

**COMPARISON OF KNOWLEDGE, ATTITUDE & PRACTICE TOWARDS PHARMACOVIGILANCE BETWEEN INDUSTRIAL AND HOSPITAL PHARMACISTS**Sunita Kumari<sup>1</sup>, Palaniappan Senthilkumar<sup>2\*</sup><sup>1</sup>Ph.D. Research Scholar, Sri Venkateshwara University – Pharmacy Stream, NH-24, Venkateshwara Nagar, Rajabpur, Gajraula, Amroha, (U.P.) – 244 236, India<sup>2</sup>Asst. Professor, KMCH College of Pharmacy, Kovai Estate, Kalapatti Road, Coimbatore – 641 048, India**\*Corresponding author e-mail:** [drsenthilkumarp@gmail.com](mailto:drsenthilkumarp@gmail.com)**ABSTRACT**

Pharmacist's knowledge and expertise is important to the application of drug safety profile. Pharmacists are more likely to detect adverse drug reactions than other healthcare professionals. The main objective of the study is to assess the knowledge and attitude of industry and hospital pharmacist towards pharmacovigilance and also to find out the effect of educational intervention towards the knowledge, attitude & participation in reporting adverse drug reactions at tertiary care hospital in New Delhi. This study was conducted by using validated KAP questionnaire. Out of 230 pharmacists responded, 115 were from the industry and 115 from the hospital. The overall response shows that industrial pharmacist are better in terms of knowledge, practice and attitude towards pharmacovigilance because of their regular training and updates. Hospital pharmacists lack awareness about pharmacovigilance and needs to update their knowledge and practice. There is a regular need for educational intervention. After intervention, a significant improvement in the knowledge, attitude and practice towards pharmacovigilance was observed among hospital pharmacists.

**Keywords:** Pharmacovigilance; Adverse Drug Reaction; Educational intervention; Hospital pharmacists; KAP; Industrial Pharmacist.**INTRODUCTION**

According to the World Health Organization (WHO), Pharmacovigilance (PV) is defined as “the study of activities related to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem”.<sup>[1]</sup> The International Drug Monitoring Program was established after the thalidomide disaster detected in 1961 by WHO.<sup>[2]</sup> By 2010, 134 countries have become a part of the WHO PV Programme.<sup>[1]</sup> By its effective assessment of the risk-benefit profile of medicines and balanced information, WHO PV programme has supported public health. The MED WATCH programme of Food and Drug Administration (FDA) in USA collects reports from medical practitioners and

healthcare professionals about the occurrence of adverse drug events as a voluntary support.<sup>[3]</sup> The new Med Watch training program, MedWatch Learn, released by FDA teaches health professionals, students, and patients about the guidelines to complete the online FDA forms necessary to report medication errors.<sup>[4]</sup>

Philippine Pharmacists' Association (PPhA) Code of Ethics for Pharmacists defines Pharmacists as health professionals who help individuals protect themselves against diseases, maintain good health and make the best use of their medications. Adverse drug reactions (ADRs) accounts for 0.2 to 24 % of hospital admissions, 3.7 % of patients have fatal ADRs.<sup>[5]</sup> Adverse Drug Reaction (ADR) leads to number of medical and economic consequences like

prolong hospital stay, increased cost of treatment and risk of death. Hence, early detection and prevention of ADR is necessary. The global interest in the monitoring of drug safety showed a remarkable increase in the last four decades especially after the thalidomide disaster in pregnant women in the sixties.<sup>[6]</sup>

In India, National Pharmacovigilance Program of India (PvPI) is responsible for conducting activities related to ADR monitoring. Spontaneous reporting of ADRs by health professionals is the corner stone of PV. The health professionals have major contribution in signal detection of unsuspected and unusual ADRs previously undetected during the initial evaluation of a drug.<sup>[7]</sup> A major limitation associated with spontaneous ADR reporting system is underreporting.<sup>[8]</sup> It is estimated that only 6–10 % of all ADRs are reported.<sup>[9]</sup> India rates below 1 % in terms of ADR reporting.<sup>[10]</sup> This clearly emphasizes that the current status of PV in India is far from satisfactory.

Assessment of awareness of PV among the healthcare professionals is very important due to under reporting of ADRs. Although previous studies indicated that pharmacists are pivotal players in ADR monitoring and reporting, most pharmacists are unaware or not knowledgeable about the guidelines used by their respective countries, drug regulatory bodies responsible for assessing ADRs.<sup>[11,12]</sup> As drug experts, pharmacists should be equipped with the skills to prevent, identify, and resolve drug related problems and counsel patients on drug therapy.<sup>[13]</sup> The involvement of pharmacists in PV programs is considered to be vital. Modern pharmacists consider pharmaceutical care as their prime focus and play an important role in patient care. Ensuring the safe use of drugs is a combined responsibility of the healthcare team that includes Doctors, Nurses, Pharmacists and other supporting staffs.<sup>[14]</sup>

Pharmacist roles have truly evolved from their traditional roles of filling prescriptions to the management of medication therapy of their patients through Pharmaceutical Care, a concept introduced by Hepler and Strand in the late 1980s.<sup>[15]</sup> Pharmacist, as part of the Healthcare Team, is committed to place the well being of the patient at the centre of professional practice. Pharmacist's knowledge and expertise is important to the application of the safety profile of a medicine to the needs of a particular patient. Maintaining and monitoring of drugs safety and efficacy is an integral part of clinical practice. PV being part of the clinical discipline will play a vital role in assessing clinical practice standards in each country.<sup>[16]</sup>

Since, ADRs are common causes of morbidity and mortality in different healthcare settings, pharmacists

are more likely to detect ADRs than other healthcare professionals.<sup>[17]</sup> Previous studies<sup>[18]</sup> from our group revealed that pharmacists lack awareness and proper knowledge about the PV. This lead us to compare the awareness of pharmacists working in hospital and the pharmacists working in the industry towards PV. And also to create an awareness and improve the knowledge of PV among the pharmacists.

## MATERIALS AND METHODS

This study was conducted using validated KAP questionnaire after getting approval from Institutional Ethics Committee of Apollo Hospitals. The survey was carried from 3 April, 2014 to 3 Jun, 2014 where the pharmacists were approached in the hospital and industry with the questionnaire.

The reliability of validated KAP questionnaires was analyzed by conducting pilot study on 50 pharmacist and calculating Cronbach Alfa value (0.823), in order to identify the knowledge, attitude, practice of pharmacists in PV. Based on the previous study conducted by Rajesh *et. al.*,<sup>[19]</sup> the sample size (230) was calculated by using Statistical Package for Social Science (SPSS) version 21.0 with the significant level  $P < 0.001$ . The standard deviation (SD) between pre- and post-KAP score is 242 and the mean per cent difference is 4. We recruited 230 subjects at 80 % power and 5 % level of significance. The study was conducted in the tertiary healthcare hospital in New Delhi, by using validated KAP questionnaire. The survey questionnaire was administered to 500 staff pharmacists belonging to different specialties practicing across the tertiary healthcare hospital and Industry in New Delhi. Among which 230 responded to the questionnaire. The final KAP questionnaire (Appendix I) consisted of 22 questionnaire. Question number 1 to 13 are knowledge based, question number 14 to 19 are attitude based and question number 20 to 22 are practice based questions, designed specifically to answer the awareness about Pharmacovigilance. In order to preclude any potential bias the disclosure of name of the responder was made optional. All participants were also provided with sufficient time to fill the KAP questionnaire. KAP questionnaire was administered at the beginning of the study, in order to identify the knowledge, attitude, and practice of PV. The KAP survey questionnaires were analyzed question wise and their percentage value was calculated.

## RESULTS & DISCUSSION

Out of 500 KAP questionnaires circulated, 230 pharmacists in tertiary health care hospital and industry in New Delhi responded and involved in the

KAP survey. The overall response of the pharmacists in filling the KAP was not good and most of them didn't have enough time to answer the questions. The results are tabulated in **table 1**.

Question 1 sought information about definition of PV. A response rate for Question 1 by hospital pharmacists was 20.00 % whereas for industry pharmacist was 90.90 %.

Question 2 investigated important purpose of PV. According to the data for question 2, 21.24 % hospital pharmacists gave correct response and 72.72 % pharmacist from industry gave correct answer.

Question 3 sought information about methods commonly employed by the pharmaceutical company for monitoring ADRs of new drugs once they are launched in the market. Response rate for Question 3 from hospital pharmacists was 24.87 % while a 100 % response from industry pharmacist.

Question 4 investigated health care professional's awareness of reporting serious adverse events with regulatory body in India. In case of question 4 approximately 6.73 % of hospital pharmacists gave correct response whereas 69.69 % of industrial pharmacists responded correctly.

Question 5 sought information about international center for adverse drug reactions monitoring and the response rate for hospital pharmacists were 12.95 % and it was found to be 93.93 % for industrial pharmacists.

Question 6 sought information about agency in United States of America involved in drug safety issues. Response rate for Question 6 from hospital pharmacists was 25.90 % whereas for industry it was 96.96 %.

Question 7 sought information about major risk factors for the occurrence of maximum adverse drug reactions. Response rate for Question 7 from hospital pharmacists was 25.38 % and it was found to be 96.96 % for pharmacists from industry.

Question 8 investigated about the regulatory body responsible for monitoring ADRs in India. Response rate for Question 8 for Industrial pharmacists was 100 % whereas for hospital pharmacist it was only 27.46 %.

Question 9 sought information about most commonly used causality assessment of ADRs. According to the data for question 9, 14.50 % of hospital pharmacists gave correct response and 96.96 % pharmacist from industry gave correct response.

Question 10 investigated the ADR reporting system of the respective countries by means of match the following. In case of hospital pharmacist's response for yellow card – United Kingdom 15.73 %, green card – Scotland 3.04 %, ADR reporting form – India 21.82 %, blue card – Australia 3.55 %. For Industry pharmacist's response for yellow card – United

Kingdom 93.93 %, green card – Scotland 72.72 %, ADR reporting form – India 100 %, blue card – Australia 93.93 %.

Question 11 sought information about knowledge of National Pharmacovigilance Centre in India. Hospital pharmacists responded 25.38 % for KAP, whereas it was 96.96 % for industry.

Question 12 investigated about WHO online data base for reporting ADRs. The percentages of correct response in industry pharmacists were found to be 87.87 % and for hospital pharmacists it was 15.02 %.

Question 13 sought information about the clinical trial phase which can identify the rare ADRs. The percentages of correct response in pharmacists from hospital were 14.50 % and it was 90.90 % for pharmacist working in industry.

Question 14 sought information about professional responsibility for reporting ADRs. The percentages of correct response of pharmacists from hospital and industry were 25.90 % and 87.87 % respectively.

Question 15 investigated about factors discouraging ADRs reporting. The percentage of correct response of pharmacists from hospital was found to be 9.32 % and 84.84 % from industry.

Question 16 investigated about attitude of reporting ADRs. The percentage of correct response of hospital pharmacists were 14.50 % and 72.72 % for the pharmacist from industry.

Question 17 investigated opinions about establishing ADR monitoring centre in every hospital. The percentage of correct response of pharmacists from industry and hospitals were found to be 96.96 % and 30.56 % respectively.

Question 18 shows attitude of pharmacists towards PV practice by means of 'yes' or 'no' questionnaires, the percentage of correct response was 33.67 % from hospital pharmacists whereas for industry pharmacist it was 100 %.

Question 19 showed attitude of pharmacist towards PV by means of 'yes' or 'no' questionnaire. The percentage of correct response among hospital pharmacists was found to be 31.60 % and for industry it was 100 %.

The aim of the Question 20 was to assess health care professionals' perception and practice of reading articles on prevention of adverse drug reaction. It was found that only 22.27 % of pharmacists from hospital were in habit of referring articles whereas, 100 % pharmacist were from industry.

Finally, Questions 21 and 22 sought information about practice of PV by means of 'yes' or 'no' questionnaire. In case of Question 21, 23.83 % hospital pharmacists and 33.33% of industrial pharmacist responded 'yes'. In case of Question 22, 12.43 % pharmacists from hospital responded 'yes' and 45.45 % for pharmacist working in industry.

On comparing the knowledge of pharmacists in hospitals and pharmacists in industry, the results were found to be 19.51 % and 91.15 % respectively. Overall knowledge about International Reporting System among hospital pharmacists and industrial pharmacist was found to be 11.04 % and 94.69 % respectively. There is a need for educational intervention for hospital pharmacist in order to enhance the knowledge about PV practices. As pharmacist are the one who mainly interacts with patients, therefore they should be regularly trained and updated for better healthcare practices.

The attitude towards PV among the pharmacists in hospitals was found to be 26.42 % whereas those of pharmacists in industry was 90.15 %. Among industrial pharmacist 100 % awareness of ADR reporting was there, however, they were interested in PV training whereas in hospital pharmacist, the awareness level was very low as compared with the industrial pharmacists. The reason behind this large difference may be because of the regular training programs on PV given to the industrial pharmacists.

The main discouraging factor for reporting the ADRs was lack of time. Among the industrial pharmacists it was found to be 84.84 % and for hospital pharmacist was found to be 77.20 %. The hospital pharmacists believe that a single unreported case may not affect PV practice. Industrial pharmacists found it difficult to decide whether ADR has occurred or not.

96.96 % of industry pharmacist & 30.56 % of hospital pharmacists responded that there should be an ADR monitoring centre in every hospital. 17.09 % of hospital pharmacist responded for no need of ADR monitoring centre in hospitals

Overall, 52.52 % of pharmacists in industry and only 19.51 % of hospital pharmacists are practicing PV. Hence, there is a need for PV awareness among the HCPs. Compared to the hospital pharmacist, the pharmacist working in industry get updated because of regular training provided in the industry and which lacks in the hospital.

From the findings, it can be concluded that pharmacist working in industry has much better understanding about PV. They possess more knowledge compared to the hospital pharmacists and are practicing PV more effectively. However, there is a need of educational intervention for hospital pharmacists as their knowledge regarding PV practice is very low.

Looking at the need of educational intervention, an education intervention for a week was given to the hospital pharmacists and the survey was conducted (pre- and post- KAP survey) by using same KAP Questionnaire. (Table 2, 3, 4, 5, 6)

A significant improvement in the knowledge, practice and attitude of hospital pharmacists towards reporting of ADRs was observed. (Figure 1 to 5)

## Appendix I

### Knowledge, Attitude and Practices of Pharmacovigilance Questionnaires.

Name:

Age:

Occupation:

Sex: M  F

*Instructions: You are requested to give information to the best of your knowledge.*

*Please mark tick (✓) for the correct response.*

*(Knowledge based questions 1-13; Attitude based questions 14-19; Practice based questions 20-22)*

- 1) Define Pharmacovigilance? (Most appropriate any one only)
  - The science of monitoring ADR's happening in a Hospital
  - The process of improving the safety of Drugs
  - The detection, assessment, understanding & prevention of adverse effects
  - The science detecting the type & incidence of ADR after drug is marketed.
- 2) The important purpose of Pharmacovigilance is (Most appropriate one)
  - To identify safety of drugs
  - To calculate incidence of ADR's
  - To identify predisposing factors to ADR's
  - To identify unrecognized ADR's
- 3) Which of the following methods is commonly employed by the pharmaceutical companies to monitor adverse drug reactions of new drugs once they are launched in the market?

- Meta analysis
  - Post Marketing Surveillance (PMS) studies.
  - Population studies
  - Regression analysis
- 4) A serious adverse event in India should be reported to the Regulatory body within
- One day
  - Seven calendar days
  - Fourteen calendar days
  - Fifteen Calendar days
- 5) The international centre for adverse drug reaction monitoring is located in
- Unites States of America
  - Australia
  - France
  - Sweden
- 6) One of the following is the agency in Unites States of America involved in drug safety issues.
- American Society of Health System Pharmacists (ASHP)
  - United States food and drug administration (US FDA)
  - American Medical Association (AMA)
  - American Pharmaceutical Association (APA)
- 7) One of the following is a major risk factor for the occurrence of maximum adverse drug reactions
- Arthritis
  - Renal failure
  - Visual impairment
  - Vasculitis
- 8) In India which Regulatory body is responsible for monitoring of ADR's?
- Central Drugs Standard Control Organization
  - Indian Institute of sciences
  - Pharmacy Council of India
  - Medical Council of India
- 9) Which of the following scales is most commonly used to establish the causality of an ADR?
- Hartwig scale
  - Naranjo algorithm
  - Schumock and Thornton scale
  - Karch & Lasagna scale
- 10) Match the ADR reporting systems to the respective countries. (Write the number in the appropriate boxes)
- |  |                |
|--|----------------|
| <input type="checkbox"/> 1) Yellow card        | India          |
| <input type="checkbox"/> 2) Green card         | Scotland       |
| <input type="checkbox"/> 3) ADR reporting Form | United Kingdom |
| <input type="checkbox"/> 4) Blue card          | Australia      |
- 11) One among these is a national Pharmacovigilance centre?
- Kasturba Hospital, Manipal
  - AIIMS Delhi
  - JSS Medical College & Hospital, Mysore
  - CMC, Vellore
- 12) Which one of the following is the 'WHO online database' for reporting ADRs?
- ADR advisory committee
  - Medsafe

- Vigibase
  - Med watch
- 13) Rare ADRs can be identified in the following phase of a clinical trial
- During phase-1 clinical trials
  - During phase-2 clinical trials
  - During phase-3 clinical trials
  - During phase-4 clinical trials
- 14) The healthcare professionals responsible for reporting ADR in a hospital is/are
- Doctor
  - Pharmacist
  - Pharmacists
  - All of the above
- 15) Which among the following factors discourage you from reporting Adverse Drug Reactions? (Any one only)
- Non-remuneration for reporting
  - Lack of time to report ADR
  - A single unreported case may not affect ADR database
  - Difficult to decide whether ADR has occurred or not
- 16) Do you think reporting is a professional obligation for you?
- Yes
  - No
  - Don't know
  - Perhaps
- 17) What is your opinion about establishing ADR monitoring centre in every hospital?
- Should be in every hospital
  - Not necessary in every hospital
  - One in a city is sufficient
  - Depends on number of bed size in the hospitals.
- 18) Do you think reporting of adverse drug reaction is necessary?
- Yes
  - No
- 19) Do you think Pharmacovigilance should be taught in detail to healthcare professionals?
- Yes
  - No
- 20) Have you anytime read any article on prevention of adverse drug reactions?
- Yes
  - No
- 21) Have you ever come across with an ADR?
- Yes
  - No
- 22) Have you ever been trained on how to report Adverse Drug Reaction (ADR)?
- Yes
  - No

It was observed that after educational intervention there was significant increase in reporting rate and quality of work among the hospital pharmacists towards PV.

**CONCLUSIONS**

The overall response of pharmacists showed that pharmacist working in industry are better in terms of knowledge and practice towards PV because of their regular training and updates. There is a lack of awareness regarding PV among the hospital pharmacists as compared with the industrial

pharmacists. Like nurses and other paramedical staffs, pharmacists spent maximum time with patients and hence have very important role in drug safety. There is a need for an educational intervention on regular basis to update the knowledge and to create awareness and to incorporate the gained knowledge into their every day clinical practice.

**Table 1. Responses for knowledge, attitude and practice of the Hospital Pharmacists and Industrial Pharmacists towards Pharmacovigilance Questionnaires**

S. No.	Question	Response of pharmacist			
		In hospital	%	In Industry	%
<b>1.</b>	<b>Define Pharmacovigilance</b>				
	The science of monitoring ADRs happening in a Hospital	70	35.53	01	03.03
	The process of improving the safety of Drugs	80	40.60	01	03.03
	The detection, assessment, understanding & prevention of adverse effects*	39	20.20	30	90.90
	The science detecting the type & incidence of ADR after drug is marketed.	08	04.06	01	03.03
<b>2.</b>	<b>The important purpose of Pharmacovigilance is</b>				
	To identify safety of drugs*	41	21.24	24	72.72
	To calculate incidence of ADR's	11	05.58	09	27.27
	To identify predisposing factors to ADR's	74	37.56	00	00.00
	To identify unrecognized ADR's	71	36.04	00	00.00
<b>3.</b>	<b>Which of the following methods is commonly employed by the pharmaceutical companies to monitor adverse drug reactions of new drugs once they are launched in the market</b>				
	Meta analysis	10	05.07	00	00.00
	Post Marketing Surveillance (PMS) studies*	48	24.87	33	100.00
	Population studies	25	12.69	00	00.00
	Regression analysis	114	57.86	00	00.00
<b>4.</b>	<b>A serious adverse Event in India should be reported to the Regulatory body within</b>				
	One day*	13	6.73	23	69.69
	Seven calendar days	104	52.79	01	03.03
	Fourteen calendar days	13	6.59	09	27.27
	Fifteen Calendar days	67	34.01	00	00.00
<b>5.</b>	<b>The international centre for adverse drug reaction monitoring is located in</b>				
	Unites States of America	145	73.60	02	06.06
	Australia	01	00.50	00	00.00
	France	26	13.19	00	00.00
	Sweden*	25	12.95	31	93.93
<b>6.</b>	<b>One of the following is the agency in USA involved in drug safety issues.</b>				
	American Society of Health System Pharmacists (ASHP)	12	06.09	00	00.00
	United States food and drug administration (US FDA)*	50	25.90	32	96.96
	American Medical Association (AMA)	134	68.02	01	03.03
	American Pharmaceutical Association (APA)	01	00.50	00	00.00
<b>7.</b>	<b>One of the following is a major risk factor for the occurrence of maximum ADRs</b>				
	Arthritis	00	00.00	00	00.00
	Renal failure*	49	25.38	32	96.96
	Visual impairment	74	37.56	01	03.03
	Vasculitis	74	37.56	00	00.00

<b>8.</b>	<b>In India which Regulatory body is responsible for monitoring of ADR's</b>				
	Central Drugs Standard Control Organization*	53	27.46	33	100.00
	Indian Institute of sciences	00	00.00	00	00.00
	Pharmacy Council of India	11	05.58	00	00.00
	Medical Council of India	133	67.51	00	00.00
<b>9.</b>	<b>Which of the following scales is most commonly used to establish the causality of an ADR</b>				
	Hartwig scale	76	38.57	00	00.00
	Naranjo algorithm*	28	14.50	32	96.96
	Schumock and Thornton scale	78	39.59	01	03.03
	Karch & Lasagna scale	15	07.61	00	00.00
<b>10.</b>	<b>Match the ADR reporting systems to the respective countries.</b>				
	1) Yellow card - United Kingdom	31	15.73	31	93.93
	2) Green card - Scotland	06	03.04	30	72.72
	3) ADR reporting Form - India	43	21.82	33	100.00
	4) Blue card - Australia	07	03.55	31	93.93
<b>11.</b>	<b>One among these is a national Pharmacovigilance centre</b>				
	Kasturba Hospital, Manipal	69	35.02	00	00.00
	AIIMS Delhi*	49	25.38	32	96.96
	JSS Medical College & Hospital, Mysore	67	34.01	01	03.03
	CMC, Vellore	02	01.01	00	00.00
<b>12.</b>	<b>Which one of the following is the 'WHO online database' for reporting ADRs</b>				
	ADR advisory committee	99	50.25	00	00.00
	Medsafe	02	01.01	01	03.03
	Vigibase*	29	15.02	29	87.87
	Med watch	67	34.01	03	09.09
<b>13.</b>	<b>Rare ADRs can be identified in the following phase of a clinical trial</b>				
	During phase-1 clinical trials	141	71.57	00	00.00
	During phase-2 clinical trials	07	03.55	00	00.00
	During phase-3 clinical trials	21	10.65	03	09.09
	During phase-4 clinical trials*	28	14.50	30	90.90
<b>14.</b>	<b>The healthcare professionals responsible for reporting ADR in a hospital is/are</b>				
	Doctor	70	35.53	00	00.00
	Pharmacist	11	05.58	04	12.12
	Nurses	66	33.50	00	0
	All of the above*	50	25.90	29	87.87
<b>15.</b>	<b>Which among the following factors discourage you from reporting Adverse Drug Reactions</b>				
	Non-remuneration for reporting	16	8.12	00	0
	Lack of time to report ADR*	18	9.32	28	84.84
	A single unreported case may not affect ADR database	149	75.63	00	00.00
	Difficult to decide whether ADR has occurred or not	14	7.10	05	15.15
<b>16.</b>	<b>Do you think reporting is a professional obligation for you</b>				
	Yes*	28	14.50	24	72.72
	No	156	79.18	07	21.21
	Don't know	12	06.09	01	03.03
	Perhaps	01	00.50	01	03.03
<b>17.</b>	<b>What is your opinion about establishing ADR monitoring centre in every hospital</b>				
	Should be in every hospital*	59	30.56	32	96.96
	Not necessary in every hospital	133	67.51	00	00.00
	One in a city is sufficient	03	01.52	01	03.03
	Depends on number of bed size in the hospitals.	02	01.01	00	00.00
<b>18.</b>	<b>Do you think reporting of adverse drug reaction is necessary</b>				
	a) Yes*	65	33.67	33	100.0
	b) No	132	67.03	00	00.00

<b>19.</b>	<b>Do you think Pharmacovigilance should be taught in detail to healthcare professionals</b>				
	a) Yes*	61	31.60	33	100.00
	b) No	136	69.03	00	00.00
<b>20.</b>	<b>Have you anytime read any article on prevention of adverse drug reactions</b>				
	a) Yes*	43	22.27	26	78.78
	b) No	154	78.17	07	21.21
<b>21.</b>	<b>Have you ever come across with an ADR</b>				
	a) Yes*	46	23.83	11	33.33
	b) No	151	76.64	22	66.66
<b>22.</b>	<b>Have you ever been trained on how to report Adverse Drug Reaction (ADR)</b>				
	a) Yes*	24	12.43	15	45.45
	b) No	176	86.34	18	54.54

**Table 2. Knowledge Response towards the KAP Questionnaire – pre- and post- KAP Survey.**

<b>Intervention given to the hospital pharmacist</b>	<b>Pre - KAP</b>	<b>Post - KAP</b>
PV Definition	20.20 %	27.91 %
Purpose PV	21.24 %	32.48 %
PMS	24.87 %	38.07 %
Time lines for reporting	06.73 %	19.28 %
International center for ADR monitoring	12.95 %	27.41 %
Regulatory agencies	25.90 %	39.59 %
ADR	25.38 %	34.51 %
Regulatory body in India	27.46 %	42.13 %
Scale CA	14.50 %	35.02 %
PVPI	25.38 %	40.60 %
WHO online data base	15.02 %	29.44 %
Rare ADRS	14.50 %	26.39 %

**Table 3. Practice Response towards the KAP Questionnaire – pre- and post- KAP Survey.**

<b>Practice</b>	<b>Pre - KAP</b>	<b>Post - KAP</b>
Reading PV article	22.27 %	31.97 %
ADR reported	23.83 %	33.50 %
Trained on ADR	12.43 %	23.85 %

**Table 4. Attitude Response towards the KAP Questionnaire – pre- and post- KAP Survey.**

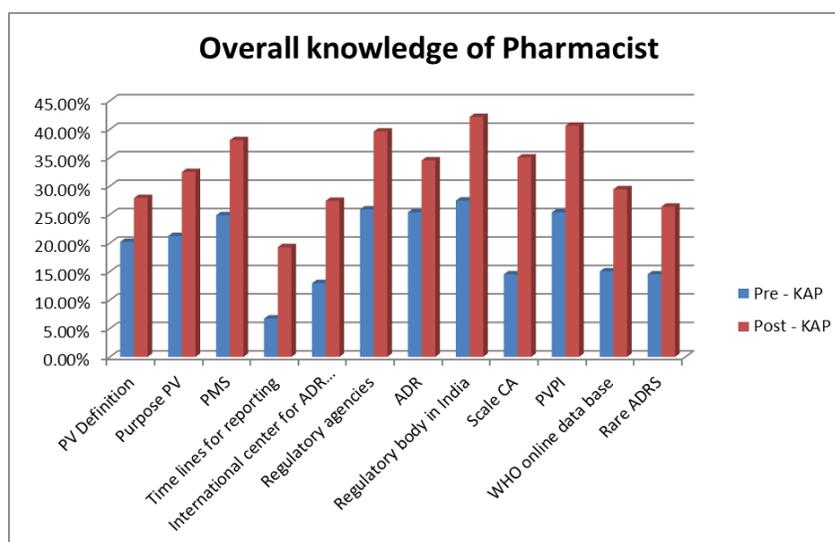
<b>Attitude</b>	<b>Pre - KAP</b>	<b>Post - KAP</b>
ADR reporting responsibility of HCP	25.90 %	39.59 %
Professional obligation	14.50 %	31.47 %
Reporting of ADR is important	33.67 %	46.70 %
PV teaching for HCPS	31.60 %	46.19 %

**Table 5. Various discouraging factors – pre- and post- KAP Survey.**

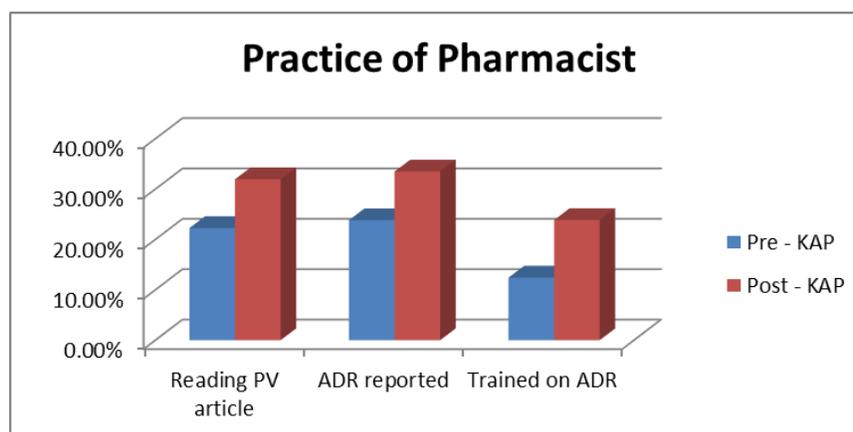
Discouraging factor	Pre - KAP	Post - KAP
Non-remuneration for reporting	8.29 %	15.73 %
Lack of time to report ADR*	9.32 %	15.73 %
A single unreported case may not affect ADR database	77.20 %	48.22 %
Difficult to decide whether ADR has occurred or not	7.25 %	20.30 %

**Table 6. Response for ADR Monitoring center in hospitals – pre- and post- KAP Survey.**

ADR monitoring center in hospitals	Pre - KAP	Post - KAP
Should be in every hospital	30.56 %	51.77 %
Not necessary in every hospital	17.09 %	17.76 %
One in a city is sufficient	1.55 %	14.21 %
Depends on number of bed size in the hospitals.	1.03 %	16.24 %



**Figure 1. Comparison of pre- and post- intervention of the knowledge of hospital pharmacist towards pharmacovigilance**



**Figure 2. Bar diagram representing the practice of hospital pharmacist towards pharmacovigilance (pre- and post- KAP)**

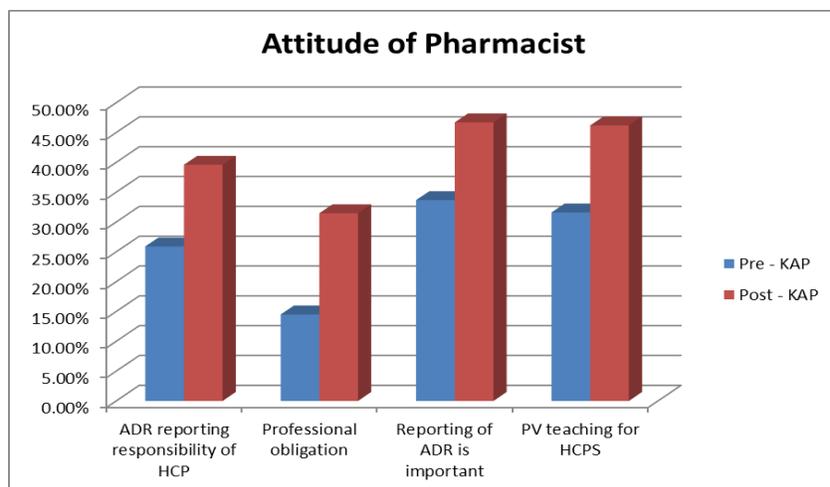


Figure 3. Bar diagram representing the attitude of hospital pharmacist towards pharmacovigilance (pre- and post- KAP)

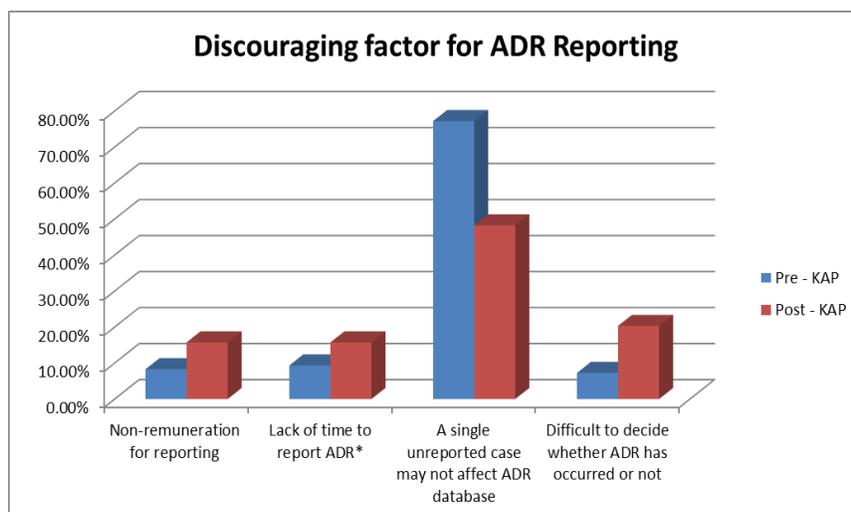


Figure 4. Bar diagram representing the various discouraging factors towards pharmacovigilance (pre- and post- KAP)

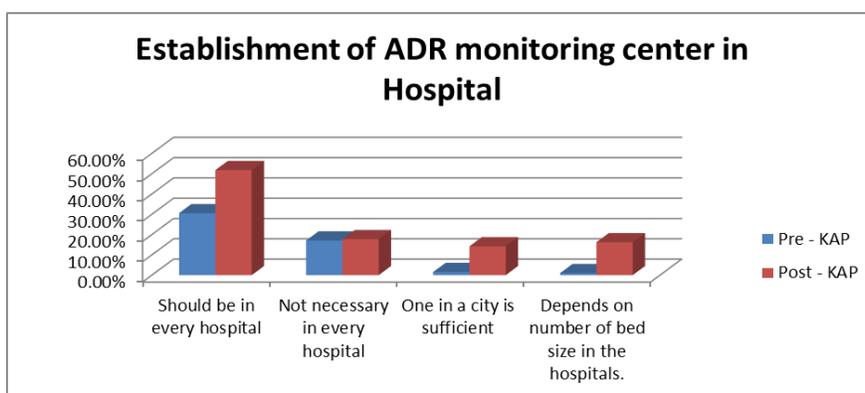


Figure 5. Bar diagram representing the response for establishing ADR monitoring centers in hospitals (pre- and post- KAP)

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