A Study on the awareness of Vaccine Pharmacovigilance and its need during COVID-19 pandemic among some Medical Students, Pharmacy Students and Healthcare Professionals

*Masheer A. Khan, Kriti Shrivastava, Neeta Chhabra, Priyal Jain, Priyanka Parmar and Tasneem Singaporewala

*Corresponding Author, School of Pharmacy, Devi Ahilya Vishwavidyalaya, Takshshila Campus, Khandwa Road, Indore, India

ABSTRACT

Background: The aim of our project is to "study awareness on Vaccine Pharmacovigilance and its need during covid-19 Pandemic among Medical students, Pharmacy students and Healthcare professionals". The purpose of survey is to check the practices regarding reporting of AEFI and their knowledge about the Vaccine Pharmacovigilance as some of them are front line workers during this pandemic or practicing under a professional or have studied this as a subject in their curriculum and have general information about it.

Result: A questionnaire consisting of 20 questions was formulated including questions corresponding to basic awareness of Vaccine Pharmacovigilance, suspected ADRs after covid-19 vaccination, its reporting and whether they have dealt with an AEFI/ADR case. Also, we have studied about the ways to increase AEFI/ADR case reporting and WHO contribute in AEFI/ADR reporting..

Conclusion: The study suggested that, medical students, pharmacy students and healthcare professionals have a fundamental understanding of vaccine Pharmacovigilance. The more emphasis on the awareness and the need of vaccine Pharmacovigilance during covid-19 pandemic among all the target groups should be there for early detection and notification of AEFI. From a future perspective, our study could be used to focus on evaluating training materials and methods used to introduce AEFI and vaccine safety to students and healthcare professionals.

Keyword: Vaccine Pharmacovigilance, COVID-19, AEFIs,

Background:

According to the World Health Organization, "Pharmacovigilance is defined as the science and activities relating to the detection, assessment, understanding and prevention of adverse effect or any other possible drug-related drawback, particular, long term and short-term adverse effects of medicines"[1]

Vaccines are complex biological products that can contain multiple antigens, living organisms, supplements and preservatives. Each component can have its own safety implications. [2] The World Health Organization (WHO) defines a vaccine, as a biological agent that can act by inducing the body's immune system to trigger an immune response against specific pathogens. Vaccines are generally considered as safe, but like any other medicine, they are not absolutely harmless, and AEs sometimes occurs after administration. [3]

Pharmacovigilance vaccine is paramount to promote the safe use of the vaccine among beneficiaries. According to WHO and FDA, Vaccine Pharmacovigilance is defined as, "the science and activities relating to the Detection, Assessment, Understanding and Communication of adverse events following immunization and other vaccine- or immunization-related issues, and to the prevention of untoward effects of the vaccine or immunization". [4]

Vaccine Pharmacovigilance, like drug Pharmacovigilance, aims for early detection of adverse events in order to determine an accurate risk assessment and appropriate response (risk management) to the matter." [3]

The purpose of survey is to check the practices regarding reporting of AEFI and their knowledge about the Vaccine Pharmacovigilance as some of them are front line workers during this pandemic or practicing under a professional or have studied this as a subject in their curriculum and have general information about it.

The COVID-19 vaccination program was launched on 16thJanuary, 2021 in India. The primary gathering of recipients included medical care and frontline workers. The subsequent gathering, involving individuals more than 60 years old (as of January 1st, 2021) and those in the age-section of (45–59) a long time with co morbid conditions began accepting immunizations from March first, 2021 while vaccination for those over 45 years old began from April first, 2021 (Ministry of Health and Family Welfare, Govt. of India, 2021). COVISHIELD (AstraZeneca's immunization produced by Serum Institute of India) and COVAXIN (fabricated by Bharat Biotech Limited) are the two antibodies that have been granted crisis use approval by the Central Drugs Standard Control Organization (CDSCO) in India. In the underlying dispatching period of the immunization program, the recipients were encouraged to get two dosages at least delay of 28 days. Albeit the second portion of COVAXIN can be taken four to about a month and a half after the principal portion, nonetheless, the delay between two dosages of the COVISHIELD antibody has been reached [5].

Vaccine Pharmacovigilance plays an important role in early detection of AEFI and minimizing the negative impact on human health and reducing the potential negative impact on population immunity. [6]

The public's lack of confidence in the safety of the vaccination plan will hinder the coverage of the vaccine and affect the population's immunity. A prominent recent example is the decline in measles vaccination rates in Italy. It is a major cause of outbreaks since January 2017, accounting for 29% of all cases of measles reported in EU countries in 2017-18. At the same time, the vaccination rate of polio vaccine is less than the threshold of 95%. The Italian Ministry of Health has issued four to ten mandatory vaccinations for children by June 2017 (diphtheria, tetanus, hepatitis B, polio, whooping cough, influenza b, measles, mumps, rubella and chickenpox) for the children up to 16 years old (Law No. 119/2017). This policy has had a positive impact on ensuring universal vaccination coverage [7].

The two main goals of an effective vaccine drug monitoring system are:

1. To monitor and evaluate the safety of vaccines through the early and timely detection and management of any AEFIs to ensure a favorable benefit/risk situation and safe use of vaccines, and

2. Ensure transparent and up-to-date communication of the risk / benefit profile of

vaccines and provide information and answers to questions to the public to alleviate vaccine safety concerns.

Thus, Vaccine vigilance can effectively cope with the phenomenon of "social amplification of risks" and foster a vaccine culture by increasing public trust in vaccines [6]. The lack of information regarding vaccine safety and AEFI has always been a source of concern for vaccine recipients. AEFI monitoring is a very important program, started very early to prevent AEFI and ensure safety. Awareness should be raised among medical professionals working in the public and private sectors to report all suspicious AEs related to immunization, so that appropriate measures can be taken to prevent such incidents in the future. A strong AEFI program will go a long way building people's confidence in vaccination [3].

Vaccine safety is important to the success of any vaccination program. Global drug monitoring teams play most important role in collecting and evaluating data in clinical trials and post-marketing settings to monitor the safety of vaccines and drugs used for COVID-19. [8]

Any gaps in communication between local, regional and international public health authorities where AEFI data are processed should be filled, and any weaknesses in the existing health data network should be strengthened. "AEFI-X", an unexpected adverse event, requires consideration of different signal detection methods. New vaccine technologies, such as those being explored for COVID-19 vaccines, can cause more complex AEFI that can be difficult-to-recognize. Methods such as syndrome surveillance may be considered; it was originally developed for early detection of biological weapon releases in order to identify disease clusters early, before a diagnosis is confirmed, and to mobilize a rapid response. Elucidation, the mechanisms by which vaccines can cause harm requires collaboration with immunogenetics. If vaccine safety problem is discovered, the regulatory agency will work to determine how and why AEFI occurs, no matter how rare it can be, is essential to broaden our knowledge of the immune system and ensuring public confidence in the immunization programs [9].

The World Health Organization (WHO) defines an AEFI as, "Any untoward medical occurrence follows immunization and which does not necessarily have a casual relationship with the usage of the vaccine."[8] AEFI is any uncomfortable medical event that occurs after vaccination and is not necessarily causally related to the use of the vaccine. [10]

The purpose of the investigation of AEFI cases is to confirm the reported diagnosis of AEFI and to clarify details and findings and to determine the cause of AEFI in order to provide best practice for intervention / medical care and take any other measure deemed necessary. [11]

The types of various AEFI are as follows:

1. Vaccine product-related reaction-

An AEFI which is caused or induce by the vaccines that is due to one or more inherent characteristics of the vaccine products. Example: Extensive swelling of the extremities after DPT vaccination.

2. Vaccine after quality defect-related reaction-

An AEFI that is generated or precipitated by a vaccine which is due to one or more quality defects of the vaccine products (including their delivery devices) provided by the manufacturer. Example: Failure to completely inactivate a large number of inactivated polio vaccines by the manufacturer resulted in paralytic polio cases.

3. Immunization error-related reaction-

AEFI is caused by improper handling, prescription or administration of the vaccine, so its nature is preventable. Example: Transmission of infection through contaminated multidose vials.

4. Immunization anxiety-related reaction- AEFI caused by immune anxiety. Example: An adolescent develops vasovagal syncope during or after vaccination.

A Coincidental event

An AEFI caused by reasons other than vaccine products, immune errors, or immune anxiety. Example: Fever (time correlation) occurred during vaccination, but it was actually caused by malaria. The coincident incident reflects the natural occurrence of health problems in the community, and common problems are frequently reported.

SERIOUS EVENT:

An AEFI will be considered serious, if it: -

Results in death are life-threatening. Need to be hospitalized or extend the current hospital stay, because continuous or severe disability/incapacity is a congenital anomaly/birth defect, or requires intervention.

SEVERE EVENT:

Severe is employed to explain the intensity of a selected event (as in mild, moderate or severe); the event itself, however, could also be of relatively minor medical significance (e.g., Fever is a common relatively minor medical event, but consistent with its severity it are often graded as mild fever or moderate fever). [8]

AEFI recognition fundamentally happens through passive surveillance. This includes antibody beneficiaries, guardians of vaccinated babies/kids, medical care suppliers and staff in vaccination or medical services offices identifying the AEFIs and detailing them to any medical services supplier working inside the medical care framework. AEFIs can likewise be identified through active surveillance, by means of sentinel sites. Furthermore, AEFIs might be identified in stage IV clinical investigations of COVID-19 antibodies where they ought to be autonomously detailed, evaluated and handled, in consistence with the examination convention and ought not be accounted for through the passive reporting systems.

All AEFIs ought to be accounted for utilizing the standard COVID-19 AEFI revealing structure utilizing the quickest methods possible. At the point when the AEFI is decided to be serious, detailing ought to likewise incorporate a telephonic call, direct discussion or notice through a particular application, depending upon what is accessible in the country. AEFI announcing structures contain a base arrangement of centre factors to make the worldwide assessment of signs possible and accordingly assist nations with assessing the AEFIs that happen.

For COVID-19 immunization-related AEFIs, notwithstanding standard data, it is essential to record the brand name, the maker, just as the group numbers. An extensive complete AEFI report is the essential hotspot for populating an AEFI line list which when prepared gives key graphic epidemiological information that is basic for recognizing groups and for signal location. The AEFI revealing structure additionally gives data on nature of the passive surveillance framework as far as the completeness and practicality of the reporting. This is significant for checking the exhibition of the Pharmacovigilance framework. The primary reporter, i.e., the vaccination supplier/medical services proficient is answerable for giving all the data needed in the COVID-19 AEFI revealing structure. [12]

The study was necessary in order to ensure the early detection of AEFI and minimizing the negative impact on human health and reducing the potential negative impact on population immunity.

METHOD

In response to ICH E2E instructions, which primarily focus on safety specifications and drug monitoring programs? It also provides the structure of the Pharmacovigilance Plan and sets the principles of best practices for the design and execution of Observational studies. Public health monitoring methods are used to identify new signals for possible ADRs. Pharmacoepidemiology studies are intended to be either “hypothesis generation” or “hypothesis testing”. There are various pharmacoepidemiological methods of collecting safety information and they are passive surveillance, stimulated reporting, active surveillance, comparative observational studies, descriptive studies and targeted clinical investigations. Passive surveillance includes spontaneous reporting and case series. Active surveillance includes registries drug event monitoring and sentinels sites. Descriptive studies include Drug utilization studies and Natural history of diseases. Whereas Comparative observational studies are further divided into cohort study, cross sectional study and case control study. [13-23]

Ethics Statement:

PROJECT STUDY

The survey was conducted with a prospective to know the awareness, knowledge and application methods of Vaccine Pharmacovigilance in 3 different groups of respondents. This is because during this pandemic, they are on the front line and are generally the AEFI respondents. They also received training to accurately diagnose AEFI. They play an important role in the interaction between clinical departments and patients. They are also a valuable source of ADR compilation, analysis and reporting.

MATERIALS

STUDY CENTRE

The study was conducted at School of Pharmacy, DEVI AHILYA VISHWAVIDYALAYA, INDORE, M.P which is an educational centre with comprehensive facilities for educational, research, and the institute provides full time postgraduate and doctoral courses in pharmacy.

STUDY DESIGN

A cohort study was carried out to determine awareness and need of vaccine Pharmacovigilance among healthcare professional and students.

STUDY DURATION

This study was conducted for a period of 3 days (MAY 28-JUNE 1).

STUDY POPULATION

The survey questionnaire was distributed to 230 healthcare professionals and students. , However the total numbers of respondents were 205.

STUDY TOOLS

The questionnaire was prepared after extensive literature review, discussion with mentors and colleagues. The survey questions were analyzed and response was calculated in data percentage.

DISTRIBUTION AND COLLECTION OF DATA

The questionnaire was surfaced online using Google forms and was subsequently distributed to various institutions all over India. The objectives of the study were briefed and the respondents were asked to fill up the survey.

RESULTS

GENERAL INFORMATION

In this study, we evaluated the awareness, knowledge and application methods of vaccine pharmacovigilance in 3 different groups of respondents. Out of 205 respondents 52.5% males and 47.8% Females participated in the study.

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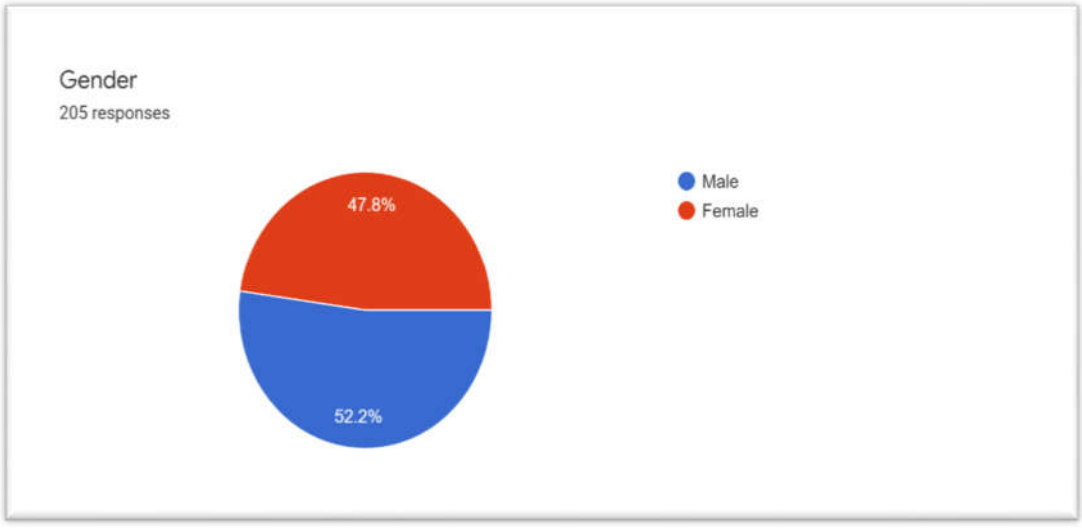

Among the three groups, 19.5% Healthcare Professionals, 26.8% Medical Students and 53.7% Pharmacy Students participated in the study.

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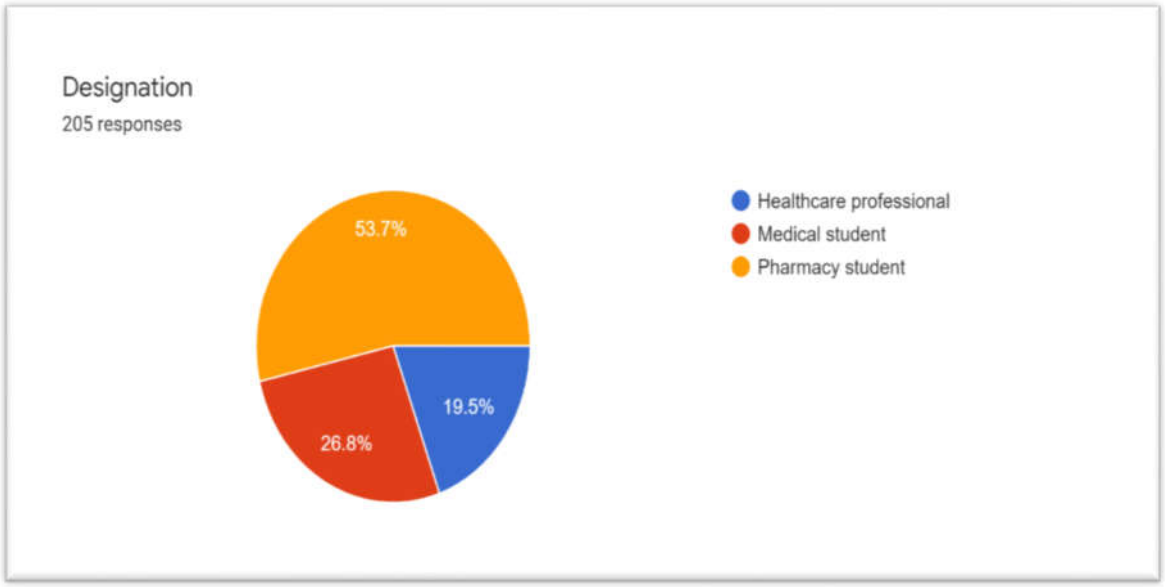
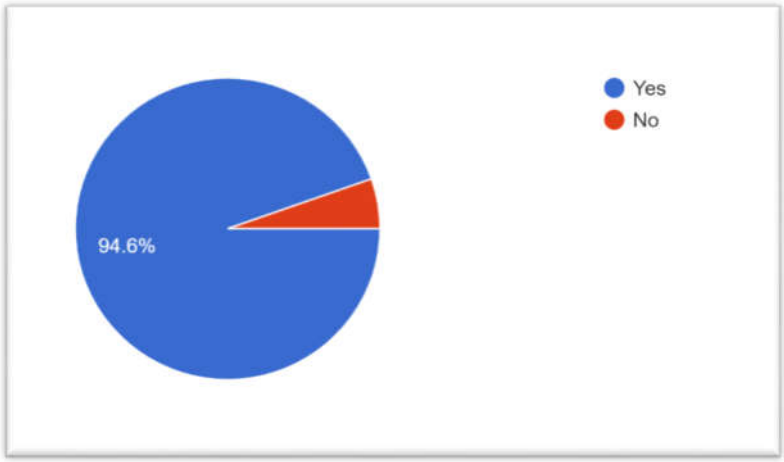


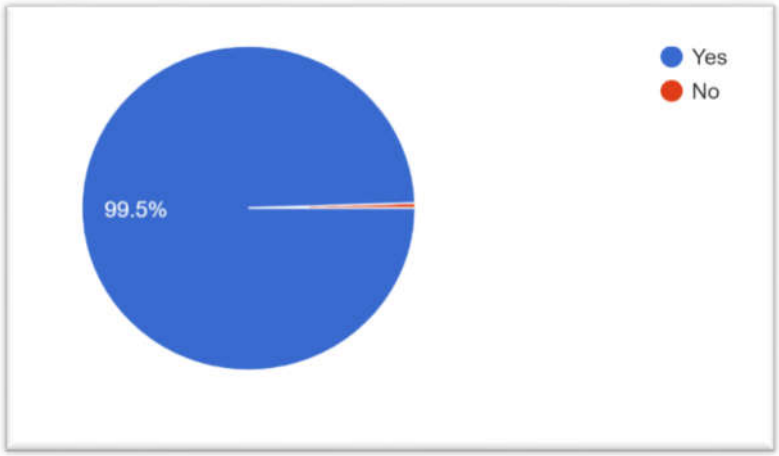
QUESTIONS ON VACCINE PHARMACOVIGILANCE AND ITS NEED DURING COVID 19 PANDEMIC:

The findings from our study indicate that:-

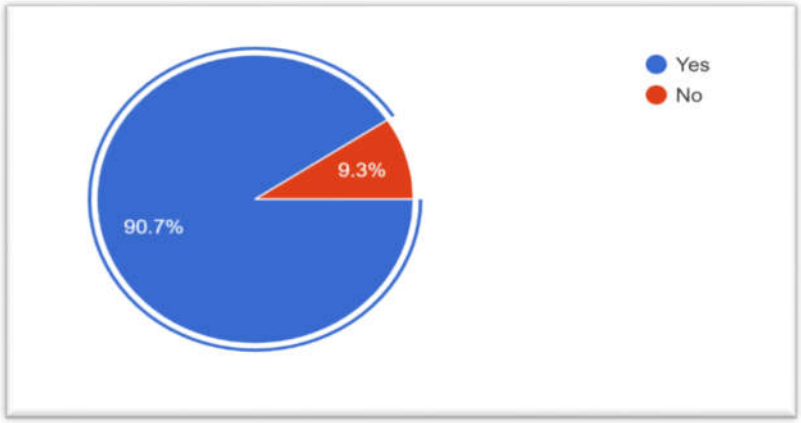
About 94.6% candidates were aware about the term Vaccine Pharmacovigilance while the rest were not.



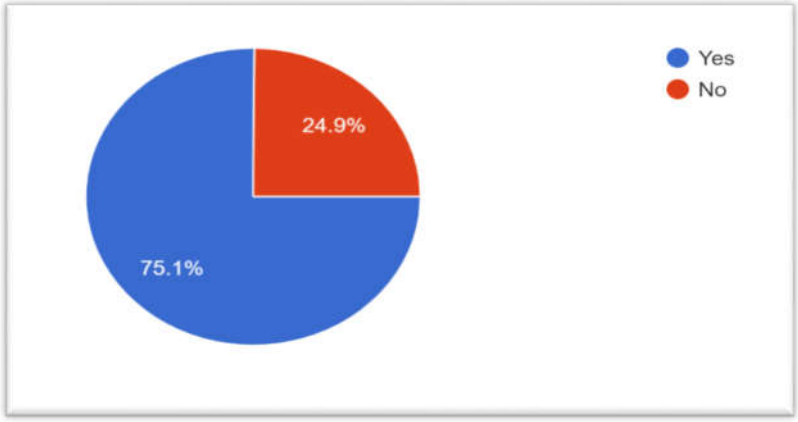
99.5% of the candidates think there is a need of Vaccine Pharmacovigilance during covid-19 pandemic while the rest were not.



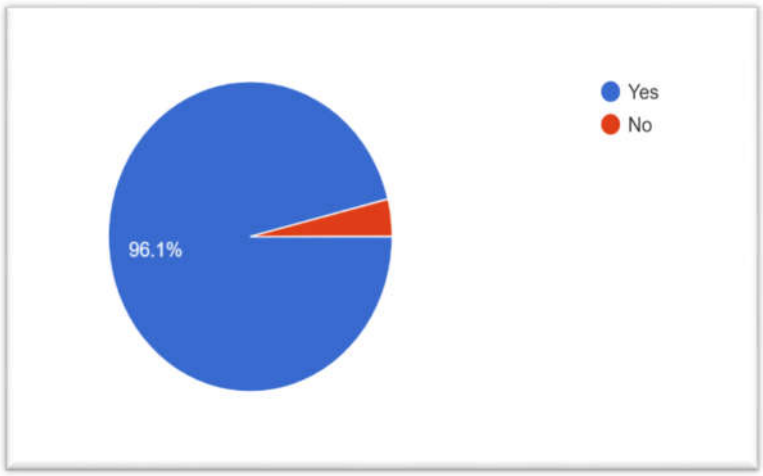
90.7% of the candidates were aware about the term Adverse Event Following Immunization while 9.3% were not.



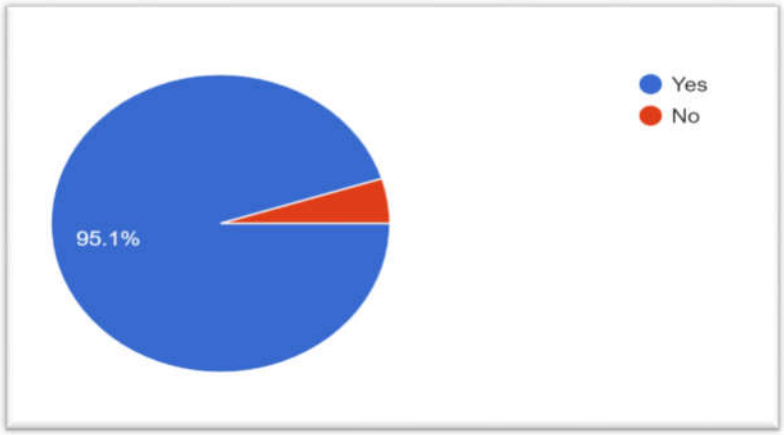
75.1% of the candidates know about the types of AEFI and 24.9% were not aware.



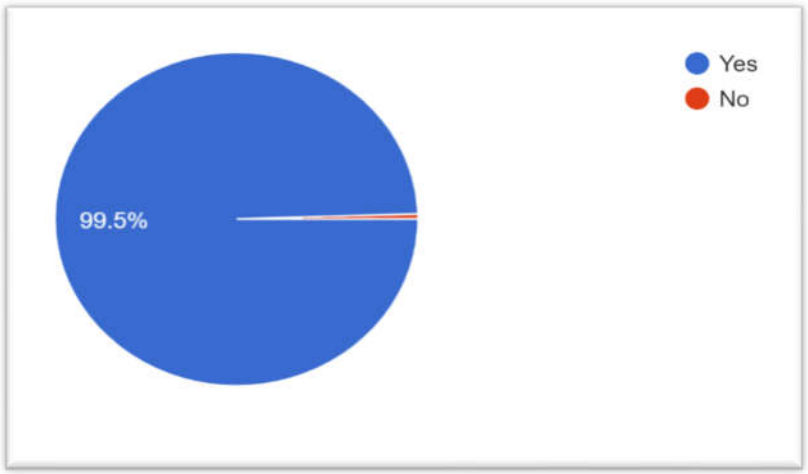
96.1% of the candidates acknowledge the statement that, “vaccines require different immunization safety surveillance to monitor adverse events" and 3.9% did not.



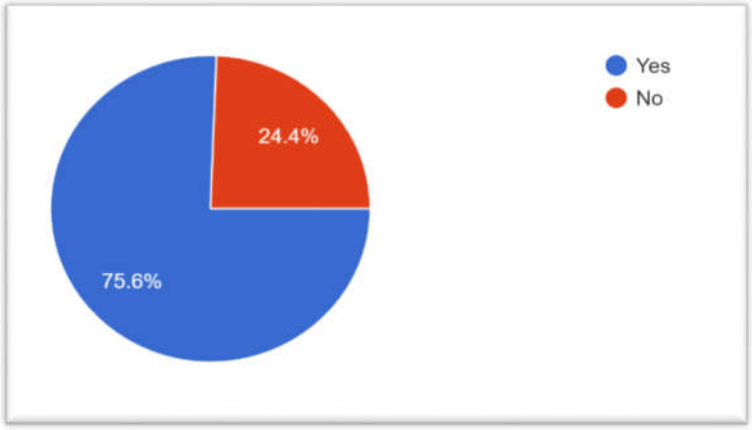
95.1% of the candidates agree that during covid-19 pandemic, the reporting of AEFI should be compulsory and 4.9% did not agreed.



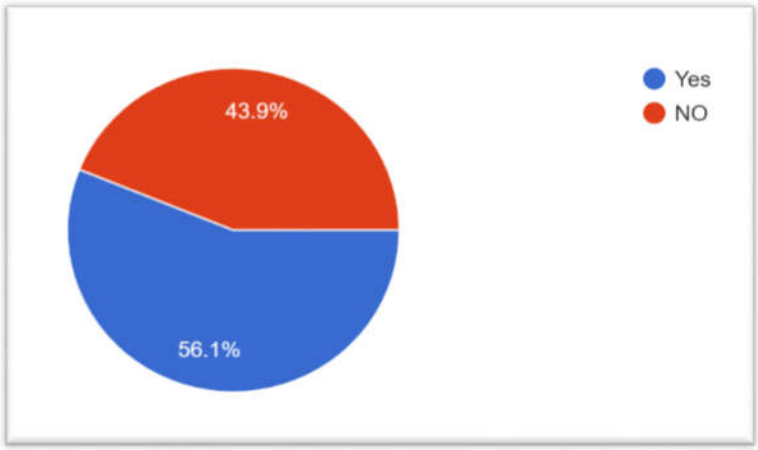
99.5% of the candidates were about the general symptoms that are likely to occur at the vaccination administration site



75.6% of the candidates were familiar with gastrointestinal symptoms that could occ1ur after vaccination and 24.4% were not.

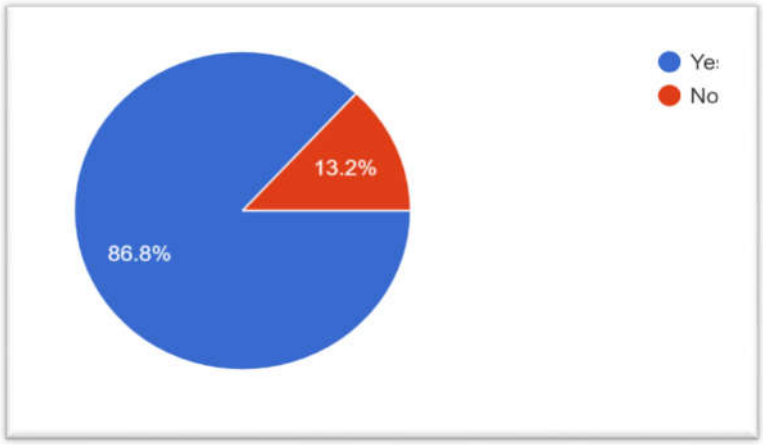


56.1% were aware about the respiratory symptoms that might occur after vaccination and 43.9% were not.

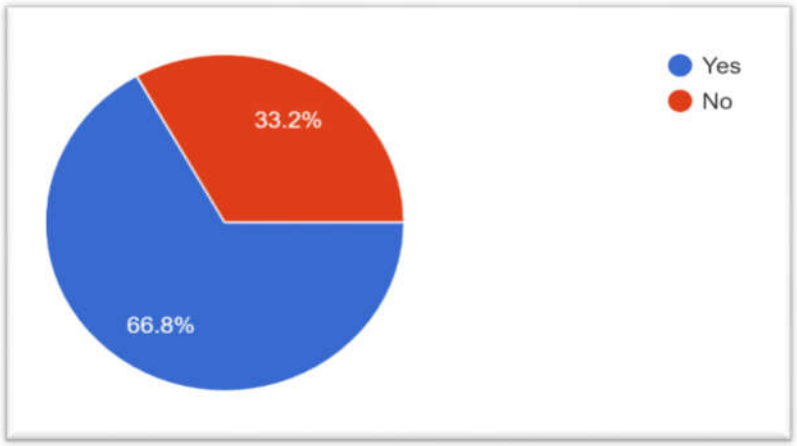


. 86.8% were about the common neurological symptoms that occur after vaccination

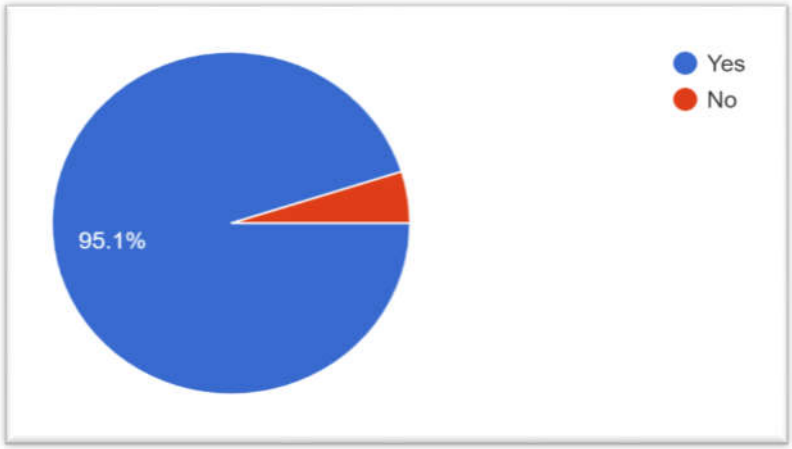
and 13.2% were not.



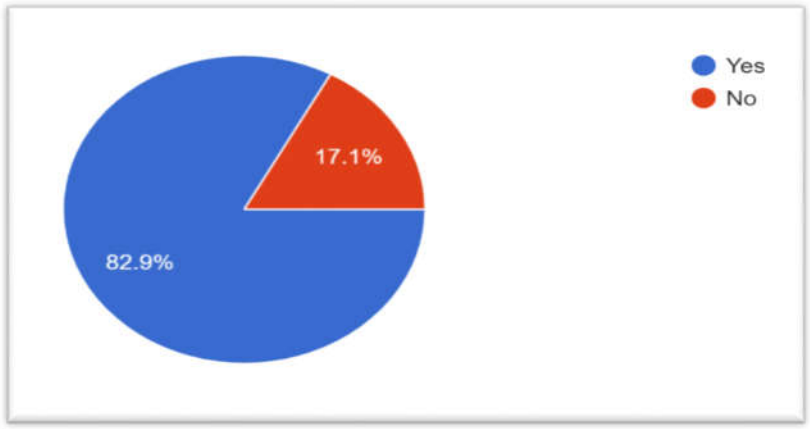
66.8% were aware that there is a very little but definitive risk of bleeding and clotting cases following COVID-19 vaccination.



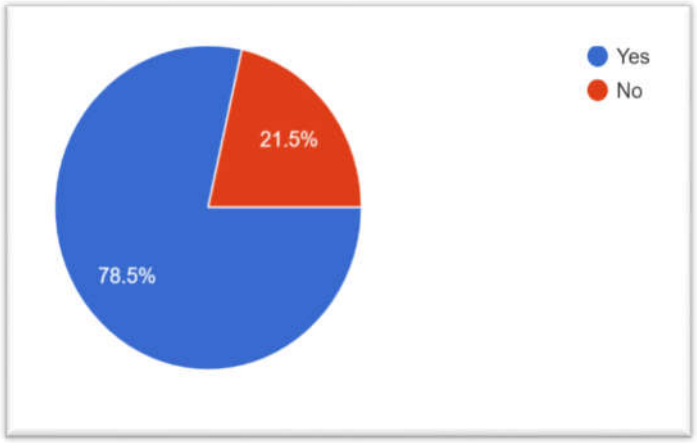
95.1% now about the musculoskeletal symptoms that occur after vaccination and 4.9% were not.



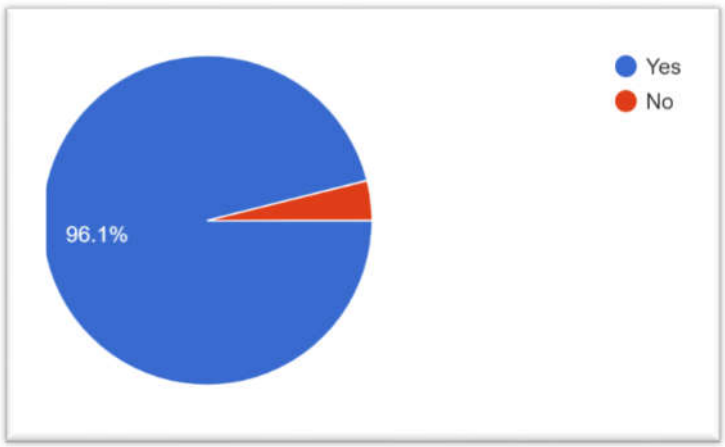
82.9% were vigilant of the immune system response that could happen within 4 hours of getting vaccinated



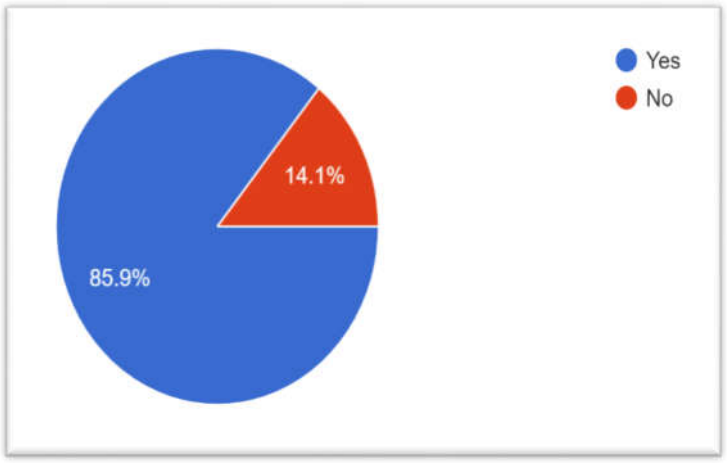
78.5% were aware about the skin symptoms that could occur a few days after vaccination and 21.5% were not.



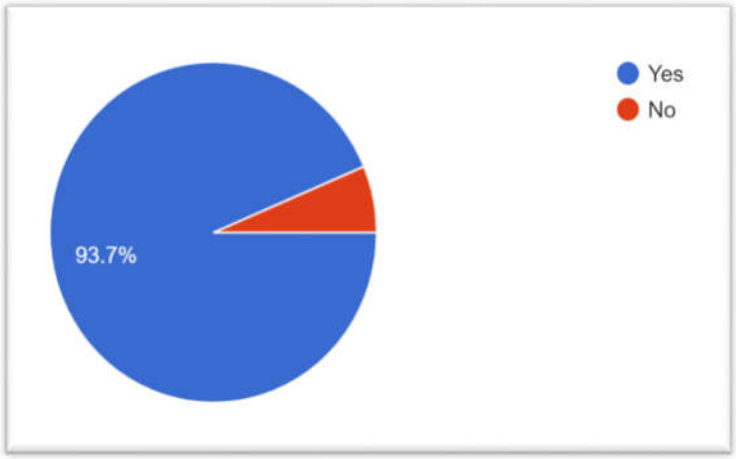
95.1% agreed that all severe AEFIs should be reported immediately but 4.9% did not.



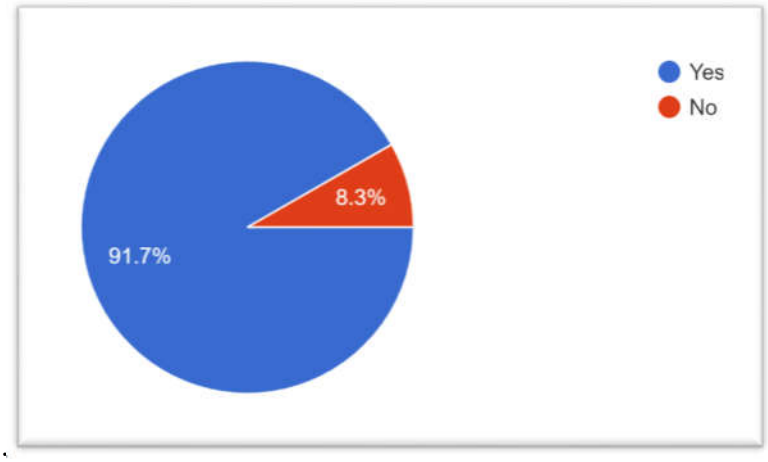
85.9% were aware about that all severe AEFI are to be reported in a case reporting format but 14.1% were not.



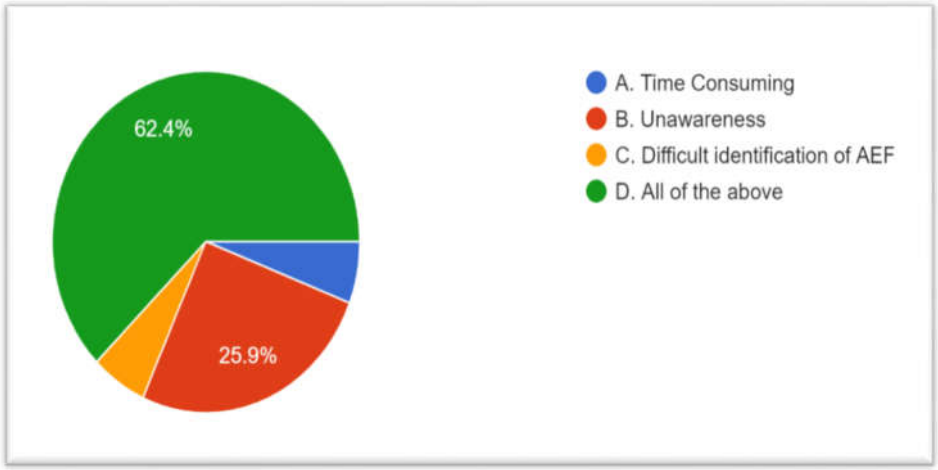
93.7% were aware that all severe AEFI should be sent to DIO within 24 hours and 6.3% were not.



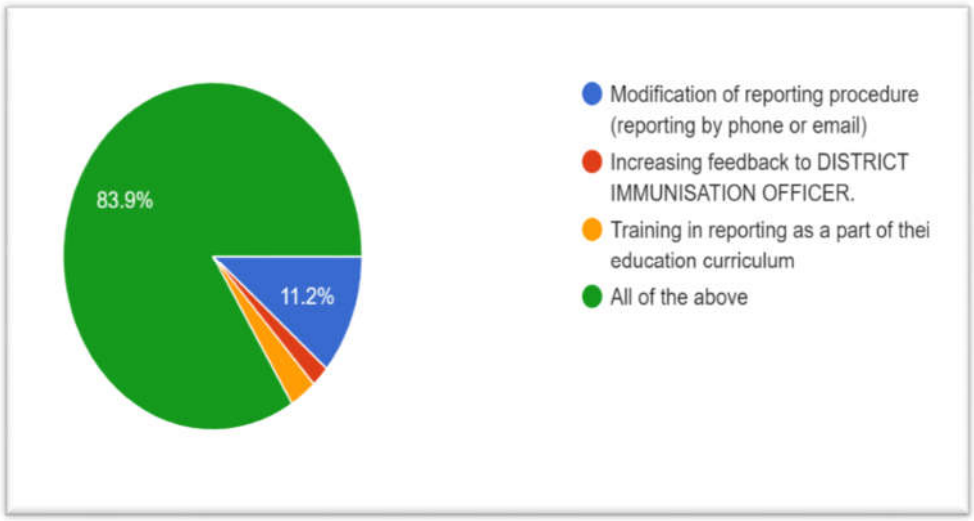
91.7% believe that pharmacist's assistance is helpful in detection, reporting and management of an AEFI and 8.3% believe it to be not



25.9% think the reason behind low Adverse Drug Reaction reporting is unawareness,5.9% think is time consuming and difficult identification of AEFI ,whereas 62.4 % believe all the above three reasons are the cause



At last,11.2 % think that modification of reporting procedure by phone or mail will encourage Vaccine Pharmacovigilance ,2% agreed to increasing feedback to district immunization officer will encourage ,2.9% think that training in reporting would encourage Vaccine Pharmacovigilance whereas 83.9 % agreed to all of the above three reasons .



DISCUSSION

In this study, we evaluated the awareness, knowledge and application methods of vaccine pharmacovigilance in 3 different groups of respondents. This is because during this pandemic, they are on the front line and are generally the AEFI responders. They also received training to accurately diagnose AEFI. They play an important role in the interaction between clinical departments and patients. They are also a valuable source of ADR compilation, analysis and reporting.Our research shows that 94.6% of respondents knew the basic terms of vaccine pharmacovigilance, 90.7% of the study participants knew the meaning of the term AEFI, and 75.1% knew the types of AEFI. This indicates potential AEFI awareness in the target group.Patients and healthcare professionals should be aware of the potential risk of AEFI among vaccinated individuals.

About 99.5% of respondents believe Pharmacovigilance of vaccines are needed during the COVID-19 pandemic and 96.1% agree that vaccines require different immune safety monitoring systems to control the adverse events. 95.1% of respondents thought AEFI should be reported and 96.1% agreed with reporting AEFI immediately, but 14.1% of participants did not know the reporting format. The reasons for low AEFI reporting during the Covid-19 vaccination period are time-consuming reporting methods, lack of understanding of AEFI reporting and difficulty in identifying AEFI. Majority 97.1% of respondents had a positive impact on active pharmacist support, testing, reporting and management of AEFI. Key steps in developing the necessary action plan for vaccine vigilance include reaching a 2% agreement to improve feedback to regional immunization officers, 11.2% of change procedures informed (notification by phone or email), 2.9% agree to participate in reporting training as part of their education program and 83.9% agree with all three options as measures to promote vaccine vigilance.

Our observations indicate that serious steps should be taken to educate students and healthcare professionals in practical aspects of vaccine pharmacovigilance. These studies also attempt to identify possible measures that can improve doctors' participation in vaccine pharmacovigilance programs. These measures include raising pharmacovigilance awareness, using ADR reports as an integral part of undergraduate, internship, and graduate training, providing an active workforce to collect ADR reports from busy doctors, and providing feedback to healthcare professionals who have notified nurses and paramedical staff to participate In the ADR notice.

To promote pharmacovigilance activities, the culture of pharmacovigilance must be learned early in the professional training of healthcare students. In addition, their responsibilities to participate in the national pharmacovigilance plan were also emphasized.

Most pharmacology textbooks cover an overview of adverse drug reactions. The scheme should include theoretical knowledge of pharmacovigilance, the national Pharmacovigilance plan. However there is not enough practical knowledge and training among students. By visiting the Pharmacovigilance center and observing its operation, real practical knowledge can be obtained.

Pharmacists are a valuable resource for collecting, analyzing, and reporting adverse reactions. They play a vital role in the interaction with patients in the pharmaceutical and hospital environment. The two main objectives of an effective vaccine pharmacovigilance system are: (1) to monitor and evaluate the safety of vaccines through the early and timely detection and management of any AEFI to ensure a favorable benefit / risk profile and safe use of vaccines, and (2) ensure a transparent and up-to-date exchange of information on the risks / benefits of vaccines, and provide information and responses to the public to alleviate concerns about vaccine safety.

SUMMARY

SNO	STATEMENT	YES	NO
1	Are you aware of the term Vaccine Pharmacovigilance?	94.6%	5.4%
2	Do you think there is a need of vaccine Pharmacovigilance during covid0-19 pandemic?	99.5%	0.5%
3	Are you aware of the term "ADVERSE EVENT FOLLOWING IMMUNISATION "(AEFI)?	90.7%	9.3%
4	Are you aware of the types of AEFI -common minor AEFIs, serious AEFIs, severe AEFIs (not minor)?	75.1%	24.9%
5	Do you acknowledge the statement that, “vaccines require different immunization safety surveillance to monitor adverse events"?	96.1%	3.9%
6	Do you agree that during COVID -19 pandemic, the reporting of AEFI should be compulsory?	95.1%	4.9%
7	Are you aware of the general symptoms at the vaccine administration site (pain around the injection site, discomfort, fever, fatigue) that are most likely to occur?	99.5%	0.5%
8	Are you familiar with gastrointestinal symptoms (stomach pain, nausea, vomiting, and diarrhea) that could occur after vaccination?	75.6%	24.9%
9	The respiratory tract symptoms that might occur after vaccination are difficulty breathing, shortness of breath, hyperventilation, and cough?	56.1%	43.9%
10	The most common neurological symptoms are headache, dizziness, loss of consciousness, numbness, cramp that occur after vaccination	86.8%	13.2%

11	Are you aware that there is a very little but definitive risk of bleeding and clotting cases following COVID-19 vaccination?	66.8%	33.2%
12	Most common musculoskeletal symptoms that occur after vaccination are muscle pain, joint pain, muscle stiffness?	95.1%	4.9%
13	Are you vigilant of immune system symptoms (allergic reactions) that could happen within 4 hours of getting vaccinated?	82.9%	17.1%
14	Are you aware of the skin symptoms (rash, itching, and redness) that could occur a few days after the vaccination?	78.5%	21.5%
15	Do you agree that all severe AEFIs should be reported immediately?	96.1%	3.9%
16	Are you aware that all severe AEFI are to be reported in a case reporting format?	85.9%	14.1%
17	All severe AEFIs should be sent to the district immunization officer (DIO) within 24 hours?	93.7%	6.3%
18	Do you think pharmacist's assistance is helpful in detection, reporting and management of an Adverse Event Following Immunization (AEFI)?	91.7%	8.3%

19	According to you which of the following method would encourage vaccine Pharmacovigilance during covid-19 management? A modification of reporting procedure B increasing feedback to DIO C training in reporting as part of curriculum D all of the above	a.11.2% b 2% c 2.9% d 83.9%
20	What do you think is the reason behind low AEFI reporting during COVID-19 pandemic? A time consuming B unawareness C difficult identification of AEFI D all of the above	A 5.9% B 25.9% C 5.9% D 62.4%

Gender:

Male	52.2%
Female	47.8%

WORKING STATUS

Medical Students	26.8%
Pharmacy Students	53.7%
Healthcare Professionals	19.5%

CONCLUSION

To conclude, in this study it was observed that, medical students, pharmacy students and healthcare professionals have a fundamental understanding of vaccine Pharmacovigilance. However, there is an urgent need for a systematic analysis of the various Adverse event reported in this study in order to measure causalities through correct review of reports and data generation in primary studies. The more emphasis on the awareness and the need of vaccine Pharmacovigilance during covid-19 pandemic among all the target groups should be there for early detection and notification of AEFI. In addition, more extensive training programs should be organized. From a future perspective, our study could be used to focus on evaluating training materials and methods used to introduce AEFI and vaccine safety to students and healthcare professionals.

List of Abbreviations:

WHO: World Health Organization.

PMS: Post marketing surveillance.

AE: Adverse Effect

AEFI: Adverse effect following immunization.

ADR: adverse drug reaction.

FDA: Food and Drug Administration.

CDSCO: Central Drugs Standard Control Organization.

EU: European Union

DPT: Diptheria

ICH: International Conference of Harmonisation.

DIO: District immunization officer.

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