

**EXTENT OF KNOWLEDGE, ATTITUDE AND PRACTICES OF PHARMACIST
TOWARDS ADVERSE DRUG REACTION REPORTING IN COMMUNITY PHARMACY
SETTING**

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ABSTRACT

Under-reporting of ADR is one of the main problems in the healthcare system. The pharmacist is solely the responsible healthcare professional in monitoring and documenting adverse drug reactions. Studies cited to express that community pharmacists have inadequate knowledge about Adverse Drug Reaction reporting but have an advanced attitude. This scenario greatly affects the pharmacists' practice, so the researchers aimed to study community pharmacists' knowledge, attitude, and practice towards ADR reporting. A cross-sectional survey questionnaire was distributed to community pharmacists in the selected localities in the Philippines. Researchers used descriptive quantitative research and collected data using the web-based and distributed it in different social media platforms. A stratified sampling technique was used to group the population, and from each locality, researchers get an equal number of respondents. Using a 5-point Likert-scale type of evaluation, researchers assess the data using descriptive statistics such as the weighted mean, frequency, percentage, Pearson r, and chi-square. Data gathered are from the 139 community pharmacists from the six localities and the pharmacists agreed that adverse drug reactions should be reported once it happened to their patients. This means that they have adequate knowledge about reporting adverse drug reactions encountered by their patients and they know how and when to report ADRs, they also agreed that it is a duty and obligation to report and attend to patients who complained about ADRs. This shows that the community pharmacists have a positive attitude towards ADR reporting, as this is part of their job, and the pharmacists agreed that they had enough practice in reporting ADRs. This means that community pharmacists are performing well in terms of ADR reporting and they follow the different protocols in reporting ADRs as part of their profession. The researchers therefore conclude that there is no significant difference between their knowledge and attitude in the pharmacy community setting in terms of age, gender, position and number of years employed. On the other hand, there is a significant difference in terms of practice.

KEYWORDS: Adverse Drug Reaction, Community Pharmacist, Knowledge, Attitude, Practice, Barriers.

INTRODUCTION

Pharmacists in the community setting are healthcare professionals highly accessible to the public to provide medication counseling to patients, information among physicians, ensuring patient safety and compliance on the medication and general health. Through the years, a pharmacist's functions evolve from a drug-focused to a patient-driven profession to ensure patient medication safety, utilization of drugs, whether prescribed or not prescribed by medical authorities (WHO, 2019). Pharmacists' roles have evolved from filling up prescriptions and their patients' medication safety through pharmaceutical care. And as part of the Healthcare Team, pharmacists are now devoted to placing the patient at the center of practice. At present, the pharmacist is expected to be an active participant in

Adverse Drug Reaction Reporting and that knowledge and expertise are important for the safe application of medicine to the patient, and that pharmacovigilance plays a very vital role in the assessment of clinical practice standards (Limuaco et al., 2014). Pharmacovigilance (PV) started in 1848 when Hannah Green from England passed away after taking chloroform anesthetic before getting rid of an infected toenail; the cause of death was looked into, but it was unfeasible to pinpoint the killer, a conclusion is that Hannah died of lethal arrhythmia. As the result of more deaths raised by clinicians and the public about the safety of anesthesia, the Lancet Journal established a committee about the problem; English doctors, doctor in colonies are encouraged to report deaths caused by anesthesia, and the outcome was published in The Lancet (1893) (Fornasier et al., 2018).

Lack of understanding about pharmacovigilance and ADR reporting has been perceived as one factor for the under-reporting of Adverse Drug Reaction. Health professionals should contemplate adverse drug reactions as part of their obligation and take part in the existent adverse drug reporting system program in their country. ADR is the principal origin of drug-related unwholesomeness and death. The science that takes part in the depletion of ADR is Pharmacovigilance; hence, the uprising and growth are crucial for clinical practice's safety and effectiveness (Suyagh *et al.*, 2015). Pharmacovigilance is defined as the prevention, assessment, detection, and understanding of adverse drug reactions and drug-related problems. It is also considered essential for the safe usage of medications. It is an indicator and a discipline in detecting and reporting ADR. After the thalidomide tragedy, the WHO established the ADR Reporting System (ADRs) and describe adverse drug reaction or ADR as feedback to a drug that is harmful, accidental and takes place on normal doses usually used in diagnosis, treatment, human prophylaxis, and mitigation of diseases (Farooq and Amin, 2019). Adverse Drug Reporting has been effective in practice for more than 60 years. Health practitioners, especially pharmacists, are the ones who usually write reports regarding the ADR that happen to the patient. As we are now in our digital age, it is anticipated that using auto electronic devices will become the standard in a few years (Dalmacion *et al.*, 2015). ADRs are a vital concern of the health system regarding early recognition, proper management, and prevention (Rajalakshmi *et al.*, 2017).

In the Philippine setting, pharmacovigilance is recognized by the local health authority Food and Drug Administration (formerly known as BFAD or Bureau of Food and Drug). Dr. Quintin Kintanar, then Director of BFAD, signed a Memorandum Circular No. 5 of 1994 that requires all serious ADR to be reported and submitted to BFAD within two weeks of receipt and that other ADR must be reported and submitted on or before January 15 of each year. The ADR Reporting System was entrenched in the Philippines in 1994 in August and is considered the national center member of the WHO International Drug Monitoring by February 1995. The Uppsala Monitoring Center is the cooperating center of pharmacovigilance to support patient protection through efficacious practice. (Carandang *et al.*, 2015). When the Philippines became a constituent of the Collaborating Center for the International Drug Monitoring by WHO, ADR Reports were regularly reported to Uppsala. The National Adverse Drug Reaction Advisory Committee reviewed studies on the potential causality of global introspection. However, since almost zero ADR reports have been reported, the committee has dissolved. The Philippine FDA in the year 2007 set in motion a WHO-supported pharmacovigilance strategy called "Bantay Gamot" or "Drug Watch" that is a paper-based reporting scheme that is continuously receiving reports on substandard drugs (Dalmacion *et al.*, 2015).

The Food and Drug Administration is the one who handles the ADR-SRS in the Philippines, and according to a key informer, under-reporting of ADR has impeded the system in the Philippine setting (Dalmacion *et al.*, 2015). Healthcare professionals like physicians, pharmacists, and nurses are the primary sources of adverse drug reaction reports because they always encounter different patients every day; thus, knowledge and attitude greatly affect ADR reporting practice (Carandang *et al.*, 2015). The researchers aimed to study community pharmacists' knowledge, attitude, and practice towards adverse drug reaction reporting.

Background of the Study

Implementation of the ADR reporting system has been beneficial in drug monitoring as it allows the detection of undesirable effects of drugs offered in the marketplace (Gurmesa and Dedefo, 2016). In the Philippines, Republic Act 3720, or the "Food, Drugs and Devices and Cosmetic Act," was signed by Dr. Quintin Kintanar, and this law requires all ADR reports must be submitted to BFAD within two weeks after the incident. In line with this, ADR reports are required to be submitted on January 15th every year. A study in the Philippines came up with a result in which nurses (86%) said to be the most knowledgeable about ADR reporting, followed by physicians (72%), and lastly the pharmacists (61%) (Carandang *et al.*, 2015). Besides the Philippines, other countries like India, the United Kingdom, and Pakistan have been practicing this system for several years. In 2015, India launched a mobile application where healthcare providers can promptly report ADR cases to prevent inconvenience. Research in India concluded that healthcare practitioners' unawareness and the experience was a big factor why ADR reporting did not perform (Mulchandani and Kakkar, 2018). A study regarding the barriers in reporting ADR among community pharmacists has been published in the United Kingdom. According to the study, training about the different ADR types can improve ADR reporting, and re-enforcement about pharmacovigilance education should be strengthened (Cheema *et al.*, 2017). Another study also mentioned that only 43.4% of the healthcare professionals knew the term adverse drug reaction. Most of the respondents do not know that there is an organization concerning the ADR in Pakistan. Almost 67.3% admitted that pharmacists contribute a big help in the ADR reporting system's progress. About a half percent of the healthcare professionals are well trained to control, detect, and report the ADR that happened. The study also tackles some of the factors concerning the underreporting of ADR; 84.6% of the respondents are hesitant if the reaction transpires due to the medicine, and 71.8% said that it was because of the scarcity of legally licensed pharmacists in the drugstore. It is reported that underreporting of ADR is the 8th leading cause of eternal death, yet in the first world countries that usually practice ADR reporting, the ADR linked deaths are a matter of major concern (Shamim *et al.*, 2016).

The Philippine Pharmacists Association Inc. database presented approximately 50,000 licensed pharmacists as of February 2019, yet just half of them were active in the field of pharmacy. Among the healthcare practitioners, physicians are the one who is more involved in adverse drug reaction reporting, followed by the pharmacists for the reason that pharmacists get to communicate with patients daily (Coleman, 2018). Community pharmacists are responsible for assessing the patients who visit the pharmacy and give the right medications. Part of this job was to conduct patient counseling to communicate with the patients about the medicine, thus preventing possible adverse drug reactions (Carter, 2018). Medicine has been improving from time to time, but its adverse reactions were almost the same (Tariq et al., 2020). There is no such thing as a safe drug; thus, there could be ways to make the drug safer to use (FDA, 2017). The communication barrier is one of the reasons that make ADRs happen. There are times that the healthcare practitioner does not ask if the patient is allergic to any other medications (Tariq et al., 2020). In public health, the usage of medicine should be observed through effective pharmacovigilance systems, and that over one hundred and fifty ADR monitoring centers are established in different hospitals and medical institutions to monitor and collect ADR reports (Vivekanandan et al., 2015). The pharmaceutical companies may submit individual product reports to the authority and the filled ADR reporting forms can be directly submitted to the National Coordination Center for Pharmacovigilance or to the nearest ADR Monitoring Center that will be submitted for review and committed to the WHO-Uppsala Monitoring Center for analysis and assessments of experts (Vivekanandan et al., 2015).

The Food and Drug Administration (FDA) has developed various ways of reporting ADR through e-mail, FAX, telephone, or mail to their office. Even non-health allied professionals can also report an ADR case because forms

were available online at the FDA website. The FDA will analyze the forms that will be passed. After approval, the Integrated Management System (IMS) operations unit will review it again for modification and editing according to the Department of Health order number 2012-0121. This study's main concept evaluated the pharmacist's knowledge, attitude, and practice towards ADR reporting in a community pharmacy setting. This analysis would recognize other factors and barriers affecting ADR reporting.

Conceptual Framework

This study aimed to know the pharmacists' knowledge, attitude, practice and barriers in the community settings and how this professional deals with ADRs reporting. Furthermore, this research sought to minimize underreporting of ADRs to the Food and Drug Administration and the Department of Health in the community setting. It is found that many pharmacists in the community setting are intimidated when reporting ADRs, including the patient's incomplete information and if there are no available ADR forms. It includes being unaware of reporting to the national ADRs, and few pharmacists in the community setting guess that ADRs are irrelevant or do not notify them.

The study is cross-sectional research that focused on the Knowledge, Attitude, and Practice of community pharmacists as regards the ADR reporting process. The respondents are classified as community pharmacists. It consists of the input taken from the preparation of the questionnaire, determination of the respondents, and approval of the protocol. The process included the design, conducting the survey, collecting data, statistical treatment, interpretation, and analysis. The output of the study recognized the extent of the community pharmacists' knowledge, attitude, practices, and barriers towards ADR reporting. In envisioning the research, a model is presented:

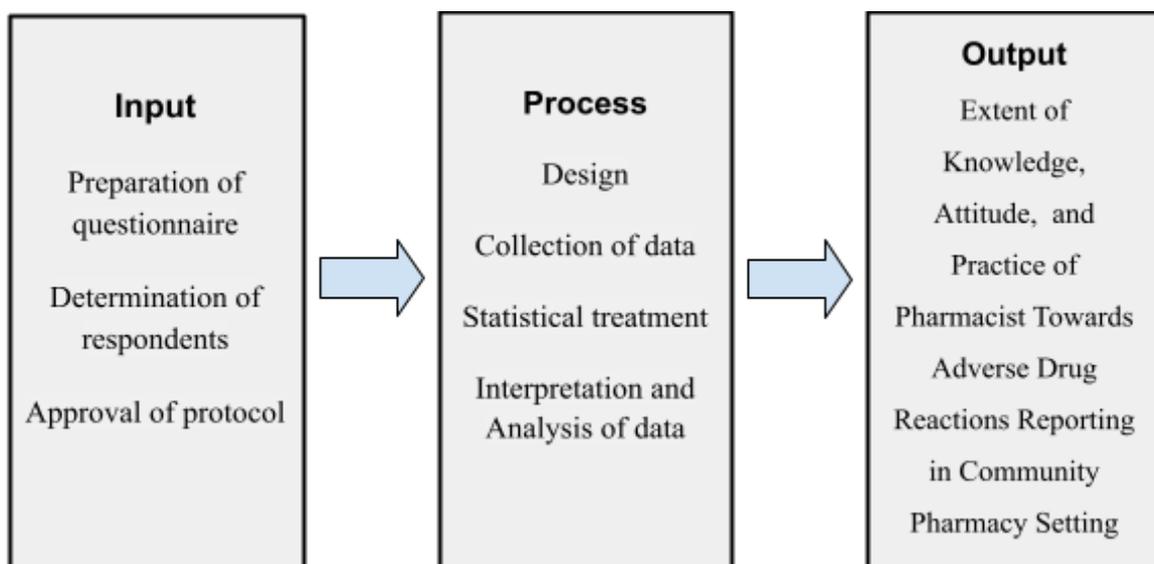


Figure 1.

This Model Showing the Flow of the Study on the Extent of Knowledge, Attitude, and Practices of Pharmacist Towards Adverse Drug Reaction Reporting in Community Pharmacy Setting.

Main Objective

The study aimed to determine the extent of pharmacists' knowledge, attitude, and practices towards ADR reporting in a community pharmacy setting.

Specific Objectives

1. To determine the socio-demographic profile of the respondents based on
 - 1.1 age;
 - 1.2 gender;
 - 1.3 employment information;
 - 1.3.1 position
 - 1.3.2 number of years of employed
2. To determine the respondent's level/extent of ADR reporting based on;
 - 2.1 knowledge;
 - 2.2 attitude; and
 - 2.3 practices
3. To determine the association of the respondents demographic information on the level/extent of adverse drug reactions reporting relative to;
 - 3.1 knowledge;
 - 3.2 attitude; and
 - 3.3 practices
4. To identify the barriers/problems encountered by community pharmacists in adverse drug reaction reporting

Hypotheses

The researchers devised the following hypotheses:

Null hypothesis: There is no significant difference in the extent of knowledge, attitude, and practices of pharmacists towards ADR reporting in community pharmacy settings.

Alternative hypothesis: There is a significant difference in the extent of knowledge, attitude, and practices of pharmacists towards ADR reporting in community pharmacy settings.

Significance of the Study

One of the most major public health issues globally is a drug-related risk due to the absence of reporting information. Healthcare workers often forget to disclose all potential adverse drug effects in the population. In detecting reported adverse drug reactions, healthcare professionals play a significant role, specifically the pharmacist. Rapid identification and documentation of adverse drug reactions are important to promptly identify unrecognized hazards and take effective regulatory measures to ensure that medications are used safely. Nowadays, pharmacists tend to focus on patients by

dispensing the right medication, sharing knowledge on how to take the drugs properly, and raising awareness about adverse drug reactions. The importance of this study will evaluate the community pharmacists in the Philippines in terms of KAP and the other factors experienced in ADRs reporting. This study would serve as a basis to determine if the absence of knowledge, attitude, and practices really affect community pharmacists when it comes to ADR reporting. Specifically, it would benefit the community pharmacist by raising the consciousness of the significance of reporting ADRs to avoid an unwanted reaction and harmful experience due to wrong administration and combination of drugs. This study can give the pharmacists a self-assessment based on their reporting. When pharmacists have the confidence that their knowledge, attitude, and practices are high in ADR reporting, they can ensure the patient's safety in the community. It will benefit the local government, considering that reporting ADR plays an important role in patient safety. They will know the contributing factors that affect pharmacists' reports on adverse drug reactions. This study also allows the local government to convince the pharmacist to report any adverse drug reaction events. Determining the extent of knowledge, attitude, and practice towards ADR reporting among community pharmacists in selected places in the Philippines helps improve patient well-being, hence decreasing the community's risk of ADRs.

Scope and Delimitation

The study determined the knowledge, attitude, and practice of selected community pharmacists in different localities of Antipolo Rizal, Pili Bicol, San Juan City Metro Manila, San Mateo Rizal, Silang Cavite, and Taytay Rizal. The following places were selected to determine how the community pharmacists are familiar and knowledgeable in conducting ADR reporting. This solely involved community pharmacists in the given area and excluded other pharmacy practice fields like hospital, manufacturing, regulatory, academe, etc.

Research was conducted by using and giving questionnaires to the community pharmacist as a survey and reference. The survey questionnaire provided in this study came from several journals and was prepared by modification from previous instruments used. The survey questionnaire was distributed to the community pharmacists through Google forms. The questionnaire's content centered on the knowledge, attitude, and practice in reporting adverse drug reactions. The researchers gained thorough understanding of community pharmacist's knowledge, attitude, and practice in terms of ADR reporting from gathered data.

Definition of Terms

The following terms are hereby defined to establish a better understanding of the study presented:

Adverse drug reaction. It refers to harmful or unintended reactions of drugs in the body during

therapeutic use to treat diseases.

Adverse drug reaction reporting. It is a process of reporting any unintended reaction that happens to a patient. ADR reporting can be done through a phone call, e-mail, fax, and personal reporting.

Attitude. It refers to a set of emotions, behaviors, and beliefs of a pharmacist towards a particular object or person.

Chain pharmacy. It is a type of community pharmacy with different branches around the area, and it is being managed under the same administration.

Community pharmacist. It is a healthcare provider that can be easily accessed by the public even without an appointment. It is also responsible for reporting any adverse drug reaction that happens to a patient.

Community pharmacy. This refers to a retail pharmacy. It is the usual type of pharmacy that is very accessible to the community. It deals directly with people in the local area.

Extent. This refers to the range covered about the knowledge, attitude, and practice of community pharmacists about ADR reporting.

Independent pharmacy. It is a locally-owned pharmacy; it refers to a small business drugstore that offers different services and personal care that cannot be found in most chain drug stores.

Knowledge. This refers to the information and skills acquired by the pharmacist through experience or education.

Medicine. This refers to a compound used for treating or preventing disease.

Patient counseling. Role of pharmacists in providing information, advice, knowledge, and assistance to help their patients with their medication.

Pharmacist. Part of healthcare practitioners plays an important role by helping their patients to get the best results from their medicines, and it is also responsible for preparing, dispensing, and compounding medications.

Pharmacy. It refers to a place where the drug is being dispensed or compounded by the pharmacists.

Practice. Act of doing something repeatedly that improves pharmacists' skills like dispensing of medicines and patient counseling.

Prescription drug. Type of medicine that requires a prescription from a physician or dentist before dispensing

it by a pharmacist.

Review of Related Literature And Studies

This chapter presents the related literature and studies gathered from the researcher's local and foreign studies, including peer-reviewed journal abstracts, scientific research, and scholarly articles that would justify the importance of conducting this research. The cited literature and studies will help analyze the findings, and that this chapter will also include the synthesis.

History of Adverse Drug Reaction

Adverse drug reaction (ADR) is a noxious or unintended reaction of the body caused by taking or administering medicinal products. The medication is commonly given to a person at normal doses, and it is being used for the treatment of disease (Coleman *et al.*, 2016). The most remarkable cases of adverse drug events are in the late 1950s when thalidomide was released by the Chemie-Grünenthal company and distributed in 46 countries as a treatment for morning sickness in pregnant women and very effective in the treatment of nausea and vomiting. This was the World Health Organization's key aim, which launched the superior ADR reporting Program for International Drug Monitoring (PDIM). In 1961 thalidomide was withdrawn from the market because it can cause severe birth effects in over 10,000 children (Vargesson, 2015). Adverse drug reaction is classified into seven different categories; type A or augmented type is the most common, type B or bizarre is the uncommon, type C or chronic reaction is dependent on both dose and time, type D or delayed reaction is manifested having a long exposure of drug, type E or withdrawal and lastly the type F which is a failure of efficacy (Barros *et al.*, 2015). For over 15 years, the investigation focused on different types of ADR happening in primary healthcare, and the most common type are drug-related allergies. The most-reported ADR happened were those linked to the central nervous system, cardiovascular system, and gastrointestinal system (Khalil and Huang, 2020). In certain nations, ADR is one of the top 10 main causes of mortality as it is a significant global public health issue. Research performed in developing countries indicated that the incidence of fatal ADR ranged from 0.05% to 3% of all patients admitted due to an ADR (Baynes, 2020).

Adverse drug reaction is what most of the people are suffering from. As at first glance we do not know which may have caused it and how it happened. Reporting of ADRs started when the news about thalidomide happened wherein babies are born lacking limbs and that ADR is classified into many types being the most common is drug-related allergies and the most reported cases are linked to the CNS, CS and gastrointestinal system.

Implementation of ADR Reporting

Adverse drug reaction reporting is fundamental in the science of pharmacovigilance. Mandatory reporting of

any adverse drug reaction is now implemented in different countries. Since 1965, the health sector has maintained adverse drug reaction reporting systems in Canada as the government encourages consumers and healthcare professionals to conduct voluntary reporting about any suspected ADR (Dweik *et al.*, 2020). The Canadian Government provides a law known as “The protecting Canadian from unsafe drug Act or Vanessa’s Law” and introduced during December 2013 (Li *et al.*, 2018). In 2000, the Korean government obligated the pharmacies and pharmaceutical companies to report adverse drug reactions. ADR reporting in Korea is progressively increasing the Regional Pharmacovigilance Center (RPVC), and this is the Korean Food and Drug Administration (KFDA) experimental project (Kang *et al.*, 2017). The Saudi Arabia National Pharmacovigilance Centre (NPC) was formed as a semi-autonomous department of the Saudi Food and Drug Authority (SFDA) in 2009. It became the 92nd member of the WHO-Uppsala Monitoring Centre as healthcare workers are required to report any adverse drug reactions experienced by patients. To maintain and enhance ADR reporting in the country, several hospitals established Medication Safety Units (MSUs) (Ali *et al.*, 2018).

Adverse drug reaction monitoring in China was started between 1988 and 2001. The Chinese government established the “drug administration law of the People’s Republic of China.” This law encourages all healthcare professionals to practice and report any adverse drug reaction and that ADR monitoring in China has formally entered the orbit of the regulation (Wang *et al.*, 2016). During this modern era, having a computer, cellphone, and cyberspace is very helpful to have rapid connectivity between the patients and healthcare professionals. The use of technology in health delivery services is not new. Text messaging was being used as an instrument to report a drug adverse reaction. In 2008, mobile phone texting for pharmaceutical care in a hospital was implemented in China (Dalmacion *et al.*, 2015).

Reporting of ADR in the Philippines was recognized in the local setting. It was established in August 1994 as a member of the International Drug Monitoring Center of the World Health Organization, but the name was changed to Uppsala Monitoring Center in February 1995. This circular memorandum was amended by the FDA Circular 2010-09 on 16 April 2020. It includes a change in the reporting timeline from fourteen to three working days but not to exceed seven working days (Carandang *et al.*, 2015). The beneficiaries of implementing Adverse Drug Reaction Reporting are the patients and healthcare professionals become more aware about the reaction of drugs to the body. Reporting of ADR will provide a mechanism for monitoring the safety of drug use in high-risk patient populations, and stimulate the education of health professionals regarding potential ADRs.

Process of ADR reporting (what, where, how, to whom)

Pharmacists are known to be specialists in medication and have direct communication to the patient they considered to play a vital role about ADR reporting (Sharad *et al.*, 2017). The advancement of medical and pharmaceutical science in India has made it possible for products to be made available on the market that aims to prevent and manage diseases, regardless of their associated benefits, to cause adverse effects on the observing and reporting of ADRs population. In public health, the usage of medicine should be observed through effective pharmacovigilance systems, and that over one hundred and fifty ADR monitoring centers are established in different hospitals and medical institutions to monitor and collect ADR reports (Vivekanandan *et al.*, 2015). Suspected ADRs should be reported depending on the cause and effect relationship formed, and it is documented as unknown, severe, non-serious, normal, or unusual. Those connected with the usage of vaccines, allopathic medicines, contrast media, medical devices, and traditional medicines should also be recorded to health professionals such as- clinicians, dentists, pharmacists, nurses. The pharmaceutical companies may submit individual product reports to the authority. Indian Pharmacopoeia Commission (IPC) website for healthcare professionals and customers has the ADR reporting forms available. It can be registered via the IPC Helpline number also; a mobile application has been made available to the public. The filled ADR reporting form can be directly submitted to the National Coordination Center for Pharmacovigilance in India or to the nearest ADR Monitoring Center that will be submitted for review and committed to the WHO-Uppsala Monitoring Center for analysis and assessments of experts (Vivekanandan *et al.*, 2015).

ADR cases should be reported and not ignored in order to prevent such events from happening again, the area where to file an ADR report can be searchable and it can also be done through online reporting by passing it to the credible website or email. Pharmacists are more than willing to help, just provide all the information needed to figure out and submit the case.

Pharmacists Knowledge, Attitude and Practice on ADR reporting

A study in Ethiopia stated that a spontaneous reporting system of adverse events drug reactions is essential to discovering adverse drug reactions, but under-reporting is the main restraint. Factors such as lack of awareness, difficulties, lack of feedback reports, and others are reasons why under-reporting is gained. Under the FDA, Ethiopia possesses its own pharmacovigilance system; still, deficient ADR reports have been received since the start of its system, and it is found that most of the healthcare professionals have inadequate knowledge and practice, however, Have a good approach towards ADR reporting (Gidey *et al.*, 2020). As part of healthcare professionals, community pharmacists provide support

and advice on medicines taken by patients to ensure the safe and effective use of drugs. Community pharmacists are also accountable for delivering and optimizing patients' health results. It is essential to determine community pharmacists' awareness, attitude, and practice related to adverse drug reaction reporting. If a community pharmacist has sufficient knowledge and practice of the ADR reporting process, community pharmacists can also help and improve the awareness of other healthcare professionals about the reporting processes of adverse drug reactions (Deepalakshmi *et al.*, 2019). To improve patient safety, community pharmacists are recognized as affordable and readily available healthcare providers since they have the chance to identify the possible ADRs happening in the patient with chronic diseases and non hospitalized patients. Even though there are centers available where pharmacists can report alleged ADR, underreporting is a crucial problem due to insufficient knowledge and awareness this is considered a starting point for resolving this issue (Tahir and Hussein, 2020). Results from a study in Kuwait shows that the majority of pharmacists had good knowledge regarding the concept of PV and ADRs in terms of their definitions and purposes and that these results reflects other published studies from the Middle East countries on the knowledge and awareness of PV and ADRs (Abdel-Latif and Abdel-Wahab, 2014, Jose *et al.*, 2014, Mahmoud *et al.*, 2014, Suyagh *et al.*, 2015).

Factors that Encourage and Discourage Healthcare Professionals to Report

A study conducted in Jordan stated that the nature and severity of ADR are what requires pharmacists to report. It is preferable to report severe reactions and unusual reactions and reactions that have not been reported before (Suyagh *et al.*, 2015). It is similar in a study on Saudi Arabia that the factors that encourage reporting include the seriousness of action, unusual reaction, reactions on new products, and encouraged health professionals to report (Faqihi and Fageehi, 2019). However, Some studies have shown that healthcare professionals do not report a large proportion of ADRs, especially in developing countries, due to various reasons, including lack of understanding and knowledge of pharmacovigilance and ADR reporting (Omitogun *et al.*, 2019). Many factors discourage community pharmacist in reporting ADR; in fact, there is a study in India that discussed it, lack of time and training and unknown address of ADR reporting system, the study also observed that the pharmacists were afraid of the legal consequences while reporting adverse drug reaction (Ravinandan *et al.*, 2015).

In Ethiopia, some community pharmacists are not reporting ADR due to a lack of clinical knowledge, which is very important in determining whether it is a reaction to the drug or allergies and other factors (Sultana, 2019). In both developed and developing countries, a lack of awareness and attitudes such as ignorance, lack of assistance, fear of crime, and lack of

time are the reasons why community pharmacists are discouraged from reporting. Lack of pharmacovigilance knowledge among pharmacists has been documented in many other parts of India and even in various countries (Vigneshwaran *et al.*, 2020). Community pharmacists in Saudi also concern that ADR reporting may need extra effort. Some consider that the physician should be the one who will be responsible for reporting the ADR. Some of the respondents say that there is not enough information from the patient, so they do not know what to write in the report (Suyagh *et al.*, 2015). Research on Nnewi Nigeria aimed to identify the factors and challenges connected with ADR reporting by healthcare professionals suggested that unavailability of automated reporting, recording forms, and ignorance are reasons why under-reporting is a common health issue (Ezeuko *et al.*, 2015). (Ezeuko *et al.*, 2015). Reports of adverse drug reaction in Ibadan, Southwest Nigeria, are not documented by healthcare professionals due to numerous reasons such as lack of information and understanding of pharmacovigilance and ADR reporting. (Adiza and Omitogun, 2019).

A study in the Philippines also shows that community pharmacists lack knowledge about ADR; that is why there is an under-reporting of the matter. According to (Carandang *et al.*, 2015), it might be because of low exposure to the clinical practice; therefore, pharmacists are not familiar with the process in ADR reporting. Nepal's current ADR monitoring system is based on voluntary reporting by physicians, pharmacists, nurses, and health assistants. Unfortunately, the current system for pharmacovigilance in Nepal is not recognized by many health care practitioners. They lack information on the ADR monitoring and reporting system, accessible ADR reporting forms, and no mechanism for periodically updating and sharing information among health care professionals in hospitals, health centers, and the community about recent ADRs (Alshammri *et al.*, 2015).

There are several factors affecting Adverse Drug Reaction (ADR) reporting of healthcare professionals. Studies conducted from different countries globally showed that a large portion of ADR are usually not reported, particularly in developing countries. The factors leading to under reporting include insufficient knowledge on pharmacovigilance, lack of training, fear of facing legal consequences, lack of address for reporting and lack of time (since ADR reporting can be quite complex). For other pharmacists, they do not report ADR because they think that the physicians are the ones who should be doing that.

In some other countries, there are reports of ADR but these aren't documented due to lack of knowledge and low exposure to clinical practice. These attitudes of healthcare professionals regarding reporting of ADR are also caused by a lack of ADR monitoring and reporting system, accessible ADR forms, and lack of mechanism

for regular updating of ADR information among the community of health professionals.

Pharmacist-Patient Relationship

Pharmacists are recognized as an expert in medication management, educating and communicating with patients that makes them well placed to intervene. An affirmation indicated that pharmacists' role in drug stores reduces the adverse drug events, hence improving patient outcomes (Nicolls *et al.*, 2016). By reporting such cases, pharmaceutical companies are encouraged to improve and produce new formulations that help prevent crucial drug interactions (Lucic *et al.*, 2018). An adverse drug reaction report may be filed dependently, but that happens often. Given that anyone can issue a form about ADR, pharmacists showed willingness to report ADRs not just because it is a duty, but also because the profession itself aimed for patient-centered care (Hadi *et al.*, 2017). A pharmacist's role was traditionally limited to dispensing, preparing, and compounding drugs prescribed by the physicians. But in this era, the role of pharmacists was expanded in different aspects in providing patient care. Pharmacists are now practicing adverse drug reaction reporting. Participation of pharmacists in reporting ADR plays an important role in countering the under-reported adverse drug reaction (Ap *et al.*, 2015). When counseling, patients are required to state all necessary information needed to complete the form. Afterward, the pharmacist will evaluate the form according to personal knowledge and experience. Treating patients instantly will never be the pharmacists' duty; besides, the goal is to utilize the most appropriate agent to minimize therapy hazards (Sherif, 2017). The major cause of ADR is due to the drug's pharmacological effect and its toxic effects. Physicians should be careful enough in prescribing medications, and pharmacists are obligated to review the medication and counsel the patient. The main reasons why patients are admitted to hospital are due to drug-related problems, non-compliance, drug misuse, drug overdose, and inadequate therapy (Sherif, 2017).

Pharmacists have an impactful role in the community that they need to be sensitive to their patient reporting in having the ADR. A pharmacist will report the case like ADR. They will fill an evaluation of the patient and report for it or do some counseling for their patient. On this day, pharmacists study more about the ADR reports improving their knowledge in assisting the patient and will have their action with the patient having ADR.

Direct Patient Reporting of Adverse Drug Reaction

Direct reporting of patients regarding ADR to regulatory authorities such as the Food and Drug Administration (FDA) has significant consequences for patients, enabling them to participate actively towards the treatment rather than passive recipients of medical interventions (Santos, 2015). Direct Patient reporting of adverse drug reactions is essential for continuous improvement and successful pharmacovigilance (Dweik

et al., 2016). When a patient is directly reporting ADR, it provides detailed and clearer information because the patient has experienced it than the healthcare professionals (Hariraj and Aziz, 2018). In Denmark, a campaign was launched entitled, "Not everyone reacts the same," in pharmaceutical companies and small pharmacies. This is a way to encourage direct-patient reporting and serve as an awareness to patients. Patients are allowed to report any suspected ADR in paper form and even electronically. Its form can be completed within 10 minutes because it only comprises six steps. Right after submission, a confirmation will be sent through email by the Danish Health and Medicines Authority for validation (Santos, 2015). Popular reasons have been altruistic or personal for patients to report ADRs. They give examples of altruistic motivations to avoid others' damage to feel guilty for reporting ADRs and publicly disclose their experiences to increase drug safety. The intensity of reactions and the need of patients for input were personal motives.

The need for input was also a driving force for HCPs to report ADRs (Yaya *et al.*, 2016). The increase of adverse drug reactions was a major factor in why morbidity and mortality are rapidly growing (Adisa *et al.*, 2019).

Methods and Procedures

This chapter presents the research methodology, the setting of the study, population size, sampling technique, survey instrument, data gathering procedure, statistical treatment, and ethical considerations. These variables are essential in analyzing and interpreting the gathered data, which serve as the study's basis.

Methods of Research Used

The study used a descriptive quantitative research. It is a general research model devised to qualify and analyze variables on the knowledge, attitude, and practice of pharmacists. It aims to examine one or more variables to make it reliable and precise; moreover, it describes a population or condition systematically. It often addresses questions about what, when, where, and how, rather than whys (Apuke, 2017).

Respondents and Population Size

The community pharmacists from both chain and independent pharmacies in different localities of Antipolo Rizal, Pili Bicol, San Juan City Metro Manila, San Mateo Rizal, Silang Cavite, and Taytay Rizal were selected for data collection. Due to the researchers' lack of information about the number of community pharmacists in the aforementioned areas, they decided to utilize Cochran's formula, wherein it is used to compute the number of respondents. The procedure allows calculating an ideal sample size provided the desired level of accuracy, the desired level of confidence, and the population attribute's estimated proportion. The formula is:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where;

e = estimated level of precision

p = estimated proportion of the population q = 1 - p

Sampling Technique

The researchers used a stratified sampling method. Each member of the population has an equal probability of participating in the study and selecting essential characteristics to the survey (Parsons, 2017). It identifies the people to perform the sampling process, chooses the sample size, lists all the people, and selects members to create the sample.

Survey Instrument

From the previous studies of (O' Callaghan et al., 2018), (Syed et al., 2018), and (Tew et al., 2016), the instrument was adapted and modified by the researchers. It consists of 24 item questions divided into five parts; part 1 contains the respondents' demographic profile, while part 2, 3, 4, and 5 specifies the knowledge, attitude, practices, and barriers encountered with ADR reporting. The outline device is based on a modified Likert scale with the given choices, strongly agree (5) as the highest followed by agree (4), neither agree nor disagree (3), disagree (2), and strongly disagree (1) as the lowest.

Data Gathering Procedure

The data gathering procedure was conducted via a web-based survey questionnaire through Google forms, with the information disseminated on different social media platforms such as Facebook, Messenger, and Gmail. Subsequently, the respondents' participation was voluntary. Anonymity and attachment of letters seeking approval were indicated in the survey questionnaire so the respondents can withdraw their participation during the study at any time. Development and presentation of survey questionnaires were written in English. The time allotted for gathering data and follow-ups were two months. Moreover, the utilization of an online questionnaire allowed minimal financial requirements.

Statistical Treatment

Weighted Mean, Frequency, Percentage, Pearson's r, and Chi-square were the statistical treatments used in data analysis.

The weighted mean formula determines the respondents' knowledge, attitude, and practice about Adverse Drug Reaction (ADR) Reporting. To evaluate the relative value of each quantity on average, the Weighted Mean is use with this formula:

$$\frac{\sum fx}{\sum w}$$

Where:

$\sum fx$ = total of products of Frequency \bar{X} = the weighted mean and weight

$\sum w$ = total of all the frequency/ subjects

Frequency calculates the number of times each element happens in the group. The proportion of the total responses from the respondents' overall data, the frequency quotient, and the total quantity of respondents multiplied by 100. The percentage is a part of a whole and expressed as 0 - 100 rather than a fraction. It is used to define the socio-demographic profile of respondents. The formula for percentage is

$$\% = \frac{f}{N} \times 100$$

Where:

% = computed percentage distribution f = observed Frequency of responses N = total number of respondents

Chi-square is commonly used in testing the nominal or categorical variables. The null hypothesis states that no relationship exists on the categorical variables in the population; hence they are independent (Hayes, 2020). The chi-square formula is:

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where;

c= Degrees of freedom O= Observed value(s) E= Expected value(s)

According to (Allen 2017), the Pearson correlation coefficient is also known as the Pearson product-moment correlation coefficient. R is a calculation to evaluate the relationship instead of the difference among the two quantitative variables like the interval or ratio, and the degree to which the two variables agree with each other also that is the extent to which the two variables are linearly related: change in one variable corresponds to change. Pearson r used to correlate the continuous values of different variables such as the knowledge, attitude, practice, and barriers in conducting ADR reporting. The formula for Pearson r is:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where;

r = correlation coefficient

x_i = values of the x-variable in a sample

\bar{x} = mean of the values of the x-variable

y_i = values of the y-variable in a sample

\bar{y} = mean of the values of they-variable

Ethical Considerations

The research protocol of the present study is submitted to the Centro Escolar University Research and Evaluation Office (REO) for review and approval of the Institutional

Ethics Review Committee (IERC).

thoroughly according to the sequence of specific questions.

Presentation, Analysis and Interpretation of Data

This chapter introduces the data gathered, the results of the statistical analysis and interpretation of data from the socio-demographic profile of the respondents, the Knowledge, Attitude, and Practice, as fine as the barriers in ADR Reporting with the research objectives. The collected data are presented in tabular and were arranged

1. The socio demographic profiles of community pharmacists.

Table 1: Frequency Distribution of Respondents in terms of Age.

	Frequency	Percentage
Young adult (18 to 35 years)	116	83.5%
Middle adult (36 to 55 years)	23	16.5%
Older adult (55 years and above)	0	0
Total	139	100.0%

Table 1.1 shows the distribution of the respondents in terms of Age. The majority of respondents are young adults within the Age 18 to 35 years old with a percentage of 83.5 and frequency of 116, while some of the respondents are middle adults the Age of 36 to 55 years old with a percentage of 16.5 and have a frequency of 23; however, older adults have 0 frequency and percentage. This table shows that most community

pharmacists who responded in the survey are within the Age of 18 to 35 years old, which falls under the category of young adults, while the middle adults have the least respondents in the group of community pharmacists. Young adults are more active on social media and have more access to google than middle adults when it comes to the survey distribution.

Table 2: Frequency Distribution of Respondents in terms of Gender.

	Frequency	Percentage
Male	28	20.1%
Female	111	79.9%
Total	139	100.0%

Table 1.2 shows the distribution of the respondents in terms of Gender. The majority of the respondents are female with a percentage of 79.9 and frequency of 111, and the rest are male respondents that constitute a percentage of 20.1 with a frequency of 28. This shows

that most community pharmacists who responded in the survey fall under the category of female, and only some of them are male. Women have generally been attracted to pharmacy because it is used as a woman's occupation (Janzen et al., 2013).

Table 3: Frequency Distribution of Respondents in terms of Employment Position.

	Frequency	Percentage
Chief Pharmacist	6	4.3%
Pharmacist	133	95.7%
Total	139	100.0%

Table 1.3.1 shows the distribution of the respondents in terms of position. The majority of the respondents are pharmacists with a percentage of 95.7 with a frequency of 133 and a percentage of 4.3 with the frequency of 6 are chief pharmacists. The data shows that most of the

respondents who answer the survey fall under the category of a pharmacist, and only a few are chief pharmacists since most of the respondents came from independent pharmacies.

Table 4: Frequency Distribution of Respondents in terms of Number of Years of Employment.

	Frequency	Percentage
Less than a year	39	28.1%
1 year - 5 years	68	48.9%
5 years and above	32	23.0%
Total	139	100.0%

Table 1.3.2 shows the distribution of the 139 respondents in terms of the number of years of employment as

pharmacists. Almost half of the respondents, with a percentage of 48.9 and a frequency of 68, are employed

for 1 to 5 years. Those who were employed for less than a year correspond to a percentage of 28.1 and a frequency of 39 respondents, while those who were employed for more than five years correspond to a percentage of 23 and a frequency of 32 respondents. This table shows that the majority of the respondents are employed within the range of 1 year to 5 years while in the five years and above have the least respondents. Those respondents employed in the range of 1 to 5 years are the most active when it comes to adverse drug reaction events.

2. In the table shown are the Extent of Knowledge, Attitude and Practices of community pharmacist in adverse drug reaction reporting.

Table 5: Knowledge of the Community Pharmacists Towards Adverse Drug Reaction Reporting.

	Mean	Verbal Interpretation	Std. Deviation
1. All serious ADRs are known before a medicine is marketed	3.17	Neither agree nor disagree	1.344
2. Pharmacists should report to FDA serious ADRs even if uncertain that the medicine caused the event	4.42	Strongly agree	.681
3. One case reported by a pharmacist does not contribute much to knowledge on medicine risks	1.99	Disagree	1.007
4. Pharmacists should report to FDA serious ADRs even if they do not have all the details of the event	3.59	Agree	1.034
5. Pharmacist should report ADRs associated with overdose, misuse, or error	4.50	Strongly agree	.793
6. Patients can report ADRs directly to the pharmacist	4.53	Strongly agree	.569
Overall Weighted Mean	3.70	Agree	1.315

Legend: 1.00 – 1.80: Strongly disagree; 1.81 – 2.60: Disagree; 2.61 – 3.40: Neither agree nor disagree; 3.41 – 4.20: Agree; 4.21 – 5.00: Strongly agree

Table 2.1 shows the knowledge of the pharmacists towards adverse drug reaction reporting. Some respondents disagreed that one reported case does not contribute much to the knowledge ($\bar{x} = 1.99$). And some answered that they neither agree nor disagree that all serious ADRs are known before medicine is marketed ($\bar{x} = 3.17$). Meanwhile, some respondents agreed that they should report serious ADRs to FDA even if they do not have all the details of the event ($\bar{x} = 3.59$). Some answered that they strongly agree that serious ADRs should be reported to FDA even if they are uncertain

that the medicine caused the event ($\bar{x} = 4.42$), and those ADRs associated with overdose, misuse, or error ($\bar{x} = 4.50$). Also, pharmacists strongly agreed that patients could report ADRs directly to them ($\bar{x} = 4.53$).

Thus, the pharmacists agreed that adverse drug reactions should be reported once they happened to their patients ($\bar{x} = 3.70$). This means that community pharmacists from six localities have adequate knowledge about reporting adverse drug reactions encountered by their patients, and they know how and when to report ADRs.

Table 6: Attitude of the Community Pharmacists Towards Adverse Drug Reaction Reporting.

	Mean	Verbal Interpretation	Std. Deviation
7. Reporting of ADRs is a duty of the pharmacist	4.62	Strongly agree	0.557
8. I assume that reporting of only one ADR makes no significant contribution to the ADR reporting scheme	2.05	Disagree	.980
9. FDA ADR form is too complicated to fill			
10. ADR reporting is a professional obligation	2.40	Disagree	1.027
11. Pharmacist should hide the identity of the patient who reported the ADR	4.63	Strongly agree	0.629
12. Being attentive on patient complained ADR shows that concerns are being taken seriously	4.06	Agree	.969
Overall Weighted Mean	3.74	Agree	1.357

Legend: 1.00 – 1.80: Strongly disagree; 1.81 – 2.60: Disagree; 2.61 – 3.40: Neither agree nor disagree; 3.41 – 4.20: Agree; 4.21 – 5.00: Strongly agree

Table 2.2 shows the attitude of the pharmacists towards adverse drug reaction reporting. The respondents disagreed that one reported ADR makes no significant contribution to the ADR reporting scheme ($\bar{x} = 2.05$) and filling up the FDA ADR form is complicated ($\bar{x} = 2.40$). But they agreed on the confidentiality of the patient who experienced ADR ($\bar{x} = 4.06$) and on giving attention to patients who complained ADR ($\bar{x} = 4.66$). Also, the respondents strongly agreed that it is their duty to report ADRs ($\bar{x} = 4.62$) and it is a professional obligation ($\bar{x} = 4.63$).

Based on the findings, it shows that most community pharmacists are aware about the ADR reporting itself, its

protocols and importance to the public. The other way around, pharmacists also have this positive attitude towards ADR reporting which will help the patients to easily give the important details about the case. Thus, the pharmacists agreed that it is a duty and obligation to report and attend to patients who complained ADRs ($\bar{x} = 3.74$). This shows that the community pharmacists from six localities have a positive attitude towards ADR reporting, as this is part of their job and based on the results of the survey being conducted.

Table 7: Practice of the Community Pharmacists Towards Adverse Drug Reaction Reporting.

	Mean	Verbal Interpretation	Std. Deviation
13. I am following approaches in ADR prevention such as confidentiality of the report	4.55	Strongly agree	0.554
14. I have reported an ADR at least once a year	3.40	Neither agree nor disagree	1.068
	3.60		
15. I have received appropriate training and seminars for proper ADR reporting.	2.11	Agree	1.034
16. I only report severe or life-threatening ADR	4.50	Disagree	1.081
	3.27		
17. I keep ADR reports confidential			
18. I have received an ADR complaint outside my work hours		Strongly agree	.582
		Neither agree nor disagree	1.147
Overall Weighted Mean	3.57	Agree	1.251

Legend: 1.00 – 1.80: Strongly disagree; 1.81 – 2.60: Disagree; 2.61 – 3.40: Neither agree nor disagree; 3.41 – 4.20: Agree; 4.21 – 5.00: Strongly agree

Table 2.3 shows the practice of pharmacists towards adverse drug reaction reporting. The respondents disagreed that they only report severe or life-threatening ADR ($\bar{x} = 2.11$). They neither agree nor disagree that they have received an ADR complaint outside their work hours ($\bar{x} = 3.27$) and have reported an ADR at least once a year ($\bar{x} = 3.40$).

Meanwhile, some of the respondents agreed that they have received appropriate training and seminars for proper ADR reporting ($\bar{x} = 3.60$). Some also strongly agreed that ADR reports should be kept confidential ($\bar{x} = 4.50$) and that they are following approaches in ADR

prevention ($\bar{x} = 4.55$). In line with the results, this ADR reporting is being performed because most of the respondents have experienced reporting. Thus, the pharmacists agreed that they had enough practice in reporting ADRs ($\bar{x} = 3.57$). This means that community pharmacists are performing well in terms of ADR reporting and they follow the different protocols in reporting ADRs as part of their profession.

3. In the table shown are the relation of the respondents from the demographic information on the level/extent of adverse drug reactions reporting relative to knowledge, attitude and practices.

Table 8: The Level/Extent of Knowledge, Attitude and Practices of Community Pharmacist in Reporting Adverse Drug Reactions When Grouped According to Age.

	Mean Rank	Mann-Whitney U	p-value	Decision	Remarks	
Knowledge	Young adult (18 to 35 years)	68.20	1125.5	0.232	Accept the null hypothesis	Not significant
	Middle adult (36 to 55 years)	79.07				
Attitude	Young adult (18 to 35 years)	70.61	1263.0	0.679	Accept the null hypothesis	Not significant
	Middle adult (36 to 55 years)	66.91				

Practice	Young adult (18 to 35 years)	64.95	748.0	0.001	Reject the null hypothesis	Significant
	Middle adult (36 to 55 years)	95.48				

Note: If p-value < 0.05, reject the null hypothesis.

Table 3.1 shows the level/extent of knowledge, attitude and practices of community pharmacists in reporting adverse drug reactions when grouped according to age. The results of the Mann-Whitney test indicated that there is no statistically significant difference in the level of knowledge between young adult pharmacists and middle adult pharmacists ($U = 1125.5$, $p = 0.232$). This also shows that there is no statistically significant difference in the attitude between young adult pharmacists and middle adult pharmacists ($U = 1263$, $p = 0.679$).

However, there is a statistically significant difference in the practice between young adult pharmacists and middle adult pharmacists ($U = 748$, $p = 0.001$).

Among the three variables between knowledge, attitude and practice about ADR reporting, the young adult community pharmacists and middle adult community pharmacists differ mainly on practices since middle adult pharmacists have more experience in reporting ADR than the younger adults.

Table 9: The Level/Extent of Knowledge, Attitude and Practices of Community Pharmacist in Reporting Adverse Drug Reactions When Grouped According to Gender.

		Mean Rank	Mann-Whitney U	p-value	Decision	Remarks
Knowledge	Male	65.64	143 2.0	0.517	Accept the null hypothesis	Not significant
	Female	71.10				
Attitude	Male	80.11	127 1.0	0.127	Accept the null hypothesis	Not significant
	Female	67.45				
Practice	Male	88.43	103 8.0	0.006	Reject the null hypothesis	Significant
	Female	65.35				

Note: If p-value < 0.05, reject the null hypothesis.

Table 3.2 shows the level/extent of adverse drug reactions reporting when grouped according to gender. The results of the Mann-Whitney test indicated that there is no statistically significant difference in the level of knowledge between male and female pharmacists ($U = 1432$, $p = 0.517$). This also shows that there is no statistically significant difference in the attitude between male and female pharmacists ($U = 1271$, $p = 0.127$).

However, there is a statistically significant difference in the practice between male and female pharmacists ($U = 1038$, $p = 0.006$). This shows that male community pharmacists have a greater ranked level in terms of practice in reporting adverse drug reactions compared to female community pharmacists based on the gathered data.

Table 10: The Level/Extent of Knowledge, Attitude and Practices of Community Pharmacist in Reporting Adverse Drug Reactions When Grouped According to Position.

		Mean Rank	Mann-Whitney U	p-value	Decision	Remarks
Knowledge	Chief Pharmacist	68.42	389.5	0.921	Accept the null hypothesis	Not significant
	Pharmacist	70.07				
Attitude	Chief Pharmacist	84.42	312.5	0.357	Accept the null hypothesis	Not significant
	Pharmacist	69.35				
Practice	Chief Pharmacist	106.50	180.0	0.022	Reject the null hypothesis	Significant
	Pharmacist	68.35				

Note: If p-value < 0.05, reject the null hypothesis.

Table 3.3 shows the level/extent of pharmacists' knowledge, attitude and practices in adverse drug reactions reporting when grouped according to position. The results of the Mann-Whitney test indicated that there is no statistically significant difference in the level of knowledge between chief pharmacists and pharmacists ($U = 389.5$, $p = 0.921$). This also shows that there is no

statistically significant difference in the attitude between chief pharmacists and pharmacists ($U = 312.5$, $p = 0.357$).

However, there is a statistically significant difference in the practice between chief pharmacists and pharmacists ($U = 180$, $p = 0.022$). This shows that chief pharmacists have a greater ranked level in terms of practice compared

to pharmacists. Chief pharmacists have more experience on addressing issues and reports regarding adverse drug reactions encountered by their patients.

Table 11: The Level/Extent of Knowledge, Attitude and Practices of Community Pharmacist in Reporting Adverse Drug Reactions When Grouped According to Years of Employment.

		Mean Rank	Chi-Square	p-value	Decision	Remarks
Knowledge	Less than 1 year	74.38	0.81	0.666	Accept the null hypothesis	Not significant
	1 year - 5 years	69.37				
	5 years and above	66.00				
Attitude	Less than 1 year	82.08	5.49	0.064	Accept the null hypothesis	Not significant
	1 year - 5 years	63.72				
	5 years and above	68.63				
Practice	Less than 1 year	63.14	3.37	0.185	Accept the null hypothesis	Not significant
	1 year - 5 years	69.01				
	5 years and above	80.45				

Note: If p-value < 0.05, reject the null hypothesis.

Table 3.4 shows the level/extent of adverse drug reactions reporting when grouped according to years of employment. The results of the Kruskal-Wallis test indicated that there is no statistically significant difference in the level of knowledge between groups ($X^2 = 0.81$, $p = 0.666$). This also shows that there is no statistically significant difference in the attitude between

groups ($X^2 = 5.49$, $p = 0.064$). There is also no statistically significant difference in the practice between groups ($X^2 = 3.37$, $p = 0.185$). This means that the knowledge, attitude, and practice of the community pharmacists does not differ in terms of the length of their employment.

Table 12: Barriers Encountered by the Community Pharmacists Towards Adverse Drug Reaction Reporting.

	Mean	Verbal Interpretation	Std. Deviation
19. Forms for ADR reporting are not available.	2.28		1.130
20. Drugs that are newly introduced in the market are safe from serious ADRs	2.08	Disagree	1.057
	3.50	Agree	0.904
21. Patients do not inform the pharmacist about the reaction they have encountered after taking the medicine.	2.88	Neither agree nor disagree	0.951
22. Inadequate knowledge of detecting ADRs		Disagree	
23. ADR reporting is time-consuming	2.32	Neither agree nor disagree	1.118
24. Pharmacists are unable to find which drug caused ADR.	2.68		.901
Overall Weighted Mean	2.62	Neither agree nor disagree	1.116

Legend: 1.00 – 1.80: Strongly disagree; 1.81 – 2.60: Disagree; 2.61 – 3.40: Neither agree nor disagree; 3.41 – 4.20: Agree; 4.21 – 5.00: Strongly agree

Table 4 shows the barriers encountered by community pharmacists towards adverse drug reaction reporting. The pharmacists disagreed that newly-introduced drugs are safe from ADRs ($\bar{x} = 2.08$). They also disagreed that forms for ADR reporting are not available ($\bar{x} = 2.28$) and time consuming ($\bar{x} = 2.32$).

Meanwhile, the pharmacists neither agreed nor disagreed that they are unable to find which drug caused ADR ($\bar{x} = 2.68$) and have inadequate knowledge of detecting ADRs ($\bar{x} = 2.88$). But they agreed that patients do not inform the pharmacists about the reaction they have encountered

after taking the medicine ($\bar{x} = 3.50$).

Overall, the pharmacist neither agreed nor disagreed that the barriers affect adverse drug reaction reporting ($\bar{x} = 2.62$). This implies that forms are readily available but the information given by the patients is somehow insufficient so community pharmacists cannot determine what is really the cause of reactions experienced by their patients.

Summary, Conclusions and Recommendations

This chapter presents the summary of the findings,

conclusions, and recommendations of the researchers. Based on the data presented in the answered survey questionnaire, the following are the findings:

Summary of Findings

1. Socio-demographic Profile of the respondents:

- 1.1 Majority of the respondents 116 (83.5%) were young adults aged 18 to 35 years old while few of the respondents 23 (16.5%) were 55 years old and above. Young adults have a higher number of respondents since most pharmacists having age 18 to 35 years old are more active on social media and have more access to google compared to middle adults when it comes to the survey distribution.
- 1.2 Majority of the respondents were female which had a total of 111 (79.9%) and the male population constituted 28 (20.1%). Most of the respondents working in the pharmacy are female and very limited when it comes to males.
- 1.3 Majority of the respondents were pharmacists 133 (95.7%) in terms of the position and chief pharmacist constituted 6 (4.3%) since most of the respondents came from independent pharmacies.
- 1.4 Majority of the respondents had a career experience of less than a year 39 (28.1%) some answered 1 to 5 years which is equivalent to 68 (48.9%) and the remaining are for 5 years and above 32 (23.0%). Those respondents employed in the range of 1 to 5 years are the most active when it comes to adverse drug reaction events.

2. The respondent's level/extent of ADR reporting based on:

2.1 Knowledge

The pharmacists agreed that adverse drug reaction should be reported once it happened to their patients ($\bar{x} = 3.70$). This means that community pharmacists from six localities have adequate knowledge about reporting adverse drug reactions encountered by their patients and they know how and when to report ADRs.

2.2 Attitude

The pharmacists agreed that it is a duty and obligation to report and attend to patients who complained of ADRs ($\bar{x} = 3.74$). This shows that community pharmacists from six localities have a positive attitude towards ADR reporting as part of their profession.

2.3 Practice

The pharmacists agreed that they had enough practice in reporting ADRs ($\bar{x} = 3.57$). This means that community pharmacists are performing well in terms of ADR reporting and following the different protocols.

3. The association of the respondents demographic information on the level/extent of adverse drug reactions reporting relative to:

3.1 Knowledge

- 3.1.1 Age: Young adults have a mean rank of 68.20 while middle adults have 79.07 with ($U = 1125.5$, $p = 0.232$).

- 3.1.2 Gender: Male respondents have a mean rank of

65.64 while female respondents have 71.10 with ($U = 1432.0$, $p = 0.157$).

- 3.1.3 Position: Chief pharmacist have a mean rank of 68.42 while pharmacists have a mean rank of 70.07 with ($U = 389.5$, $p = 0.921$).

- 3.1.4 Number of years employed: Respondents who are employed for less than a year have a mean rank of 74.38, those employed for 1 year to 5 years have a mean of 69.37 and those employed for 5 years and above have a mean of 66.0 with ($X^2 = 3.37$, $p = 0.185$).

3.2 Attitude

- 3.2.1 Age: Young adults have a mean rank of 70.61 while middle adults have 66.91 with ($U = 1263.0$, $p = 0.679$).

- 3.2.2 Gender: Male respondents have a mean rank of 80.11 while female respondents have 67.45 with ($U = 1271.0$, $p = 0.127$).

- 3.2.3 Position: Chief pharmacist have a mean rank of 84.42 while pharmacists have a mean rank of 69.35 with ($U = 312.5$, $p = 0.357$).

- 3.2.4 Number of years employed: Respondents who are employed for less than a year have a mean rank of 82.08, those employed for 1 year to 5 years have a mean of 63.72 and those employed for 5 years and above have a mean of 68.63 with ($X^2 = 5.49$, $p = 0.064$).

3.3 Practice

- 3.3.1 Age: Young adults have a mean rank of 64.95 while middle adults have 95.48 with ($U = 748$, $p = 0.001$) which rejected the null hypothesis.

- 3.3.2 Gender: Male respondents have a mean rank of 88.43 while female respondents have 65.35 with ($U = 1038.0$, $p = 0.006$).

- 3.3.3 Position: Chief pharmacist have a mean rank of 106.50 while pharmacists have a mean rank of 68.35 with ($U = 180.0$, $p = 0.022$).

- 3.3.4 Number of years employed: Respondents who are employed for less than a year have a mean rank of 63.14, those employed for 1 year to 5 years have a mean of 69.01 and those employed for 5 years and above have a mean of 80.45 with ($X^2 = 3.37$, $p = 0.185$).

4. The barriers/problems encountered by community pharmacists in adverse drug reaction reporting.

The pharmacists neither agreed nor disagreed that the barriers affect adverse drug reaction reporting ($\bar{x} = 2.62$). This implies that forms are readily available but the information given by the patients is somehow insufficient so community pharmacists cannot determine what is really the cause of reactions experienced by their patients.

CONCLUSIONS

The researchers conclude that there is no significant difference between their knowledge and attitude in the pharmacy community setting in terms of age, gender, position, and the number of years employed. On the other hand, there is a significant difference in terms of

practice.

Recommendations

The researchers would like to recommend the following for the improvement of this research in the future:

1. To use exam-type questions to measure the knowledge, attitude, and practice of the respondents.
2. To have an equal number of respondents in terms of their demographic profiles.
3. To conduct a similar study in selected municipalities in Visayas and Mindanao.
4. To focus on hospital pharmacists or other fields of pharmacy in determining the knowledge, attitude, and practice about ADR reporting.
5. To compare the knowledge, attitudes, and practices of chain and independent pharmacists towards ADR reporting.

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BIBLIOGRAPHY

1. Adisa, R., & Omitogun, T. I. (2019). Awareness, knowledge, attitude and practice of adverse drug reaction reporting among health workers and patients in selected primary healthcare centers in Ibadan, southwestern Nigeria. *BMC Health Services Research*, 19(1). Retrieved from <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4775-9>
2. Adisa, R., Adeniyi, O. R., & Fakeye, T. O. (2019). Knowledge, awareness, perception and reporting of experienced adverse drug reactions among outpatients in Nigeria. *International Journal of Clinical Pharmacy*, 41(4); 1062-1073. <https://pubmed.ncbi.nlm.nih.gov/31140162/>
3. Alemu, B. K., & Biru, T. T. (2019). Health Care Professionals' Knowledge, Attitude, and Practice towards Adverse Drug Reaction Reporting and Associated Factors at Selected Public Hospitals in Northeast Ethiopia: A Cross-Sectional Study. *BioMed Research International*, 2019; 1-11. Retrieved from <https://www.hindawi.com/journals/bmri/2019/8690546/>
4. Apuke, O. (2017). Quantitative Research Methods : A Synopsis Approach.” *ResearchGate*, Retrieved from www.researchgate.net/publication/320346875_Quantitative_Research_Methods_A_Synopsis_Approach
5. Barros M.C., Timpe Behnen, E.M., and Hultgren, K.E. (2015). *Adverse Drug Reactions*. Retrieved from <https://www.accp.com/docs/bookstore/psap/2015B2.SampleChapter.pdf>
6. Carandang, R., Cao, K., Beatrice Jose, N., Diana Almonte, F., & Michael Tinio, R. (2015). Knowledge and Attitudes on Adverse Drug Reaction Reporting of Selected Hospital-based Health Practitioners in Manila, Philippines. *Scholars Academic Journal of Pharmacy (SAJP)*, 4(6), 301–307. Retrieved from https://www.researchgate.net/publication/331563338_Knowledge_and_Attitudes_on_Adverse_Drug_Reaction_Reporting_of_Selected_Hospital-based_Health_Practitioners_in_Manila_Philippines
7. Carandang, Rogie Royce & Cao, Karen & Jose, Nikki & Almonte, Frances & Tinio, Ron. (2015). Knowledge and Attitudes on Adverse Drug Reaction Reporting of Selected Hospital-based Health Practitioners in Manila, Philippines. *SAS Journal*, 4: 301-307. Retrieved from https://www.researchgate.net/publication/331563338_Knowledge_and_Attitudes_on_Adverse_Drug_Reaction_Reporting_of_Selected_Hospital-based_Health_Practitioners_in_Manila_Philippines/citation/download
8. Carter, B. (2018). Team-Based Care for Hypertension Management. *Hypertension: A Companion to Braunwald's Heart Disease (Third Edition)*, 2018; 443-451. Retrieved from <https://www.sciencedirect.com/science/article/pii/B9780323429733000482>
9. Cheema, E., Haseeb, A., Khan, T., Sucliff, P., Singer, D. (2017) Barriers to reporting of adverse drug reactions: a cross sectional study among community pharmacists in United Kingdom. *Pharmacy Practice*, 15(3): 931. Retrieved from <https://search.proquest.com/scholarly-journals/barriers-reporting-adverse-drugs-reactions-cross/docview/1966851693/se-2?accountid=31613>
10. Coleman, J. J., & Pontefract, S. K. (2016). Adverse drug reactions. *Clinical medicine (London, England)*, 16(5): 481–485. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6297296/>
11. Coleman, Jamie & Pontefract Sarah. (2016). Adverse drug reactions (ADR) remain a challenge in modern healthcare, particularly given the increasing complexity of therapeutics, an ageing population and rising multimorbidity. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6297296/pdf/clinmed-16-5-481.pdf>

12. Deepalakshmi, M., Kumar, P., Arun, K. P., & Ponnusankar, S. (2019). *Impact of Continuing Pharmacy Education on the Knowledge, Attitude and Practice of Community Pharmacists about ADR Monitoring and Reporting*. *Indian Journal of Pharmaceutical Sciences*, 81(4). Retrieved from <https://www.ijpsonline.com/archive/ijps-volume-81-issue-4-year-2019.html>
13. Dweik, R. A., Kohen, D., Stacey, D., & Yaya, S. (2020). Adverse drug reaction reporting in Canada: Consumer versus physician reports. *Drugs & Therapy Perspectives*, 36(10): 469-475. Retrieved from <https://link.springer.com/article/10.1007%2Fs40267-020-00762-6>
14. Dweik, R. A., Stacey, D., Kohen, D., & Yaya, S. (2016). Factors affecting patient reporting of adverse drug reactions: A systematic review. *British Journal of Clinical Pharmacology*, 83(4): 875-883. Retrieved from <https://bpspubs.onlinelibrary.wiley.com/doi/full/10.1111/bcp.13159>
15. Dweik, R. A., Yaya, S., Stacey, D., & Kohen, D. (2016). Spontaneous adverse drug reaction reporting by patients in Canada: A multi-method study—study protocol. *SpringerPlus*, 5(1). Retrieved from <https://springerplus.springeropen.com/articles/10.1186/s40064-016-1838-9>
16. Faqih, M., & Fageehi, W. (2019). Pharmacist's knowledge, attitude, and practice towards pharmacovigilance and adverse drug reactions reporting process: A cross-sectional survey. *International Journal of Medicine in Developing Countries*, 409-414. Retrieved from <http://ijmdc.com/fulltext/51-1545949009.pdf>
17. Farooq, N., and F. Amin. (2019) Role Of Community Pharmacist In Pharmacovigilance". *Khyber Medical University Journal*, 11(3): 181-3. Retrieved from <https://www.kmuj.kmu.edu.pk/article/view/18589>
18. Alsaleh, Fatima M., et. al (2017) Knowledge, attitude and practices of pharmacovigilance and adverse drug reaction reporting among pharmacists working in secondary and tertiary governmental hospitals in Kuwait. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1319016416301384>
19. Fornasier, G., Francescon, S., Leone, R., & Baldo, P. (2018). An historical overview over Pharmacovigilance. *International Journal of Clinical Pharmacy*, 40(4): 744–747. Retrieved from <https://link.springer.com/article/10.1007/s11096-018-0657-1>
20. Gurmessa, L., Dedefo, M. (2016). Factors Affecting Adverse Drug Reaction Reporting of Healthcare Professionals and Their Knowledge, Attitude, and Practice towards ADR Reporting in Nekemte Town, West Ethiopia. *BioMed Research International* 2016; 6. Retrieved from <https://www.hindawi.com/journals/bmri/2016/5728462/>
21. Hadi, M. A., Neoh, C. F., Zin, R. M., Elrggal, M., & Cheema, E. (2017). Pharmacovigilance: Pharmacists' perspective on spontaneous adverse drug reaction reporting. *Integrated Pharmacy Research and Practice*, 6: 91-98. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/29354555/>
22. Hailu, A. D., & Mohammed, S. A. (2020). Adverse Drug Reaction Reporting in Ethiopia: Systematic Review. *BioMed Research International*, 2020; 1-12. Retrieved from <https://www.hindawi.com/journals/bmri/2020/8569314/>
23. Hariraj, V., & Aziz, Z. (2018). Direct patient reporting of adverse drug reactions: An analysis of spontaneous reports submitted to Malaysian pharmacovigilance centre. *Tropical Journal of Pharmaceutical Research*, 17(8): 1673. Retrieved from <https://www.ajol.info/index.php/tjpr/article/view/178195>
24. Hayes, A. (2020, October 07). Chi-Square (χ^2) Statistic Definition. Retrieved from http://stikeskeluargabunda.ac.id/app_other/file/buku/materi_1549510368.pdf?fbclid=IwAR0_uMOeon63LA6EXAET32Ywf5d9fPvwkwqRIrIc7GjCeA-1-lozDhwOGoh
[https://www.investopedia.com/terms/c/chi-square-statistic.asp#:~:text=A%20chi%2Dsquare%20\(%CF%872\)%20statistic%20is%20a%20measure,freedom%2C%20and%20the%20samples%20size](https://www.investopedia.com/terms/c/chi-square-statistic.asp#:~:text=A%20chi%2Dsquare%20(%CF%872)%20statistic%20is%20a%20measure,freedom%2C%20and%20the%20samples%20size)
25. Jha, N., Rathore, D. S., Shankar, P. R., Gyawali, S., Hassali, M. A., Alshakka, M., & Alshammri, T. M. (2015). Strengthening adverse drug reaction reporting in Nepal. *Asian Journal of Medical Sciences*, 6(4): 9-13. Retrieved from <https://www.nepjol.info/index.php/AJMS/article/view/11659>
26. Kang, Dong & Ahn, Kyung-Min & Kang, Hye-Ryun & Cho, Sang-Heon. (2017). Past, present, and future of pharmacovigilance in Korea. *Asia Pacific Allergy*. 7. 173. 10.5415/apallergy.2017.7.3.173. Retrieved from https://www.researchgate.net/publication/318764397_Past_present_and_future_of_pharmacovigilance_in_Korea/citation/download
27. L. Wise, J. P., Y. Alvarez, A. H., L. Hazell, S. S., E. Lopez-Gonzalez, M. H., S. Stergiopoulos, C. B., JJ. Borg, G. A., . . . M. Backstrom, E. E. (2018).
28. Knowledge of Adverse Drug Reaction Reporting and the Pharmacovigilance of Biological Medicines: A Survey of Healthcare Professionals in Ireland. Retrieved from <https://link.springer.com/article/10.1007/s40259-018-0281-6#Tab2>
29. Lučić, M., Milošević, N., Martić, N., Paut-Kusturica, M., Jovančević, V., Ubavić, M.,... Rašković, A. (2018). The role of a pharmacist in the pharmacovigilance system. *Hospital Pharmacology-International Multidisciplinary Journal*, 5(3):

- 715-727. Retrieved from https://www.researchgate.net/publication/330813046_The_role_of_a_pharmacist_in_pharmacovigilance_system
30. M. Limuaco, O. (2014). The Extent of Pharmacovigilance Awareness among Pharmacy Senior Students of Centro Escolar University, Manila, Philippines. *Journal of Pharmacovigilance*, 02(01): 2–4. Retrieved from <https://www.longdom.org/open-access/the-extent-of-pharmacovigilance-awareness-among-pharmacy-senior-students-ofcentro-escolar-university-manila-philippines-2-329-6887-2-121.pdf>
 31. Mm, T., & Bc, T. (2016). Assessment of Knowledge, Attitude and Practices of Adverse Drug Reaction Reporting among Doctors and Pharmacists in Primary Healthcare. *Advances in Pharmacoepidemiology & Drug Safety*, 5(4). Retrieved from <https://www.longdom.org/open-access/assessment-of-knowledge-attitude-and-practices-of-adverse-drugreaction-reporting-among-doctors-and-pharmacists-in-primary-healthcar-2167-1052-1000206.pdf>
 32. Mulchandani, R., Kakkar, A. (2018). Reporting of adverse drug reactions in India: A review of the current scenario, obstacles and possible solutions. *The International journal of risk & safety in medicine*, 30(8): 1-12. Retrieved from https://www.researchgate.net/publication/327352091_Reporting_of_adverse_drug_reactions_in_India_A_review_of_the_current_scenario_obstacles_and_possible_solutions
 33. Nicholls, J., Mackenzie, C., & Braund, R. (2017). Preventing drug-related adverse events following hospital discharge: The role of the pharmacist. *Integrated Pharmacy Research and Practice*, 6: 61-69. Retrieved from <https://www.dovepress.com/preventing-drug-related-adverse-events-following-hospital-discharge-the-peer-reviewed-article-IPRP>
 34. Nnebue, C., Ugoji, J., Ezeuko, A., & Ebenebe, U. (2015). Factors associated with the reporting of adverse drug reactions by health workers in Nnewi Nigeria. *International Journal of Preventive Medicine*, 6(1): 25. Retrieved from <https://www.ijpvmjournal.net/article.asp?issn=2008-7802;year=2015;volume=6;issue=1;page=25;epage=25;aulast=Ezeuko>
 35. O'Callaghan, J., Griffin, B. T., Morris, J. M., & Bermingham, M. (2018, May 02). Knowledge of Adverse Drug Reaction Reporting and the Pharmacovigilance of Biological Medicines: A Survey of Healthcare Professionals in Ireland. Retrieved from <https://link.springer.com/article/10.1007/s40259-018-0281-6/tables/3>
 36. Parsons, V. (2017). Stratified Sampling. Retrieved from https://www.researchgate.net/publication/313793894_Stratified_Sampling
 37. Rajalakshmi, R., Vasundara-Devi, B., Durga-Prasad, T.D., Swetha, S., Dharini, B. (2017). Knowledge, Attitude and Practice Towards Pharmacovigilance and Adverse Drug Reaction Reporting Among Nurses in A Tertiary Care Hospital, Tirupati. *International Journal of Pharmaceutical and Clinical Research*, 9(11): 683-689. Retrieved from <http://impactfactor.org/PDF/IJPCR/9/IJPCR,Vol9,Issue11,Article4.pdf>
 38. Shamim, S., Sharib, S. M., Malhi, S.M., Muntaha, S., Raza, H., Ata, S., Hussain, M. (2016). Adverse drug reactions (ADRS) reporting: awareness and reasons of under-reporting among health care professionals, a challenge for pharmacists. *SpringerPlus*. Retrieved from <https://springerplus.springeropen.com/articles/10.1186/s40064-016-3337-4#Sec7>
 39. Sherif, F. M. (2017). Role of the pharmacist in adverse drug reaction monitoring. *Pharmacy & Pharmacology International Journal*, 5(5). Retrieved from <https://medcraveonline.com/PPIJ/role-of-the-pharmacist-in-adverse-drug-reaction-monitoring.html>
 40. Suyagh, M., Farah, D., & Abu Farha, R. (2015). Pharmacist's knowledge, practice and attitudes toward pharmacovigilance and adverse drug reactions reporting process. *Saudi Pharmaceutical Journal*, 23(2): 147–153. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1319016414000681#f001>
 41. Tahir, R. M., & Hussein, M. (2020). Knowledge, Attitude, and Practice of Community Pharmacists towards Pharmacovigilance and Adverse Drug Reactions: A Study from Sudan. *Journal of Scientific Research in Medical and Biological Sciences*, 1(2): 123-132. Retrieved from <https://bcsdjournals.com/index.php/jsrmb/article/view/118>
 42. Vargesson, N. (2015). Thalidomide-induced teratogenesis: History and mechanisms. *Birth Defects Research Part C: Embryo Today: Reviews*, 105(2): 140-156. Retrieved from <https://onlinelibrary.wiley.com/doi/full/10.1002/bdrc.21096>
 43. Vergeire-Dalmacio, G., Castillo-Carandang, N., Juban, N., Amarillo, M.L., Tagle, M.P., Baja, E. (2015). Texting-Based Reporting of Adverse Drug Reactions to Ensure Patient Safety: A Feasibility Study. *JMIR Public Health Surveill*, 1(2). Retrieved from https://publichealth.jmir.org/2015/2/e12/?fbclid=IwAR0jW-Z7VzDAC3PPC3sHxK1os6k-DH81Bo3GmfArK_xwgQ9eVNsv9g6cKtg
 44. Vigneshwaran, E., Harichandana, V., Sadiq, M. M., Alavudeen, S. S., Khan, N. A., & Ahmed, T. (2020). Knowledge, Attitude and Practice of Community Pharmacists towards Adverse Drug Reactions Reporting. *Journal of Young Pharmacists*, 12(1): 75-80. Retrieved from

<http://www.jyoungpharm.org/article/1424>

45. Wang, J., & Wang, N. (2016). The Present Situation and Management Measures of Adverse Drug Reactions in China. Proceedings of the 2016 International Conference on Education, Management Science and Economics. Retrieved from <https://www.atlantispress.com/proceedings/icemse-16/25867266>
46. World Health Organization. (2019). The legal and regulatory framework for community pharmacies in the WHO European Region. Retrieved from <https://apps.who.int/iris/bitstream/handle/10665/326394/9789289054249-eng.pdf?sequence=1&isAllowed=y>

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