



# Awareness of Pesticide Poisoning among the Health Care Workers of Chitwan, Nepal

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## Abstract

*The pesticide use in Nepal has increased by 10-20% annually, thereby increasing the chances of pesticide poisoning. Five million people die every year because of pesticide exposure worldwide. Cross sectional study was conducted to determine the knowledge of PP among HCWs. Six out of forty HCWs had received pesticide training. Only ten and two HCWs had knowledge about red and green color coding of pesticides, respectively. HCWs were aware of either two or more than two clinical features of acute pesticide poisoning but none of them knew about the complete set of clinical features. Half of the HCWs were unaware of the chronic effects of PP. In spite of dealing and managing cases on a regular basis, most of the HCWs had an insufficient knowledge on pesticide poisoning. So there stands a need for strengthening knowledge and creating awareness among HCWs for prompt diagnosis, proper management and prevention of PP.*

**Keywords:** Pesticides, Knowledge, Poisoning, Health care workers.

## Introduction

In Nepal, the use of pesticide is increasing by about 10-20%<sup>1</sup>. Due to intentional, accidental and occupational exposure to pesticide; five million people die every year worldwide<sup>2</sup>. Acute pesticide poisoning (APP) account for significant morbidity and mortality worldwide, especially in developing countries<sup>3,4</sup>.

Millions of people who handle pesticide are exposed to danger by highly hazardous occupational practices and unsafe storage of pesticide. Deliberate self poisoning due to agricultural pesticide put tremendous pressure on the already over stretched health care services in the developing countries<sup>5</sup>.

The recognition of potential toxicity of pesticides has not received much attention in the medical settings of Nepal and neither have adequate studies been carried out to evaluate the presence of acute poisoning and the contribution of pesticides to existing illness. Consequently, PP cases are generally mismanaged and underreported.

Although health care workers have been involved in community education, including campaign for safe use of pesticides little is known about their knowledge, skill and practice with regard to pesticide hazards and their management<sup>6</sup>.

There are hardly any published studies regarding HCW knowledge on PP in Nepal. Hence this study was conducted to identify the awareness of HCWs regarding pesticide poisoning in Chitwan, Nepal.

## Methodology

The study was conducted in Chitwan district from December 2012 to June 2013 which is popular for commercial and intensive vegetable cultivation and high volume of pesticide use<sup>7</sup>.

A list of HCWs was obtained from the District Public Health Office from a randomly selected four Village Development Committees (Bharatpur, Darechowk, Phulbari, and Mangalpur) of the district. Among 200 HCWs, on the basis of convenient sampling, forty HCWs of five different levels (Auxiliary Health Worker (AHW), Assistant Nurse Midwives (ANM), Health Assistant (HA), Village Health Worker (VHW), Bachelor of Medicine and Bachelor of Surgery (MBBS) were selected from four different Health care settings (Medical Collage, Primary Health Centre, Health Post, Sub Health Post) to assess their knowledge of PP. Data were collected by an interview schedule and analyzed by using computer software package SPSS 16.

Only those HCWs who acknowledged and given informed consent were included in the study maintaining confidentiality of the respondents.

## Results and Discussion

**Profile of HCWs:** Out of 40 HCWs, half were male. The average age was 37.8 years and average work experience was 10.25 years.

**Reported PP cases:** There were a total of 20 PP cases which includes 14 male and 6 females. Twelve cases were accounted

to accidental poisoning. Average age of the poisoned cases was 36.25 years. Only 10 PP cases were treated properly at the medical emergency room. There were two cases reported dead out of the notified PP cases.

**Awareness regarding PP:** Only 10 HCWs knew the rationale behind color coding of pesticides. Out of them, only two could identify the blue as “Least Dangerous” while all of them identified the red code as a “Most Dangerous”. All HCWs knew two or more than two signs and symptoms of acute pesticide poisoning (APP) while only half of them were aware of the chronic effects of PP. Only 6 HCWs had taken a formal training pertaining to diagnosis/ treatment of APP. 26 HCWs had dealt with the acute pesticide poisoning cases in their premises irrespective of their knowledge.

**Knowledge on pathways of pesticide entry in the body:** 38 HCWs correctly identified skin as the primary entry site of pesticide in the body. 32, 28 and 26 HCWs stated pesticide could also enter via inhalation, mouth and eyes respectively.

**Table-1**  
**Knowledge on signs and symptoms of acute pesticide poisoning (APP)**

Signs and Symptoms	Number of HCWs	Percent
Nausea	40	100
Abdominal pain	38	95
Vomiting	36	90
Respiratory difficulties	34	85
Skin irritation/rash	34	85
Headache	28	70
Extreme tiredness	26	65
Salivation	24	60
Trembling hands	22	55
Muscular weakness	22	55
Dizziness	18	45
Blurred vision	12	30

Multiple responses were obtained from the HCWs

**Discussion:** Health surveillance is a key element in the control of APP<sup>8,9</sup>. The efficient utilization of the health care network in campaigns to prevent and control poisoning may add to the

current efforts to minimize the health impact of pesticides on the population.

In the present study, few number of PP cases were reported by HCWs within one year period. Less than 2/3<sup>rd</sup> of HCWs had dealt with the poisoning case in their entire period of life. This may be explained as per reports and records due to: i. many health care workers may be unaware of the relationship between pesticide and illness and fail to diagnose or report the incident properly; ii. Most of the health care workers had not taken any kind of training regarding pesticide poisoning<sup>10</sup>.

Most of the pesticide poisoning cases reported were accidental poisoning. However, a review article by Litchfield contradicts our results by mentioning that many records do not adequately distinguish between accidental, occupational and intentional poisoning and are therefore dominated by intentional poisoning<sup>11</sup>. A higher number of cases of accidental poisoning found in the present study may be attributed to the fact that intentional poisoning cases are labeled as police cases in Nepal and also because persons who attempt suicide are considered as cowards or insane in the Nepalese context.

In this study, most of the PP cases were males probably because males are more involved in farming. However, a study conducted in Nepal by Lohani contradicts stating that females were more exposed to pesticide poisoning due to suicidal intent<sup>5</sup>.

Most of the HCWs were aware of skin as the major site for entry of pesticide in the body, followed by respiratory tract, mouth and eye. However, a study conducted in Tanzania by Aiwerasia et al. revealed that HCWs reported respiratory tract as the most common route of entry, followed by gastrointestinal tract, skin, and eyes<sup>6</sup>. The emphasis given on use of personal protective equipment by the health workers in Nepal was quite reasonable and effective enough to protect them against PP.

Few of the HCWs had knowledge about pesticide color coding, sign and symptoms of acute and chronic PP. Very few HCWs had taken training regarding diagnosis/treatment of acute pesticide poisoning. A study conducted by Lacouture et al. showed that health worker generally receive a very limited amount of training about occupational and environmental health, and in pesticide related illness<sup>12</sup>. Health care service reach the majority of the Nepalese population through a nationwide network of dispensaries, health centers, district and regional hospitals, but there is a lack of well trained local health care worker to make correct diagnosis, and hospital service to stabilize and sustain the patient in case of acute pesticide exposure<sup>13</sup>. Unsafe and misuse of highly hazardous pesticide, coupled with a weak or a totally absent legislative framework in the use of pesticides and lack of health personnel skill in diagnosis and treatment of pesticide poisoning, are major reasons for the high incidence of pesticide poisoning in the developing countries<sup>14</sup>.

## Conclusion

Majority of the HCWs had an insufficient knowledge and poor awareness status regarding PP. In spite of the fact, HCWs were regularly dealing with a substantial number of PP cases in their daily lives. So, there stands an urgent need for strengthening the knowledge and creating awareness among HCWs for prompt diagnosis, proper management and effective precaution of PP cases.

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