

ORIGINAL ARTICLE

Role of Non-Governmental Organizations in the Prevention and Control of Poisoning in Pakistan

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Abstract

Introduction: Poisoning is an important public health issue globally. There are very few poison control centers in Pakistan with a very limited capacity to deal with poisoning emergencies. The aim of this study was to identify non-governmental organizations (NGOs) working for poison control and prevention in Pakistan and to assess their capacity and role in control of poisoning in Pakistan.

Methods: A cross-sectional study was conducted between October and December 2017. NGOs were identified through web-based search. They were contacted through telephone and emails. The data was recorded on a predesigned structured questionnaire. The questions were related to major areas including poison information, advice service, infrastructure, human resource and availability of clinical services.

Results: We found 408 healthcare NGOs, of which 168 responded either via phone call or email. Eight out of 168 were found to have some role in the field of prevention and control of poisoning. Of these, complete information was available for only six organizations. All were involved in some aspect of environmental poisoning with a focus on pesticide poisoning mostly for farmers. Almost all organization referred cases to local hospitals when necessary. However, they did not have any official referral system in place and links with any tertiary level facilities.

Conclusion: The study highlights that very few NGOs have some focus on the poisoning control and prevention. There is a window of opportunity for non-governmental sector to strengthen poisoning prevention and control for other forms of environmental poisoning for example caused by medicines, household chemicals, drug misuse, etc.

Keywords: Non-Governmental Organizations (NGOs); Pakistan; Poisoning

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INTRODUCTION

Poisoning is an important public health issue and can be caused by misuse of medicines, household chemicals, drugs or by environmental and occupational exposures (1). Globally more than half of poisoning cases occur among most productive years of life, i.e. 15 – 59 years of age (2). Unintentional poisoning is more common in children, whereas intentional (particularly suicidal) poisoning is more common in young adults (3). Center of Disease Control (CDC) defines unintentional poisoning as use of drug or chemicals for recreational or non-recreational purpose in excess amount for example household products, chemicals, legal or illegal drugs, snake or spider bite, etc. (4). Estimates from World Health Organization (WHO) shows that in 2012 unintentional poisoning resulted in 1.93 million deaths worldwide and loss of over 10.7 million years of healthy life (disability adjusted life years, DALYs). More than 80% of these cases occur in low- and middle-income countries (LMICs) (5) with hydrocarbon and pesticides

poisoning as the most common reason accounting for high morbidity and mortality followed by drugs (6-8).

There is scarcity of information on burden of unintentional poisoning from South Asia. Estimates from epidemiological studies report burden from hospital studies; for instance, in Dhaka, Bangladesh there were 300,000 poisoning cases reported with around 2,000 deaths per year (9). In Sri Lanka, it was found that the incidence of poisoning is 75 per 100,000 populations with a death rate of 22 per 100,000 populations, with more than half (59%) of the cases being due to agrochemicals (10). Two hospital-based studies from Iran reported the prevalence rate in poisoning has doubled from 95 to 172 per 100,000 during 2004-2011 and that three most common causes of hospital admissions due to poisoning include pharmaceuticals, chemicals and natural toxins (11, 12). According to GBD 2017 estimates, in Pakistan there are annually 1,150 deaths due to poisoning and it is responsible for over 86 thousand disability adjusted life years (DALYs) (2) which is substantially high.

Previous work done on poisoning in Pakistan (13-15) is

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limited but has identified poisoning as an important area where primary prevention needs to be focused upon. Poisoning prevention and control requires a multidisciplinary approach and needs to involve multiple stakeholders including government, hospitals, academia, private organizations, non-governmental organizations (NGOs), community, education and social sector. In this regard, poison control centers play a critical role by providing information related to hazard prevention, product safety, occupational toxic exposure, hazardous material, monitoring of adverse drug effects and toxic event, surveillance, etc. (16). Pakistan has only two registered poison control centers affiliated with tertiary care hospitals with a very limited capacity to deal with poisoning emergencies (16). In the absence of well-functioning public poison control centers, the role of NGOs to fill this gap becomes very crucial (17). They can fill the lacunae by providing either technical and financial support or help raising awareness at the governmental level investment in the prevention of the poisoning (18). Thus, this study proposes to fill this gap by identifying strategies employed by non-governmental sector for poison control and prevention and to assess the level of acuity and facilities which are in place for the functioning of these NGOs in Pakistan.

METHODS

Study design

This was a cross sectional study conducted between October and December 2017. The list of NGOs was obtained through web-based search working in healthcare sector across Pakistan. We searched the list of NGOs on Google search by using the terms “NGOs in Pakistan” and

“list of NGOs in Pakistan”. We combined the results of two searches and made a list of NGOs. In order to contact the NGOs, our research volunteer (RV) searched contact information and made a complete list in an excel spreadsheet. NGOs were contacted through telephone and emails by the RV who was specifically trained for this project. Eligibility for the NGO to be included in the survey was determined by asking screening question, i.e. whether the NGO is currently working in Pakistan for the Prevention and Control of Poisoning (Figure 1). Furthermore, the inclusion criteria were defined as the NGOs working in the areas of ingested and inhaled poisons, drug overdose, environmental poisoning, acute prevention and treatment of these poisons. We excluded hospitals, rehabilitation programs, and water purification and sanitation NGOs.

Every possible effort was made to establish contact with NGOs on the list, including 3 attempts of phone calls on different days followed by an email. Those with no phone number were emailed directly. In cases where attempt to contact the NGO was unsuccessful, next NGO on the list was contacted.

Data collection

The information was recorded on a predesigned questionnaire adopted from a published study conducted to identify the current status of poison control centers in Pakistan (16). Domains included in the questionnaire are: a) provision of information and consultation services, b) facilities and equipment, c) staffing, d) clinical services, e) analytical toxicology and laboratory services, f) toxicovigilance and prevention of poisoning, g) response to major emergencies involving chemicals, h) antidotes and

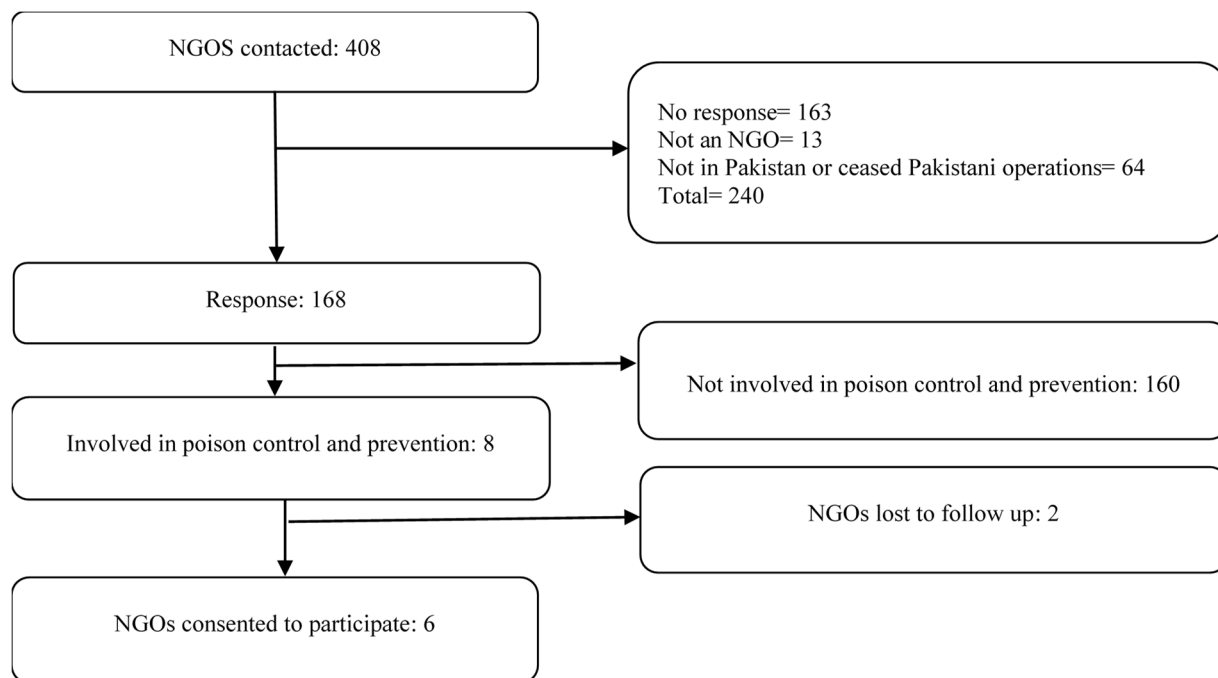


Figure 1. Flow chart for inclusion of NGOs

their availability, and i) education and training. Six out of 168 consented to participate in the study. The representatives of eligible NGOs that provided oral consent to be part of survey were questioned on above functions and capacity. The information was obtained over a phone call and each call took around half an hour to complete the survey questions.

Data management

Data were entered anonymously and protected with password and only the research team had the access to them. The data were entered into an excel sheet for analysis and presented as means and frequencies.

Ethical approval

The approval to conduct the study was granted by the ethical review committee (4920-EM-ERC-17) of Aga Khan University. In addition, the verbal consent was obtained from the participating NGOs.

RESULTS

As detailed in Figure 1, 408 NGOs were contacted, of

which 168 responded either via phone call or email. Only eight out of 168 were involved in prevention and control of poisoning. Of these, one refused to answer any further questions and another did not respond even after three follow-ups. Results were compiled for the six NGOs, those that provided full information, as shown in Table 1. All six NGOs were working in the area of agricultural poisoning. Three of these NGOs were involved in poison control and prevention and have been working for 14 years. The other three had started their operations at various points in time between the 80s and the 90s. Two NGOs have operations in all four provinces, two in Khyber Pakhtunkhwa and Punjab and the remaining two were operating in Sindh only (Figure 2).

Table 1 depicts status of all the services provided by these NGOs. All of these NGOs have access to external database sources in collaboration with different academic and government institutions including the Ministry of Climate Change Pakistan and government databases which help them answer poisoning queries and stay updated on knowledge of poisonous materials in their area of work, i.e. agricultural poisoning.

Table 1. Status of services available in the NGOs

Services	Number of NGOs that answered yes (%)
Provision of Information and Advice Services (limited to agricultural / local pesticides)	
External sources and databases	6 (100%)
Local commercial product data including pharmaceutical, natural toxins by plants and animals	5 (83%)
Drug information	0 (0%)
Capacity to identify tablets/capsules/plants/fungi/insects/animals	2 (33%)
Data regularly updated	5 (83%)
Documentation of cases of poisoning	4 (67%)
Information on inquiries with standardized recording	0 (0%)
Information on health and other relevant resources (dialysis, hyperbaric chamber, analytical facilities, etc.)	4 (67%)
Computerization information package	5 (83%)
Library	6 (100%)
Facilities and Equipment	
Office space and meeting rooms with furniture	6 (100%)
Immediate access to literature and other sources of information	6 (100%)
Answering and information services with telephones	4 (67%)
Computer/printer/fax/internet/teaching aids (multimedia/projector)	6 (100%)
Human Resources	
Medical director experience in toxicology	1 (17%)
Sufficient personnel to operate 7 days a week 24 hours a day	4 (67%)
Poison information specialist	2 (33%)
Veterinary expertise	3 (50%)
Administrative and support staff	6 (100%)
Advisers in special areas	5 (83%)

Table 2. Continued.

Services	Number of NGOs that answered yes (%)
Toxicovigilance and Prevention of Poisoning (limited to local agricultural pesticides)	
Identifying serious poisoning risks in the local community	5 (83%)
Identifying changes in incidence of poisoning	5 (83%)
Monitoring the toxicity of commercial product	5 (83%)
Reporting to health authorities	5 (83)
Liaison with Clinical Services	
Emergency services	1 (17%)
Intensive care units	1 (17%)
General medical units	3 (50%)
Specialized services/poison control centers	0 (0%)
Clinical toxicology units	0 (0%)
Laboratory services	3 (50%)
Response to Major Emergencies Involving Chemicals (limited to local agricultural pesticides)	
Toxic chemicals and their effects	6 (100%)
High risk areas and processes	6 (100%)
Which chemical might be released in what forms and quantities?	6 (100%)
Possible protective and remedial measures	5 (83%)
Contingency planning with other agencies for chemical accidents	3 (50%)
Collaboration with poison control centers	1 (17%)
Miscellaneous	
Antidotes and their availability	0 (0%)
Education and training (for farmers only)	5 (83%)

Almost all have preparedness plan to respond to chemical disasters and are active in toxicovigilance and poisoning prevention in the areas they worked in, reflected by the importance given to the training of farmers and local inhabitants for poisoning prevention. Most of them have formal training program for farmers. All NGOs have updated libraries in the form of their own publications and access to research journals. With regards to human resources, only one NGO had a toxicology medical director, two had poisoning specialists in the area of agricultural poisoning while three had veterinarians. None of the NGO provided telephonic consultation to general public, i.e. answer question or provide information on any drug or poison while none had any referral mechanism to transfer casualties.

DISCUSSION

Our study highlighted that very few NGOs have been working in the field of poisoning control and prevention in Pakistan with a particular focus on the agricultural poisoning. It further highlights that these NGOs are conducting their work within limited available resources. The dearth of resources – human and physical – is a

challenge in provision of poison control _____ services at national level. Study findings also highlight that with limited function and capacity, non-governmental sector is contributing to the control and prevention of poisoning with deficient centralized poison control efforts in the country.

The access to external sources, upgraded reference library and making database of cases are of the most valuable features in functioning of NGOs in poisoning control and prevention (16). The domain is strengthened by the collaboration with academic institutions, Ministry of Climate Change and government databases. This feature allows them to record cases in the database presented at these NGOs. Through use of these databases, NGOs can play a critical role in the identification of toxic chemicals available in the community, highlight the poisoning trends, occupational hazards and, addiction patterns and errors in drug prescription (19). In order to design the strategies to prevent poisoning emergencies, such data would be of great value to alert the healthcare professionals in effective case management and guide researchers and policy makers in designing interventions and programs to make neighborhoods and communities safe.

Another strength of these NGOs is the response mechanism

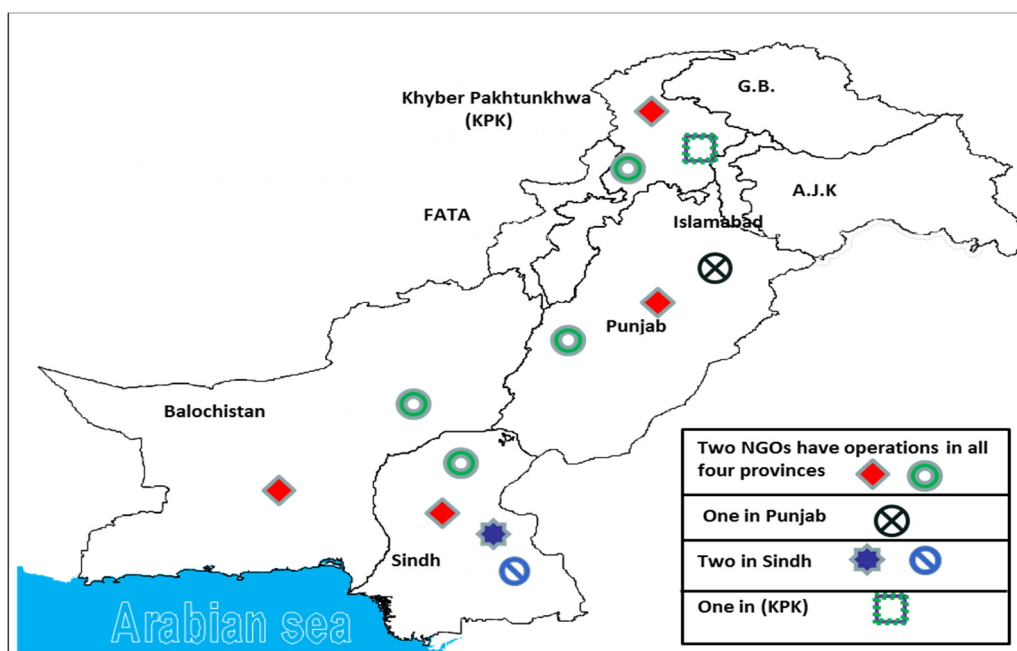


Figure 2. NGOs operations in all four provinces

by which they deal with major emergencies involving chemicals in agricultural field. Five out of six NGOs are able to identify toxic risks existing in the community by monitoring the toxicity of commercial products and reporting it to health authorities. Unfortunately, there is a lack of regulatory agencies in resource constraint countries like Pakistan and other neighbors to limit the use of highly toxic compounds by restricting their entry into the market (16, 20). Antidotes and other measures like decontamination and respiratory support are crucial in saving lives and hospitalization in patients (21). It is concerning not to have regulation to control the use of toxic products and antidotes to minimize the extent of damage caused by poison in the body.

Moreover, five out of six NGOs had well-functioning training programs targeting the farmers in area of pesticides prevention. It is well documented in the literature that the training programs targeted at teaching the risk factors and prevention could reduce the incidence of cases with poisoning (16). In India, the group of farmers trained on integrated pest management (IPM) showed that farmers avoided behaviors that are risky and have negative health outcomes (20). However, in terms of human resources, there is much to be achieved as only one NGO has the expert personnel functioning as a medical director in the field of poison control with sole focus on the agricultural poisoning. However, in the rest of the NGOs there are advisers in the special area but those instructions were limited to the field of agriculture and rural areas. There should be some alternate ways to overcome the shortage of human resources such as mobilization of the community to take charge of the problem; this is more sustainable and is considered as a low-cost intervention. The examples prevail in India and

Sri Lanka where access to pesticides were monitored by the community leaders/stakeholders to help prevent suicides (22).

The important need in the current era is the accessible universal phone line service which provides information and awareness to general public (16). Our survey shows none of the NGO provides this kind of services that adds to poor case management of poisoning cases and mortality in long run. This telephonic consultation service can work as a filter by reducing the number of Emergency Department (ED) visits and also such strategy could improve community case management of poisoning in the absence of an expert in toxicology (16). This area needs further exploration as we do not know if they lacked capacity to provide telephonic consultations or it was because general public is not aware of the poison control centers.

In this study, we were able to provide the overview and landscape analysis of the NGOs working for poisoning control and prevention; however, we could not visit any of the NGOs to observe their operations and functioning directly. The information acquired was solely dependent on the responses provided by the organization's representatives. In search terms on Google to find out the list of NGOs, we did not use full form of NGO because we observed that the full form is not commonly used on the Internet. We observed very high drop-outs as we could not find the contact details of almost half of the NGOs which was a major limitation of this study.

CONCLUSION

The study shows that very few NGOs have been working in the field of poisoning control and prevention. Their scope is limited to agricultural pesticides and health of the farmers.

There is a great opportunity for NGOs in health sector in Pakistan to bridge the gap and provide services for prevention and control of poisoning in the absence of well-functioning poison control centers. There exists a need for population wide interventions which includes universal telephone line which provides information and awareness to general public. Moreover, a strong collaboration is needed to strengthen the collaboration between NGOs and departments run by the government to improve service delivery in far-flung areas in this field.

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