of Attitude among Healthcare Professionals

A few questions were included in the questionnaire to assess the attitude of HCPs towards ADRs. Firstly, table 4 has three questions that assess the attitude of HCPs. 92.6% physicians, 59.9% nurses and 90.6% pharmacists agreed that reporting of ADR is important.

Table 4: Attitude of HCPs towards ADRs

Variable	Occupation	Strongly Agree N (%)	Agree N (%)	Neither Agree nor Disagree N (%)	Disagree N (%)	Strongly Disagree N (%)	χ^2	p value
It is important to report an ADR	Physician	27 (39.7)	36 (52.9)	5 (7.3)	0 (0)	0 (0)	1.4	0.60
	Nurse	9 (3)	17 (56.6)	4 (13.3)	0 (0)	0 (0)		
	Pharmacist	12 (37.5)	17 (53.1)	3 (9.3)	0 (0)	0 (0)		
Reporting of ADR is a professional obligation for HCPs	Physician	10 (14.7)	26 (38.2)	17 (25.0)	12 (17.6)	3 (4.4)	3.7	0.47
	Nurse	8 (2.7)	12 (40)	5 (16.7)	3 (10)	2 (6.7)		
	Pharmacist	5 (15.6)	13 (40.6)	8 (25.0)	5 (15.6)	1 (3.1)		
Reporting of ADR improves the patient safety	Physician	15 (22.1)	24 (35.2)	18 (26.5)	8 (11.8)	3 (4.4)	6.5	0.07
	Nurse	5 (16.7)	12 (40)	10 (33.3)	3 (10)	0 (0)		
	Pharmacist	10 (31.2)	14 (43.8)	6 (18.8)	2 (6.2)	0 (0)		

On the other hand, no physician, nurse and pharmacist disagreed that. After that 52.9% physicians think ADR reporting is a professional obligation where 42.7% nurses and 56.2%

pharmacists agreed with that. 57.3 % physicians, 56.7% nurses and 75.0% pharmacists agreed that reporting of ADR improves the safety of patients. In contrast 4.4% physicians disagreed that ADR reporting improves patient safety. The table below shows their (HCPs) attitude towards ADRs.

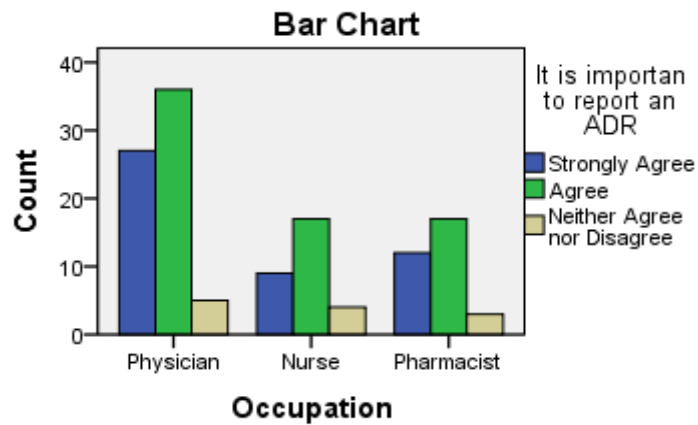


Figure 13: Number of HCPs who think ADR reporting is important

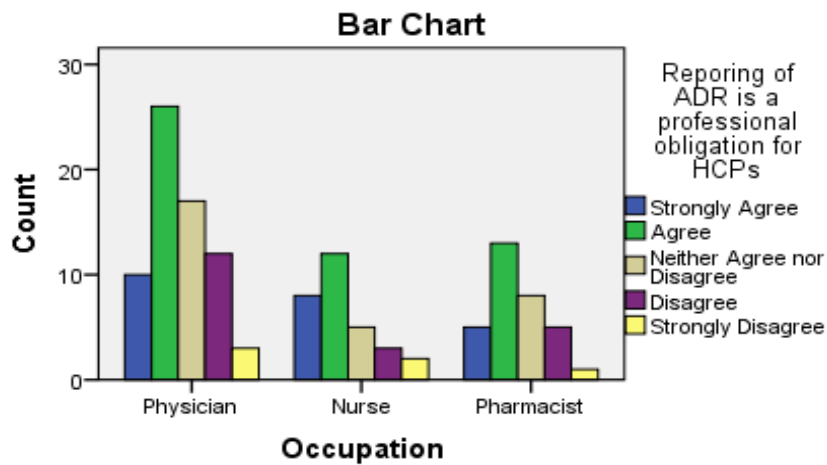


Figure 14: HCPs who think reporting of ADR is a professional obligation

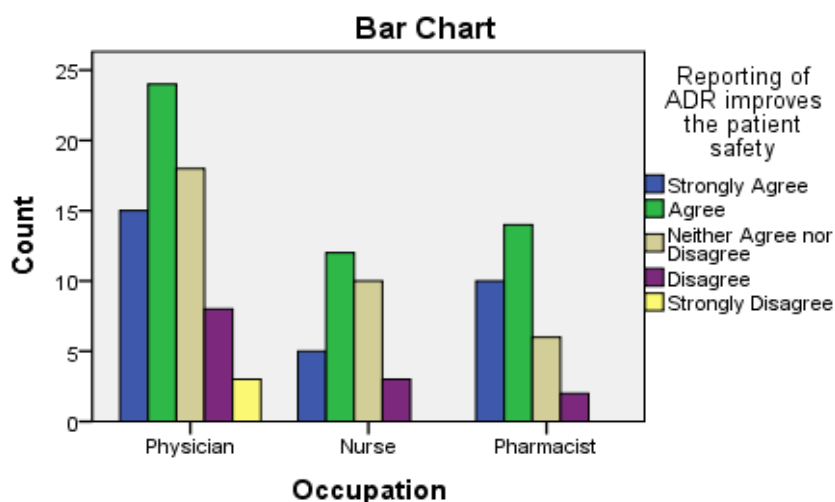


Figure15: HCPs who think ADR reporting improves patient safety

Table 5 also contains some attitude related questions for the HCPs. Again 7.3% physicians strongly agreed that teaching patients about ADR is necessary and 25.0% agreed that. However, 38.2% physicians neither agreed nor disagreed that statement and 19.1% of them disagreed. Similarly, only 6.7% nurses strongly agreed that teaching patient about ADR is important and 23.3% of nurses agreed. On the other hand, 40.0% nurses disagreed that where 30% neither agreed nor disagreed. 40.6% pharmacists think that to teach patient about ADR is important in contrast 25.0% disagreed. Among the physician's 47.1% believes that ADR reporting is time consuming where only 26.4% disagreed that. Similarly, 40.0% nurses and 28.1% pharmacists think reporting is time consuming. However, 26.4% physicians, 36.7% nurses and 28.1% of pharmacists think reporting of ADR is not time consuming. Again, 38.2% physicians, 46.7% nurses and 34.3% pharmacists think reporting of ADR increases workload and rest of the HCPs either disagreed or neither agreed nor disagreed. 0% physicians strongly agreed with the statement that ADR reporting affects the confidentiality issues of patients where 42.6% disagreed. Similarly, major number of nurses (40.0%) and 64.6% pharmacists disagreed the statement.

Table 5: Attitude of HCPs towards ADRs

Variable	Occupation	Strongly Agree N (%)	Agree N (%)	Neither Agree nor Disagree N (%)	Disagree N (%)	Strongly Disagree N (%)	χ^2	P value
It is necessary to teach patients about ADR	Physician	5 (7.3)	17 (25.0)	26 (38.2)	13 (19.1)	7 (10.3)	5.3	0.53
	Nurse	2 (6.7)	7 (23.3)	9 (30)	10 (33.3)	2 (6.7)		
	Pharmacist	4 (12.5)	9 (28.1)	11 (34.5)	4 (12.5)	4 (12.5)		
Reporting of ADR is time consuming	Physician	11 (16.2)	21 (30.9)	18 (26.4)	13 (19.1)	5 (7.3)	6.8	0.18
	Nurse	2 (6.7)	10 (33.3)	7 (23.3)	8 (26.7)	3 (10.0)		
	Pharmacist	3 (9.4)	6 (18.7)	14 (43.8)	6 (18.7)	3 (9.4)		
ADR reporting increases workload	Physician	5 (7.3)	21 (30.9)	22 (35.3)	17 (25.0)	3 (4.4)	10.3	0.35
	Nurse	3 (10)	11 (36.7)	9 (30)	7 (23.3)	0 (0)		
	Pharmacist	2 (6.2)	9 (28.1)	9 (28.1)	6 (18.7)	6 (18.7)		
Reporting of ADR affects the confidentiality issue of Patients	Physician	0 (0)	8 (11.7)	31 (45.6)	19 (27.9)	10 (14.7)	9.4	0.05
	Nurse	0 (0)	5 (16.7)	13 (43.3)	10 (33.3)	2 (6.7)		
	Pharmacist	0 (0)	0 (0)	11 (34.4)	14 (43.7)	7 (21.9)		

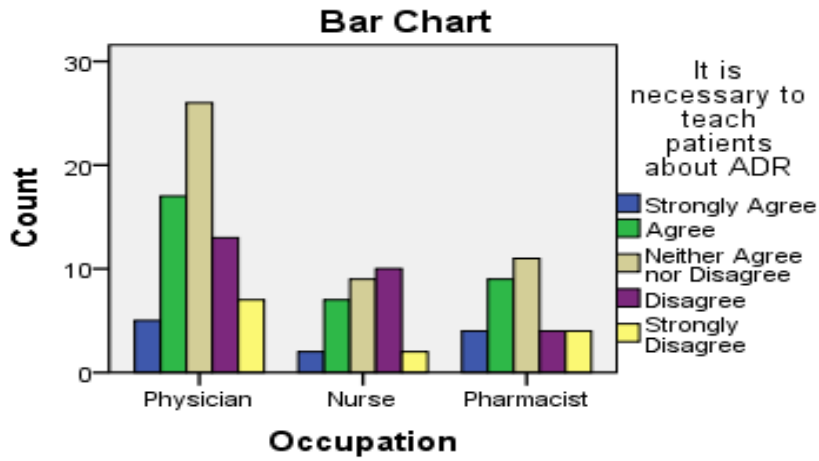


Figure 16: Attitude of HCPs towards teaching patients about ADR

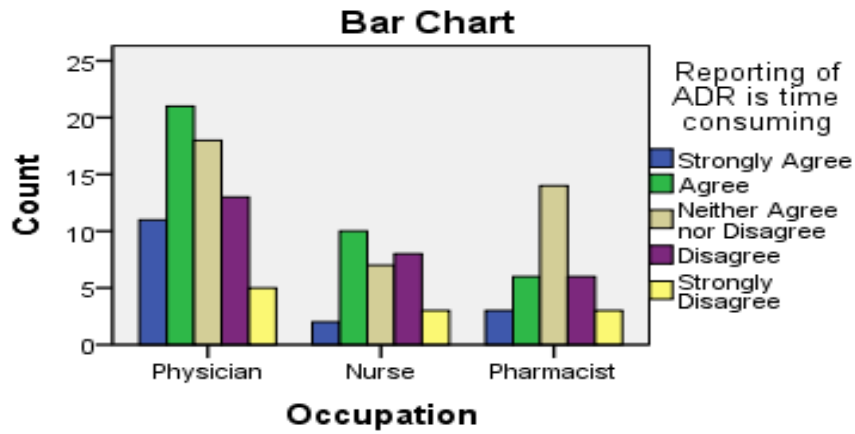


Figure 17: HCPs who think reporting of ADR is time consuming

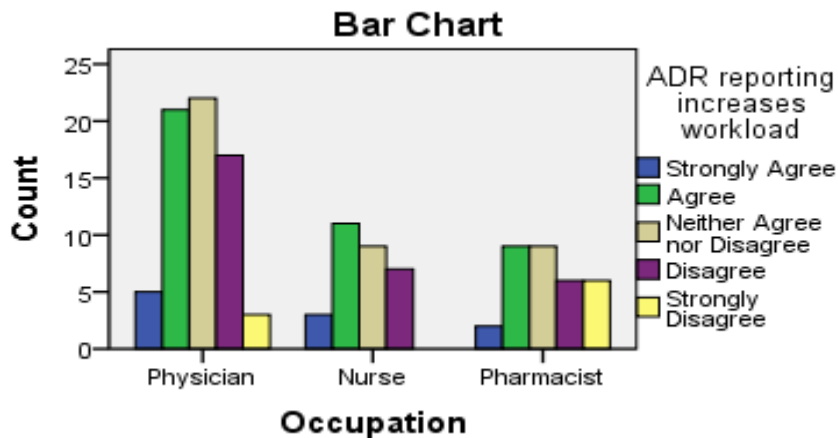


Figure 18: HCPs who think ADR reporting increases workload

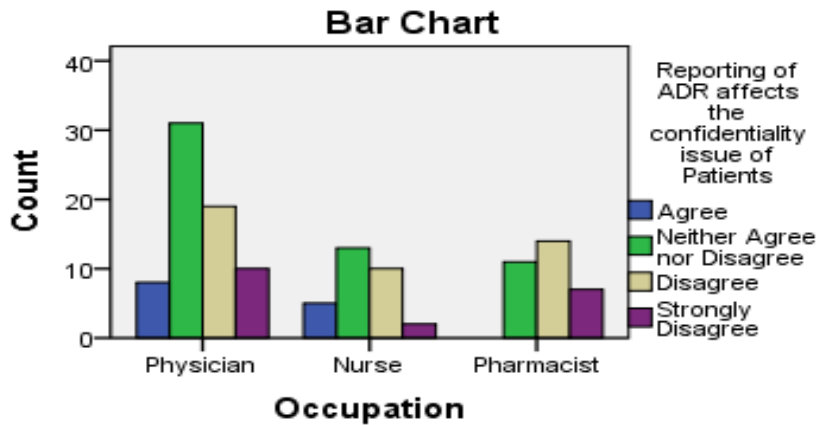


Figure 19: Attitude of HCPs towards confidentiality issues of patients

The table in the next page (Table-6) shows some question regarding the attitudes of HCPs. 54.4% physicians, 50.0% nurses and 24.2% pharmacists think that it is important to establish ADR monitoring center in every hospital but 24.4% physicians, 26.7% nurses and 20.6% pharmacists neither agreed nor disagreed and rest of the HCPs disagreed. Many physicians (26.5%) think the goal of PV is to report ADRs due to allopathic medicines only where 48.5% disagreed the statement. On the other hand, 23.6% nurses and 21.8% pharmacists think same as physicians. However, major of them neither agreed nor dis agreed. Most of the HCPs agreed that drugs with serious ADRs should be banned although few of them disagreed the statement.

Table 6: Attitude of HCPs towards ADRs

Variable	Occupation	Strongly Agree N (%)	Agree N (%)	Neither Agree nor Disagree N (%)	Disagree N (%)	Strongly Disagree N (%)	χ^2	P Value
Establishing ADR monitoring center in necessary in each hospital	Physician	16 (23.5)	21 (30.9)	18 (24.4)	7 (10.2)	6 (8.8)	7.0	0.3
	Nurse	6 (20.0)	9 (30.0)	8 (26.7)	6 (20.0)	1 (3.3)		
	Pharmacist	4 (12.5)	8 (11.7)	14 (20.6)	5 (15.6)	1 (3.1)		
The aim of PV is to report ADRs due to allopathic medicine only	Physician	3 (4.4)	15 (22.1)	17 (25.0)	27 (39.7)	6 (8.8)	8.2	0.4
	Nurse	4 (13.3)	8 (26.7)	10 (33.3)	7 (23.3)	1 (3.3)		
	Pharmacist	1 (3.1)	6 (18.7)	13 (40.6)	10 (31.2)	2 (6.25)		
Drugs that cause serious ADRs should be banned in Bangladesh	Physician	16 (23.5)	31 (45.6)	16 (23.5)	5 (7.3)	0 (0)	1.4	0.5
	Nurse	6 (20.0)	16 (53.3)	7 (23.3)	1 (3.3)	0 (0)		
	Pharmacist	9 (28.1)	15 (46.9)	6 (18.7)	2 (6.2)	0 (0)		

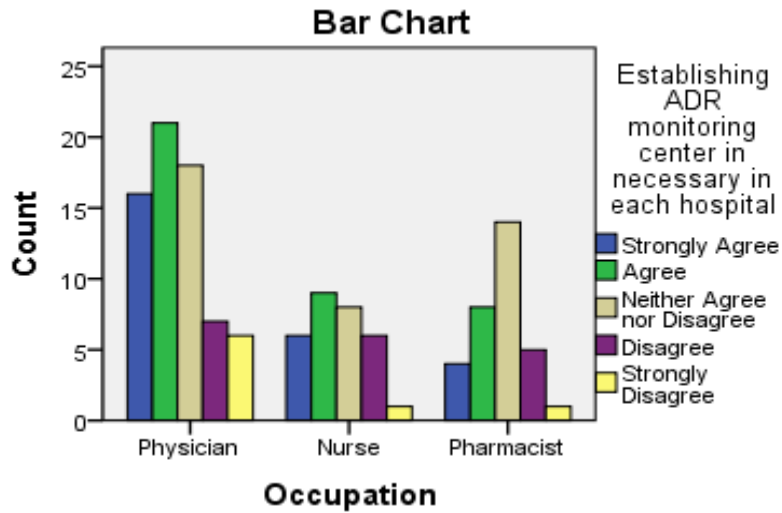


Figure 20: HCP's attitude towards establishing ADR monitoring center in every hospital

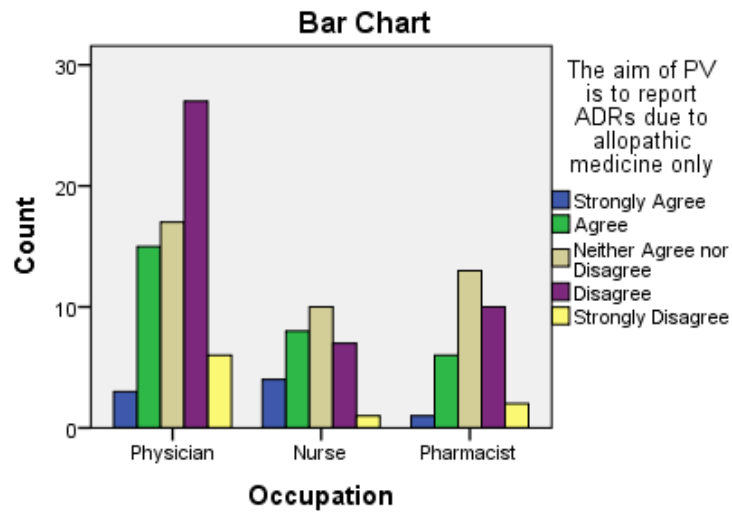


Figure 21: HCPs who think the aim of PV is to report ADRs due to allopathic medicines only

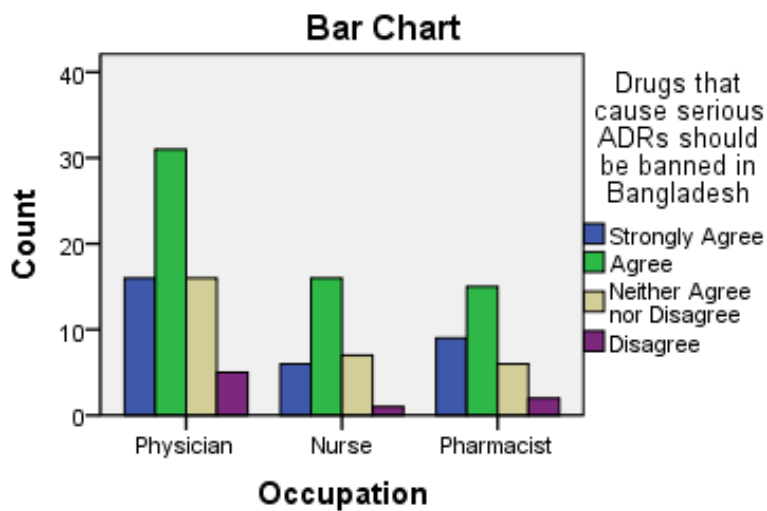


Figure 22: HCPs who think serious ADR causing drugs should be banned

3.4 General Information

Three questions were included in the questionnaire to know about the aspects of HCPs. Most of the HCPs prefer e-mail or online reporting system. 60.2% physicians, 30% nurses and 46.9% pharmacists choose e-mail or online reporting system as most preferable system to report an ADR. However, 26.5% physicians, 43.3% nurses and 40.6% pharmacists think direct contact is suitable to report an ADR. Rest of them has chosen telephone to report but none of the HCPs has chosen post to report an ADR.

Table 7: Reporting system that HCPs prefer

Variable	Methods	Healthcare Professionals			χ^2	p value
		Physician N (%)	Nurse N (%)	Pharmacist N (%)		
Which type of reporting system do you prefer?	E-mail/ Online	41 (60.2)	9 (30.0)	15 (46.9)	8.9	0.21
	Direct Contact	18 (26.5)	13 (43.3)	13 (40.6)		
	Telephone	9 (13.3)	8 (26.7)	4 (12.5)		
	Post	0 (0)	0 (0)	0 (0)		

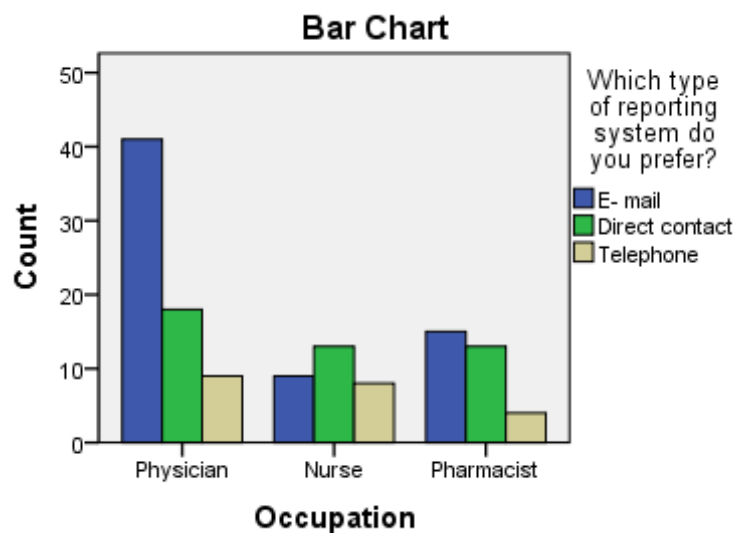


Figure 23: Types of reporting system that HCPs prefer

After that, 33.8% physicians, 43.3% nurses and 21.1% pharmacists think only serious ADRs should be reported. However, major number of HCPs thinks all types of ADRs should be reported. 44.1% physicians, 40% nurses and 56.25% pharmacists think all types of ADRs should be reported.

Table 8: Type of ADRs that should be reported

Variable	Type of ADR	Healthcare Professionals			χ^2	p value
		Physician N (%)	Nurse N (%)	Pharmacist N (%)		
From your view which type of ADR should be reported?	Serious ADRs	23 (33.8)	13 (43.3)	7 (21.9)	7.8	0.35
	ADR to new drug	9 (13.2)	5 (16.7)	4 (12.5)		
	ADR to vaccine	4 (5.9)	0 (0)	3 (9.3)		
	ADR to non-allopathic drug	2 (2.9)	0 (0)	0 (0)		
	Above all	30 (44.1)	12 (40.0)	18 (56.25)		

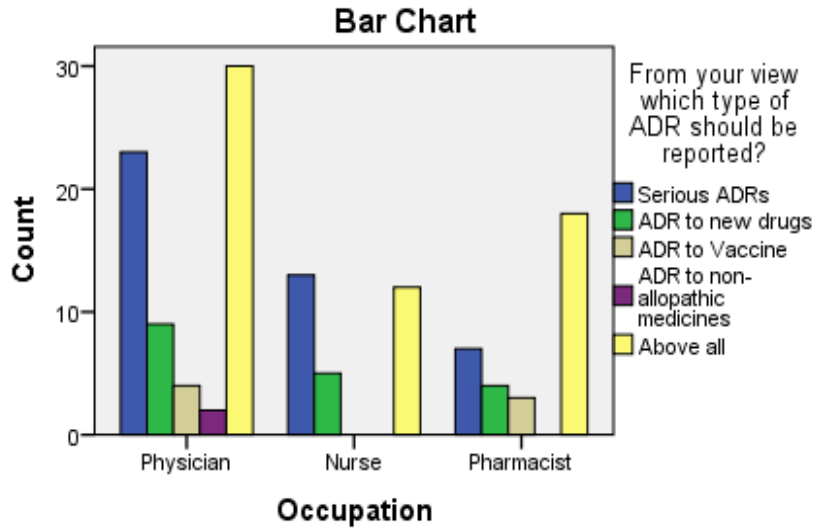


Figure 24: HCPs perception about the types of ADR should be reported

Table 9 below is about the opinion of HCPs from where they knew about ADR. According to the study 70 out of 130 HCPs knew about ADR during their study. 60.2% physicians, 43.3% nurses and 50% pharmacists have heard about ADR while they were students. Following that, 26.5% physicians, 36.7% nurses and 28.1% pharmacists knew about ADR from others and rest of the HCPs heard about ADR from internet. However, no one of the HCPs knew about ADR from newspaper.

Table 9: From where the HCPs first heard about ADRs

Variable	From Where	Healthcare Professionals			χ^2	p value
		Physician N (%)	Nurse N (%)	Pharmacist N (%)		
Where have you first heard about ADR?	During study	41 (60.2)	13 (43.3)	16 (50.0)	3.61	0.48
	On internet	9 (13.3)	6 (20)	7 (21.9)		
	On newspaper	0 (0)	0 (0)	0 (0)		
	From others	18 (26.5)	11 (36.7)	9 (28.1)		

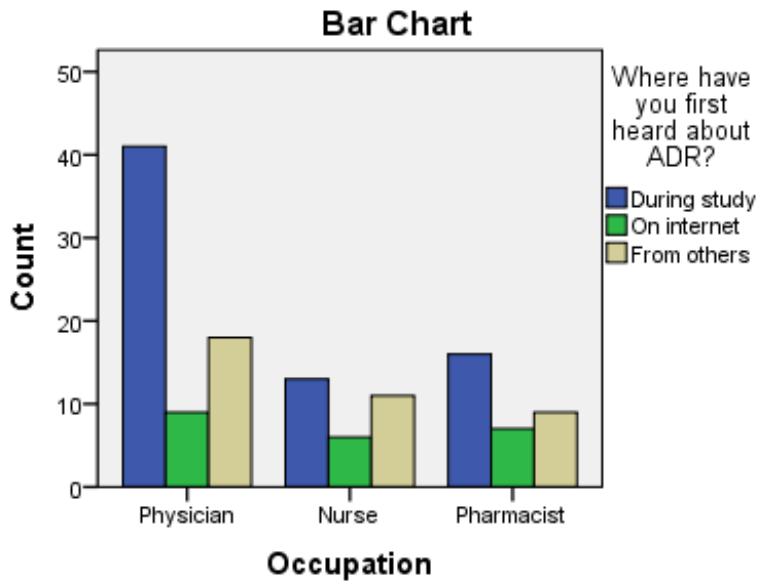


Figure 25: Opinion of HCPs from where they knew about ADR

Chapter 4

Discussion

PV is a fruitful method for identifying and responding to the risks and benefits of the newly marketed medicine. All the HCPs play a key role in PV system. They must have vast knowledge and must be proficient in this area to ensure the safety as well as efficacy of medicines (A. M. A. Hossain, 2018).

Nowadays ADRs are becoming more common but according to this study the HCPs are not much aware of this. In this situation the study and practice of PV is very necessary to improve the safety of medicines. From this study, it can be seen that although 54.4% of physicians identified an ADR in patient but the reporting percentage is only 19.1%. Moreover, only 2 (6.7%) nurses reported ADRs. This has indicated that there is a noticeable knowledge gap between physicians and nurses. Again, 58.8% physicians have not seen the standardized ADR reporting form and the nurses are in worst situation. 93.3% nurses did not see the ADR reporting form. Similarly, 78.1% pharmacists have not seen the standardized form yet. This indicates that most of the HCPs have little interest to report an ADR. The major number of HCPs does not know where the international center for ADR monitoring is located. Furthermore, 58.8% physician, 93.3% nurses and 59.4% pharmacists do not know about any drug that has been banned in Bangladesh due to ADR. These results say that PV study is badly needed for this nation and we are now exporting medicines to many different. If the safety of medicines cannot be improved our country will face a serious economic as well as health related problem in near future. After assessing of the knowledge of HCPs it can be said that they lack in ADR as well as PV and the nurses are in the worst situation

After assessment of the attitude of HCPs it can be said that most of the HCPs have few interests in ADR reporting. Although they believe that reporting of ADR is important, 22.1%

physicians, 16.7% nurses and 18.7% pharmacists disagreed that it is their professional obligation. Few of the physicians think ADR reporting does not improve the patient safety. A large number of HCPs think reporting of ADR is time consuming and it increases the workload despite of saying that reporting of ADR is important. Many of the HCPs were neutral in some questions of the questionnaire.

Although the practice of PV has been started at DGDA, the HCPs have not started to follow yet. In different studies that have been conducted in last few years, say the same thing that many ADRs are now found but reporting rate is very low. According to DGDA till 2017 only 531 reports were evaluated by ADR Advisory Committee and only 9% reports were come from the hospitals (*Newsletter-29-07-18--.pdf*, n.d.). This indicates that the HCPs are not interested to report an ADR.

Besides the HCPs the patients and the stakeholders need to be aware to reduce the incidences related to drugs like, practice of self-administration should decline as well as irrational selling of drugs must be stopped. Moreover, the knowledge of patients as well should be enriched because many of the patients do not know where the ADR reporting form is get, where to report and ADR and many do not know the procedure to fill an ADR reporting form. There are also some incidences related to medication related problem in Bangladesh. For instance, Di-ethylene glycol tragedy, substandard vitamin A tragedy these shows that the study of PV in Bangladesh is not satisfactory and the government cannot solve this problem alone. Lastly, this study shows that how much PV is necessary for Bangladesh and current scenario of PV practice among the HCPs.

Chapter 5

Conclusion

Pharmacovigilance (PV) is essentially aimed at the safety of medication where all types of HCPs play a vital role to use of drugs rationally. Effective practice of PV by the HCPs would give improved result in drug therapy (Toklu & Mensah, 2016). In the developing countries there are challenges and obstacles to ensure the good practice of PV. The HCPs do not show much interest on ADRs and PV. They lack in knowledge and attitude towards ADRs. The practice of PV should be made mandatory to HCPs to ensure the safety issue of patients. Moreover, people are not that much health conscious in Bangladesh. By creating public awareness this situation can be improved. There is no recommended reporting system to report an ADR in Bangladesh. However, most of the HCPs prefer to report the ADRs via email or through online submission but the reporting rate is not satisfactory. Although PV is not functioning in Bangladesh properly, many serious cases are found related to drugs and the DGDA is taking steps to control drug related problems. DGDA strives to assure the safety as well as quality for all drugs that are marketed in Bangladesh. As Bangladesh is exporting medicines to many different countries, DGDA nowadays work for ensuring the quality, security and safety of supply chains for drugs and medical devices. It also works to ensure the affordability as well as rational drug use. It can be expected in the near future the practice and study on PV will improve and the morbidity as well as mortality due to ADRs will fall down.

Chapter 6

Limitations

- I. The major number of Healthcare Practitioners was not willing to fill up the questionnaire and they showed less interest about PV.
- II. The work of pharmacists in the hospitals has not started in the hospitals broadly yet.
- III. The nurses have very few knowledges about ADRs and PV and also on how to fill up the questionnaire.
- IV. The number of HCPs in the hospitals in rural areas was very low.

Chapter 7

Future Work Plan

This questionnaire study was designed to find out the present scenario of practice of PV among HCPs in some different types of hospitals in different areas. This study helped to create awareness and drew the importance of PV study among HCPs. Future research plan related to this survey would be creating awareness and assessing knowledge among the patients in different hospitals of Bangladesh by doing a questionnaire survey to ensure the drug safety of patients.

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Appendix

Questionnaire for Assessing Knowledge and Attitude on Adverse Drug Reactions among Healthcare Professionals in Bangladesh

Dear Sir/ Madam,

Assalamu alaikum. I am Sanjoy kumer Paul a research student of the department of Pharmacy, BRAC University, Dhaka, Bangladesh. I am writing my B.pharm dissertation designated as *Assessment of knowledge and Attitude of Adverse Drug Reactions among Healthcare Professionals in Bangladesh* under the guidance of Mohammad Kawsar Sharif Siam (AMRSC), Senior Lecturer, Department of Pharmacy, BRAC University. The ambition of the dissertation is to investigate and assess the knowledge and attitude towards adverse drug reactions among three types of healthcare professionals (Physicians, Pharmacists, and Nurses).

To complete my research work, I have been doing a survey to find out whether the healthcare professionals of our country are aware of adverse effects of drugs or not as it has been a serious issue worldwide. Therefore, I would request you to respond to these questions based on your experience. *I promise, all the information that are provided will be presented in my research work merely and it will be kept confidential totally.*

It will take few minutes to complete the questions. I would like to request you to read the instructions carefully and answer these.

I hope it will be enjoyable for you to complete the questionnaire and thank you a lot to spend some time on this. Your response is essential and very much helpful to draw the current scenario on adverse drug reaction in Bangladesh. For your further query regarding the project please feel free to contact me on 01645369815 or email me at sanjoykumerpaul94@gmail.com.

Again thank you for your cooperation.

Sincerely,

Sanjoy Kumer Paul
B. Pharm Research Student
Department of Pharmacy
BRAC University

Demographic Information:

Name:

Gender:

Age:

Occupation:

Nationality:

Experience: _____ years.

Contact No(Optional):

Email(Optional):

Part One: Knowledge on Adverse Drug Reactions.

Instructions: *The questions below are designed to know the depth of knowledge on Adverse Drug Reactions among healthcare professionals in Bangladesh. Kindly tick (√) in the box (□) that best corresponds with your view. You are requested to tick only one box from each table.*

Scale: 1= strongly agree; 2= agree; 3= somewhat agree; 4= neither agree nor disagree; 5= somewhat disagree; 6= disagree; 7= strongly disagree.

1. All the healthcare professionals (HCPs) must know the terms “Adverse Drug Reactions (ADR)” and “Pharmacovigilance”

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Pharmacovigilance is the study of medicine that relates to ADR

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. HCPs should know from where the ADR reporting form is got

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. HCPs should know where to report an ADR

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. HCPs need to be trained on how to report an ADRs

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. HCPs must know the purposes of pharmacovigilance very well

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Instructions: The questions below are also designed to know the depth of knowledge on Adverse Drug Reactions among healthcare professionals in Bangladesh. Kindly tick (✓) in the box (□) that best corresponds with your view. You are requested to tick only one box from each table.

Scale: 1. Yes; 2. No; 3. Do not know

7. Do you know about Adverse Drug Reactions?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Have you ever identified an ADR in patient?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Have you ever seen the standardized ADR reporting form?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Is there any ADR reporting center in Bangladesh in your knowledge?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Have you ever reported an ADR?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Do you know where the international center for ADR monitoring is located?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Are you aware of any drug that has been banned due to ADR?

1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Two: Health care Professionals Attitude on Adverse Drug Reactions.

Instructions: The following questions are designed to know about the opinion of healthcare professionals towards ADRs in Bangladesh. Please tick (✓) in the box (□) that best corresponds with your view. You are requested to tick only one box from each table.

Scale: 1= strongly agree; 2= agree; 3= somewhat agree; 4= neither agree nor disagree; 5= somewhat disagree; 6= disagree; 7= strongly disagree.

1. It is important to report an ADR

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Reporting of ADR is a professional obligation for a health professional

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. It is important to know about whether a patient has past ADR history or not before prescribing

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Reporting of ADR improves the safety of patients

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Health professionals should share information about ADR with others

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. It is necessary to teach patients about ADR broadly

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. It is necessary to establish ADR monitoring center/committee in every hospital

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Reporting of ADR is time consuming

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. ADR reporting increases workload

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. ADR reporting brings any difference

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Reporting of ADR affects confidentiality issues of patients

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Side effects like headache, fever and vomiting should not be reported

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. The aim of pharmacovigilance is to report ADRs due to allopathic medicines only

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Drugs that cause serious adverse effects should be banned in Bangladesh

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Three: Some General Information

Instructions: The following questions are designed to know about your view towards ADRs in Bangladesh. Please tick (✓) in the box (□) that best corresponds with your view. You are requested to tick only one box from each table.

1. Where have you first heard about Adverse Drug Reactions?
 - During study
 - On internet
 - On newspaper
 - From other person
 - Other (please mention).....

2. Which method would you prefer to send information about ADRs to ADR reporting center?
 - E-mail/ Website
 - Direct contact
 - Telephone
 - Post
 - Other (please mention).....

3. If you ever witnessed an ADR, likely cause was
 - Drug-drug interaction
 - Medication error
 - Idiosyncratic
 - Other (please mention).....

4. From your view which type of ADRs should be reported?
 - Serious ADRs
 - ADR to new drugs
 - ADR to vaccine
 - ADR to non-allopathic medicines
 - ADR to old drugs
 - Above all

Thank you for your cooperation.

Your signature:

Date:

Researcher: Sanjoy Kumer Paul; Bachelor of Pharmacy Student; Department of Pharmacy; BRAC University.

Supervisor: Mohammad Kawsar Sharif Siam (AMRSC); Senior Lecturer; Department of Pharmacy; BRAC University.

Objectives of the Study:

The main purpose of this study is to evaluate the knowledge and attitude of health professionals like physicians, pharmacists and nurses towards adverse reactions due to medication of drugs in Bangladesh. A more expanded objective of this study is given below:

1. To admit understanding, attitudes and behavior, this can encourage the health professionals to submit ADRs.
2. To encourage the physicians to identify the serious unknown adverse effects of drugs.
3. To inspire the healthcare professionals to focus on new drugs and serious types of reactions due to the medication.
4. Spontaneous reporting of ADRs can contribute significantly to improved levels of pharmacovigilance thus decrease the fatality rate and improve patient safety.
5. To make the health professionals aware about the harshness of ADRs.
6. To inspire them sharing information about ADRs with their colleagues and patients.
7. To let the pharmacists and nurses know that besides physicians they can play important role in reporting of ADRs.
8. This type of study on pharmacovigilance contributes to the assessment of benefit, harm, effectiveness and risk of medicines, encouraging their safety, rational and more effective use.
9. Study of pharmacovigilance decrease illegal sale of medicines and self-medication practices thus improve the safety of patients.