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Knowledge and Practices of Doctors and Nurses in Oncology Clinics Regarding Sperm Bank Use in Adolescent Boys Diagnosed with Cancer

Onkoloji Kliniklerinde Çalışan Hekim ve Hemşirelerin Kanser Tanısı Almış Adolesan Erkeklerde Sperm Bankasının Kullanımına Yönelik Bilgi ve Uygulamaları

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SUMMARY

Introduction: This descriptive study aimed to identify the knowledge and practices regarding sperm banks among doctors and nurses treating young male patients with cancer.

Materials and Methods: The study population comprised 71 doctors and 150 nurses working in the oncology clinics of hospitals affiliated with the Istanbul Health Directorate between January 1st and March 30th, 2012. No sampling was carried out, because the study aimed to reach the whole population.

Results: Among the participants, 70% of the doctors and 42% of the nurses stated that there were no written rules on sperm preservation in their current institutions. Those wishing to have children, who are single, and who have to start chemotherapy immediately were the 3 most important patient groups doctors recommended for sperm preservation. Meanwhile, the nurses reported those wishing to have children, who were diagnosed recently, and who have to start chemotherapy immediately as the most important patients for fertility preservation. Doctors' and nurses' practices related to sperm freezing were unsatisfactory; the main factors influencing this situation were cultural factors, religious beliefs, and work load.

Conclusions: Although health personnel are aware of the importance of sperm preservation in young male patients diagnosed with cancer, the related practices are not at desirable levels. (Journal of Current Pediatrics 2013; 11: 114-20)

Key words: Cancer, adolescent, sperm banking, fertilization, infertility

ÖZET

Giriş: Bu tanımlayıcı araştırmada, kanserli genç erkeklerde sperm bankasının kullanımına yönelik hekim ve hemşirelerin bilgi ve uygulamalarını belirlemek amaçlanmıştır.

Gereç ve Yöntem: Çalışma, 1 Ocak-30 Mart 2012 tarihleri arasında İstanbul İl Sağlık Müdürlüğü'ne bağlı hastanelerin onkoloji kliniklerinde çalışan 71 doktor ve 150 hemşirede yapıldı. Evrenin tamamına ulaşılması hedeflendi, örneklem seçimi yapılmadı.

Bulgular: Çalışmaya katılan doktorların %70'i ve hemşirelerin %42'si çalıştıkları kurumda sperm bankasına yönelik yazılı kuralların olmadığını belirtti. Doktorların sperm bankasını önerecekleri gruplar sorulduğunda ilk üç sırada sırasıyla; çocuk sahibi olmak isteyenler, bekarlar ve hemen kemoterapiye başlayan hastaların yer aldığı belirlendi. Hemşirelerde ise ilk üç sırada; çocuk sahibi olmak isteyenler, yeni tanı konulanlar ve hemen kemoterapiye başlayan hastalar yer almakta idi. Doktorların ve hemşirelerin sperm dondurma işlemine yönelik uygulamaları yetersiz idi. Bu durumu etkileyen en önemli faktörler ise kültürel faktörler, dini inançlar ve iş yükü idi.

Sonuç: Sağlık çalışanları kanserli genç erkek hastalarda sperm bankasının önemini bilmesine rağmen uygulamaların istenilen düzeyde olmadığı sonucuna varıldı. (Güncel Pediatri 2013; 11: 114-20)

Anahtar kelimeler: Kanser, adolesan, sperm bankası, fertilizasyon, infertilite

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Introduction

Survival after cancer therapy has improved enormously in the last decade for adults of reproductive age as well as younger children and adolescents (1). The local and systemic effects of the progression or treatment of cancer negatively affect the entire body (2,3). Advances in cancer treatment in the modern era have given rise to problems related to treatment with the increase in life expectancy (4,5). Researchers highlight the importance of fertility preservation in cancer treatment (4,6,7). Gonadal damage in young people treated for cancer can result from either systemic chemotherapy or radiotherapy affecting the spinal or pelvic area including whole-body irradiation (8). The fact that infertility due to cancer treatment (4,5) can be resolved by pretreatment precautions has increased attention to this topic (5,9).

It is acknowledged that all health professionals are responsible for fertility preservation in young cancer patients (5,7,10,11); informing patients about sperm freezing before the initiation of cancer treatment strongly influences patient acceptance of treatment (4,12).

In recent years, sperm banks specifically for oncology patients have been established. Studies conducted outside Turkey have analysed health workers' knowledge and practices related to the topic (5,7,9,12,13). However, studies investigating this topic are lacking in Turkey. Therefore, the present study was carried to identify health workers' knowledge and practices related to sperm bank use among young cancer patients and to propose solutions to overcome any shortcomings. Providing necessary support to young patients should help alleviate the problems such patients face because of treatment.

Materials and Methods

This descriptive study aimed to identify doctors' and nurses' knowledge and practices of sperm bank use in young cancer patients. The population comprised doctors and nurses working in the oncology clinics of hospitals affiliated with the Istanbul Health Directorate between January 1st and March 30th, 2012. Since the study aimed to reach the whole population, no sampling was carried out. A total of 221 subjects including 71 doctors (i.e., oncologists) and 150 nurses who worked in the specified clinics in the set period and agreed to participate in the study were included.

Informed consent was obtained from all participants before the baseline assessment. The questionnaire booklet for the assessment was completed by doctors and nurses after obtaining verbal consent.

A questionnaire that encompassed health workers' sociodemographic features as well as knowledge and practices related to sperm freezing was used as the data collection instrument. The questionnaire comprised 4 sections and 49 questions: the first section included 17 questions on sociodemographic features, the second section included 7 questions on the current institution's practices related to sperm freezing operation, the third section included 14 questions evaluating the knowledge of sperm banking, and the fourth section included 11 questions assessing practices related to sperm banks. The data were analysed using appropriate statistical analyses in SPSS 11.5 such as mean, standard deviation, percent, and independent t test.

Results

A total of 221 health workers including 71 doctors and 150 nurses participated in this study on the knowledge and practices of sperm freezing operations. The mean total work experience and period of working in the current clinic for the doctors was 18.18±7.99 years and 9.55±6.22 years, respectively. Meanwhile, the mean total work experience and period of working in the current clinic

Table 1. The doctors' responses related to their institution and units in relation to sperm freezing

Question	Yes		No		Don't Know	
	n	%	n	%	n	%
Does your institution have written rules with sperm freezing (cryopreservation)	20	28.2	50	70.4	1	1.4
Does your institution have a connection with any other institution related to the sperm collection/ preservation?	15	21.2	53	74.6	3	4.2
Does your institution have practices for the protection of sperm during treatment?	13	18.3	51	71.8	7	9.9
Does your institution are being consulted on issues related to infertility?	19	26.8	36	50.7	16	22.5
Is sperm preservation discussed with the male patients receiving treatmen in your institution?	6	8.5	48	67.6	17	23.9
Are rules of sperm preservation discussed among the institution workers?	13	18.3	48	67.6	10	14.1
Are standardized rules needed for preventing infertility?	4	5.6	12	16.9	55	77.5

for the nurses was 10.98±7.82 years and 4.61±4.54 years, respectively. The doctors had significantly more total experience than the nurses (ttotal = 6.302, p total = 0.000; t service = 65.974, p service = 0.000).

Analysis of the doctors' responses related to sperm freezing in their institutions and units revealed that the majority reported there are no written rules about patients who consider sperm freezing (70.4%), standardized rules are needed for preventing infertility (77.5%), there are no practices for sperm preservation in the institution's treatment practices (71.8%), sperm preservation was not discussed with male patients (67.6%) or the institution workers providing treatment (67.6%), and there was no guidance on fertility issues in the institution (50.7%) (Table 1).

More than half of the nurses (57.3%) stated that there are written rules on patients considering cryopreservation and that the institution has rules for preserving sperm on account of the drugs used for treatment (53.3%). Moreover, 47.3% stated that guidance on fertility issues is provided, 46.7% stated that the institution workers have discussed the rules of sperm preservation in recent years, and 41.3% stated that the male patients treated in their unit were informed about sperm preservation. Regarding whether standard rules are necessary for preventing fertility, 36.7% of the nurses replied positively while 52% stated they were not knowledgeable about the issue.

The nurses' accuracy regarding the following statements was significantly higher than that of the doctors ($p<0.05$): 'In the majority of male cancer patients, sperm quantity and motility decreased in the diagnosis period', 'Even if the quantity and motility of semen/sperm sample is low, sperm preservation is significant since modern infertility treatments enable pregnancy', 'Sperm samples with poor quantity and

Table 2. Information on sperm banking of doctors and nurses and comparison between groups

Knowledge	Doctors		Nurses			
	n	%	n	%	T	p
a. In the majority of male cancer patients. sperm counts and motility decreased in the diagnosis period. (T)	8	11.3	76	50.6	6.061	0.000
b. Congenital defect risk is higher for children born of semen/sperm taken in the first week of chemotherapy/radiotherapy. (F)	31	43.7	33	22.0	-3.386	0.001
c. The costs of banking sperm are very high. (T)	16	22.5	19	12.7	-1.883	0.061
d. To have adequate semen samples for sperm banking. you need to collect 3 to 6 semen samples before cancer treatment begins. (F)	5	7.0	17	11.3	0.993	0.322
e. Even if the quantity and motility of semen/sperm sample is low, sperm preservation is significant since modern infertility treatments enable pregnancy. (T)	7	9.9	68	45.3	5.527	0.000
f. The probability of fertilization for sperm samples taken in adolescence is low. (F)	44	62.0	42	28.0	-5.092	0.000
g. The sperm samples which have low quantity and motility can live by freezing too. (T)	11	15.5	83	55.3	6.010	0.000
h. In order to reach sufficient quantity and motility for sperm freezing. the semen/sperm samples must be collected daily. (T)	22	31.0	109	72.7	6.385	0.000
i. The preferred method of collecting semen for sperm banking is by using a condom during intercourse. (F)	19	26.8	41	27.3	0.089	0.929
j. In pediatric cancers the infertility risk for boys is much higher than that of girls. (T)	34	47.8	98	65.3	2.493	0.013
k. Since in vitro fertilization is always costly. there is no need to preserve the sperm sample for intrauterine vaccination. (F)	50	70.4	52	34.7	-5.260	0.000
l. Most of the adolescent male patients have sperms of sufficient quality for preserving sperm. (T)	13	18.3	94	62.7	6.740	0.000
m. With today's cancer treatments, most male patients can retain or regain adequate fertility so that banking sperm is just added insurance. (F)	45	63.4	50	33.4	-4.374	0.000
n. A patient with a post thaw sperm count of <1 million per mL and a motility of 20% would be a good candidate to use his samples for intrauterine insemination of his wife. (F)	12	16.9	21	14.0	-0.563	0.574

motility can still be viable', 'In order to obtain a sufficient quantity of sperm with sufficient motility, semen/sperm samples must be collected daily', 'In paediatric cancers, the infertility risk for boys is much higher than that of girls', and 'Most adolescent male patients have sperm of sufficient quality for preservation'. On the other hand, the doctors' accuracy rate regarding the following statements was significantly higher than that of the nurses ($p<0.05$): 'The risk of congenital defects is higher for children born from semen/sperm taken in the first week of chemotherapy/radiotherapy', 'The probability of fertilization with sperm samples taken in adolescence is low', 'Since in vitro fertilization is always costly, there is no need to preserve the sperm sample for intrauterine vaccination', and 'The fertility of many patients is preserved in cancer centres' (Table 2).

A statistically significant difference was observed between doctors and nurses regarding not having time to talk to the patients about sperm banking because of their heavy workload in the unit (59.2% vs. 35.3%, respectively) ($p<0.01$). Talking about sperm banks with the patients was reported to be irritating by 83.1% and 54% of the doctors and nurses, respectively, and the difference between the rates was found to be considerably significant. More specifically, doctors found this situation to be more irritating than nurses. Regarding the recommendation of sperm banks to male adolescents receiving cancer treatment, 63.4% and 48% of the doctors and nurses, respectively, stated that it should be recommended; the difference between the 2 groups was found to be statistically significant. That is, doctors recommend sperm banks significantly more often than nurses. A significant difference was also observed between doctors and nurses (45.1% vs. 70%, respectively) regarding the belief that finding sperm banks appropriate for oncology patients is difficult ($p<0.01$) (Table 3).

The doctors who recommended sperm banking primarily recommended it to those wishing to have children, who are single, and who have to start chemotherapy immediately. Meanwhile, the nurses recommended sperm preservation to those wishing to have children, who were recently diagnosed, and who have to start chemotherapy immediately. Doctors recommended sperm preservation to all potential groups at significantly higher rates than the nurses.

The distribution of recommendations regarding sperm bank by doctors and nurses revealed that doctors recommended sperm banks at a higher rate than nurses. The first 3 disorders to which doctors recommend sperm banking are Hodgkin lymphoma, germ cell tumours, and non-Hodgkin lymphoma. Meanwhile, the nurses primarily recommended sperm banking to patients with germ cell tumours, Hodgkin lymphoma, and non-Hodgkin lymphoma.

Among the doctors and nurses, 88.7% and 80.7% stated that talking about sperm banks increases the hope

Table 3. Practices related to sperm banking of doctors and nurses and comparison between groups

Practices	Doctors		Nurses			
	n	%	n	%	t	p
a. I don't have time to talk about sperm banking due to their heavy workload in the unit	42	59.2	53	35.3	3.412	0.001
b. Talking about sperm banks with the patients may be irritating	59	83.1	81	54.0	4.350	0.000
c. Sperm storage is affordable for most patients.	30	42.3	82	54.7	-1.727	0.086
d. Success rate of fertility treatment using frozen sperm is very low.	65	91.5	125	83.3	1.645	0.101
e. Sperm bank should be recommended to all male adolescents who receive cancer treatment.	45	63.4	72	48.0	2.152	0.033
f. The expense of assisted reproductive treatments with frozen/thawed sperm is so high that it is not worthwhile to bank sperm	62	87.3	123	82.0	0.999	0.319
g. It is preferable for a cancer survivor who has undergone potentially mutagenic cancer treatment to use banked sperm instead of trying to conceive with fresh semen even ≥ 6-12 months after cancer treatment	58	81.7	121	80.7	0.180	0.857
h. It is difficult to find suitable sperm banks for the oncology patients	32	45.1	105	70.0	-3.656	0.000
i. All men who bank sperm should be asked to sign an advance directive about options for use or disposal in the event of death	29	40.8	99	66.0	-3.625	0.000
j. Boys under age 18 should not be told about sperm banking unless their parents have given consent for this topic to be addressed	49	69.0	109	72.7	-0.560	0.576
k. Boys under 18 should not be given erotic magazines or videos during semen collection unless their parents have been informed and have agreed to these procedures	37	52.1	98	65.3	-1.889	0.060

of patients and their families, respectively; the difference between groups was not significant (t= -1.501; p=0.135).

While 63.4% and 71.3% of the doctors and nurses agreed with the idea that treatment should be postponed, 36.6% and 28.7% thought it could be postponed for 1–2 weeks, respectively. Of the doctors and nurses, 81.7% and 74.7% believed that patients are willing to obtain information about sperm banks, respectively; the difference between groups was not significant (t = -1.026; p=0.306).

The majority of the doctors (80.3%) and nurses (70%) stated that the diagnosis affected the use of sperm banks; the difference between groups was not significant. Most of the doctors and nurses (78.9% and 57.3%, respectively) reported that the phase of the disorder may be influential ($p<0.05$). The vast majority of the doctors (91.5%) and more than half of the nurses (64%) stated that patients' lack of knowledge on sperm banks may influence sperm bank usage ($p<0.05$) (Table 4).

Analysis of doctors' and nurses' responses regarding factors influencing sperm bank use revealed that the majority of the doctors thought that cultural differences (87.3%), economic status (84.5%), and religious beliefs (78.9%) affected sperm back use, while the majority of the nurses thought that cultural factors (82%) and religious beliefs (61.3%) were influential. The doctors' response rates were significantly higher than those of nurses ($p<0.05$) (Table 4).

Discussion

The present study aimed to identify health workers' knowledge and practices related to sperm bank use in young male cancer patients and eliminate shortcomings. The results show that doctors are more knowledgeable about these issues than nurses. Among the doctors and nurses, 56.3% and 78% stated that the risk of congenital defects is high in babies born of the semen/sperm taken in the first week of chemotherapy and radiotherapy, respectively. The majority of the doctors and nurses reported that the cost is high (doctors, 77.5%; nurses, 87.3%) and that 3–6 samples are required (doctors, 93%; nurses, 88.7%). The study of Reebals et al. (2006) on American nurses' recommendations for newly diagnosed male adolescents before chemotherapy found that 63% of the nurses replied accurately and only 1 nurse responded correctly answers all items. The same study revealed that 51.9% of nurses think the risk of congenital defects is high for children born of semen/sperm taken in the first week of chemotherapy/ radiotherapy. The majority of the nurses stated that the cost is high (92.6%) and that 3-6 samples should be taken before cancer treatment (70%). Only 48% of nurses knew that the risk of infertility after cancer treatment is higher for boys than girls (4). In the present study, 47.8% of doctors and 65.3% of nurses knew this.

The issue of the preservation/continuation of fertilization, which might affect the quality of life of oncology patients, is a largely overlooked topic (4,6,10,11). The present study shows similar results to those of previous studies in that there are no written rules in the study institutions, this topic is not often discussed with the patients or health workers, and inadequate guidance is provided to patients on fertility. Health workers were observed to be indecisive about whether standard rules are needed for preventing infertility. Reebals et al. (2006) state that 96.3% of the nurses believed patients should be informed about infertility as a potential side

Table 4. Doctors' and nurses' responses in terms of individual and environmental factors influencing sperm bank use and comparison between groups

	Doctors		Nurses		t	p
	n	%	n	%		
Age	60	84.5	92	61.3	-3.554	0.000
Diagnosis	57	80.3	105	70.0	-1.616	0.108
Stages of the disease	56	78.9	86	57.3	-3.177	0.002
Patient's lack of information about the sperm bank	65	91.5	96	64.0	-4.472	0.000
Parents' attitude	49	69.0	69	46.0	-3.265	0.001
Cultural differences	62	87.3	123	82.0	-0.903	0.368
Religious belief	56	78.9	92	61.3	-2.617	0.009
The economic situation	60	84.5	69	46.0	-5.798	0.000
Challenges related to health protocols	52	73.2	37	24.7	-7.719	0.000
Emotional shock	53	74.6	62	41.3	-4.849	0.000

effect of treatment; meanwhile, 85.2% thought parents should not make sperm banking decisions on behalf of adolescents younger than 19 years of age, and 62.9% did not have enough time to discuss the issue in practice (4). Other studies report similar results (6,10,11).

In the present study, the first 3 groups of patient recommended to use sperm banks by the doctors included those who wish to have children, are single, and needed to start chemotherapy immediately; meanwhile, nurses recommended sperm banks to those who wish to have children, were recently diagnosed, and needed to start chemotherapy immediately. Reebals et al. (2006) report that nurses' rankings included those who wish to have children (85.2%) and are engaged or married (37%) (4). Similarly, Vadaparampil et al. (2007) report that nurses rankings included those who wish to have children (93%) and are engaged or married (67%) (14).

Fertilization is generally one of the most important topics for patients. In disorders whose treatment might influence fertilization, such as cancer, patients become concerned about fertility once the disorder's shock effects end and after the remission process starts. In this case, issues such as sperm banking, which might preserve the continuity of fertilization in adolescents, create a dilemma among health workers. Some health workers argue that talking about this issue might give hope to these patients and a negative ending might discourage them. Meanwhile, some health workers think the adolescent patient and their family should definitely be informed since it is a practice that may preserve fertility (7). Doctors and nurses (88.7% and 80.7% respectively) stated that talking about sperm banks provides hope for patients and their families.

Most of the participating doctors (63.4%) and nurses (71.3%) reported that treatment should not be postponed to take sperm samples, while 36.6% of doctors and 28.7% of nurses stated treatment can be postponed by 1-2 weeks. Most of the doctors (81.7%) and nurses (74.7%) thought patients want to be informed about sperm banks. It was thought that the lack of information provided to patients might stem from the priority given to treatment.

The majority of the participating doctors stated that cultural factors (87.3%), economic status (84.5%), and religious beliefs (78.9%) might influence sperm bank use. Meanwhile, the majority of nurses stated that cultural factors (82%) and religious beliefs (61.3%) are influential. Previous studies report that cultural factors, economic status, the family's emotional state, and the family's perception of fertilization are important factors affecting patients' knowledge and use of sperm banks (15).

Conclusion

Although health workers knew that fertility preservation is important for young male patients being treated for cancer, practices were not at desired levels. The main factors influencing health workers' discussion of sperm banks with male adolescent patients are as follows: cultural factors, the family's economic status, the family's religious beliefs, the emotional shock experienced by the patient and their family, the parents' attitudes, health workers' heavy work load, and giving priority to the treatment of the disorder. Health workers reported that talking about the topic gives hope to the patients and their families.

Advances in cancer treatment have increased patients' life expectancy and help maintain complete remission. With the increase in life expectancy, factors such as quality of life have become more important. Fertilization, which is an important topic thought to influence quality of life, should be discussed with both patients and their families. Health workers should pay more attention and allot more time to this issue. Because of large patient numbers and intensive treatment in oncology clinics, there is little opportunity to talk about fertility preservation. To this end, increasing the number of health workers and improving work schedules are recommended. In addition, it is recommended that health workers be trained about fertility preservation.

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