

## Original Research Article

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# Assessment of knowledge of multipurpose health workers regarding adverse events following immunization in a rural block of Haryana, India

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## ABSTRACT

**Background:** No vaccine is entirely free from the risk of adverse reactions or remote sequel. Knowledge and reporting of AEFI is very important in this vaccine era. Objective of the study was to assess the knowledge of Multipurpose Health Workers (MPHWs) regarding AEFI.

**Methods:** A cross-sectional study was undertaken on randomly selected 30 MPHWs of Beri block. A semi-structured questionnaire was administered after taking verbal consent. The MPHWs had a minimum of one year experience and had received the latest formal training during measles catch up campaign. Data compiled and analysed using appropriate statistical tests.

**Results:** A total of 30 MPHWs duly completed and returned their questionnaires. The mean age was  $36.5 \pm 2.54$  years and mean post-qualification experience was 5.3 years. About 83% of the MPHWs knew that fever, pain, redness and swelling at injection site were symptoms of AEFI and 93% knew about proper storage temperature, dose, route and site of vaccines. Only 56% knew about the storage temperature of diluents and risk of its contamination, 30% knew proper reconstitution of the vaccine. Only 33% knew about filling an adverse event form to report an AEFI. Twenty-five (83.5%) MPHWs had encountered an AEFI and only 14(46.6%) reported such within 24 h. It was observed that level of correct knowledge was decreasing with increasing age of respondents.

**Conclusions:** There was a lack of knowledge about the cause, identification and reporting of AEFI despite periodic training programmes. There is need to train the health workers to improve reporting and prevent complications due to vaccines. There is also further need to ponder over the lacunae in training programmes responsible for persistent inadequate knowledge among MPHWs. Last but not the least "DO NOT FURTHER HARM" should always be the primary aim.

**Keywords:** Adverse event following immunization, Immunization, Knowledge, Multipurpose health worker

## INTRODUCTION

Immunization is one of the most cost-effective interventions to prevent a series of major illnesses and promote child health. Despite significant progress in vaccine-preventable disease control, Vaccine safety is increasingly becoming important because of alleged

safety issues derailing vaccine programs worldwide. An Adverse Event Following Immunization (AEFI) is defined as any untoward medical occurrence that follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine.<sup>1</sup> An Adverse Event Following Immunization (AEFI) is any untoward medical occurrence which follows

immunization and which does not necessarily have a causal relationship with the usage of the vaccine. AEFIs are divided in 5 categories.

- Vaccine product-related reaction: An AEFI that is caused or precipitated by a vaccine due to one or more of the inherent properties of the vaccine product. (i.e.: Extensive limb swelling following DTP vaccination).
- Vaccine quality defect-related reaction: An AEFI that is caused or precipitated by a vaccine that is due to one or more quality defects of the vaccine product including its administration device as provided by the manufacturer. (i.e.: Failure by the manufacturer to completely inactivate a lot of inactivated polio vaccine leads to cases of paralytic polio).
- Immunization error-related reaction: An AEFI that is caused by inappropriate vaccine handling, prescribing or administration and thus by its nature is preventable. (i.e.: Transmission of infection by contaminated multidose vial).
- Immunization anxiety-related reaction: An AEFI arising from anxiety about the immunization (i.e.: Vasovagal syncope in an adolescent during/following vaccination).
- Coincidental event: An AEFI that is caused by something other than the vaccine product, immunization error or immunization anxiety. (i.e.: A fever occurs at the time of the vaccination (temporal association) but is in fact caused by malaria.<sup>2</sup>

All AEFIs need to be screened and triaged by trained staff to ensure patient safety and programme's credibility. Even though AEFIs are common and well known, not much is known about how healthcare workers recognize or report them.

It is likely that differences in healthcare professionals' AEFI knowledge and practice of reporting result in inconsistent adverse event data collection. Several studies in various other countries show that there was gap in knowledge and practices regarding AEFI. But there is no study in India on knowledge and practices among healthcare workers regarding AEFI. The present study is a small Endeavour to judge the existing knowledge and to judge whether these health providers need more training regarding AEFI.

Objectives to assess the knowledge of Multipurpose Health Workers (MPHWs) regarding Adverse Events Following Immunization (AEFI).

## METHODS

This cross-sectional descriptive study was conducted from April 2015 to June 2015 on Multipurpose health workers of Beri block involved in routine immunization, a Community health centre to Medical College Pt. BD

Sharma University of health science, Rohtak, Haryana with collaboration of District Health Services. Prior approval was taken from Institutional ethics committee

### **Inclusion criteria**

All CHC workers working in CHC Sub centres in Beri block of Haryana state that provide routine immunization services

- Ready to participate in the study voluntarily
- Given informed verbal consent
- Having worked at the above facilities for at least twelve consecutive months.

### **Exclusion criteria**

- Not willing to participate in the study
- Not present at the time of study
- Having work experience less than twelve months at the above facilities.

Single batch of training was organized once in a month having 15-20 participants working at various sub centres to CHC Beri and actively involved in routine immunization. After explaining the study to the health workers, oral consents were taken. Then eligible MPHWs were given the self-administered and semi structured questionnaire.

In order to ensure reliability and reproducibility of the tool, a pilot study had been already done at one sub centre to know the feasibility of the study. Questionnaire was filled at the same sitting, if needed questions were explained in Hindi also.

In addition, space was provided to give suggestions and furnish any additional information. The correct methods and means were suggested to improve their knowledge regarding vaccine at the end of the training session.

### **Statistical analysis**

Author combined and analyzed data with SPSS version 20 (IBM Corp., Armonk, NY, USA). Descriptive statistics was computed to generate frequencies, means and standard deviation.

## **RESULTS**

A total of 30 MPHWs were recruited into the study. Majority of the respondent were the females (86.6%). The largest age group was 30-39 yrs. Only 50% of the health workers had received prior training before starting routine immunization (Table 1).

While most of them (93%) had adequate knowledge and practices regarding dose, route, site, proper storage of vaccines in cold chain system but only 53% knew about the storage temperature and risk of contamination of

diluents as a risk factor for AEFI. Only 30% knew about how to reconstitute the vaccine properly (Table 2).

**Table 1: Socio-demographic characteristics of the study population.**

	Socio-demographic characteristics	Study group	Percentage (%)
Gender	Male	4	13.4
	Female	26	86.6
Age (in years)	20-29	9	30
	30-39	15	50
	40-49	6	20
	50-59	0	0
	Certificate	28	93
Educational status	diploma or degree holder	2	6.67
	<5 years	16	53.3
Year of experience	>5 years	14	46.6
	1	5	16.6
No of trainings attended	2	15	50
	3	10	33.3

**Table 2: Knowledge about possible causes of AEFI.**

Cause of AEFI	No. of health workers acknowledging (n=30)	% of health workers acknowledging
Diluent	Improper temperature	17
	Contamination	17
Vaccine	Improper temperature	28
	wrong dose, route, site	28
Reconstitution	Wrong practice	21
	Time effect	21
Needle phobia	10	33

The most common AEFI symptoms that MPHWs were able to recognize and initially manage were fever (100%) followed by local reactions (83%) and hypersensitivity reaction (50%).

Less than half of the respondents were familiar with serious complications like toxic shock syndrome and Vaccine Associated Paralytic Polio (VAPP) as symptoms of AEFI and no health worker felt confident enough to manage this serious AEFI and only 33% of them knew where and how to properly report AEFI (Table 3).

Only half of them had received formal training regarding vaccination and level of satisfaction regarding training sessions was poor among respondents. (Table 4).

**Table 3: Knowledge of MPHWs regarding selected variables.**

Adverse event	Selected variables	Yes
Hypersensitivity	Primarily vaccine responsible (all)	30(100%)
	Identification	15 (50%)
	Initial management	05(17%)
Local reaction	Primarily vaccine responsible (DPT)	10 (33%)
	Identification	25(83%)
	Initial management	25(83%)
Toxic shock syndrome (TSS)	Primarily vaccine responsible (measles)	15(50%)
	Identification	8(27%)
	Initial management	0(none)
Vaccine associated paralytic polio (VAPP)	Primarily vaccine responsible (polio)	14(47%)
	Identification	10(33%)
	Reporting	10(33%)
Fever	Primarily vaccine responsible (DPT)	20(67%)
	Identification	30(100%)
	Initial management	20(67%)

**Table 4: Training issues regarding AEFI.**

Training issue	Yes	No
Formal training received	15(50%)	15(50%)
Satisfied	5(33%)	10(67%)
Need for further and better training	30(100%)	0

## DISCUSSION

There are very limited studies done on AEFI in India. The present study was undertaken with an aim to assess the knowledge of Multipurpose Health Workers (MPHWs) regarding Adverse Events Following Immunization (AEFI). MPHWs are the main vehicle to provide immunization in community settings and should be competent enough to identify and timely manage AEFI and know about how and where to report it. So, Training of healthcare workers regarding AEFIs is important to assuring patient safety and public confidence in immunization programmes. Moreover, the knowledge of health care workers about AEFI becomes more important when new vaccines are being introduced to the immunization schedule and there is increased need for effective surveillance of AEFI. Majority of the respondent were the females in this study. The largest age group was 30-39 years. This shows that majority of health workers were in productive age group and this corroborated with findings of earlier studies done in India regarding immunization practices in health workers.<sup>3</sup> Eighty-three respondents knew the common symptoms of AEFIs such as fever, pain and swelling at injection site. The high level of knowledge of the health workers on

these clinical signs of AEFI can be explained by the fact that these symptoms occur in high frequency in children post-vaccination. In this study it was seen that half of the MPHWs did not get any training related to immunization or AEFI. These results are consistent to earlier studies done by Swarnkar et al, and Ibrahim H Al-Ayed in India and Saudi Arabia respectively where also majority of the health workers were untrained.<sup>4,5</sup> Although healthcare workers in this study were knowledgeable on several aspects of causes of AEFIs like proper storage, temperature, site and route of vaccine (93%) there were knowledge gaps in recognizing more serious AEFIs and practices regarding management of serious AEFI were very poor among MPHWs. Over 80% of the healthcare workers knew that fever, pain, redness and swelling at injection site were clinical signs and symptoms of AEFI, and 33% knew about filling an adverse event form to report an AEFI in this study. These results are consistent to various other studies done in other parts of world. Fifty-five (33.5%) healthcare workers had encountered an AEFI and 31 (56.4%) reported such within 24 hours in a study by Ogunyemi RA et al, and in this study also more than 80% of healthcare workers knew that fever, local reaction were clinical symptom and signs of AEFI.<sup>6</sup> In an earlier study by Mehmeti et al, in Albania, majority of health care professionals have encountered an AEFI during their practice (72/102, 70.5%), only half of them have never reported an AEFI (37/102, 36.2%).<sup>7</sup> Majority of the respondents did not have any training about AEFI (68.6%, 70/102) while in this study almost 80% healthcare workers have encountered an AEFI and 50% did not receive any training about AEFI. In a study by Masika et al, in Kenya using Binary logistic regression model, 29.2%, 32.1%, and 45.3% of the respondents had good knowledge, good practices, and good perceptions on AEFI surveillance, respectively.<sup>8</sup> Respondents with diploma or degree nursing training level were 1.8 times and 2.5 times more likely to have good knowledge and good perception in AEFI surveillance, respectively. Nurses with previous AEFI training were 9.7 times and 1.8 times more likely to have good AEFI knowledge and practices, respectively. While in this study more than half healthcare workers are already knowledgeable about possible causes of AEFI but health workers with diploma or degree were no better than others in present study emphasizing the need for better training during diploma course in India. Another study by Yamoah et al, in Ghana revealed that knowledge of AEFIs was high in 49(10.8%) participants, moderate in 213(47.0%) participants, and low in 191(42.2%) participants whereas in this study more than 80% healthcare workers had good knowledge of less serious AEFI but knowledge regarding more serious AEFI was considerably poor as compared to the study done by Yamoah et al.<sup>9</sup> In 2013 a qualitative study by Parrella et al, found confusion about how to report an AEFI and variability, according to the provider group, as to the type of events that would constitute a reportable AEFI.<sup>10</sup> Common barriers to reporting included time constraints and unsatisfactory reporting processes similar to this study where only 33% health workers knew how

and where to report AEFI. Also, in this study majority of the health workers denied any information regarding AEFI form highlighting the deficiencies /gaps in training of MPH workers regarding AEFI and develop newer guidelines for their training which can be used at state and national levels.

## CONCLUSION

There was a lack of knowledge about the cause, identification & reporting of AEFI despite periodic training programmes. There is need to train the health workers in order to improve reporting and prevent complications due to vaccines. There is also further need to ponder over the lacunae in training programmes responsible for persistent inadequate knowledge among health workers. And in the last, but not the least “DO NO FURTHER HARM “should always be the primary aim.

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## REFERENCES

1. Mehta U, Milstien JB, Duclos P, Folb PI. Developing a national system for dealing with adverse events following immunization. Bull World Health Org. 2000;78:170-7.
2. World Health Organization. Vaccine safety Basics e-learning course. MODULE 1: Introduction to vaccine safety. ADVERSE EVENTS: CLASSIFICATION. Available at: <https://vaccine-safety-training.org/adverse-eventsclassification.html>. Accessed 9 December 2019.
3. Bairwa A, Meena KC, Gupta PP. Knowledge attitude and practice of health workers in immunization. Ind Pediatr. 1995;32(1):107-8.
4. Swarnkar M, Baig VN, Soni SC, Shukla US, Ali J. Assessment of knowledge and practice about immunization among health care providers. Comm Med. 2016;7(4):281285.
5. Al-Ayed IH. Knowledge and practices of childhood immunization among primary health care providers in Riyadh city: Part I: Handling and administration of vaccines. Curr Pediatr Res. 2005;9(1-2):15-21.
6. Ogunyemi RA, Odusanya OO. A survey of knowledge and reporting practices of primary healthcare workers on adverse experiences following immunisation in alimosho local government area, Lagos. Nigerian Postgrad Med J. 2016;23(2):79.
7. Mehmeti I, Nelaj E, Simaku A, Tomini E, Bino S. Knowledge, practice and approaches of health professionals to adverse events following immunization and their reporting in Albania. Heliyon. 2017;3(6):e00331.
8. Masika CW, Atieli H, Were T. Knowledge, perceptions, and practice of nurses on surveillance

of adverse events following childhood immunization in Nairobi, Kenya. *BioMed Res Int.* 2016;2016.

9. Yamoah P, Bangalee V, Oosthuizen F. Knowledge and Perceptions of Adverse Events Following Immunization among Healthcare Professionals in Africa: A Case Study from Ghana. *Vaccines.* 2019;7(1).pii:E28.

10. Parrella A, Braunack-Mayer A, Gold M, Marshall H, Baghurst P. Healthcare providers' knowledge, experience and challenges of reporting adverse events following immunisation: a qualitative study. *BMC Health Services Res.* 2013;13(1):313.

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