

KNOWLEDGE, ATTITUDE AND BEHAVIOR OF CHEMOTHERAPY PATIENTS ABOUT INTERVENTIONS FOR FERTILITY PRESERVATION: A DESCRIPTIVE SAMPLE STUDY FROM ÇANAKKALE

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ABSTRACT

Objective: Neoplasm treatments include chemotherapy and radiotherapy methods alternatively in relation to the type of neoplasms. These methods have many side effects for different tissues and organs. One of these side effects is infertility. Infertility is associated with toxic effects of chemotherapeutics to the germ cells. The aim of this study was to investigate the knowledge, attitude and behavior related to fertility preservation among patients who received chemotherapy.

Material and Method: This descriptive type epidemiologic research was completed at a University Research Hospital Oncology Clinic after obtaining written permissions from the chief doctor of the hospital and the oncology clinic and ethical board. The study included patients aged 18 and older with neoplasms attending a University Research Hospital Oncology Clinic from November 2016 to April 2017. The data obtained were analyzed with the SPSS 20.0 statistical program.

Results: Of 167 people in the study group, 48.5% were female. In our study, 79.1% of patients stated that doctors did not provide information before beginning neoplasm treatment. In our study reproductive technics assisted intervention consultations were requested by 35.3% who reported they were concerned about experiencing reproductive problems after neoplasm diagnosis, 11.4% who were not concerned and 30.0% who didn't remember their emotions about this topic ($p<0.05$).

Conclusion: It is necessary to create awareness among patients of who, where and when to apply about preserving reproduction and to ensure doctors direct these patients to the correct center. With this aim, it may be useful to train oncologists by embryologists about reproductive technics assisted interventions.

Keywords: Neoplasms, chemotherapy, fertility preservation, reproductive technics assisted. Nobel Med 2019; 15(1): 47-55

KEMOTERAPİ HASTALARININ ÜREME KORUYUCU YÖNTEMLER KONUSUNDA BİLGİ, TUTUM VE DAVRANIŞ DURUMLARI: ÇANAKKALE'DEN TANIMLAYICI ÖRNEK BİR ÇALIŞMA

ÖZET

Amaç: Kanser tedavisinde kanserin türüne göre, kemoterapi ve radyoterapi yöntemleri vazgeçilmez seçenekler olmakla birlikte organ ve dokular üzerine çeşitli yan etkileri mevcuttur. Kemoterapötikler, germ hücreleri üzerine toksik etki gösterdiği için infertiliteye neden olabilir. Bu çalışmanın amacı, kemoterapi alan hastaların, fertilitte koruyucu yöntemler üzerine bilgi, tutum ve davranış durumlarının araştırılmasıdır.

Materyal ve Metot: Tanımlayıcı tipteki bu epidemiyolojik araştırma Üniversite Araştırma ve Uygulama Hastanesi Onkoloji Kliniğinde Hastane Başhekim, Onkoloji Klinik Sorumlusu ve etik kurul izinleri alınarak yapılmıştır. Çalışmaya Kasım 2016-Nisan 2017 tarihleri arasında, Üniversite Araştırma Hastanesi Onkoloji Kliniğinde kanser tanısı almış, 18 yaş ve üzeri hastalar dahil edilmiştir. Veriler SPSS 20.0 istatistik paket programı ile analiz edilmiştir.

Bulgular: Çalışma grubundaki 167 kişiden %48,5'i kadındı. Çalışmamızda, hastaların %79,1'i doktorların kanser tedavisine başlamadan önce kendilerine bilgi vermediğini bildirdi. Kanser tanısı sonrasında üreme problemleri yaşamaktan endişelenenlerin %35,3'ü, endişelenmeyenlerin %11,4'ü, bu konudaki duygudurumunu hatırlamayanların ise %30,0'i üremeyi koruyucu işlemler konusunda danışmanlık almak istediklerini belirttiler ve bu durum istatistiksel olarak anlamlı bulundu ($p<0,05$).

Sonuç: Hastalara üremenin korunması hususunda kime, nerede ve ne zaman başvurmaları gerektiği bilincinin kazandırılması ve hekimlerin hastalarını bu konuda mutlaka doğru merkezlere yönlendirmelerinin sağlanması gerekmektedir. Bu amaçla, onkoloji hastalarını poliklinikte takip eden onkologlara ve uzmanlık öğrencilerine Üremeye Yardımcı Tedavi (ÜYTE) uygulamaları ile ilgili embriyoloji uzmanı tarafından eğitimler verilmesi yararlı olabilir.

Anahtar kelimeler: Kanser, kemoterapi, fertilitte koruyucu yöntemler, yardımcı üreme yöntemleri. *Nobel Med 2019; 15(1): 47-55*

INTRODUCTION

Neoplasm is a disease that significantly affects the quality of life of people and the incidence has rapidly increased in recent years. Neoplasm is the second most common cause of death globally after cardiovascular system diseases In Turkey. The most common neoplasm types in males are lung, prostate, colorectal, bladder and stomach neoplasms in that order, while in women the five most common neoplasm types are breast, thyroid, colorectal, endometrial and lung neoplasms.¹⁻³

There are many surgical and non-surgical methods used for the treatment of neoplasms. Non-surgical treatments such as chemotherapy and radiotherapy are effective against many types of cancer but do have side effects. These side effects differ linked to the patient, neoplasm type, localization of the neoplasms, type of chemotherapy medications used, dose of chemotherapy and radiotherapy and the individual's general health state. Thus, chemotherapy and radiotherapy affect nearly all organs and systems. Tissues that are especially affected are germ cells and the genital system. During neoplasm treatment, situations that have indications for preservation of fertility include high dose chemotherapy and pediatric or adult neoplasms requiring radiotherapy

to the abdominal or pelvic regions.⁴ As chemotherapy medications may cause hormonal imbalance, they may lead to menopausal symptoms and infertility in women and loss of erection, stimulation problems and infertility in men.^{5,6}

Chemotherapy has varying degrees of effect from temporary amenorrhea of ovaries to permanent ovarian failure resulting in apoptotic death of primordial follicles. The most important factors in determining the probability of postchemotherapy ovarian failure are the patient's age, type of chemotherapy agent, cumulative dose of medications used and ovarian reserve before chemotherapy. As older women have lower ovarian reserves compared to young women, the risk of ovarian failure is higher for older women with the same dose of medication.⁴ Chemotherapeutics have many side effects on the male reproductive system. These include side effects like sexual loss of libido, oligospermia, asthenospermia and teratozoospermia, disorders of the testicular structure, spermatogenesis and steroidogenesis, variations in gonadotropin levels, damage to sperm DNA and total sterility.⁶ Due to developments in reproductive technics assisted (RTA) applications, many fertility preservations are a source of hope for patients faced with premature ovarian

failure and infertility. Some of these choices include cryopreservation of embryos, oocytes, ovarian tissue and sperm and in vitro maturation (IVM) of oocytes.^{3,4,6} Contrary to cryopreservation of embryos and sperm, oocytes are more liable to cryodamage, so oocyte cryopreservation is a more difficult process. However, in situations where chemotherapy is an emergency, cryopreservation of ovarian tissue may be a more appropriate approach.⁴

The increase in age giving birth and the accompanying increase in chronic diseases and fertility problems has made in vitro fertilization applications an increasingly important topic for the preservation and development of reproductive health.⁷⁻¹³ Though there are studies investigating the consultation services provided by health personnel about this topic in the literature, there are limited numbers of studies investigating the knowledge, attitude and behavior of patients. A study investigating consultation with nurses in Turkey found that nurses considered a large portion of patients had experienced sexual health problems; however only a very small number had requested consultation from the nurses.⁵ The results of this study showed that patients were not sufficiently aware of the necessary procedures to preserve reproductive health, did not know who to ask and what support they would receive. To prevent negative effects on reproductive health and to ensure the necessary precautions are taken in cooperation with the patient, it is necessary that patients be informed, monitored and offered consultation about reproductive health problems that may be caused by chemotherapy medications by the patient's treatment team before treatment, during treatment and after treatment.^{5,14} Diagnosis of some neoplasm types, like breast neoplasm, is becoming more common in younger age groups, so it was reported that not just survival but reproductive health preservation behavior should be investigated to increase the quality of life of women.¹⁵

In the literature, there is no study accessed investigating the knowledge, attitude and behavior of the patient group receiving chemotherapy in Turkey about reproductive technics assisted (RTA). The original aspect of our study is that it is the first study on this topic in Turkey and provides data to both the national and international literature. The aim of this study was to investigate the knowledge, attitude and behavior related to RTA among patients who received/planned to receive chemotherapy in a university hospital oncology clinic.

MATERIAL AND METHOD

This study is descriptive type epidemiologic research. The study included patients aged 18 years and older with neoplasm diagnosis attending a University Research Hospital Oncology Clinic from November 2016 to April 2017. Participants who voluntarily accepted the invitation to participate were given information about the aims and methods of the study by the researchers. This study has been approved by the Çanakkale Onsekiz Mart University Clinical Researches Ethics Committee with the number of 2016-20. This work was supported by Çanakkale Onsekiz Mart University The Scientific Research Coordination Unit (Project number: TSA-2017-1165).

Study Design

The research team comprised an embryologist expert in RTA applications, a public health doctor, a medical oncologist and assisting teaching personnel. Before applying the survey used in the research, pre-training was given to the research team. After pre-training, pre-trials of the survey form under observation were held with 10 random people with chemotherapy planned who were not included in the study. During interviews patients had the survey applied with face-to-face interview methods observed by the research team. After completing pre-trials of the survey form and the team, the questions on the survey form were revised again with deficient or erroneous questions corrected to produce the final form of the survey. The assistant researchers on the team applying the surveys were observed during pre-trials and errors, requirements and deficiencies were resolved to standardize the "face-to-face patient interview method".

This research was completed at a University Education and Research Hospital Oncology Clinic. With this aim, verbal and written permission was obtained from the chief doctor of the hospital and the oncology clinic. This study investigated the knowledge levels, beliefs, attitudes and behavior related to "RTA interventions" of patients continuing treatment with the oncology service. Patient interviews were held regularly each week at a time that the doctor responsible for the University Education and Research Hospital Oncology Clinic deemed appropriate. Before beginning the interviews, the researchers provided detailed information about the aims and targets of the research to the patients. At the end of the interview, participants who wished to benefit from RTA interventions were directed to the relevant unit under observation of the oncologist and embryologist.

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Table 1. Distribution of descriptive characteristics of the study group		
Variables	n	%
Sex		
Female	81	48.5
Male	86	51.5
Neoplasm diagnosis		
Genitourinary system	71	42.5
Gastrointestinal system	52	31.1
Respiratory system	44	26.4
Educational level		
Less than high school	106	63.9
High school and above	60	36.1
Marital status		
Married	151	91.0
Single	15	9.0
Perception of income		
Bad	17	10.2
Moderate	118	70.7
Good	32	19.1
Do you have children?		
Yes	159	95.2
No	8	4.8
Are you considering having children?		
Yes	4	2.4
No	157	94.0
I don't know	6	3.6
Did you physician provide information about RTA before you began neoplasm treatment?		
Yes	31	17.5
No	140	79.1
I don't remember	6	3.4

n: Number, **%:** percentage, **RTA:** reproductive technics assisted

The survey form comprised items including suggestions under subheadings of “knowledge level, beliefs, attitude and behavior related to RTA interventions”. This form was applied over 10-15 minutes with the face-to-face patient interview method.

Statistical Analysis

The data obtained in the study were analyzed with the SPSS 20.0 statistical packet program. Data are presented as number, percentage, mean, standard deviation, median, minimum and maximum. For analysis of categorical data, the chi-square test was used. The degree of statistical significance was taken as $p < 0.05$ at 95% confidence interval.

RESULTS

A total of 167 people were in the study and 48.5% of them were female and 51.5% were male. The mean age of participants was 55.49 ± 11.48 years (median:55, Min-Max:22-85). The mean age of males was 59.40 ± 9.93 years (median:58, Min-Max:32-82), while the mean age of females was 51.33 ± 11.60 years (median:52, Min-Max:22-85). Forty two point five percentage of participants were receiving treatment for genitourinary system cancer diagnosis. In the study group 63.9% had education less than high school, 91% were married, 10.2% had bad perceived income situation, 95.2% had children, 2.4% considered having children and 79.1% stated they had not received information from their clinician before beginning neoplasm treatment (Table 1).

The correlations between age, sex, neoplasm diagnosis, educational level, marital status, perception of income, having children and considering having children with requests for consultation about RTA interventions were investigated with single variable analyses. Consultation was requested by 29.5% of those younger than 50 years, and 13% of those older than 50 years and this situation was statistically significant ($p=0.024$). Fifty percentage of participants of those who considering having children requested consultation about RTA interventions, while 14.6% of those who were not considering having children and 66.7% of those who were undecided requested consultation. This situation was statistically significant ($p=0.006$). The results of other comparisons between the groups are presented in (Table 2).

Single variable analyses were used to investigate the correlations between knowledge of the concept of infertility, desire to have children after neoplasm treatment, previous consultation about preventing infertility, knowledge of reproductive health risks of neoplasm treatments, knowledge of preserving female reproductive cells by freezing eggs, knowledge of preserving male reproductive cells by freezing sperm, receiving information about RTA interventions from doctors before neoplasm treatment, knowledge of whether insurance covers costs of RTA interventions and worry about experiencing problems with reproduction after neoplasm diagnosis with requests for consultation on the topic of RTA interventions. Of those who knew about infertility, 13.4% requested consultation, while 34.4% of those who did not know about infertility requested consultation and this was statistically significant ($p=0.011$). RTA intervention consultations were requested by 66.7% of those who

wanted to have children after neoplasm treatment and those who were undecided and by 13.5% of those who did not want children and this situation was statistically significant ($p < 0.001$). In terms of concerns about experiencing reproductive problems after neoplasm diagnosis, 35.3% of those who were concerned requested consultation, 11.4% of those who were not concerned requested consultation and 30% who did not remember their mental state requested consultations about RTA interventions. This was statistically significant ($p = 0.005$). Other comparisons between the groups are shown in (Table 3).

When the study groups were asked about risks to reproductive health from neoplasm treatments, the majority answered sexual dysfunction (66.5%) and infertility (62.9%). One hundred twenty four participants (74.3%) knew about the sperm freezing procedure, and 114 people (68.3%) knew about oocyte freezing procedure. When places that can be applied to for RTA interventions were questioned, the majority answered hospitals (68.3%) and IVF centers (54.5%). When the time of RTA interventions after neoplasm diagnosis was asked, the majority stated before neoplasm treatment began (47.9%) followed by those who did not know (37.7%) (Table 4).

DISCUSSION

In this study the knowledge, attitudes and behavior related to RTA interventions of patients receiving/ planning to receive chemotherapy at the oncology clinic were assessed. The most important aspect of the study is that the majority of voluntary participants were individuals with genitourinary system neoplasm diagnosis. The majority of participants stated they had not received information from their clinician about this topic before beginning neoplasm treatment. Nearly 1/3 who were worried about experiencing reproductive problems after neoplasm diagnosis requested consultation on this topic.

Tissues especially affected by chemotherapy include germ cells and the genital system. Consultation about infertility risks and available fertility preservation is very important for neoplasm patients. Additionally, studies have shown that consultation about other adverse effects related to reproduction (like early menopause) increases awareness of the topic among women.¹⁶

In our study RTA intervention consultations were requested by 35.3% who stated they were concerned about experiencing reproductive problems after

Table 2. Correlation between sociodemographic characteristics of the study group and requests for consultation about reproductive technics assisted (RTA)

	Requested Consultation (n=29)	Did Not Request Consultation (n=138)	
Variables	n (%)	n (%)	p value
Age			
<50	13 (29.5)	31 (70.5)	0.024
≥50	16 (13.0)	107 (87.0)	
Sex			
Female	15 (18.5)	66 (81.5)	0.859
Male	14 (16.3)	72 (83.7)	
Neoplasm diagnosis			
Genitourinary system	16 (22.5)	55 (77.5)	0.082
Gastrointestinal system	4 (7.7)	48 (92.3)	
Respiratory system	9 (20.5)	35 (79.5)	
Educational level			
Less than high school	17 (16.0)	89 (84.0)	0.665
High school and above	12 (20.0)	48 (80.0)	
Marital status			
Married	25 (16.6)	126 (83.4)	0.302
Single	4 (26.7)	11 (73.3)	
Perception of income			
Bad	3 (17.6)	14 (82.4)	0.702
Moderate	22 (18.6)	96 (81.4)	
Good	4 (12.5)	28 (87.5)	
Have children			
Yes	26 (16.4)	133 (83.6)	0.143
No	3 (37.5)	5 (62.5)	
Considering having children			
Yes	2 (50.0)	2 (50.0)	0.006
No	23 (14.6)	134 (85.4)	
Undecided	4 (66.7)	2 (33.3)	

n: Number, %: row percentage, p: chi-square test

neoplasm diagnosis, 11.4% who were not concerned and 30% who did not remember their emotions about this topic. This situation was statistically significant. Additionally, 13.4% of those who knew about the concept of infertility and 34.4% of those who did not know were identified to request consultation and this was statistically significant. This situation may be interpreted as showing that patients with low knowledge levels and those who are concerned about the situation request consultation more often. A similar study showed that loss of fertility linked to neoplasm treatment caused severe depression in women.¹⁷ Just as loss of fertility after treatment may cause depression, the concern that fertility will end

Table 3. Correlation between information levels about reproductive technics assisted (RTA) and requests for consultation

	Requested Consultation (n=29)	Did Not Request Consultation (n=138)	
Variables	n (%)	n (%)	p
Knowledge of infertility concept			
Yes	18 (13.4)	116 (86.6)	0.011
No	11 (34.4)	21 (65.6)	
Desire to have children after neoplasm treatment			
Yes	4 (66.7)	2 (33.3)	<0.001
No	21 (13.5)	134 (86.5)	
Undecided	4 (66.7)	2 (33.3)	
Previous consultation about preventing infertility			
Yes	0 (0.0)	11 (100.0)	0.215
No	29 (18.6)	127 (81.4)	
Knowledge of risks to reproductive health from neoplasm treatments			
Yes	14 (25.0)	42 (75.0)	0.102
No	15 (13.5)	96 (86.5)	
Knowledge that female reproductive cells can be protected by freezing eggs			
Yes	23 (19.8)	93 (80.2)	0.296
No	6 (11.8)	45 (88.2)	
Knowledge that male reproductive cells can be protected by freezing sperm			
Yes	23 (18.4)	102 (81.6)	0.709
No	6 (14.3)	36 (85.7)	
Information given by physician about RTA before neoplasm treatment			
Yes	6 (21.4)	22 (78.6)	0.831
No	22 (16.5)	111 (83.5)	
Can't remember	1 (16.7)	5 (83.3)	
Knowledge of insurance covering RTA interventions			
Yes	9 (16.1)	47 (83.9)	0.923
No	20 (18.0)	91 (82.0)	
Concern about experiencing reproduction problems after neoplasm diagnosis			
Yes	12 (35.3)	22 (64.7)	0.005
No	14 (11.4)	109 (88.6)	
Can't remember	3 (30.0)	7 (70.0)	

n: Number, %: row percentage, p: chi-square test

after neoplasm treatment may cause anxiety and this anxiety affects the requests for consultation about RTA applications. As a result, providing consultation about RTA interventions may ensure a reduction in the anxiety of patients; thus may ensure an increase in quality of life. In our study group, 42.5% had diagnosis of genitourinary system neoplasms. In addition to the side effects to reproductive health of the treatment these patients will receive, the type of neoplasms may affect requests for consultation. In fact the majority of patients who requested consultation were genitourinary system neoplasm patients. Another study identified that appointments related to sexual matters were more common among prostate and cervical neoplasm patients. The same study revealed that there were fewer requests related to sexual matters as age increased.¹⁸ In our study the majority of those who requested consultation were genitourinary system neoplasm patients. Additionally there were fewer participants over the age of 50 who requested consultation compared to those under the age of 50 years. Among reasons for this situation may be that the majority of our study group had children and that in society individuals over the age of 50 consider the fertile period to have passed.

In our study those considering having children and those who were undecided on this topic requested consultation more often. Another study reported that 75% of female participants wanted to have children after neoplasm treatment, while 29% rejected life-saving treatment due to a fear of infertility.¹⁹ In our study the majority of participants had children which may have affected their desire to have children and may have caused patients to not request consultation about fertility preservation. Contrary to this, 14.6% of those not considering having children stated they requested consultation about this topic. This reveals that in society though there is a portion not considering having children, they still require information about the topic. In our study 50% of those stating they considered having children after treatment, 14.6% of those not considering having children and 66.7% of those who were undecided requested consultation about RTA interventions. This result indicates that patients who are undecided about having children still have high requests for consultation.

Studies have shown women are less inclined to talk about sexual matters with health service providers and they make less requests to talk on their own initiative.¹⁸ In our study, of total participants 18.5% who requested consultation were female and 16.3%

were male, and this was not statistically significant. Another study of nurses found that they considered the majority of patients had experienced sexual problems. However they found very low numbers of patients requested consultation on these topics, and they determined that the majority of patients were not comfortable sharing their sexual problems.⁵ The mean age of participants in our study was 55.49±11.48 years. The incidence of disrupted sexual health increases with increasing age, which increases the need for consultation. A study showing that sexual function reduced with increasing age, was interpreted as increasing the need for RTA interventions after neoplasm treatment.¹⁸ Additionally studies have shown that males and females become parents later than what they consider the ideal age. If they experience fertility problems later, both males and females are open to the use of RTA interventions.⁹ In our study when the age factor is compared with the consultation requests, there was a statistically significant difference identified and those younger than 50 years of age appeared to request consultations more often. However, among participants under the age of 50 years, only 29.5% requested consultations. If it is considered that the capacity for fertility in men and women continues in this age group, it appears that requests for consultations are low in this age group. Among reasons for this may be the destructive psychological effects of receiving a neoplasm diagnosis, and more reluctant behavior about consultation with this neoplasm type and age group. There is no definite age group when consultation should be given as people of advanced age may wish to have children, so this service should be planned in terms of reproductive health for each group.

A study found that the majority of doctors know the effects of neoplasm treatment on fertility; however very few were determined to provide information about preserving fertility to patients. It is reported that patient characteristics (like sex, neoplasm type) and systemic factors (like cost, access to RTA interventions) affect this situation.²⁰ In our study, 79.1% of patients stated that doctors did not provide information before beginning neoplasm treatment. This situation leads to the consideration that there is a lack of information about RTA interventions given to neoplasm treatment patients. Among the reasons for this may be high costs not covered by insurance, lack of integration of a fertility expert into treatment, and immediate need to start treatment. Another study explained this situation as due to a lack of sufficient information about RTA interventions among oncologists, and lack of sufficient time to discuss

Table 4. Distribution of knowledge about reproductive technics assisted (RTA) interventions in the study group

Variables	n	(%)
Risks to reproductive health from neoplasm treatments		
Infertility	105	62.9
Early menopause	88	52.7
Sexual dysfunction	111	66.5
Lack of development of the baby due to neoplasm treatment	99	59.3
Continuation of side effects	1	0.6
Knowledge of storage and protection of reproductive cells related to preserving fertility		
Freezing of oocytes	114	68.3
Freezing of ovarian tissue	44	26.3
Freezing of sperm	124	74.3
Places to apply for RTA interventions		
Hospitals	114	68.3
Provincial health centers	28	16.8
RTA intervention centers	76	45.5
Family practitioners	59	35.3
IVF centers	91	54.5
Don't know	24	14.4
Time of RTA intervention after neoplasm diagnosis		
Before beginning neoplasm treatment	80	47.9
During neoplasm treatment	13	7.8
After neoplasm treatment	22	13.2
Don't know	63	37.7
n: Number, %: percentage of whole study group		

these topics with patients.¹⁹ In conclusion, patients appear not to be given sufficient information about RTA interventions. According to the literature, during neoplasm diagnosis patients receive varying levels of consultation about reproductive health topics and RTA interventions.^{16,19} A study comparing the sex in terms of use of RTA interventions found the majority of males obtained information about the effects of neoplasm treatment on reproductive health and RTA interventions and froze their sperm. Contrary to this, very few female patients received information about RTA interventions and chose these interventions.²¹ This difference between the sexes observed in the literature was not observed in our study. There were very low rates of patients requesting consultation among both female and male participants. This result may be due to the insufficient sampling size or to differences depending on the neoplasm type and treatment choices.

Study Limitations

Our study assessed the topic of fertility preservation interventions for patients receiving or planning to receive chemotherapy and did not assess the knowledge, attitude and behavior of health personnel related to this topic. Determination of this situation among health personnel may resolve deficient and/or mistaken information and thus increase the awareness levels of patients through health personnel. Our study is a preliminary study and did not assess sexual health. As our study group comprised patients applying or receiving/planning to receive chemotherapy at the university hospital oncology clinic during the period of the study, the patient population reached is low and there are representative limitations. However, results were obtained that are not found in any other study in our country which may be a road map for future studies. In this way our study is original and is the first study on this topic in our region and in our country. Additionally, factors like patient age, disease type and localization, change the degree of the effect on reproductive health. As a result, there is a need for multi-center studies in locations with oncology institutes that allow access to a broader population.

CONCLUSION

Chemotherapeutic agents commonly used in neoplasm treatment may cause side effects in the reproductive organs, tissue and cells of neoplasm patients and healthy individuals. Sharing helpful and supportive information like what protective methods can reduce or prevent these effects with neoplasm patients is very important for the rehabilitation

process. Explaining what processes can be applied with the aim of preserving reproduction in neoplasm patients in a variety of trainings before treatment will improve the knowledge, attitude and behavior of the individual about this topic and may positively develop sexual quality of life after treatment. The cumulative effect of these studies on society will ensure the creation of awareness about the topic.

It is necessary to create awareness among patients of who, where and when to apply about preserving reproduction and to ensure doctors direct these patients to the correct center. With this aim, training may be given by embryology experts about RTA interventions to oncologists and specialization students monitoring patients in oncology clinics. In oncology clinics, information and consultation services about fertility preservation may be given to patients with chemotherapy planned one day per week. In this way, patients will personally evaluate questions on the topic and provide better answers and patients requesting consultation or RTA interventions may be directed to RTA centers before beginning treatment. At the end of this study, one day training was planned about RTA interventions and consultancy services for patients in the study group and health personnel working in the oncology clinic.

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