

**REMINISCENCES OF GOIÂNIA
TEN YEARS LATER: THE
PSYCHOLOGICAL EFFECTS**



A.B. CARVALHO
Rio de Janeiro,
Brazil

Abstract

REMINISCENCES OF GOIANIA TEN YEARS LATER: THE PSYCHOLOGICAL EFFECTS.

The author recalls her experiences during the follow-up of the radiological accident in Goiânia, Brazil, in 1987, when a ^{137}Cs capsule was removed from an abandoned radiotherapy clinic. At the time of the accident she was employed by the Brazilian Nuclear Energy Commission's (CNEN) Department of Human Resources Management as a psychologist. She describes the emotional impact suffered by the victims, the population, the medical care team and the staff of emergency responders of CNEN as they decontaminated the city and cared for the victims. The author puts forward proposals for psychological preparedness for radiological emergencies and nuclear accidents.

1. INTRODUCTION

On 29 September 1987 the Brazilian Nuclear Energy Commission (CNEN) was notified of an accident in Goiânia with a ^{137}Cs source. A small group of experts composed of physicists, radiation protection specialists and two doctors flew to Goiânia on 30 September to assess the situation. The cleanup of the city was initiated as well as the medical care at the Goiânia General Hospital (HGG) of the 20 persons suffering from radiation exposure and contamination.

Fourteen victims, in a more serious situation, were flown to Rio de Janeiro for specialized medical care at the Marcílio Dias Naval Hospital (HNMD). Four people died as a result of their injuries.

Although the levels of stress and panic were very high during the recovery operations, no specific attention was dedicated to the psychological aspects of this disaster. The radiation protection teams, under considerable stress, who were working with the victims at the hospitals and the rescuers, surprised, unprepared and feeling extremely stressed by their work in the cleanup of the city of Goiânia, informally asked for our psychological support.

According to the CNEN leaders in charge of the emergency efforts, this kind of relief was not necessary, since the accident was strictly of a technical nature. Later it was ascertained that psychological counselling was one of the most important items to be considered [3].

But the workers insisted and I conducted informal interviews at my office at CNEN headquarters. All I did was listen to them, and I slowly started to understand their predicament and attempted to give whatever support was possible. Some of them suggested that I write about what was happening in the area of the accident, that I study the psychological after-effects of a radiological emergency and that, after drawing the lessons from this experience, I put psychological guidelines forward. In the future, with the aid of these guidelines, other people might be psychologically prepared to deal with a catastrophe of this kind.

In February 1988 I was finally given permission to go to Goiânia to study the psychological after-effects of the accident and to report on them.

2. METHOD

2.1. Collection of data

During the first half of March 1988 I interviewed the following groups of people in Goiânia: the victims who had been hospitalized and those who had not; psychiatrists and nurses who had treated the victims at the HGG; neighbourhood residents who lived near the focal points of contamination; workers from the newly-formed Leide das Neves Ferreira Foundation, in particular the social workers; city dwellers chosen at random; the individuals who had first come into contact with the source and had faced the disaster: the physicist who had first found out about the source and deduced that an accident had occurred and the veterinary doctor from the sanitary post the victims first turned to when their radiation syndrome symptoms started to appear; and finally, journalists from Goiânia. Additionally, I watched and analyzed taped TV news reports of the accident.

During the second half of March 1988 in Rio de Janeiro I interviewed doctors, nurses, a chaplain and the staff of the Marcílio Dias Naval Hospital (HNMD); the first two medical experts to treat the victims, and the former Director General of Community Support of the Civil Defence Department of Rio de Janeiro, who had participated in the cleanup of Goiânia and in caring for the victims.

At the end of March and in April 1988, with the aid of a structured questionnaire and individual interviews, I gathered research on 78 rescuers (about 10% of CNEN staff) chosen at random at the headquarters of CNEN and its institutes.

2.2. Procedure

The subjects were interviewed in their homes, working areas or wherever they were situated at the time. The structured questionnaires were given to the workers at their place of work.

2.3. Data analysis and review

Psychiatrists and psychologists were consulted and were very helpful; hypotheses about disorders were formulated. Assistance was also provided by CNEN's Centre for Nuclear Information (CIN) which was able to find literature on instances of contamination which had taken place in laboratories.

3. RESULTS

3.1. The population of Goiânia

The TV tapes were a neutral means of obtaining an exact measure of the scope of the accident. In particular, they showed how official communications were conveyed to the population, the neutrality of some channels and the partiality of others with respect to radioactivity, the panic in the population, their anger or aggressiveness, and how politicians and well known figures tried to use the accident to focus attention on themselves, sometimes complicating the work of the emergency responders.

Interviews with the first CNEN workers to arrive at the scene were also helpful in shedding light on the emotional impact the accident had on the population, exemplified by the terror which took hold of people who had their contamination indices measured at the CNEN

monitoring post, where many fainted out of panic or showed enormous blisters and reddened skins. The monitoring of these individuals showed no contamination whatsoever [3].

Interviews with the population and with the people who had lost property or had their houses interdicted were also crucial, providing many insights into the instances of ostracism and discrimination [4].

3.2. The victims

The victims who had been hospitalized talked about what had happened to them, how they had been treated, aspects of their stay at the hospitals, their fears and how they were fatalistic about what had happened. They further spoke of how their fright had started with the first deaths, the stress caused by the rigid radiation protection rules, the daily painful medical procedures, bodily deterioration and opportunistic infections. Patients became depressive, which aggravated their state, and became prone to suicidal wishes. They felt rage, were agitated, aggressive, irritable, anxious and had nightmares [1, 2, 4].

After their discharge from hospital, the victims continued to suffer the consequences of contamination: they were discriminated against and had difficulty in finding jobs [4]. The government of the state of Goiás established an institution called the Leide das Neves Foundation to help them.

3.3. The emergency responders

Although the radiation protection staff of CNEN dispatched to the Marcílio Dias Naval Hospital in Rio de Janeiro and the Goiânia General Hospital had theoretical knowledge of radiation syndrome, they had no practical experience with real victims of radiation in hospitals. The first shock they experienced was to find out about the accident and the initial sight of radiation induced dermatitis. For most of them, the cause of stress was overwork caused by the organization of the service, procedures, co-ordination and the division of tasks. Wearing protective clothing and masks, working with the rigid standards of radiation protection, CNEN staff had to follow the prolonged hospitalization and isolation of the victims because of opportunistic infections as well as share their physical and mental suffering and pain. They were always afraid the patients would die, were strongly affected by their injuries and deaths and felt that the monitoring of autopsies was unbearable [1, 3].

A few radiation protection workers said that they had been sufficiently prepared for the event and felt nothing, but nonetheless became deeply involved. Others found it difficult to work because they were so affected; they wept freely, away from the sight of patients and co-workers [1, 3].

Later, as the victims returned to Goiânia, the CNEN staff was assigned to different areas. While some went to work in the city cleanup, others were sent to the HGG to continue radiation protection activities [1, 3].

It was difficult to find people to work at the HGG because of the fear of radiation. The victims were experiencing serious psychological reactions which the team did not understand or know how to deal with. After two weeks at this hospital, the radiation protection team was completely exhausted owing to excess work and emotional stress.

Due to the lack of regular hospital personnel, they were forced to assume the role of nurses and guards, because some of the patients, screaming and in fury, wanted to escape from the ward by throwing themselves out of the windows. At this point, many of the CNEN workers began to present psychosomatic disturbances such as insomnia or gastric problems [3].

The work of the radiation protection staff in the emergency efforts during and following the accident had a significant impact on their feelings. The first groups to arrive, with no prior knowledge of what was happening, were the ones to suffer the most. As the months passed, more information became available about what to expect, staff became more aware and their anxiety lessened. At this stage according to the survey, they were not afraid to confront the disaster and their main psychological impact was pity, worry and a strong feeling of solidarity with the victims and population.

Some workers felt claustrophobia as they had to use unfamiliar clothes and masks in a very hot climate, some collapsed and gave up entirely and others felt numb or became so involved in their work that they neglected to take precautions for their own safety in places where the radiation was high.

3.4. The psychological effects on the medical team

The victims were transferred to the HGG, then on strike, where the director had arranged for the evacuation of a ward to accommodate them. There, they were left for a time unattended, either because of the hospital personnel's lack of preparation or due to fear on their part. A physician from Furnas Centrais Elétricas, the electricity utility in Rio, who initially dealt with these victims, stated that he had been very shocked by this abandonment [2, 3]. Doctors from the CNEN and from Brazilian Nuclear Industries stayed on and at the HGG and worked there for the next six months. These physicians were brought almost to breaking point by the problems they encountered at the hospital. These were: the fears of the nursing staff and consequent lack of assistance, the lack of response from the Goiânia medical community to the appeals made by the physicians and their own lack of practical experience [1, 2].

The health team at the HNMD stated they had sorely felt the need for a psychologist (who would have counselled both the victims and the team itself) during the time the radiation victims were being cared for there. This hospital was better equipped to receive the victims and had the benefit of international co-operation, yet there was much stress among the doctors as they were accustomed to practising nuclear medicine and not radiation medicine [1].

4. THE FOLLOWING YEARS

While I was undertaking research on the psychological consequences of the accident, I was transferred from the Department of Human Resources Management to work as a psychologist in the Health Group Project of CNEN responsible for the study of the accident's aftermath. In the ensuing years I followed up the emergency responders and accompanied the Health Group physicians every time they flew to Goiânia to check on the victims at the Leide da Neves Foundation, some four or five times a year.

Some rescuers interviewed over the years remained affected and, to this today, have a vivid recollection of their emotional involvement. Yet they have been able to cope well with these memories.

In Goiânia, I was able to notice first hand the intense fear experienced by the neighbourhood residents who lived in the area of the accident. As we visited them, we perceived health problems with interesting aspects, manifested also by some persons who had never been near the source nor contaminated nor irradiated. These individuals were presenting high blood pressure, cardiovascular symptoms, somatic and gastrointestinal troubles, difficulty in concentration — they were pointing to radiation as the cause of their

ailments. I asked the doctors if radiation could have been the cause of these disorders and their answer was no. These symptoms were an imitation of radiation syndrome and might have been a neurotic disorder such as hysteria, similar perhaps to the one presented in the screening lines in the initial stages of the accident. But there were too many people with similar symptoms to simply be classified as neurotics.

At that time I met Dr. Daniel Collins, from the United States Air Force, who had done research in Three Mile Island on chronic stress. Together we conducted the same study in Goiânia. Studies in this field have shown that during situations of danger, the human body prepares itself for confrontation: chemicals increase in volume in the nervous system, causing rapid breathing, rapid pulse, palpitations, trembling, excessive sweating, vomiting, diarrhoea, headaches and high blood pressure. People experiencing fear on an ongoing basis like the ones we interviewed might have acquired the symptoms of chronic stress. This was confirmed by the results of our research, published in the winter of 1993, which proved the existence of chronic stress in Goiânia [5].

In 1991, I was transferred to another CNEN department, the Health Service, and stopped travelling to Goiânia. I did not, however, stop studying aspects of nuclear or radiological disasters and relief, nor writing on these topics.

5. CONCLUSIONS

The Goiânia experience has taught us that it is vital to include the help of a group of mental health teams during an accident, not only to give support to the victims in hospitals and implement a net of psychological assistance to the population, but most importantly, to help the disaster rescuers (the group of workers and hospital staff) bear the stress of their jobs. This group of mental health specialists should be trained not to be afraid of radioactivity and should consist of psychiatrists, psychologists and social workers as well as of hospital and terminal patient psychologists [1].

It was also demonstrated that it is important to emotionally prepare the emergency responders and hospital teams while they are being trained. Aside from the technical subjects which are a normal part of the curriculum, notions such as the human behaviour patterns during a catastrophe, the differences between radiological and nuclear accidents and how to speak to the public in simple language should be taught to the rescuers. They should also have a knowledge of what to do and how to react in the presence of human injury or death [6].

It might be worthwhile to use pre-employment psychological and personality tests in the selection of personnel for relief planning, as certain individuals are not suited for work under stressful conditions [1, 2].

REFERENCES

- [1] CARVALHO, A.B., "The Psychological Impact of the Radiological Accident in Goiânia", Recovery Operations in the Event of a Nuclear Accident or Radiological Emergency (Proc. IAEA Symp. Vienna, 1989), IAEA, Vienna (1990) 463–477.
- [2] BRANDAO-MELLO, C.E., OLIVEIRA, A., CARVALHO, A.B., The Psychological Effects of the Goiânia Radiological Accident on the Hospitalized Victims, in The Medical Basis for Radiation-Accident Preparedness III, The Psychological Perspective, Elsevier, New York (1991) 121–129.

- [3] CARVALHO, A.B., The Psychological Effects of the Goiânia Radiological Accident on the Emergency Responders, in The Medical Basis for Radiation-Accident Preparedness III, The Psychological Perspective, Elsevier, New York (1991) 131–141.
- [4] CARVALHO, A.B., DAMASCENO, E., “Reflections on psychosocial aspects of nuclear energy within the framework of sustainable development, liability and damages related thereto”, Proc Int. Biennial Congr. “Nuclear Energy and Sustainable Development – the Role of Law”, Nuclear Inter Jura '93, Rio de Janeiro, Forense, Rio de Janeiro (1993) 423–429.
- [5] COLLINS, D.L., CARVALHO, A.B., The Goiânia ¹³⁷Cs radiation accident: psychological, behavioral and neuroendocrine chronic stress indices, Behavioral Medicine, **18** 4 Winter (1993).
- [6] CARVALHO, A.B. “A contribution for the training of responders in emergency preparedness — psychological concerns”, SGNA–007, in Symposium on Globalization of Nuclear Activities, LANS, 15–18 June, 1997, Rio de Janeiro.