



# A Qualitative Study: Determination of the Working Conditions and Knowledge Levels of Oncology Nurses in Terms of Employee Safety

Rujnan Tuna<sup>1\*</sup> and Ulku Baykal<sup>2</sup>

<sup>1</sup>Department of Nursing, Faculty of HealthSciences, Istanbul Medeniyet University, Ünalın Mahallesi, Ünalın Sokak, D-100 Karayolu Yanyol, Üsküdar, Istanbul, 34700, Turkey

<sup>2</sup>Florence Nightingale Faculty of Nursing, Department of Nursing Administration, Istanbul University, Abide-i Hürriyet Caddesi, Sisli, Istanbul, 34381, Turkey

## Abstract

**Background:** The antineoplastic drugs used in cancer treatment directly have adverse effects on health of both patients receiving the treatment and oncology nurses preparing and administering the treatment. The purpose of this study is to determine the working conditions of the oncology nurses in terms of employee safety as well as their knowledge levels regarding the safe use of antineoplastic drugs.

**Methods:** This is a qualitative study conducted with 25 oncology nurses in a phenomenological design. The data obtained were analysed by using the content analysis.

**Results:** The results of the study were gathered under 3 main themes; employee safety (sub themes-safe use of the antineoplastic drugs, health problems, health checks, waste management), working conditions (sub themes-working and resting hours,salary) and training (sub themes-orientation, chemotherapy preparation certificate, continuous training).

**Conclusion:** As happens all over the world, there have also been policies and standards regarding the safe use of antineoplastic drugs in Turkey; however, it is found that they remain insufficient to put into practice.

## Introduction

It is indicated that the antineoplastic drugs used in the treatment of cancer, the incidence of which is increasing every passing day in the world have numerous adverse effects; and affect directly and negatively the health of the healthcare staff preparing and administering the treatment and especially the oncology nurses as well as the patients receiving the treatment [1-3].

Even though it is requested that the antineoplastic drugs used in cancer treatment affect only the cancer cells without harming the normal tissues, it is indicated that these drugs have many negative effects such as mutagenic, carcinogenic, and teratogenic [2-6].

There are many standards that are developed and applied for the safe use of the antineoplastic drugs that threaten the health of healthcare staff. One of them is principles and standards developed by Occupational Safety and Health Administration-OSHA, and National Institute for Occupational Safety and Health-NIOSH [7-9]. In Turkey, the "Guideline of Safe Use Standards of Antineoplastic Drugs" developed by the Association of Oncology Nurses in 2003 and updated in 2009 is present [10].

The studies conducted in the world and in Turkey revealed that the standards for the safe use of antineoplastic drugs were developed; however, it remains insufficient to put these standards into practice despite the fact that oncology nurses had an increased knowledge level about the issue every passing day [11-13].

In oncology units, several circumstances such as critical decision-making, managing the treatment having serious side effects, monitoring patients having pain and suffering, terminal care, emotional difficulties with patients and conflicts within the team can cause stress. Burnout syndrome often occurs as a result of chronic work stress seen in these units. As a result, it can be said that job stress and accordingly burnout levels of oncology nurses increase day-by-day [14-18].

## Publication History:

Received: February 10, 2017

Accepted: April 05, 2017

Published: April 07, 2017

## Keywords:

Antineoplastic drug, Employee safety, Nurse, Oncology

This study was conducted in the qualitative design for the aim of determining working conditions of the oncology nurses in terms of employee safety as well as their knowledge levels regarding the safe use of antineoplastic drugs.

## Material and Methods

### Study design

This is a qualitative study conducted in the phenomenological design. Phenomenological studies reveal thoroughly the phenomena, which we are already aware of, but we ignore, in details [19, 20].

### Sample

Purposeful sampling method was used to carry out the interviews [20]. The study was conducted with 25 oncology nurses who were working in an oncology centre in the city of Istanbul and agreed to participate in the study, and had oncology experience for at least a year.

### Ethical Considerations

The data of the study began to be collected following the institutional approval (no. 37227) and the ethics committee approval (no. 8238) from the ethics committee of Istanbul University, Cerrahpasa Faculty of Medicine in Istanbul.

**\*Corresponding Author:** Dr. Rujnan Tuna, Department of Nursing, Faculty of HealthSciences, Istanbul Medeniyet University, Ünalın Mahallesi, Ünalın Sokak, D-100 Karayolu Yanyol, Üsküdar, Istanbul, 34700, Turkey; Tel: +902162803153; E-mail: [rujnantuna@yahoo.com](mailto:rujnantuna@yahoo.com)

**Citation:** Tuna R, Baykal U (2017) A Qualitative Study: Determination of the Working Conditions and Knowledge Levels of Oncology Nurses in Terms of Employee Safety. Int J Nurs Clin Pract 4: 231. doi: <https://doi.org/10.15344/2394-4978/2017/231>

**Copyright:** © 2017 Tuna et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Data collection

The study was carried out by a researcher and a research assistant. Before initiating the data collection for the study, the interview questions prepared by the researchers were evaluated by three field specialists. Then, the preliminary pilot application of the study was executed with randomly selected 5 oncology nurses and they were asked to respond to open ended questions. Therefore, the data were obtained for the structuring of the questions and interviews (Table 1).

How many years have you been working in the oncology unit?
Do you have job description, standards for preventive measures and practice guidelines? If you have these, do you use the mor not? If your answer is 'no', what are your suggestions or solutions?
Have chemotherapeutic drugs been prepared in the oncology unit by nurses? If your answer is 'yes', is there taken sufficient protective measures? If your answer is 'no', what are your suggestions?
Is your working conditions satisfactory for the oncology unit (employee safety, health controls, waste management, working conditions, salary, tarining etc.)?
Have you started to experience with health problems after begining to work in this unit? If your answer is 'yes', what is your recommendations to solve this problem?
Is there taking sufficient measures during the waste managemet? If your answer is 'no', what is your recommendations?
Are you taking sufficient salary in this unit or not? Are you getting a pay gap compared to other units?

Table 1: Interview Questions.

The individual, in-depth, and semi-structured face-to-face interviews continued until a new data was not obtained. The interviews lasted for averagely 51 minutes between 45 and 60 minutes, between August and October 2015.

## Data analysis

Qualitative content analysis approach was used for the analysis of the obtained data in the study [21]. The correlated concepts were unified under a certain theme.

Analysis of qualitative data was gone through the following stages (Table 2).

## Validity

In order to provide the validity and accuracy of the data obtained as a result of the interviews, the obtained analysis were confirmed by the oncology nurses, participating in the study, with the transcription texts through face-to-face interview [20].

## Results

When examining the demographic data of 25 oncology nurses included in the study, it was determined that their average age was 33.40±8.27, and their average of working years in the oncology unit

Familiarisation with the data through review, reading, listening etc
Transcription of tape recorded material
Organisation and indexing of data for easy retrieval and identification
Coding (may be called indexing)
Identification of themes
Re-coding
Development of provisional categories
Exploration of relationships between categories
Refinement of themes and categories
Development of theory and incorporation of pre-existing knowledge
Testing of theory against the data
Report writing, including excerpts from original data if appropriate (eg quotes from interviews)

Table 2: Analysis stages.

1. Employee Safety	2. Working Conditions	3. Training
Safe use of antineoplastic drugs	Working and resting hours	Orientation
Health problems	Salary	Certificate for chemotherapy drug preparation
Health checks		Continuing training
Waste Management		

Table 3: ThemesandSub-themes.

## Employee Safety

### Safe use of the antineoplastic drugs

The interviewed oncology nurses stated that the protective measures related to the safe use of the antineoplastic drugs were insufficient.

Interview 21 stated that the antineoplastic drugs were not prepared under appropriate conditions and not suitable for employee health and safety and this situation made her uneasy.

“We do currently have a B class safety cabinet but everything other than this cabinet are insufficient. The drugs need be prepared in a closed environment with negative pressure and no air flow by taking protective measures. However here, the setting where we prepare the drugs has continuous contact with the external environment, its door is always open and everyone can easily come in and go out there. It makes me uneasy” [Interview 21].

Interview 14 stated that the inability to continue the administration of antineoplastic drugs with a closed system caused her to worry about her own health.

“The serum sets of a drug, prepared with a closed system, should also be in accordance with the closed system. However, the antineoplastic drugs are prepared with the closed system and administered with the open system. As a result, while the drug is administered to the patient with the open system, it can leak and drop to the floors. I am worried about my own health” [Interview 14].

## Health problems

Interviewer 5 and 6 stated that the immune system had fallen after starting work in this department. Therefore, they expressed that they did not want to work in this unit and did not enjoy their work.

"It is like there is never a time I do not have blister on my lips during the time I work in the chemotherapy unit because my body resistance is low. I feel also chronic fatigue. I do not enjoy my work anymore" [Interview 5].

"Also, I have suffered from serious skin problems on my face during the first two years of working in this unit. I wish we were not working in this unit" [Interview 6].

Most oncology nurses participating in the study are concerned that the health problems they experience are due to inadequate working conditions in this unit. They said that this caused them anger and exhaustion.

"I had toxic hepatitis and no one was able to figure out the reason. Maybe, it depends upon the chemotherapy drugs, but no one knows that either. This situation is consuming me" [Interview 1]

"Now I have chronic fatigue and additionally, I also have leukopenia, the reason of which was not yet found somehow as well as having low haemoglobin values. I am nervous about working in this unit." [Interview 8]

"There is no one in my family who has breast cancer or fibro cystic breast history, but unfortunately, I developed fibrocystic breast case. I am unhappy and anger. I believe they are because of this unit." [Interview 25]

"I frequently had urinary tract infections since starting to work in this unit. I took a treatment for five years seriously and I am afraid that this incident will recur." [Interview 22]

## Health checks

In the interviews carried out with the nurses in the oncology department, it was stated that no health screening took place for the unit. Interview 15 stated that this situation makes her feel worthless.

"I think the health screenings carried out in the unit are insufficient. As the health screening, only routine blood tests are done and chest x-rays are taken for the last few years just as examinations carried out in other units. I feel so worthless myself." [Interview 15].

The interviewer stated that the health screenings were not convincing. It makes him feel worthless.

"But according to the test results, no transition or arrangement is organized for us. That's why I don't think these examinations are sufficient, nor are they valid. What are they going to diagnose based on hemogram or biochemistry result?" [Interview 12]

## Waste management

They stated that the waste management in the unit was insufficient. Nurses working in this unit expressed their belief that their health is

in danger. It has been observed that this situation causes uneasiness on the employees.

"Our biggest problem is the waste. The wastes are required to be collected with vacuum waste boxes. Nevertheless, the waste bins we use have open lids. We already are exposed to 40% of the toxic effects of the chemotherapy drugs while preparing, 20% while administering, and 40% from the wastes." [Interview 23]

"We do have a cabin for drug preparation and we have our protective measures, but I am directly exposed to the drug while administering and from wastes and we do not have any protective measures." [Interview 10]

## Working conditions

### Working and resting hours

The nurses participating in the study stated that there was no working hour and resting hour regulated for the unit. It was determined that this caused the nurses to feel less valuable than the workers in other units.

"A regulation concerning the working hours and resting hours is needed for the oncology unit because we are, together with the patients, exposed to the toxic effects of the antineoplastic drugs. For instance, our friends working in the nuclear medicine or x-ray departments have a dosimeter to determine the amount of radiation they are exposed to." [Interview 18]

## Salary

The oncology nurses interviewed stated that they did not take any extra payment despite working in the oncology department and their salary is not sufficient for working in a risky unit. Nurses working in this unit stated that they felt they did not care about their work.

"We do not take any extra payment for working in this department. We are working intensively and preparing chemotherapy, but we are not receiving any extra payment. They don't care that we are being exposed to drugs that threaten our health." [Interview 7]

## Training

### Orientation

All the oncology nurses interviewed stated that they were subject to no orientation training before they started working in the unit. It has been stated that nurses working in the unit do not perceive the importance of the risks of the drugs without any training. This creates discomfort in nurses who know that drugs are risk agents and can cause conflicts among employees.

"I have not been subject to any orientation training while coming to this unit. Recently, those who are assigned to the oncology unit are always newly graduated nurses. They do not have sufficient education. Chemotherapy is not something you can learn in the form of master-apprentice relationship. It is required to provide a basic antineoplastic drug training to those to be working in this unit. What are these drugs? How will you protect yourself?" [Interview 2]

“As people are not aware of how serious these prepared drugs are, they do not take the necessary protective measures. They say “I use the closed system, what is going to happen anyway?” while preparing the drugs or they do not care when it spills over floor. I think it is required to raise awareness on the issue.” [Interview 13]

### Chemotherapy preparation certificate

Only 20% of the nurses interviewed stated that they had chemotherapy preparation certificate and they received this certificate after they started working in this unit. Oncology nurses expressed their confidence in themselves after having a certificate of chemotherapy preparation.

“I had no chemotherapy preparation certificate when I began working in this unit. I have learnt my knowledge about chemotherapy through the friends working here, with what they have shown me, in the form of a master-apprentice relationship. Now, however, I do have a chemotherapy certificate and trust myself more.” [Interview 11]

### Continuous Training

The oncology nurses interviewed stated that they received only the trainings they organized within each other; even though they received a chemotherapy certificate, these trainings were not repeated at certain intervals however continuous training was very important in such specific units.

“We have trainings that we ourselves prepare and organise within each other. Training I want is to prepare the drugs consciously. I think training is very important, but the certificate programs of chemotherapy drug preparation are not sufficient. This is because these trainings are repeated at regular intervals. We learn many techniques only by hearing them from our older colleagues working here.” [Interview 16]

### Discussion

It is important to protect the health of oncology nurses who are in direct contact with the antineoplastic drugs and to make a regulation for the working conditions in such a way to protect occupational health. In the study of Olgun and Şimşek, they determined that 56.2% of the oncology nurses used the biological safety cabinet for drug preparation, 57.7% prepared drugs in specially separated rooms for chemotherapy drugs and Luer-Lock injector (screw) was used at the rate of 13.1% while preparing the drugs [12]. In another study, it was found that 82% of the nurses expressed their use of the biological safety cabinet, and only two out of four oncology units within the scope of the study had a sufficient ventilation system in the drug preparation area [3]. In the study conducted by Unsar et al. [13], it was found that 46.9% of the antineoplastic drugs were prepared with a robotic system, and 46.9% were prepared in biological safety cabinet.

Beside inappropriate working conditions, oncology nurses face problems because of growing number of patients, insufficient protective measures during preparation of antineoplastic agents, increasing workload [18]. Similarly, the reasons for oncology nurses' displeasure with the department they work were stated as the patients at terminal period and high rate of mortality, negative physical environmental conditions, insufficiency of supplies and personnel [18]. Consequence, it was emphasized that all of these negative effects were increased oncology nurses' job stress and burnout level [16-18].

In addition to work stress and exhaustion, the studies carried out until now reveal that the healthcare staff experience health problems such as nausea- vomiting, fatigue, exhaustion, sleepiness, decrease in blood values, diarrhoea, eye and throat irritation, menstrual irregularities, skin reactions, hair loss, headache and dizziness depending on chemotherapy drugs [4, 13]. In the study of Köşgeroğlu et al. [22], however, the haemoglobin and leukocyte average values of the nurses were examined and no significant difference was found among those administering and not administering chemotherapy; it was indicated that as the number of patients having daily chemotherapy administration increased, haemoglobin values decreased.

It was found in the study that no health screening specific to the oncology nurses and the unit was carried out. On the other hand, in the recommendation no. 149 of International Labour Organization (ILO) about nurses, it was emphasized that it was requested to carry out the regular health examinations of the healthcare staff and protect the occupational health [23].

As a result of the study, it was found that the waste management was insufficient in the unit. According to the resolutions of NIOSH, it is stated that any material used in the preparation and administration of the antineoplastic drugs or each waste contaminating to such drugs are required to be disposed according to the toxic waste procedure determined by the hospital [8]. Despite the existing “Regulations for Controlling of the Medical Wastes” issued by Ministry of Health in Turkey, it remains insufficient to put into practice [24].

In the study of Baykal et al. [25], it was found that the oncology nurses mostly worked for 9 hours in the daytime (49.1%), 45 hours a week (48%) and 31% of them did not work at night shift, they had resting breaks between 15-30 minutes during the day (46.2%), and they had a lunch break of 30 minutes (65.5%). Also, more than a half of them used their yearly leave for less than 20 days (55.7%). According to the recommendations of ILO, it is emphasized that nurses need to work less than 40 hours a week and use an annual leave of at least 4 weeks. On the other hand, in the recommendations of ILO, it is emphasized that it is necessary for the nurses working under adverse working conditions to be financially supported [23].

All the interviewed oncology nurses stated that they were not subjected to any orientation training before working in the unit. In addition, it is also emphasized in “Guideline of Safe Use Standards of Antineoplastic Drugs” that was accepted by OHS, NIOSH and Ministry of Health in Turkey that the newly starting staff need be trained [7-10].

In the study conducted by Olgun and Şimşek with oncology nurses, it was found that 58.9% of the oncology nurses participated in courses, in-service training programs on chemotherapy, but these programs were not repeated at certain intervals (81.5%) [12]. In other studies, it was also found that the oncology nurses had insufficient knowledge about the safe use of the antineoplastic drugs [11, 13].

### Limitations

The fact that the study was conducted only with the oncology nurses working in a single hospital in the city of Istanbul limits the generalisation of this study's results.

### Conclusions and Recommendations

While there are many standards in Turkey and in the world regarding the safe use of the antineoplastic drugs, it is important to



put these standards into practice in order to protect the occupational health. In order to protect and maintain the occupational health, it is required to raise awareness of the healthcare staff about the safe use for the antineoplastic drugs and to provide the working environment and suitable equipment in accordance with these standards.

Oncology nurses' working conditions are improved in order to reduce their job stress levels and burnout and that psychological/emotional support is provided to all health care workers, and in particular nurses, considering the patient profile in oncology units.

- Before working in the oncology unit the nurses should be trained about the safe use of antineoplastic drugs,
- The area and the physical conditions where the antineoplastic drugs are prepared and administered should be arranged in accordance with the existing safety use standards for antineoplastic drugs,
- For the working hours, annual leaves, resting hours and salary arrangements of nurses working in the oncology unit, the recommendations of ILO [23] should be taken into account.

## Competing Interests

The authors declares that they have no competing interests.

## Author Contributions

Both the authors substantially contributed to the study conception and design as well as the acquisition and interpretation of the data and drafting the manuscript.

## Acknowledgements

The authors are thankful to the nurse who participated in the survey, as well as the Research Fund of İstanbul Medeniyet University (Project Number: 973).

## References

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. (2014) Cancer incidence and mortality world wide: sources, methods and major patterns in GLOBOCAN 2012. *Intl J Cancer* 136: E359-386.
2. Elshamy K, El-Hadidi M, El-Roby M, Fouda M (2010) Health hazards among oncology nurses exposed to chemotherapy drugs. *Afr J Haematol Oncol* 1: 70-78.
3. Kyprianou M, Kapsov M, Raftopoulos V, Soteriades ES (2010) Knowledge, attitudes and beliefs of Cypriot nurses on the handling of antineoplastic agents. *Eur J Oncol Nurs* 14: 278-282.
4. Bouraoui S, Brahém A, Tabka F, Mrizek N, Saad A, Elghezal H (2011) Assessment of chromosomal aberrations, micronuclei and proliferation rate index in peripherallymphocytes from Tunisian nurses handling cytotoxic drugs. *Environ Toxicol Pharmacol* 31: 250-257.
5. Lawson CC, Rocheleau CM, Whelan EA, Lividoti Hibert EN, Grajewski B, Spiegelman D, et al. (2012) Occupational exposure among nurses and risk of spontaneous abortion. *Am J Obstet Gynecol* 206: 327.e1-328.
6. Ratner PA, Spinelli JJ, Beking K, Lorenzi M, Chow Y, Teschke K, et al. (2010) Cancer incidence and adverse pregnancy outcome in registered nurses potentially exposed to antineoplastic drugs. *BMC Nurs* 9: 1-11.
7. NIOSH (2012) NIOSH list of antineoplastic and other hazardous drugs in healthcare settings. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH). NIOSH (2009) NIOSH: Workplace Solutions: Personal Protective Equipment for Health Care Workers Who Work with Hazardous Drugs. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH).
8. Occupational Safety and Health Administration-OSHA (2001) OSHA Directorate of technical support. Controlling occupational exposure to hazardous drugs. OSHA Published 1: 7-42.
9. Guideline of Safe Use Standards of Antineoplastic Drugs (2009).
10. Ali FB, Arif S, Pesnani F (2015) Association of knowledge on the attitude and practice of registered nurses regarding handling of cytotoxic drugs in a tertiary care hospital in Karachi Pakistan. *Int J Novel Res Health Nurs* 2: 73-76.
11. Olgun N, Şimşek H (2010) The use of protective measures by nurses who prepare and administer chemotherapeutic drugs and factors these measures affecting. *HUFHSNJ* 17: 13-23.
12. Unsar S, Kurt S, Akgun Kostak M, Yaman F, Özcan M (2016) Determination of antineoplastic drug exposure of nurses at a university hospital. *International Journal of Caring Sciences* 9: 314-320.
13. Tessa O, Lenthall S, Wakerman J, Dollard M, Knight S, Rickard G, et al. (2011) Occupational stress in the Australian nursing work force: A comparison between hospital-based nurses and nurses working in very remote communities. *Aust J Adv Nurs* 28: 61-65.
14. Spooner-Lane R, Patton W (2007) Determinants of burn out among public hospital nurses. *Aust J Adv Nurs* 25: 8-16.
15. Bernard D, Anette B (2006) Relationship between stressors, work supports and burnout among cancer nursing. *Cancer Nurs* 29: 338-345.
16. Quattrin R, Aanini A, Nascig E, Annunziata M, Calligaris L, Brusaferrro S (2006) Level of burnout among nurses working in oncology in an Italian region. *Oncol Nurs Forum* 33: 815-820.
17. Tuna R, Baykal Ü (2014) The relationship between job stress and burn out levels of oncology nurses. *Asia Pac J Oncol Nurs* 1: 33-39.
18. Liampittong P (2013) *Research Methods in Health*. South Melbourne: Oxford University Press.
19. Polit DF, Beck CT (2012) *Nursing Research: Principles and Methods*. (9th edition), Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
20. Jirojwong S, Johnson M, Welch A (2014) *Research Methods in Nursing and Midwifery*. (2nd edition), Sydney: Oxford University Press.
21. Köşgeroğlu N, Ayrancı U, Özerdoğan N, Demirüstü C (2006) Turkish nurses' information about and administration of chemotherapeutic drugs. *J Clin Nurs* 15: 1179-1187.
22. International Labour Organisation-ILO (1977) The standards for health care workers adopted by ILO at Nursing Personnel Convention (No. 149) and Recommendation (No. 157).
23. Regulations for Controlling of the Medical Wastes (2013).
24. Baykal U, Seren S, Sokmen S (2009) A description of oncology nurses' working conditions in Turkey. *Eur J Oncol Nurs* 13: 368-375.