

## PERCEPTION OF ONCOLOGY UNIT WORKERS ABOUT OCCUPATIONAL RISKS

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### ABSTRACT

By developing occupational activities to cancer patients, in hospital environment, implies exposing workers to intrinsic risk situations to the work process. This study aimed to identify the perceptions of workers in a team who acts in a High Complexity Center in Oncology about occupational risks, as well as ways to prevent them. It's qualitative descriptive, with the participation of fifteen professionals. Data were collected through interviews and analyzed in the view of content analysis. As a result, there were two categories: occupational hazards in the workplace from the perspective of workers and measures used to minimize exposure to occupational risks. The risks mentioned were inherent to the work process, among them the chemical hazards - which were represented by anticancer drugs, and physical ones such as ionizing radiation. The professionals knew and identified the measures of protection, as well as the importance of using them. It was concluded that directed actions of educational intervention as health education are needed to minimize worker exposure for acting more safely and have their health preserved.

**Keywords:** Occupational Health. Occupational risks. Medical oncology. Organizational policy.

### INTRODUCTION

It is important to highlight that the concern with maintaining the health of hospital workers had their start in the 70s, when researchers developed studies on occupational health noting the presence of physical, chemical, biological, ergonomic risk and accidents<sup>(1)</sup>. The identification of the presence of risk defines what complementary health reviews are necessary.

The hospital service aims to recover the health of their clients. However, this same environment favors the occupational exposure of workers to various risks, throughout working life. To develop activities in this care environment, particularly in the oncology sector, requires the exposure of workers to intrinsic hazards at work, with the potential to trigger accidents and occupational diseases, which risks may impact the workers' lives and

health<sup>(2)</sup>.

For the authors, health professionals have an increased risk of developing disease 1.5 times when compared with the general population. These can be triggered by equipment handling, exposure to pathogens and/or chemicals, physical injuries related to patient handling. Still, exposure to biological material constitutes the main cause of accidents, followed by osteo-articular muscle injuries and infectious diseases<sup>(3)</sup>.

In this context, working in health implies the daily and continuous exposure to occupational hazards. They are defined as any possibility that some element or situation, when present in the work environment or even in the work process, may cause damage to health through sickness, accident or even suffering the worker, or environmental pollution<sup>(4)</sup>. The Brazilian Labor Legislation defines risk as biological, physical, chemical and ergonomic agent, and accident at work<sup>(5)</sup>. Thus an employee who works in the

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oncology sector is exposed to daily physical risks which are constituted mainly by radiation; biological - those caused by viruses, bacteria and fungi; chemical - relating to the handling and administration of chemotherapy; and ergonomic - triggered by improper body posture and moving patients.

To minimize occupational exposure and avoid possibilities of harm is necessary that workers know the oncology sector and identify the risks created in their work environment. It is also important to acknowledge them and adopt a pro-active attitude, with a view to responsibility in this process. Employees of the health service, to reflect on the conditions and labor relations and on their action, may be more critical and aware. To do so, discussing and achieving the humanization of the environment, more specifically from the worker, implies a dialogic and critical reflection on the principles and values that guide professional practice in order to assume their status as subjects and agents of change<sup>(6)</sup>.

For effective risk reduction among health workers, prevention measures must be addressed through continuing education, qualified supervision, organization of work, provision of material resources, with the use of individual and collective protection equipment (PPE and EPC), so that the procedures indicated to customers to be made effective, by fulfilling the safety standards strictly.

The research is justified by the fact that employees of health care organizations often experience situations and forms of inappropriate work and sometimes they do not consider them as dangerous, even if scientific evidence reveals the presence of agents of occupational risks in the workplace<sup>(7)</sup>.

Thus, this study sought to identify the perceptions of workers, of a team that operates in a High Complexity Centre for Cancer Treatment, about occupational hazards and prevention methods used.

Further studies on the subject are justified by the fact that health professionals to take responsibility for patient care, sometimes forget that what they do may have risk to their own health.

## METHODOLOGY

Descriptive qualitative research conducted in a High Complexity Centre for Cancer Treatment - Centro de Alta Complexidade para o Tratamento do Câncer /CACON, attached to a large hospital - type IV, in a municipality located in the northwest of the state of Rio Grande do Sul/Brazil.

The study subjects were employees of the health service who worked in that unit. Inclusion criteria were: being part of professional staff working at CACON; to be 18 years-old and being effective in the professional team of the institution. Exclusion criteria were: being on vacation in the period of data collection, maternity and health leave. Thus, the sample consisted of 15 employees; among them are technicians and nursing assistants, nurses, social worker, nutritionist, pharmacist, pharmacy technician, sanitizer, office assistants and technical in radiotherapy.

Data collection occurred during September and October 2010, through individual and semi-structured interviews, which were audio-tape recorded, transcribed and then analyzed, they were suspended when information began to repeat<sup>(8)</sup>. They were pre-scheduled and carried out ensuring the prerogatives which involve a scientific research. The analysis of the information happened by the ordering what undertook the reading, rereading and organization of reports; data classification on the relevant aspects to the study and final analysis, in this step, the data were articulated culminating in analysis categories<sup>(8)</sup>. In order to maintain the anonymity of the subjects, it was decided to designate them from E1 to E15.

This research was approved by Research Ethics Committee (CEP) of Universidade Regional do Noroeste do Estado do Rio Grande do Sul (Unijuí), under the Opinion No. 100/2010, respecting the ethical principles of Resolution 466/2012<sup>(9)</sup>.

## RESULTS AND DISCUSSION

From content analysis of the statements of employees who work in a CACON two analytical categories emerged. The first one is about the workers' perception about

occupational risks arising from their work process. The other category discusses protective measures used by the workers in order to minimize their occupational exposure.

### **Occupational hazard in work environment under the workers' view**

Professionals who work in health services are potentially vulnerable to risks inherent in their work process, likely to have accidents and acquire diseases that can compromise their health and quality of life. Thus, workers who participate in this study have identified some risks relating to their work process, as contamination by inhalation of chemotherapy, radiation, exposure to biological and ergonomic equipment due to the repetitiveness of the tasks.

As a workplace, the hospital is recognized as an area with numerous agents with potential to trigger situations of health risks, being considered unhealthy. It is a complex environment with various work processes, interdependent, which is developed by different professional categories, which involve specific practices<sup>(10)</sup>.

In the health unit which is focus of study, because it is an oncology treatment center, chemical and physical hazards are the most present, however, the ergonomic, biological and accident risks are also present in daily lives of workers. In this sense, for the degree of risk to which all professionals are exposed, it is necessary to identify them in their work process so that they can implement specific protection measures. Thus, when asked about the risks, the interviewees highlighted the chemical risk and related them to antineoplastic drugs.

During the manipulation of chemotherapy we have direct contact with the exposure (E13).

There's a risk of contamination by chemotherapy (E15).

A review study that aimed to identify the main risks to which the nurses were exposed assists practices in oncology units found that 50% of the articles analyzed punctuated exposure and inhalation of aerosols as health risk<sup>(11)</sup>. Scientific evidence has proved that the risks from the handling of antineoplastic involve inhalation of aerosols. Direct contact of the drug with the skin and mucous membranes, as well as food intake and medicine contaminated for waste of these agents, in author's words, are in

forms of contamination, which can cause damage to the health of those people involved in the care process<sup>(11)</sup>.

There is chemical hazard in all the chemical substances present in the health work process. In regard to chemotherapy, the issue of occupational risk awakens, in general, two patterns of behavior completely opposite: on one hand, those people who believe there are no risks, and on the other hand, those ones who refuse activities in this environment<sup>(12)</sup>.

The risk of exposure occurs at any stage, from the preparation, administration and disposal of chemotherapy. The environment for chemotherapy should follow the criteria to ensure safety for the healthcare staff. So, local of preparation, storage and administration of chemotherapy should contain ventilation and exhaust systems that control the concentration of these professionals in the environment. Thus, the study subjects identified the absence of exhaust as potential risk to their health, according to reports.

Firstly we do not have exhausters. Chemotherapy is performed in a closed place [...] we use to inhale the medication all the time (E1).

According to Norm No. 32 of the Ministry of Labor and Employment, the preparation room of chemotherapy should have a biological safety cabinet, Class II B2, containing at its installation air supply needed for its operation with local and positioning that avoid air turbulence<sup>(5)</sup>. This standard establishes criteria to provide for workers the collective security devices, which minimize the dispersal of aerosols in the atmosphere and prevent the occurrence of accidents during handling.

The presence of aerosols during the stages of dilution and administration of antineoplastic makes an unhealthy environment and generates concern and fear of contamination, especially in those workers who recognize the harmful effects of these drugs. Some of the interviewees in their pronouncements referred fear volatilization of medication and lack of equipment to regulate the ambient air quality, in particular, at the place of drug administration.

The biggest risk I'm afraid of it is with regard to contamination, because the chemo, we know that it is volatile (E6).

We note the lack of exhausters, our medicines are volatile (E8).

The risks of exposure to chemotherapy drugs when they are handled improperly, i.e., without the protective measures and safety for workers and the environment, may threaten the health professional. Inhalation of aerosol in more than 10 years, regardless of time of daily contact, show a strong association between the occurrence of genetic toxicity which manifests itself by altering the cellular DNA in exposed professionals<sup>(13)</sup>.

Another occupational hazard identified is ionizing radiation, according to reports

We work with radiation in radiotherapy here, and then there is a risk (E3).

There is risk due to radiation, ionizing radiation (E4).

Physical risks can be generated by the machinery, equipment and physical conditions at workplace, such as noise, vibration, heat, ionizing radiation, among others<sup>(5)</sup>. Hidden and acting slowly, ionizing radiation causes damage to health when they don't respect rigidly precautions to avoid unnecessary exposure. Differently to what occurs in nuclear medicine, users irradiated for treatment with radiation are not radioactive and so health workers can provide assistance when making use of appropriate radiation protection measures<sup>(14)</sup>.

The same authors state that there is need to maintain permanent education actions for clarification of workers who are exposed to ionizing radiation, not only through the provision of equipment, but also through control and validation procedures of protection, both for workers and service users. However, it is observed that these workers operated in different locations and require their own specific knowledge and skills, as they play activities that provide inherent risks

In referring to biological risks, these are present in all services that provide health care. They were identified by the study subjects as the possibility of exposure to blood and biological materials. This risk factor is primarily responsible for accidents and contamination in healthcare, especially in nursing. Study corroborates to the point that the highest rate of accidents at work, affecting the nursing staff, occur with sharp materials<sup>(4)</sup>.

This fact happen because the professionals when performing activities involving direct and indirect care to patients are often exposed to infections from microorganisms present in blood and/or other body fluids<sup>(11)</sup>. In this research, only two professionals noted the presence of this group/risk factor in their work environment.

There is also biological activity in our risks. (E6)

Contact with urine, feces, blood, and also there are others in the air, viruses, bacteria containing environment (E10).

The biohazard is the most present and incident to the professionals who work in health services manifested through exposure to blood and other organic fluids<sup>(15)</sup>. Accidents which are resulting from occupational exposure to biological materials in health care workers have been considered as disturbing factor not only for the damage they cause to the institutions, but also to workers<sup>(16)</sup>.

Another risk, pointed by the subjects who joined the search, is the ergonomic risk. This occurs when there is dysfunction between individuals and their equipment in the workplace, such as intense physical exertion, repetition, poor posture, among others.

Ergonomic risks in health area have been frequent in weight lifting, both for the patients as to equipment, and improper posture in performing procedures that require greater effort and or bending of the spine<sup>(17)</sup>. In that sense, the deponents identified in their work processes the presence of ergonomic risks and they related them to the physical exertion and repetitiveness of tasks, according to reports.

There's ergonomic risk, we handle the patient very much (E2).

The work is repetitive, there's risk of "RSI" (E12).

It can be a simple thing, but you make an effort, your back hurts (E5).

Ergonomic risks are physical and organizational elements that interfere in the comfort of labor activity and, consequently, in the psychophysiological characteristics of the worker. It includes an inappropriate work occupation, ventilation and lighting that are not according to the standards proposed by the Ministry of Labor, problems related to work organization, among others<sup>(10)</sup>. Study found that ergonomic risk constitutes a challenge in the

work environment and routine of health professionals and it can be materialized in the form of health problem<sup>(17)</sup>.

So, there are various work activities that are surrounded by repetitive actions, which need to be reorganized in a way that can minimize the risks inherent to the work process of whom work there, without incurring damage to both the workers and for the institution.

### **Measures used for minimizing the exposure to the occupational hazards**

Workers who participated in the study identify the risks of their health process, and in order to avoid injuries they have used safety devices, they think it's necessary to conduct periodically health examinations and participation in continuous education. The risks in the work process in some environments are not amenable to total elimination. Thus, it was sought to minimize them and preserve the health of workers through the maintenance of tolerable risk, i.e., to maintain the balance between the development of the task and maintaining the health of those who execute it<sup>(5)</sup>. This balance is the responsibility of the company, which should provide adequate physical environment and necessary for the protection of equipment involved in the process as well as the worker who must comply with the safety standards<sup>(5)</sup>.

To reduce the probability of injuries to the worker at hospital as well as to eliminate or minimize the possibilities of occurrence of incidents and accidents, many institutions have adopted a series of actions of individual and collective level. This occurs through the implementation of Specialized Service in Safety Engineering and Medicine - SESMT and Internal Commission for Accident Prevention - CIPA, for the safety in the workplace has the principle of security of life and health of employees of the institution<sup>(5)</sup>, through actions to protect workers, that if they have been obeyed, they can significantly reduce the presence of hazards, accidents and occupational diseases. Such actions are established through collective and individual protection.

The protections are collective actions that aim to minimize and protect one or more people in the workplace. The individual protections seek to protect only one worker, by equipping him/her safely through the Personal Protective Equipment (PPE). The Norm (NR) Paragraph 6 states that the

PPE is every device or product for single use, used by the worker, with a view to protection of health problems that may threaten the health and safety at work. These devices should be used whenever the general measures do not provide complete protection against the risk of accidents and damage to health workers<sup>(5)</sup>.

When asked about the security measures used to minimize exposure to risks identified by them in their work environment, workers reported use of PPE, especially in situations that they have to use it.

...To keep PPE at the time of puncture, at the time that you are in contact of any chemotherapy (E1).

Every work activity has generating potential risk for whom that acts it. In this sense, the use of safety devices is essential and should be part of everyday life for all workers, in order to prevent damage to health.

The equipment is very important to the performance of activities in health, in particular in oncology, because it ensures standards of safety and decreases the likelihood for complications to happen, both for the professional who is assisting and for the patient assisted<sup>(2)</sup>. In the institution focus of study, the interviewees reported they have available safety devices.

We have all PPE, gloves, safety glasses, lab coat and mask (E8).

We have the PPE which are gloves, masks, depending on what you're doing... until the glasses (E10).

According to Norm paragraph 6 of the Ministry of Labor and Employment, every company is required to provide to employees, free of charge, PPE appropriate to the risk in perfect condition and functioning<sup>(5)</sup>. Proper selection of PPE will favor both: the worker will feel himself with added protection against scratches, and the company will reach their goals regarding the prevention of health hazards to workers<sup>(18)</sup>.

Work accidents among health professionals bring losses to the institution and especially for the collaborator. In this sense, it is important that the institution intensify actions for continuing education, as well as checking their use.

Another measure of protection that the institution must implement is the assessment of workers' health to identify early subclinical

changes. This is done through the Medical Control of Occupational Health Program (Programa de Controle Médico de Saúde Ocupacional /PCMSO) as Norm No. 7<sup>(5)</sup>. This program recommends occupational health examinations, admission, periodic, return of work, role change and dismissal, with the worker's right to know the results of the evaluations submitted.

The periodicity in the examinations, as Ordinance No. 3214/78 of the Ministry of Labor and Employment, is related to risk exposure and age of the employee, and may be semi-annual, annual or biannual<sup>(5)</sup>. Thus, in the sector in which the study was conducted, the health assessments should be semi-annual, according to the Legislation. Importantly, the professionals involved in the work process knowledge expressed about the need to conduct health checks periodically, as evidenced in the testimonials.

We must have periodic examination in every six months (E3).

We have examinations in every the six months. And we check if it's alright (E4).

Every six months it is collected blood for a CBC routine. (E5).

When entering in the health field, in the first assessment, the worker must be submitted to physical and laboratory examinations, in order to meet his current and past medical history and identify possible previous exposure to drugs and radiation. Importantly to evaluate the hematologic, hepatic, renal, oncology and reproductive conditions and current status of vaccination status. Physical examination for those wishing to work in the oncology sector should be complete, with emphasis on evaluation of the skin, mucosa, cardiovascular and respiratory systems, liver and lymphatic system. And reviews every six to 12 months<sup>(12)</sup>.

In oncology, due to the specificity, all workers must carry the same health monitoring with regard to routine examinations. The interviewees showed that they are aware of the necessity of monitoring their health condition; however they realized the gap in service that has the responsibility to comply with labor laws. Given the reports of some of the interviewees, it is evident that the periodic examinations are not being performed at the recommended intervals.

They talked to the staff of SESMT and they said there was no need to do these tests, so I've been here one year and four months and I never did (E6).

When I started to work here we had examination in every three, six months, and now there has been more than one year we haven't made it yet (E8).

We used to have examinations in every six months. Now, lately, we don't have it anymore, they have not called us to this (E7).

Another aspect highlighted by respondents is referred to the lack of periodic training regarding the use of PPE and risks in different workplaces.

I did not have training, it was over working time that I've learned (E9).

There will be 5 years that I'm here and I think I had once (E1).

Educational activities in the work environment must be understood as a joint possibility which prevail in the growth and modification of reality. Therefore, it is important to involve the worker as a subject in the educational process activities. It is still necessary to invest not only in technical and scientific training of professionals, but also in the formation of a citizen with critical and reflective thinking<sup>(19)</sup>. This measure describes the work process and enables the worker to develop critical view of their inclusion in the workplace. To do so, developing actions with emphasis on education in healthcare environments is essential if the worker incorporates the standard precautions with a view to safe practices.

## CONCLUSION

The study allowed us to understand the perception of employees of a Centre of Oncology about occupational risks and preventive measures adopted by them.

It was evident that the health team highlighted with emphasis the chemical risk related to the use of antineoplastic and physical risk related to ionizing radiation. With less emphasis, they cited biological and ergonomic risk. The possibility of an accident at work was not mentioned by the interviewees.

For measures used with a view to protecting health, the respondents mentioned the use of

collective and individual security devices as well as the need for periodic health assessments. However, they highlighted the lack of periodic assessments of their health, through the evaluation of laboratory tests. It was also highlighted as incipient the educational activities focused on prevention, protection and maintenance of health.

The results of this study indicate gaps both in regard to legal enforcement actions as workers' knowledge about their working process, highlighting the need for occupational health team to be more present and active in the actions of occupational health.

## PERCEPÇÃO DE TRABALHADORES DE UMA UNIDADE ONCOLÓGICA ACERCA DOS RISCOS OCUPACIONAIS

### RESUMO

Desenvolver atividades ocupacionais com pacientes oncológicos, em ambiente hospitalar, implica na exposição dos trabalhadores a situações de risco intrínsecos ao processo de trabalho. Estudo objetivou identificar a percepção dos trabalhadores, de uma equipe que atua em um Centro de Alta Complexidade em Oncologia, acerca dos riscos ocupacionais, bem como as formas de prevenção adotadas. Qualitativo descritivo, com participação de quinze profissionais. Coleta de dados foi por meio da entrevista e analisados a luz da análise de conteúdo. Como resultado teve-se duas categorias: Riscos ocupacionais no ambiente de trabalho na ótica dos trabalhadores e, medidas utilizadas para minimizar a exposição aos riscos ocupacionais. Os riscos apontados foram inerentes ao processo de trabalho, dentre eles destacaram-se os químicos, representados pelas drogas antineoplásicas, e, os físicos, referidos pelas radiações ionizantes. Os profissionais conheciam e identificavam as medidas de proteção, assim como a importância de utilizá-las. Concluiu-se que ações de intervenção educativa direcionadas como educação à saúde são necessárias para minimização da exposição do trabalhador para que atue com maior segurança e tenha sua saúde preservada.

**Palavras-chave:** Saúde do trabalhador. Riscos ocupacionais. Oncologia. Política organizacional.

## PERCEPCIÓN DE LOS TRABAJADORES DE UNA UNIDAD ONCOLÓGICA EN RIESGOS LABORALES

### RESUMEN

Desarrollar actividades ocupacionales con los pacientes oncológicos en el entorno hospitalar, implica la exposición de los trabajadores a situaciones de riesgo intrínsecos al proceso de trabajo. Estudio tuvo como objetivo identificar la percepción de los trabajadores de un equipo que trabaja en un Centro de Alta Complejidad Oncología sobre riesgos laborales, así como las formas que adopta la prevención. Cualitativo descriptivo, con participación de quince profesionales. Recopilación de datos a través de entrevista y analizados a la luz de la análisis de contenido. Como resultados se obtuvo dos categorías: los riesgos laborales en el lugar de trabajo desde la perspectiva de los trabajadores y medidas utilizadas para minimizar la exposición a riesgos laborales. Los riesgos mencionados fueron inherentes al proceso de trabajo, entre ellos se destacaron los químicos representados por medicamentos antineoplásicos, y los físicos por la radiación ionizante. Los profesionales conocían y identificaban las medidas de protección, así como la importancia de su utilización. Se concluyó que se necesitan acciones dirigidas intervención educativa como la educación sanitaria para reducir al mínimo la exposición del trabajador a actuar con mayor seguridad y han preservado su salud.

**Palabras clave:** Salud laboral. Riesgos laborales. Oncología médica. Política organizacional.

## REFERENCES

1. Amaral MH, Pinheiro, MP, Cava AM. Riscos inerentes ao trabalho da equipe multiprofissional na Unidade de Terapia Intensiva. *Acreditação*. 2011;1(1):29-45. [https://www.google.com.br/search?q=Riscos+inerentes+ao+trabalho+da+equipe+multiprofissional+na+Unidade+de+Terapia+Intensiva&oq=Riscos+inerentes+ao+trabalho+da+equipe+multiprofissional+na+Unidade+de+Terapia+Intensiva&aqs=chrome..69i57.1642j0j8&sourceid=chrome&espv=210&es\\_sm=122&ie=UTF-8](https://www.google.com.br/search?q=Riscos+inerentes+ao+trabalho+da+equipe+multiprofissional+na+Unidade+de+Terapia+Intensiva&oq=Riscos+inerentes+ao+trabalho+da+equipe+multiprofissional+na+Unidade+de+Terapia+Intensiva&aqs=chrome..69i57.1642j0j8&sourceid=chrome&espv=210&es_sm=122&ie=UTF-8).
2. Nascimento L, Loro MM, Stumm EMF, Kirchner RM, Rosanelli CLSP, Kolankiewicz ACB. Occupational risks

- of nursing work in an oncology unit. *Rev enferm UFPE [on-line]*. 2011;5(6):1403-410. <http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/viewArticle/1637>.
3. Miranda FM, Stein J, Von A, Petri S, Pires MR, Soares LG, Ribeiral BN, Saquies LMM, Feli VEA, Oliveira MCLX. Uma contribuição à saúde dos trabalhadores: um guia sobre exposição aos fluidos biológicos. *Rev Esc Enferm USP*. 2011;45(4):1018-22. <https://www.google.com.br/#q=Uma+contribui%C3%A7%C3%A3o+%C3%A0+sa%C3%BAde+dos+trabalhadores%3A+um+guia+sobre+exposi%C3%A7%C3%A3o+aos+fluidos+biol%C3%B3gicos>.
4. Silva EJ, Lima MG, Marziale MHP. O conceito de risco e os seus efeitos simbólicos nos acidentes com instrumentos

- perfuro cortantes. *Rev bras enferm.* [on-line]. 2012; 65(5):809-814. Disponível em: <https://www.google.com.br/#q=O+conceito+de+risco+e+os+seus+efeitos+simb%C3%B3licos+nas+acidentes+com+instrumentos+perfurocortantes>.
5. Ministério do Trabalho (BR). Normas regulamentadoras: segurança e medicina do trabalho. São Paulo: Atlas; 2013.
6. Fontana, RT. Humanização no processo de trabalho da enfermagem: uma reflexão. *Rev. Reme.* 2010;11(1):200-7. Disponível em: <http://www.revistarene.ufc.br/revista/index.php/revista/artic le/view/364/pdf>.
7. Valente GSC, Nogueira JRM. The regulatory standard 32 and nursing care in the emergency service of a teaching hospital. *J Nurs UFPE on- line* [on-line]; 2012. Sep [citado 2013 ago]; 6(9):2103-10. Disponível em: <https://www.google.com.br/#q=The+regulatory+standard+32+and+nursing+care+in+the+emergency+service+of+a+tea ching+hospital>.
8. Bardin L. Análise de conteúdo. Trad. Luís Antero Reto e Augusto Pinheiro. Lisboa: Edições 70; 2008.
9. Comissão Nacional de Ética em Pesquisa (BR). Resolução Nº 466, de 12 de dezembro de 2012. Conselho Nacional de Saúde: Brasília (DF); MS; 2012.
10. Queiroz SG. Condições de trabalho e saúde dos enfermeiros em oncologia. Dissertação [Mestrado], Rio de Janeiro: Universidade do Estado do Rio de Janeiro; 2008.
11. Oliveira ADS, Alves AEC, Silva JA, Oliveira LFS, Medeiros SM. Occupational risks of the nursing team's exposure to chemotherapeutic agents: integrative literature review. *Rev enferm UFPE* [on-line]. 2013 March; 7(1):794-802. Disponível em: <https://www.google.com.br/search?q=Occupational+risks+of+the+nursing+team's+exposure+to+chemotherapeutic+agents%3A+integrative+literature+review&oq=Occupational+risks+of+the+nursing+team's+exposure+to+chemotherap eutic+agents%3A+integrative+literature+review&aqs=chrome..69i57.2319j0j8&>.
12. Bonassa EMA, Santana TR. Enfermagem em terapêutica oncológica. 3a ed. São Paulo: Atheneu; 2005.
13. Silva LF, Reis PED. Avaliação do conhecimento da equipe de enfermagem sobre riscos ocupacionais na administração de quimioterápicos. *Rev bras cancro.* 2010; 56(3):31-20. <https://www.google.com.br/search?q=Avaliação+do+conhe cimento+da+equipe+de+enfermagem+sobre+riscos+ocupac ionais+na+administração+de+quimioterápicos.&oq=Avalia ção+do+conhecimento+da+equipe+de+enfermagem+sobre +riscos+ocupacionais+na+admin>
- ção+do+conhecimento+da+equipe+de+enfermagem+sobre +riscos+ocupacionais+na+admin.
14. Flôr RC, Gelbcke FL. Tecnologias emissores de radiação ionizante e a necessidade de educação permanente para uma prática segura da enfermagem radiológica. *Rev bras enferm.* 2009; 62(5):766-70. Disponível em: <https://www.google.com.br/search?q=Tecnologias+emissor as+de+radiação+ionizante+e+a+necessidade+de+educação +permanente+para+uma+prática+segura+da+enfermagem+r adiológica&oq=Tecnologias+emissor+de+radiação+ioniz ante+e+a+necessidade+de+educação+permanente+para+u ma+prática+segura+da+enfermagem+r>.
15. Galon T, Marziale MHP, Souza WL de. A legislação brasileira e as recomendações internacionais sobre a exposição ocupacional aos agentes. *Rev bras enferm.* 2011; 64(1):160-7. Disponível em: <http://www.google.com.br/search?q=A+legislação+brasileir a+e+as+recomendações+internacionais+sobre+a+exposição +ocupacional+aos+agentes&oq=A+legislação+brasileira+e +as+recomendações+internacionais+sobre+a+exposição+o cupacional+aos+>.
16. Ramos CM, Santos RI. Acidente de trabalho com exposição à material biológico e o anti-hbs como resposta imunológica à vacina contra hepatite B. *Omnia Saúde.* 2012; 2:5-28. <https://www.google.com.br/#q=Acidentes+resultantes+de+exposi%C3%A7%C3%A3o+ocupacional+a+materiais+biol%C3%B3gicos+para+trabalhadores+da+%C3%A1rea+de+sa%C3%BAde+t%C3%AAm+sido+considerados+fator+pr eocupa>
17. Souza CS, Lima JLS, Antunes CE, Schumacher KP, Moreira RCS, Almeida NT. Riscos ergonômicos ósteo-mioesqueléticos na equipe de enfermagem em âmbito hospitalar. *Enfermeria Global.* 2011; 23:264-76.
18. Lopes ILP, Toffano SEM, Hayashida M, Canini SRMS, Cruz EDA, Reinato LAF, Gir E. Exposições acidentais com material biológico potencialmente contaminado envolvendo graduandos de enfermagem do último ano. *Rev Eletr Enf.* 2011 out-dez; 13(4):751-7. [HTTP://scielo.isciii.es/pdf/eg/v10n23/pt\\_revision1.pdf](http://scielo.isciii.es/pdf/eg/v10n23/pt_revision1.pdf).
19. Jesus MCP, Santos SMR, Merighi MAB, Oliveira DM, Figueiredo MAG, Braga VA. Vivência do estudante de enfermagem em atividades de Educação em saúde. *Cienc cuid saúde.* 2012 jul-set; 11(3):436-444. <http://www.periodicos.uem.br/ojs/index.php/CiencCuidSau de/article/view/11516/pdf>.

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