Assessment of Knowledge, Attitude, and Practices of Pharmacovigilance Among Hospital Pharmacists in Metro Manila, Philippines

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Abstract: Despite strict regulations mandated by governing bodies, drug-related morbidity and mortality due to adverse drug reactions (ADRs) have remained relevant throughout history. In pharmacovigilance, the pivotal duty of pharmacists is to detect, assess, understand, and prevent adverse effects. The study aims to assess and determine the correlation between the knowledge, attitude, and practices of hospital pharmacists in pharmacovigilance and evaluate the pharmacovigilance system in hospitals in Metro Manila based on current practices. A cross-sectional study with a descriptive and correlational design was used to evaluate hospital pharmacists using a questionnaire adapted from Abdulsalim et al. (2023), which was disseminated to 120 respondents in selected hospitals in Metro Manila. Responses were analyzed using descriptive statistics and Pearson's R Correlation. Out of 120 respondents, 45% (n=54) and 48% (n=58) showed fair and moderate knowledge, respectively. The majority of the respondents displayed a positive attitude (n=120), however, 54% (n=65) showed poor practices. There was no significant correlation between knowledge and attitude and between knowledge and practices, with weak coefficient values of -0.0002 and 0.129 and non-significant p-values of 0.987 and 0.161, respectively. Conversely, the correlation between attitude and practice was significant, with a positive value of 0.199 and a p-value of 0.029, indicating a potential relationship between variables. The weak correlations suggested that external factors may influence pharmacovigilance. Hospitals in Metro Manila followed most of the minimum requirements set by the FDA, with 79.2% (n=95) reporting that their institution submitted all adverse drug event reports to the FDA. To obtain an operative pharmacovigilance system, interventions should be made to address gaps in the knowledge and practices of hospital pharmacists, as well as in the practices of their respective institutions.

Key Words: Adverse Drug Reaction; Hospital Pharmacist; Pharmacovigilance

1. INTRODUCTION

The World Health Organization (WHO) defines adverse drug reactions (ADRs) as unintended and harmful reactions to medicines (WHO, 1972). The risk of contracting an ADR following the consumption of medicines will never be zero; its possible occurrence is compulsory alongside its desired effects (Van, 2016). In many ADR-related cases, costs from inadvertent hospitalization, surgery and hindered productivity exceeded the medication cost. To prevent these events, drug developers prioritize patient safety through post-marketing surveillance or, interchangeably, pharmacovigilance. Pharmacovigilance is done during Phase IV, wherein the drug's efficacy, safety, and purpose in large populations under real-life conditions are continuously monitored (Montastruc et al., 2006). Moreover, pharmacovigilance further elaborates on the possible expansion or restriction of the drug's therapeutic effects and the identification of unexpected or severe ADRs that have not been determined prior to its regulatory approval of its release for public consumption (Ribeiro-Vaz et al., 2016). Ultimately, pharmacovigilance serves as a vital public health function aimed at reducing the risks and increasing the benefits of medicines. In the Philippines, the Food and Drug Administration (FDA) spearheaded pharmacovigilance through the National Pharmacovigilance Center, which is responsible for

receiving and processing reports nationwide of suspected adverse drug reactions (Philippine Food and Drugs Association, 2022). However, it was mentioned that Philippines, alongside with most Asian countries, had a 'woefully low' culture of ADR reporting (Biswas, 2013). Factors such as the unrecognized reporting process of adverse events, adverse events being misconstrued as 'part of the healing action', and the condescendence of the Filipino population towards unscientific traditional herbal medicines contributed to the often-unutilized pharmacovigilance reporting system initiated by the FDA. Provided that pharmacovigilance was an indispensable dimension of drug discovery and medication safety, it remained questionable whether it was routinely practiced by institutions in the Philippines, let alone individual health professionals such as pharmacists (Biswas, 2013).

Hence this study was aimed to assess and determine the correlation between the knowledge, attitude, and practices of hospital pharmacists in Metro Manila towards pharmacovigilance. Furthermore, the study aims to evaluate the pharmacovigilance system in hospitals in Metro Manila based on current practices. In doing so, the leading causes of hindrance to a functioning pharmacovigilance system can be identified.

2. METHODOLOGY

2.1 Methods of Research

The study utilized a cross-sectional, descriptive and quantitative research design that examined the relationship between the knowledge, attitude, and practices of hospital pharmacists through a correlational approach.

2.2 Instruments Used

The questionnaire is adapted from a study conducted by Abdulsalim et al. (2023). The choices for each question depend on what is being asked. The whole questionnaire is written in the English language.

2.3 Sampling Technique

A purposive sampling technique was utilized. Individuals that do not meet a particular set of characteristics will be excluded from the sample. Based on existing literature, a hospital must have a minimum of 3 pharmacists (Karim & Adnan, 2016), thus, 3 pharmacists drawn from 40 random hospitals in Metro Manila are likely to respond, leading to a conservative estimate of 120 respondents.

2.4 Statistical Treatment

The Statistical Package for Social Science (SPSS) software was used to analyze data using descriptive statistics. The correlation between the knowledge, attitude and practices were analyzed using Pearson's R Correlation.

3. RESULTS AND DISCUSSION

3.1 Demographics

Table 1. Summary of findings regarding age

Age	n	%
> 60 years old	1	0.83%
51-55 years old	7	5.83%
46-50 years old	14	11.67%
41-45 years old	6	5.00%
36-40 years old	7	5.83%
31-35 years old	11	9.17%
25-30 years old	57	47.50%
< 25 years old	17	14.17%

Among the 120 individuals surveyed, the majority fell within the age range of 25-30 years old, comprising 47.50% of the sample. On the other end of the spectrum, participants aged 60 years and above constituted only a minor proportion, with a mere 0.83%.

Table 2. Summary of findings regarding gender

Gender	n	%
Female	102	85.00%
Male	18	15.00%

The gender distribution among the participants indicated a significant majority of female respondents, comprising 85.00% of the total sample. In contrast, male participants constituted a smaller proportion, accounting for 15.00%.

Table 3. Summary of findings regarding location of workplace

Location of Workplace	n	%
Caloocan	8	6.67%
Makati	8	6.67%
Manila	60	50.00%
Marikina	1	0.83%
Pasay	1	0.83%
Pasig	1	0.83%
Quezon City	33	27.50%
San Juan	4	3.33%
Valenzuela	4	3.33%

The majority of respondents reported their workplace location as Manila, comprising 50.00% of the

total sample. Other notable locations included Quezon City, with 27.50%.

Table 4. Summary of findings regarding level of education

Level of Education	n	%
Bachelor	108	90.00%
Master	5	4.17%
Pharm D	7	5.83%

The analysis of participants' levels of education revealed a predominantly bachelor's degree attainment within the surveyed population, constituting 90.00% of the total sample.

Table 5. Summary of findings regarding year graduated with a bachelor's degree

Year Graduated (Bachelor's Degree)	n	%
Earlier than 1990	3	2.50%
2021-2022	21	17.50%
2016-2020	42	35.00%
2011-2015	15	12.50%
2006-2010	8	6.67%
2001-2005	7	5.83%
1996-2000	14	11.67%
1991-1995	10	8.33%

The largest proportion of respondents, comprising 35.83%, had accumulated over 10 years of experience in the field. Additionally, participants with 7 to 9 years of practice accounted for 12.50% of the sample, representing a significant but smaller cohort.

Table 6. Summary of findings regarding years of practice as a pharmacist

Year of practice as a pharmacist	n	%
> 10 years	43	35.83%
1-3 years	30	25.00%
4-6 years	32	26.67%
7-9 years	15	12.50%

The largest proportion of respondents, comprising 35.83%, had accumulated over 10 years of experience in the field. Following this, individuals with 4 to 6 years of practice represented 26.67% of the total sample, indicating a mid-career stage for many participants. Similarly, those with 1 to 3 years of experience constituted 25.00%, reflecting a substantial proportion of recent entrants into the profession. Additionally, participants with 7 to 9 years of practice accounted for 12.50% of the sample, representing a significant but smaller cohort.

Table 7. Summary of findings regarding years of practice as a pharmacist

Year of practice as a hospital pharmacist	n	%
> 10 years	36	30.00%
1-3 years	51	42.50%
4-6 years	20	16.67%
7-9 years	13	10.83%

The largest proportion of respondents, comprising 42.50%, had accumulated 1 to 3 years of experience in the hospital setting, indicating a substantial number of recent entrants into this specific field. Following this, individuals with over 10 years of experience represented 30.00% of the total sample.

3.2 Knowledge of hospital pharmacists about pharmacovigilance
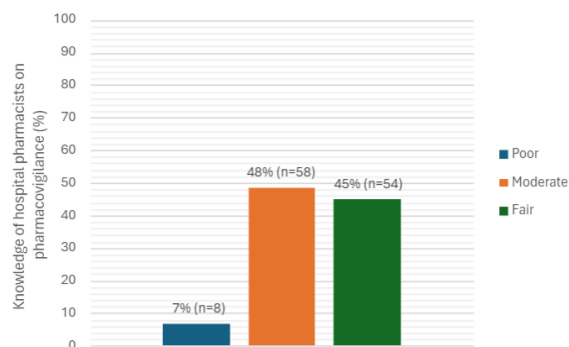

Fig. 1. Knowledge scores of hospital pharmacists on pharmacovigilance

Computed knowledge scores of hospital pharmacists were further classified as poor for scores > 50%, moderate for scores 50-75%, or fair for scores > 75%. Upon analysis, 48% (n=58) and 45% (n=54) of the respondents scored moderate and fair, respectively.

Table 8. Knowledge of hospital pharmacists in Metro Manila on pharmacovigilance

Which of the following BEST defines Pharmacovigilance according to the World Health Organization (WHO)?	n	%
The process of improving drug safety.	5	4.2
The science and activities relating to detecting, assessing, understanding and prevention of adverse effects.	72	60.0
The science of detecting the class and incidence of adverse drug reactions (ADR) after a drug is released to the market.	34	28.3

The science of monitoring adverse drug reactions (ADR) happening in an institution.	9	7.5
Which of the following is the goal of Pharmacovigilance?	**n**	**%**
Calculation of adverse drug reactions (ADR) incidence	2	1.7
Enhancing patient safety in relation to drug use	86	71.7
Identifying predisposing factors to adverse drug reactions (ADR)	13	10.8
Identifying unrecognized adverse drug reactions (ADR)	19	15.8
Which of the following are possible causes of ADRs?	**n**	**%**
Undesirable Effect	62	51.7
Incorrect Administration	57	47.5
Unsafe drug for the patient	39	32.5
Allergic reaction	88	73.3
Drug Interaction	90	75.0
Dosage Modifications (Increase or Decrease)	44	36.7
Which ADRs should be reported?	**n**	**%**
ADRs to herbal products	1	.8
ADRs to new drugs	5	4.2
ADRs to vaccines	1	.8
All serious ADRs	113	94.2
Which of these healthcare professionals are qualified to report ADRs?*	**n**	**%**
Pharmacists	114	95.0
Doctors	107	89.2
Nurses	89	74.2
Dentists	55	45.8
Physiotherapists	29	24.2
Patients	30	25.0
Are you familiar with the following medication safety processes?	**n**	**%**
No	7	5.8
Yes	113	94.2
If YES, which of the following are you familiar with?	***n***	***%***
Medication Reconciliation	64	53.3
Medication Check Review	78	65.0
Medication History	84	70.0
None of the Above	3	2.5
Are you aware of organizations responsible for educating healthcare professionals on safe medication practices?	**n**	**%**
No	7	5.8
Yes	113	94.2
If YES, which of the following are you familiar with?	**n**	**%**

Institute for Safe Medication Practices	30	25.0
International Medication Safety Network	14	11.7
World Health Organization	108	90.0
None of the Above	1	0.8
Do you know of any Center or ADR reporting system in the Philippines?	**n**	**%**
No	24	20.0
Yes	96	80.0

Some results may not total to 100% due to choice given for multiple responses

Most respondents (n=72, 60%) correctly defined pharmacovigilance according to the definition by WHO, while 71.1% (n=86) answered correctly when asked about the purpose of pharmacovigilance. Furthermore, a significant number of respondents (n=96, 80%) have knowledge of a center or ADR reporting system in the Philippines. Further details on the results for knowledge are summarized in Table 8.

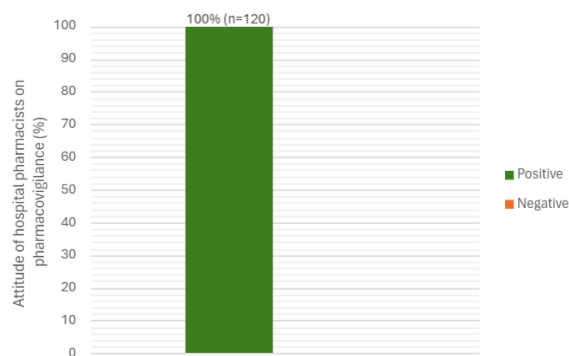*3.3 Attitudes of hospital pharmacists towards pharmacovigilance*

Fig. 2. Attitude scores of hospital pharmacists on pharmacovigilance

Attitude scores of surveyed hospital pharmacists in Metro Manila were divided into having a positive attitude for scores ≥ 50% and negative attitude for scores < 50%. The results showed that 100% (n=120) of the respondents scored ≥ 50%, signifying that hospital pharmacists in Metro Manila have a positive attitude towards pharmacovigilance.

Table 9. Attitudes of hospital pharmacists in Metro Manila towards pharmacovigilance

In your opinion, do you think it is necessary to report ADRs?	n	%
No	0	0.0

	n	%
Yes	120	100.0
In your opinion, is ADR reporting a professional obligation of pharmacists?	**n**	**%**
No	2	1.7
Yes	118	98.3
Do you think ADR reporting will improve and contribute to the healthcare system?	**n**	**%**
No	0	0.0
Yes	120	100.0
Do you think conducting a medication review can reduce ADR reporting?	**n**	**%**
No	0	0.0
Yes	120	100.0
In your own opinion, do you think ADR reporting and pharmacovigilance are taught well by healthcare professionals?	**n**	**%**
No	45	37.5
Yes	75	62.5
Are you willing to implement ADR reporting in your practice?	**n**	**%**
No	4	3.3
Yes	116	96.7

Among the 120 participants, 100% (n=120) agreed that it is necessary to report ADRs, while 96.7% (n=116) are willing to implement ADR reporting in their practice. On the other hand, 37.5% (n=45) believe that it is not being taught well. The summary of results for attitude is displayed in Table 10.

3.4 Practices of hospital pharmacists towards pharmacovigilance
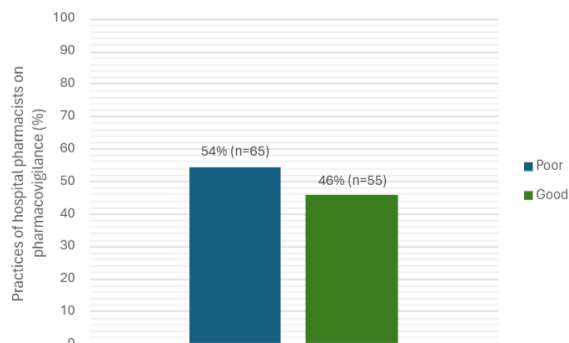

Fig. 3. Practice scores of hospital pharmacists on pharmacovigilance

The practice scores of hospital pharmacists in Metro Manila were divided as having good practice for scores ≥ 50% and poor practice for scores < 50%. More than half (n=65, 54%) of the respondents exhibited poor practices on pharmacovigilance, while 46% (n=55) were reported to have good practice.

Table 10. Practices of hospital pharmacists in Metro Manila on pharmacovigilance

	n	%
Have you ever conducted a medication review with your patients?	**n**	**%**
No	53	44.2
Yes	67	55.8
If yes, how frequent?	**n**	**%**
Always	5	4.2
Occasionally	15	12.5
Often	29	24.2
Rarely	21	17.5
What are the barriers in conducting a medication review?	**n**	**%**
Lack of Time	69	57.5
Lack of training on how to conduct a medication review	96	80.0
Lack of formal process in place	51	42.5
Language barrier	21	17.5
Lack of knowledge by the patients about their medications	62	51.7
None of the above	2	1.7
Have you ever identified an ADR in any patient?	**n**	**%**
No	59	49.2
Yes	61	50.8
If yes, how frequent?	**n**	**%**
< 5 times	52	43.3
> 10 times	8	6.7
5-10 times	2	1.7
Have you ever reported an ADR?	**n**	**%**
No	70	58.3
Yes	50	41.7
If yes, how frequent?	**n**	**%**
<5 times	40	33.3
>10 times	8	6.7
5-10 times	1	.8
Do you know to whom ADR should be reported?*	**n**	**%**
Department of Health	81	67.5
Food and Drug Administration	104	86.7
Drug Company	59	49.2
The Institution (Hospital)	66	55.0
None of the above	0	0.0
What method would you prefer in reporting ADRs to an ADR Reporting Center?	**n**	**%**
Direct contact	29	24.1
Email	69	57.4
Mail / Fax	5	4.2

	n	%
Telephone	2	1.7
Website	15	12.5
What factors do you think may be discouraging in reporting ADRs?*	**n**	**%**
Not knowing how to report	89	74.2
Knowing what information to report	63	52.5
Thinking it is not important to report an ADR incident	39	32.5
Managing patients is more important than reporting ADR	33	27.5
It is not part of my job to report ADRs	5	4.2
Patient confidentiality issues	54	45.0
Are ADRs being reported as part of "incident reports" in your institution?	**n**	**%**
No	23	19.2
Yes	97	80.8

Some results may not total to 100% due to choice given for multiple responses

In terms of identifying ADR in any patient, 50.8% (n=61) of the participants answered yes, with 43.3% (n=52) stating that they have only rarely identified ADR in their patients (< 5 times). When asked about the perceived barriers in reporting ADRs, the major factors answered are not knowing how to report ADRs (n=89, 74.2%) and knowing what information to report (n=63, 52%). The results of practices are summarized in Table 11.

3.5 Correlational analysis of the relationships between knowledge, attitude, and practices

Table 11. Summary of findings regarding the correlation between knowledge, attitude, and practices

Variable	r	Interpretation	p-value	Decision	Conclusion
Knowledge and Attitude	-0.002	Weak Negative Correlation	0.987	Failed to Reject Ho	Not significant
Knowledge and Practices	0.129	Weak Positive Correlation	0.161	Failed to Reject Ho	Not significant
Attitude and Practice	0.199	Weak Positive Correlation	0.029	Reject Ho	Significant

The correlation between knowledge and attitude yielded a negligible coefficient (r = -0.002) with a non-significant p-value (p = 0.987), indicating an absence of a substantial relationship between these domains. Similarly, the correlation between knowledge and practices exhibited a weak coefficient (r = 0.129) with a non-significant p-value (p = 0.161), suggesting no

statistically significant association. However, a noteworthy finding emerged from the correlation between attitude and practice, where a weak positive correlation (r = 0.199) was observed with a significant p-value (p = 0.029), implying a tangible link between these aspects.

3.6 Compliance of the knowledge, attitude, and practice of hospital pharmacists on pharmacovigilance regulations in the Republic of the Philippines

Table 12. Practices and training of pharmacovigilance in hospitals

What are the practices of your institution with regards to Pharmacovigilance?	n	%
Maintains a Pharmacovigilance unit	40	33.3%
Submit all reports of adverse events to the FDA	95	79.2%
Informs the National Pharmacovigilance Center of any amendments in its composition and qualifications	26	21.7%
Encourages healthcare workers to attend pharmacovigilance seminars and trainings	72	60.0%
Has a separate pharmacovigilance unit	12	10.0%
How often does your institution provide seminars and/or training regarding pharmacovigilance?	**n**	**%**
Annually	24	20.0
Biannually	1	0.8
Every ≥ 3 years	13	10.8
Monthly	7	5.8
Never	46	38.3
Quarterly	17	14.2
Semi-annually	12	10.0

In accordance with the minimum standards issued by the DOH with regards to the practice of pharmacovigilance in hospitals in the Philippines, or Administrative Order 2011-0009, results obtained show that institutions in Metro Manila most of the criteria listed. Submission of all reports of adverse events to the FDA is the most cited criteria, with 79.2% (n=95), followed by encouraging HCWs to attend seminars and training with 60% (n=72). With regards to provision of seminars and/or training by their respective institutions, many of the respondents (n=46, 38.3%) stated that their institutions have never conducted seminars and/or training regarding pharmacovigilance. Contrarily, 20% of

the respondents stated that their institutions provide them annually.

Discussion

Older hospital pharmacists were thought to be more engaged in pharmacovigilance than their younger colleagues (Cabral, 2016), but the findings did not satisfy this due to the high number of young hospital pharmacists in Metro Manila. Intermediate age brackets, including those spanning from 31 to 55 years old, exhibited varying but noticeable representation, collectively comprising 32.50% of the sample. However, despite a wide distribution range, the age of hospital pharmacists does not influence their knowledge, attitude, and practices towards pharmacovigilance (Carandang et al., 2015).

Generally, pharmacy was considered compatible with female domestic responsibilities. The gender of hospital pharmacists, regardless of whether male or female, does not affect their knowledge, attitude, and practices toward pharmacovigilance (Carandang et al., 2015). More so, the workplace of the hospital pharmacist shows little influence on their knowledge, attitude, and practice of pharmacovigilance (Carandang et al., 2015). In addition, despite the diverse range of completion periods, pharmacists practicing for an extended period and new graduates exhibited a gap in pharmacovigilance knowledge and perception based on a study (Alshayban et al., 2020).

A study indicated that Pharmacists with less than five years of experience are less knowledgeable about pharmacovigilance and adverse drug reaction reporting than pharmacists with more than ten years of experience (Shanableh et al., 2023).

Most of the respondents (n=72, 60%) properly described pharmacovigilance according to the definition by WHO, in agreement with the study by Abdulsalim et al. (2023) with 62%, Alsaleh et al. (2017) with 62%, Srinivasan et al. (2017) with 53.4% and Carandang et al. (2015) with 61%. It is noteworthy that there are inconsistencies in the training of hospital pharmacists about ADR reporting, even though they have a favorable attitude and sees the importance of ADR reporting and pharmacovigilance, if they are not taught how to execute it or report it properly, it might be a contributing factor as to why ADR reporting is not exercised frequently in Metro Manila.

There is a low culture of reporting ADRs in the Philippines (Dutta et al., 2021) that justified the poor practices on pharmacovigilance of hospital pharmacists (n=65, 54%). Barriers are mainly due to the lack of training on how to conduct a medication review (n=96, 80.0%), time (n=69, 57.5%), knowledge about patient's medications (n=62, 51.7%), formal process in place (n=51, 42.5%), and language barrier (n=21, 17.5%). Correspondingly, a study by Wong and Sze (2021), the common challenges perceived by hospital pharmacists in conducting medication review are insufficient training and education (79.8%), and time deficiency (82.7%) due to workforce shortage as 60% of Malaysian pharmacists are working in the public sector.

The results in Table 4 indicate the correlation between the variables knowledge, attitude, and practice of hospital pharmacists on pharmacovigilance. The findings on the knowledge and attitude of hospital pharmacists towards pharmacovigilance have no significant correlation (r = -0.002, p-value = 0.987), which is similar to other studies by Suyagh et al. (2015), Al Rabayah & Al Rumman (2019), and Al-Worafi et al. (2021). A correlation value of 0.129 and p-value of 0.161 suggested a weak positive correlation between knowledge and practice, showing comparable findings from Gupta et al. (2015), Gurung et al. (2019), and Abdulsalim et al. (2023). A positive weak correlation was also observed between the attitude and practice (r = 0.199, p-value = 0.029) of the hospital pharmacists on pharmacovigilance; this outcome is similar to the studies of Gupta et al. (2015), Alsaleh et al. (2017), and Abdulsalim et al. (2023).

4. CONCLUSIONS

Despite the weak correlations observed in the analysis of pharmacovigilance knowledge, attitudes, and practices, the overall understanding and dedication to pharmacovigilance principles among pharmacists in Metro Manila are evident. The recognition of the importance of reporting adverse drug reactions (ADRs) underscores a shared commitment to patient safety and regulatory compliance within the profession. However, the presence of weak correlations suggests the presence of external factors influencing pharmacovigilance activities, warranting further investigation and targeted interventions.

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