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IMPLEMENTATION OF A RADIATION PROTECTION PROGRAM: OPINION OF THE HEALTH TEAM WORKING IN A RADIOLOGY SERVICE[1]

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ABSTRACT

Objective: to identify the participation of a multi-professional healthcare team in a Radiation Protection Program, and to describe the implementation of this program by the staff working in the service.

Method: qualitative, exploratory and descriptive research, performed through a semi-structured interview with professionals of the radiology service of a public hospital in the South of Brazil. A sample of 25 participants was considered sufficient after data saturation. The content analysis was used, with Atlas-Ti 7.0 software for treatment and data analysis. Two main categories emerged: Participation of the multi-professional healthcare team in the Radiation Protection Program and Implementation of the program by the multi-professional healthcare team.

Results: the program is not known by a large part of the team, indicating that the professionals would have difficulties in identifying intercurrences involving ionizing radiation, as well as in finding fast solutions in emergency situations.

Conclusion: in the service researched, the Radiation Protection Program is only known by those who participated in its creation, and most of the members of the multi-professional team did not participate in it, which allows to deduce that its implementation by part of the team is, for this reason, impaired.

DESCRIPTORS: Ionizing radiation. Radiation protection. Hospital radiology service. Patient care team. Occupational health.

IMPLEMENTAÇÃO DO PROGRAMA DE PROTEÇÃO RADIOLÓGICA: OLHAR DA EQUIPE DE SAÚDE ATUANTE EM UM SERVIÇO DE RADIOLOGIA

RESUMO

Objetivo: identificar a participação da equipe multiprofissional de saúde no Programa de Proteção Radiológica e descrever a implementação deste programa pela equipe atuante no serviço.

Método: pesquisa qualitativa, exploratória e descritiva, realizada por meio de entrevista semiestruturada com profissionais do serviço de radiologia hospitalar de um hospital público do Sul do Brasil. A amostra de 25 participantes foi considerada suficiente após saturação dos dados. Utilizou-se a análise de conteúdo, com auxílio do *software Atlas-Ti* 7.0 para tratamento e análise dos dados. Emergiram duas categorias principais: Participação da equipe multiprofissional de saúde no Programa de Proteção Radiológica Implementação do Programa pela equipe multiprofissional.

Resultados: o programa é desconhecido por grande parte da equipe, indicando que os trabalhadores teriam dificuldades em identificar intercorrências envolvendo radiações ionizantes, bem como encontrar rápidas soluções em situações emergenciais.

Conclusão: no serviço pesquisado, o Programa de Proteção Radiológica só é conhecido por quem participou de sua elaboração, ou seja, grande parte dos integrantes da equipe multiprofissional não participou da elaboração do Programa de Proteção Radiológica, o que permite deduzir que a implementação dele por parte da equipe está, justamente por este motivo, comprometida.

DESCRITORES: Radiação ionizante. Proteção radiológica. Serviço hospitalar de radiologia. Equipe de assistência ao paciente. Saúde do trabalhador.

IMPLEMENTACIÓN DEL PROGRAMA DE PROTECCIÓN RADIOLÓGICA: UNA MIRADA DEL EQUIPO DE SALUD ACTUANTE EN UN SERVICIO DE RADIOLOGÍA

RESUMEN

Objetivo: identificar la participación del equipo multiprofesional de salud en el Programa de Protección Radiológica y describir la implementación de este programa por el equipo actuante en el servicio.

Método: investigación cualitativa, exploratoria y descriptiva, realizada a través de entrevista semiestructurada con profesionales de servicios de radiología hospitalaria, de un hospital público del Sur de Brasil. La muestra de 25 participantes fue considerada suficiente después de la saturación de datos. Se utilizó análisis de contenido, con auxilio del *software Atlas-Ti 7.0* para el tratamiento y análisis de los datos. Emergieron dos categorías principales: Participación del Equipo Multiprofesional de salud en el Programa de Protección Radiológica e Implementación del Programa por el Equipo Multiprofesional.

Resultados: el programa es desconocido por la mayor parte del equipo, indicando que los trabajadores tendrían dificultades para identificar inconvenientes que involucren radiaciones ionizantes, así como encontrar rápidas soluciones en situaciones emergenciales.

Conclusión: en el servicio investigado, el Programa de Protección Radiológico solamente es conocido por quien participó de su elaboración, es decir, gran parte de los integrantes del equipo multiprofesional no participó de la elaboración del Programa de Protección Radiológica, lo que permite deducir que la implementación de él por parte del equipo, está comprometida.

DESCRIPTORES: Radiación ionizante. Protección radiológica. Servicio hospitalario de radiología. Equipo de asistencia al paciente. Salud del trabajador.

INTRODUCTION

Ionizing radiations (IR), X-rays included, were discovered in 1895, and their immediate use brought numerous benefits to the science and medicine, but also caused a number of irreversible biological effects in patients, researchers, physicians, and other exposed individuals. This radiation is called ionizing because it has the atom ionization feature, affects molecules and cells, and causes serious damage. Thus, it is possible to state that its discovery brought not only benefits but also intrinsic and unknown dangers at the moment of its incorporation to the social practices.[1]

In a short time, less than five years after the discovery of X-rays, radiobiological health damage was observed in all those who surrounded the new technology, the equipment operators, called occupationally and para-occupationally exposed workers, a multi-professional healthcare team working in the radiodiagnosis services, and individuals from the public. In the first two years of use of X-rays, it was a common practice to expose workers to radiation to assess the intensity of X-rays. This measure was only taken after the exposed region had showed skin irritation.[2]

Professionals in contact with IR, such as radiology technicians (radiology technicians and technologists), are referred to as occupationally exposed workers, and professionals who participate in some form of performance of diagnostic imaging examinations, assisting the professionals of radiological techniques, such as nurses, nursing aides and technicians, and physicians will be referred to herein as para-occupationally exposed workers, just as Regulatory Norm 32 (NR 32) refers to the worker whose work activities are not directly connected to radiation, but who can occasionally receive doses exceeding the limits recommended by the Nuclear Standard (NN) of the National Commission of Nuclear Energy (CNEN), NN 3.01.[3]

Concomitantly with the technological development, misfortunes have occurred due to undue exposure to radiation. Biological damage, misuse, and lack of knowledge of the properties of radiation have led to the creation of regulations aimed at the protection of humans and the environment.[4] Thus, with the confirmation that high doses of IR damage human tissue, twenty years after the discovery of the X-rays, the American Röentgen Ray Society published the first recommendations of radiation protection (RP) for workers.[2-5]

In Brazil, the need to establish more stringent standards in radiodiagnosis services was triggered by an accident in Goiânia, in September 1987, with an abandoned device in a junkyard that had previously been used in radiotherapy treatments. This equipment, which was destroyed by two men, had the radioactive element Cesium-137, and caused the largest radioactive accident in Brazil. The element in question infected hundreds of people. Soon after contamination, four people died. This accident was widely disseminated, nationally and internationally, initiating various adjustments and implementation of new practices in diagnostic imaging services involving IR.[6]

Radiation protection standards in Brazil date from the beginning of 1978, in the guidelines of Occupational Safety and Medicine, determined by

Ordinance no. 3214, of June 8, 1978. Two decades later, Ordinance SVS/MS no. 453 of June 1, 1998 was published, which establishes basic guidelines of RP in medical and dental radiodiagnosis, provides for the use of diagnostic X-rays throughout the national territory, and makes other provisions; among these, in item 3.9, it requires a Descriptive Memorial (DM) that contains a Radiation Protection Program (RPP), the content of which consists of describing the appropriate ways of controlling physical risk to IR, both for occupational purposes and to minimize the dose in patients. It is mandatory that the radiology service present a DM containing the RPP to the Health Surveillance Department.[7]

Radiation Protection Programs should be incorporated into the Environmental Risk Prevention Plan (ERPP) and include the physical risk "ionizing radiation", which must be recognized by an Internal Commission for Accident Prevention, and serve as a basis for the prevention of accidents in the working routine that involves IR or radioactive materials.[8]

In addition to Ordinance 453/98, it is worth highlighting the importance of NR 32, approved by Ordinance 483/2005, which establishes a Radiation Protection Plan with basic guidelines for the implementation of measures to protect the health and safety of health workers and of those who carry out health promotion and assistance activities in general.[3]

In summary, Ordinance 453/98 requires an RPP, while NR 32 requires a Radiation Protection Plan, which has the purpose to adapt different sectors to RP. RPP, described in Ordinance 453/98, is intended for medical and dental radiodiagnostic services. The Plan referred to in NR 32 applies to Nuclear Medicine and Radiation Therapy services, that is, the NR aims to develop an RPP for services in which there are radioactive sources, and Ordinance 453/98 refers to services that use X-rays to generate diagnostic images.[7]

In this study, the RPP nomenclature is used because it was developed in a hospital radiology service, and it is assumed that the legislation regarding radiodiagnostic services is described in Ordinance 453/98. The option to use Ordinance 453/98 is also explained by the fact that it is applied and supervised in any healthcare service, regardless of being public or private.

Radiodiagnostic services using IR and involving high-tech procedures require a qualified multi-professional healthcare team to properly use the radiation-emitting equipment; thus, the lack of preparedness by professionals can cause occupational hazards to workers of these services. However, risks can be minimized or even avoided when safety measures are undertaken to carry out RP. In addition, permanent training reinforces and aggregates knowledge about RP.[9-10]

Considering the existence of IR in the environments that have radiation-emitting equipment, it is assumed that the multi-professional healthcare team should have knowledge and basis on the provisions of the current legislation on radiation protection, in an attempt to participate in the implementation of the RPP of their department, to protect everyone who is in that environment.

Accordingly, this study aims to identify the participation of the multi-professional healthcare team in the Radiation Protection Program, and to describe the implementation of this program by the team working in the radiology service of a public hospital in the South of Brazil.

METHOD

This is a qualitative, exploratory and descriptive study carried out in a public hospital in the South of Brazil, which operates at three levels of care, and is a state reference in complex pathologies. It has 253 beds, eight operating rooms, a mammographer, a dental X-ray device, two devices for fluoroscopy, seven X-ray machines, two hemodynamics devices, and a CT scanner. The researched department, known in the hospital as "radiology service", began the implementation of the RPP in the year of 2009, and has IR-emitting equipment, as follows: two conventional X-ray machines, a mammographer, a CT scanner, and a fluoroscopy machine.

The research participants are occupationally and para-occupationally IR-exposed professionals, included in the work schedule of the service. Those who were retired, or on health or maternity leave during the period of data collection were excluded. Thus, a total of 46 professionals working in the service participated: four radiologists, four medical residents, three radiology technologists, nine radiology technicians, one nurse, one nursing technician, one nursing aide, and two administrative assistants. Among the 25 participants, 11 were female and 14 were male. These have 15 years of work on average in the radiology service researched. For the sample size, the criterion of data saturation was adopted.[11]

Before data collection, there was a first contact with the head of the service and the professionals present there. At that moment, the research objectives were exposed, trying to encourage the team to participate in the research. Afterwards,

individual interviews were scheduled, which took place between July and September 2014. The semi-structured interviews were carried out in the RP room and recorded as consented by the interviewees. The content of the interviews approached the professionals' understanding regarding ionizing radiation, RPP, the current legislation dealing with the subject, and the interest in professional training on the subject.

To keep the confidentiality of the research participants, these were cited as the chemical elements of the periodic table. With the help of Atlas-Ti 7.0 software (Qualitative Research and Solutions), the data were organized and codified, categorized and subsequently submitted to content analysis.[12]

According to resolution no. 466/2012, the research was evaluated and approved by the Research Ethics Committee, under report no. 717660 of July 14, 2014, and Certificate of Presentation for Ethical Assessment CAAE: 25382813.8.0000.0121. Anonymity of the study participants was preserved.

RESULTS

The involvement of the multi-professional healthcare team working in radiodiagnostic services is essential for the elaboration of the RPP, which will present the nominal list of all the staff working in the service, as well as specific responsibilities and attributions, including procedures for cases of accidental exposure of the service users, members of the multi-professional healthcare team, and/or individuals of the public, with registration and notification of the accident.[7] These requirements are intended to promote health protection of the multi-professional team and of the service users against possible radiobiological damage. The service researched has an Internal Commission for the Prevention of Accidents and is supervised by municipal, state and national sanitary surveillance organs. Since 2003, the institution has a Hospital Sanitary Surveillance Center, which has a permanent technical-scientific nature, and should assist the National Health Surveillance Agency in obtaining qualified information about adverse events and technical complaints of health products, including diagnostic equipment.

Two categories emerged from this study: Participation of the multi-professional healthcare team in the RPP, and implementation of the RPP by the multi-professional team. They provided important reflections towards the understanding of RP, RPP, and continuing education by the hospital staff.

Category 1 - Participation of the multi-professional healthcare team in the Radiation Protection Program

The participation of the multi-professional healthcare team in the RPP is represented in Figure 1.

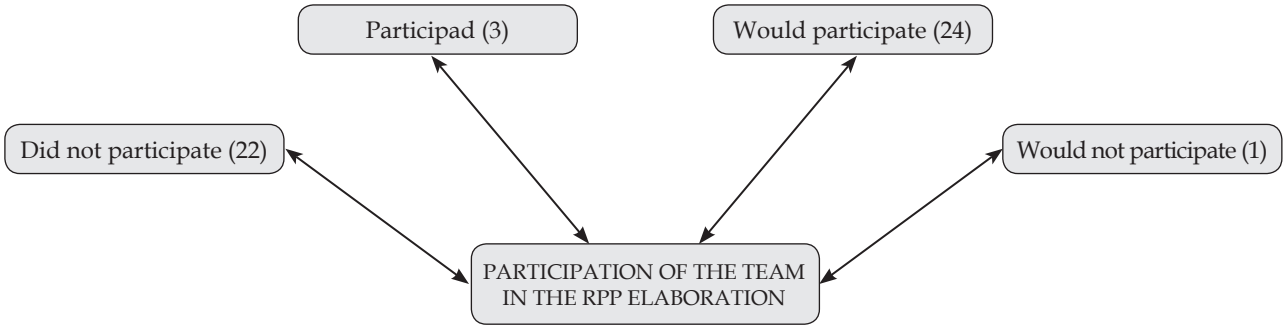

Figure 1 - Participation of the multi-professional healthcare team in the elaboration of the Radiation Protection Program

The reasons for non-participation are indicated in the following statements.

I did not really participate. There was a period that [Thorium] was here in the service controlling X-ray films waste. Thus, we had to specify the reason for the waste. Today it is digitalized, and we do not follow this system (Radium).

I've been here for almost a year now and I do not know the RPP, I had no explanation about it when I came in here. Now we have a pregnant colleague and she was told not to enter the room because the doors are not armored, so I have doubts about this shield (Gallium).

Many people have not participated in the preparation of the RPP, and this is a reason for uncertainty and unsafety about the RP of this service. The previous statements show that the institution

does not strictly comply with Ordinance 453/98, which emphasizes, in item 3.9, the existence of a periodic training and updating program, about RP in the RPP, for all the staff working in the service.[7] Interviewees who participated in the preparation of the RPP also showed incipient and fragmented knowledge on the subject.

I participated in the elaboration, because we needed to conform to Ordinance 453 and to know what it was about (Gadolinium).

I participated a little. My job was to find equipment specifications, a list of those that used a dosimeter [...]. *I had a question at that time, because my dosimeter came with a change, and I did not even work inside the rooms with X-ray equipment. I imagine this happened because the door of a room, which was in front of mine, had a problem and did not close completely* (Uranium).

We need a professional here, a radiologist, a radiology technologist, a medical physicist, who has the knowledge about radiological protection and makes everyone put what is in the RPP into practice (Cobalt).

The professionals that participated in the preparation of the RPP proved the lack of knowledge of the legislation that requires this document to license the services that use IR-emitting equipment. Furthermore, they show that they had little contact with Ordinance 453. They were obliged to study and prepare the RPP of the institution only when the Sanitary Surveillance demanded it, and to prepare the document they requested the assistance from a radiology technologist who had disciplines during his academic training that addressed RP and RPP.

Some professionals answered that they would participate in the elaboration of the RPP if they had been invited, except one, who used the lack of time as an argument not to participate.

I do not work only here, I do not have much time to spare, I have a family and small children, I do not know if I would participate. Moreover, I know almost nothing about this RPP (Gallium).

The unavailability of time, that is, the work overload to which the professional is submitted is one of the reasons that may have contributed to this report. In addition, the results show that there was little participation in the process of RPP implementation by the multi-professional team, a fact that generated category 2.

Category 2 - Implementation of the Radiation Protection Program by the multi-professional team

The reasons why the professionals did not participate in the implementation of the RPP are presented in Figure 2.

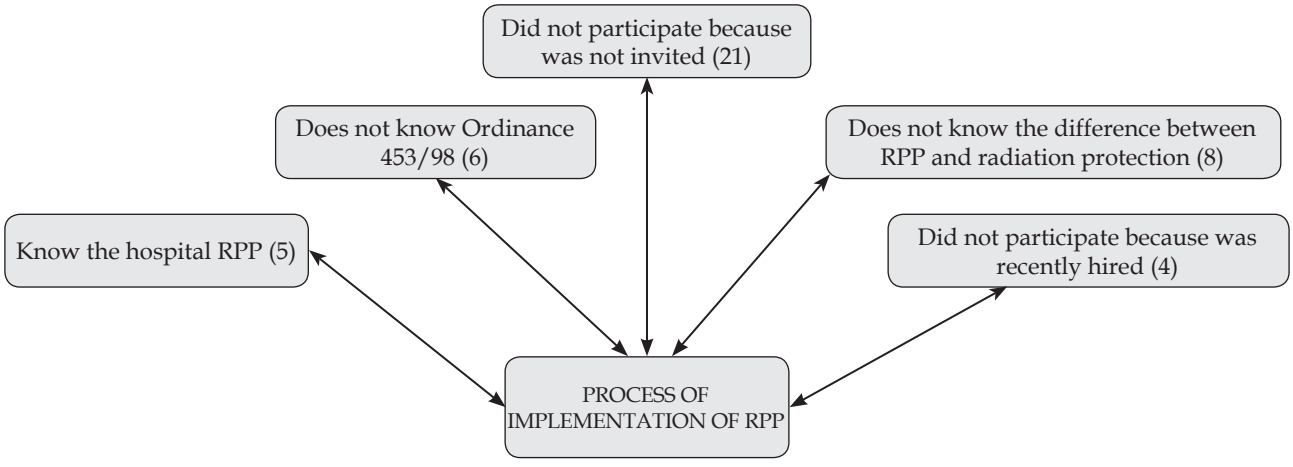

Figure 2 - Reasons why they did not participate in the implementation of the Radiation Protection Program

In the following speech, we verified the group that identified itself as uninvited:

[...] *I did not participate because I was not invited* (Radium).

Those who believe they did not participate because they had recently started in the service state that they did not know about the RPP or RP legislation during their training, nor did they receive any information when they started the

service. Their speeches emphasize the importance of training at the beginning of the work, since they are allocated in an environment that has IR-generating equipment.

I do not know the RPP specifically, I have already read about protection, but because of a test for entering an institution [...]. *We have a general notion* [...]. *The peers who have been here longer have instructed the newer ones* [...]. *Nobody in charge for this talked to us, said something specific about RP, what I think should have taken place on the first day, before entering that door* [...]. *Have you seen how many are using a dosimeter? I'm not wearing it, I'm careless. If you do not use it, it will not even have radiation registered. So, is everything ok in the radiology department? No, I think they have to check the use of the dosimeter. Those in charge did not say that we had to use the dosimeter. I wore where I thought I might be exposed. In the CT room, where we stay in the control station, I do not usually use it and I'm aware that I have to* (Cesium).

I know there is a radiation protection sector back there, but I did not receive guidance on protection and RPP [...]. *Only what I read, what the colleagues pass, but nothing official* (Beryllium).

There was a lecture of how the theoretical and practical activities that we carry on would be, but nothing specifically about RP. I studied more by myself, precisely because I know that I will be exposed to radiation, because I am a little interested in the area (Iodine).

The professionals demonstrate some discrepancy regarding the RP sector, understanding that it is external to the radiology service, and they assign this to the lack of official information. Some professionals have demonstrated that they do not understand the difference between RP and RPP.

RPP had to have RP as well [...]. *We need an awareness course with technical personnel, because there was a course in the hospital, but not for training, it was to improve the salary, the hospital was never concerned with a course of specialization, training or clarification, I have never seen it, it is necessary. It would be nice to have an annual course, with experienced physicists, doctors, radiologists, technologists and technicians* [...]. *This is also protection, it is not directly protecting, but it is raising awareness* (Polonium).

We have the protectors and something descriptive in terms of descriptive memorial, of the devices and radiology, and the SOP, the Standard Operating Procedure, which has been done recently. But in terms of RPP, nothing (Thallium).

Others do not recognize themselves as participants in the process, perhaps for lack of encouragement and knowledge, as the following statement demonstrates.

As far as I know, I've never been asked to participate. A long time ago there was a team that really cared about this, it was an employee of the Federal Technical School, she called for meetings, showed projects and our rights, but this was a long time ago. We also gave our opinions. It is important because she guided us and kept us aware of situations (Polonium).

Among the professionals who express knowledge about the RPP, there are exactly the ones who elaborated the document.

We started, we founded the DM that did not exist here in the X-ray department, surveying the equipment, age, all the technical specification of the machines, of all rooms, radioprotection, isolation, distance, room size, if it had barium, lead; we put personal protective equipment (PPE) on the floors, we renewed the individual protection material, and monitored dosimeters of X-rays, hemodynamics, angiography, surgical center, all personnel were involved. This was 8, 10 years ago, I think (Cobalt).

I volunteered to help in the setup of an RP department, and a DM and RPP. As I was already aware because of my training, I was able to help [...] (Polonium).

Some participants believe that the fact that they were hired recently was a reason for not participating in the implementation of the RPP.

I've been here for a short time, I imagine that the dosimeter control is part of a larger program, a control program, and that, to me, means that someone must be in control. [...] *during this period I did not know what dose of radiation I was exposed to, this feedback I haven't had yet. I think the control program must have that answer as well. I gave my name to receive the dosimeter, nothing more.* [...] *There should be a committee taking care of it* [...], *specifically which professional should take care of, with knowledge of the part regarding work medicine and safety* (Iodine).

Therefore, in every RPP implementation process, few professionals participated, and this is perhaps the reason for the difficulty in their existence and effectiveness in the hospital work routine.

DISCUSSION

The multi-professional team that works with equipment becomes responsible for the RP of these environments and for the elaboration of an effective RPP that meets the needs of all.

In order to reflect on the RP, it is important to remember that, in radiology services, the intention

is to perform a precise, quality and safe examination.[13] Because in these settings the presence of IR is constant, the need to know the possible damages is essential to guarantee the RP of professionals, patients and companions.

It is noticed, by the subjects' speeches, that there is still an inadequate knowledge about what an RPP is. What exists in the service is a document based on legislation, elaborated by necessity and imposition of the inspection body, leading to important weaknesses in the service, as well as a lack of socialized information.

In addition, some professionals do not understand the difference between RP and RPP, i.e., they do not understand that RP is the act of protecting oneself, others and the environment against IRs, and should occur whenever there is exposure to radiation, whereas the RPP is the document that is part of the DM, recommended by the Ministry of Health to ensure the operation of radiology services. The RPP should contain important information about the service, including a list of the staff, with their respective functions, data of those in charge for the service (Supervisor of radiation protection – SRP, and Technician in charge - TC), behavioral information for possible occurrences of accidental exposure of users, members of the multi-professional healthcare team, or individuals from the public, and the description of PPE with their respective quantities per room.[14] Thus, the RPP includes not only information about RP, but also other important items that refer to the radiology service.

Besides the difficulty in differentiating RP and RPP, the professionals raised the issue of the use of the dosimeter, showing concern about knowing the radiation dose received monthly, and at the same time the lack of willingness to use the radiation dosimeter. This demonstrates that they really do not understand and maybe do not try to question the function of the meter, sometimes assigning the responsibility to another subject, without placing themselves in the role of responsible for themselves and their acts.[15-16] The multi-professional team working in radiodiagnosis should take responsibility, and take the necessary precautions to minimize harmful risks. Therefore, the importance of the use of PPE and a dosimeter is emphasized for periodic evaluations.[17]

Therefore, permanent education is an important tool for the qualification/training of professionals, which is materialized in the opportunity of aggregated knowledge exchange, after the initial formation. From the identification of the reality experienced by the professionals in their workplace, and noting the deficiencies of knowledge and actions for the ideal performance of their functions, the resolution of possible flaws is pursued, in a collective way, thus allowing new knowledge to emerge. Through permanent education, the possibility of new dynamics and new spaces in this scenario can be expanded through a firmer path.[18]

To reinforce the importance of updating in the radiology sector, the Ministry of Health, based on Ordinance 453/1998, established that it is the duty of service providers to operationalize health education programs, at least annually. It also defines some themes that should be socialized, such as procedures for operating equipment, use of individual dosimeters, use of PPE for professionals, as well as for patients and companions, among others related to the safety of the department.[7]

It is necessary for institutions that have workers in contact with IR to facilitate their access to courses, as well as to provide educational materials that are updated by competent and qualified professionals in this area of knowledge. This pedagogical resource may result in good radiological safety practices.[19]

It is assumed that the lack of knowledge about the legislation that discusses the RPP and the unavailability of time to gather all the team have collaborated to show that the few that developed the RPP were the same that implemented it. Insufficient knowledge about the legislation and of RP in the training of these professionals may have been one of the factors that made it difficult for the entire multi-professional team to be involved in the implementation of the document. The very fact that one does not recognize oneself as a participant in the RPP implementation process can be attributed to the lack of professional knowledge.

The importance of companies to intercept the needs presented by professionals, and to develop methods to propose and define the paths to be developed to build healthy environments to aggregate knowledge is demonstrated. From this awareness, the success and quality of care are improved, and occupational biological effects are avoided.[20]

It should be emphasized here that the idea is not to propose that all healthcare professionals have specific training in radioprotection but that this approach should be included at some point in their training, ideally and systematically, to keep the information up to date. From this perspective, it is considered that most healthcare professionals will, at some point, face a radiodiagnostic examina-

tion, among others: when requesting examinations, performing examinations, and participating in the performance, or even while traveling in environments that have IR-generating equipment.

Difficulties found in the work of professionals, such as the lack of time stimulated by the high workloads imposed on these professionals, have proved to be determinant for non-participation during the implementation of the RPP. The concept of workloads refers to the dynamic process that involves the elements of the work process that interact with each other and with the professional's body itself.[21]

This interaction can trigger biological and psychic alterations, such as physical wear and tear, especially due to long working hours, double shifts, and occupational stress situations. In the meantime, it is necessary to emphasize the indifference of the professionals submitted to the high workloads regarding the RPP, highlighting that exactly the physically/psychically worn professional will be more subject to radiological exposure when failing to take the necessary precautions.

Analyzing the statements, it is noticed that the interviewees would be available to build the RPP of their service, which attests the interest of the team in RP. In the hospital sector, the multiprofessional teams working with IR, in terms of radiodiagnosis, organize their work in order to meet the demand for procedures, that is, the team organizes itself as requirements for examinations arise. It should be considered that for both low and high complexity imaging studies, RP should be of equal relevance.[22]

In the case of radiodiagnosis workers, it can be said that there is a technique to be followed for the acquisition of radiodiagnostic images, and this can be performed by only one professional category, but multidisciplinary integration can bring benefits to more accurate diagnoses, that is, exchange of experience and knowledge among professionals from different areas, which adds value to the diagnoses and consequently to patients.

Radiodiagnosis should not be treated as a puzzle game, in which all parts can be manipulated by trial and error. Diagnostic imaging tests serve to attest clinical suspicions, except for screening programs, where tests are performed for the early detection of pathologies.[23]

The level of quality of diagnostic imaging services, and their consecutive role for the country's health system, are mainly related to the level of technical, scientific and ethical training of professionals and the community.[1] If the team is aware of the basic principles of RP and the provisions of Ordinance 453/98, which refer to the radiology workforce, periodic training, and all safety standards, it will be prepared to participate effectively in the preparation of the RPP at the workplace. In addition, the SRP, responsible for the elaboration and updating of the RPP, when inviting or summoning the workers to participate in the RPP, will make sure that the team can add value to the document, as well as improve the notion that each worker is also responsible for him/herself and the other.

The RPP is the document that contains rules of how to behave in case of an emergency in each radiology service, besides containing specifications for each type of IR-emitting equipment used in the radiodiagnosis department. Moreover, it is necessary to reformulate the RPP to ensure its legitimacy, since when it comes to exposure to IR, bearing in mind that each radiation received by the human beings may pose a risk to their health, the use of radiation can only occur under proven betterment to the whole society or part of it[24]. However, the lack of resources and knowledge of all the multiprofessional teams in differentiating what is specifically an RPP, what its function is within a radiology service, and what RP is, are preponderant factors to make the RPP a reality in the service.

CONCLUSION

The results of this study show that the RPP is not known by most of the multi-professional team that works in the hospital. It can be inferred that the workers would have difficulties in identifying intercurrences involving IR, as well as find quick solutions in emergency situations. However, the RPP is known by those who participated in its elaboration, although by a derisory number of members of the multi-professional team. Therefore, from this reality, it is deduced that the implementation of the RPP by the team is, precisely for this reason, compromised.

In addition, some professionals do not differentiate RP and RPP, stating that they ignore Ordinance 453/98 that deals with this subject. Thus, only those who participated in the implementation of the RPP have the understanding of what RP effectively is, and that the RPP is a document that contains, among other items, RP standards.

It should be emphasized that the interviewees would be willing to build the RPP of their service, which demonstrates the interest of the multi-professional healthcare team in RP, explaining that the exchange of experience and knowledge among profes-

sionals from different areas can add value to diagnoses and, consequently, to the service and patient care.

Finally, the importance of services carried out by committees specialized in occupational medicine, safety engineering, and internal accident prevention commissions, among other health and safety committees present in the institutions, is highlighted, to promote the participation of workers in the programs and plans for health protection; it is suggested that inspection agencies act effectively so that the RPP can achieve the objective of preserving the health integrity of professionals working in radiodiagnostic services, as well as of those who use these services.

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