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Research Article / Araştırma Makalesi

Awareness Level of the Healthcare Professionals about Cardiopulmonary Rehabilitation: A Cross-Sectional Study

Kardiyopulmoner Rehabilitasyon Hakkında Sağlık Çalışanlarının Farkındalık Düzeyi: Kesitsel Bir Çalışma

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Abstract: We aimed to determine the awareness level of the healthcare professionals about cardiopulmonary rehabilitation (CPR) and to compare the level of CPR awareness according to occupation and practice setting among the healthcare professionals. This cross-sectional survey study included physicians, nurses and physiotherapists who were working in a university hospital in which CPR service was available at the department of physical medicine and rehabilitation (PMR). Physicians of different specialties (including PMR, cardiology, thoracic diseases, internal medicine), nurses and physiotherapists were asked to fill out the survey. This survey was developed by CPR study group of PMR association and consisted of three parts. Descriptive statistics were used to describe demographic characteristics. Knowledge level of the participants was evaluated based on occupation and practice settings. Chi-square test was used to compare the answers to the items based on occupational group and practice settings. A total of 90 volunteers from four different clinics were included in this study. Among the participants, 55.6% were physicians, 27.8% were nurses, 16.7% were physiotherapists. Responses from the third section of the survey revealed that 84.4% of the participants were familiar with CPR. On the other hand statistically lower rate of nurses knew a CPR center to which they could refer their patients compared to physicians and physiotherapists ($p<0.05$). Almost all of the participants who were practice in PMR department were familiar with CPR, however about two third of participants who were practice other departments were familiar with CPR ($p<0.05$). This study indicates that healthcare professionals have some knowledge about CPR. However in our opinion it is essential to find out new methods, novel strategies to increase the awareness of CPR in nurses as well as healthcare professionals who were not practice in PMR department.
Keywords: cardiac rehabilitation; pulmonary rehabilitation; awareness; rehabilitation.

Özet: Sağlık çalışanlarının kardiyopulmoner rehabilitasyon (KPR) ile ilgili farkındalık düzeylerini belirlemeyi ve sağlık çalışanları arasında meslek ve çalıştığı kliniğe göre KPR farkındalık düzeyini karşılaştırmayı amaçladık. Bu kesitsel anket çalışması, KPR servisinin Fiziksel Tıp ve Rehabilitasyon Bölümünde (FTR) yer aldığı bir üniversite hastanesinde çalışan doktorları, hemşireleri ve fizyoterapistleri içermekteydi. Farklı uzmanlıklarda çalışan doktorlardan (FTR, kardiyoloji, göğüs hastalıklar, iç hastalıkları), hemşirelerden ve fizyoterapistlerden anketi doldurmaları istendi. Bu anket, FTR Derneği'nin KPR çalışma grubu tarafından geliştirilmiştir ve üç bölümden oluşmaktadır. Demografik özellikleri tanımlamak için tanımlayıcı istatistikler kullanıldı. Katılımcıların bilgi düzeyleri meslek ve çalıştığı kliniğe göre değerlendirildi. Meslek ve çalıştığı kliğine göre maddelerin cevaplarını karşılaştırmak için ki-kare testi kullanıldı. Bu çalışmaya dört farklı klinikten toplam 90 gönüllü dahil edildi. Katılımcıların % 55,6'sı hekim, % 27,8'i hemşireler, % 16.7'si fizyoterapist idi. Anketin üçüncü bölümünün cevapları, katılımcıların % 84.4'ünün KPR'yi bildiğini ortaya koymuştur. Diğer taraftan, hemşireler doktorlar ve fizyoterapistler ile kıyaslandığında istatistiksel olarak daha düşük oranda hastaların başvurabilecekleri bir KPR merkezini bilmekteydi ($p <0,05$). FTR kliniğinde çalışan tüm katılımcıların neredeyse tamamı KPR'ye aşina iken, ancak diğer kliniklerde çalışan katılımcıların yaklaşık üçte ikisi KPR'ye aşina idi ($p <0,05$). Bu çalışma, sağlık profesyonellerinin KPR hakkında bir miktar bilgiye sahip olduklarını göstermektedir. Ancak bizim görüşümüze göre, hem hemşirelerde hem de FTR kliniği dışında çalışan sağlık çalışanlarında KPR farkındalığını arttırmak için yeni yöntemler ve yeni stratejiler geliştirmek önemlidir.
Anahtar Kelimeler: kardiyak rehabilitasyon; pulmoner rehabilitasyon; farkındalık; rehabilitasyon.

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1. Introduction

Cardiovascular and pulmonary diseases are the leading cause of mortality worldwide (1), and are significant contributors to morbidity and health-related costs (2). Patient participation in cardiopulmonary rehabilitation (CPR), a comprehensive outpatient risk reduction program, mitigates this burden (3). Although the beneficial effects of CPR are well established, patient uptake and completion of the treatment remains poor (4).

CPR is an interdisciplinary team approach to treat patients with functional limitations secondary to heart or pulmonary diseases (5). Despite the benefits of CPR participation in and adherence to CPR are less than optimal. It is clear that there are barriers and problems to beginning CPR. Previous studies have reported that the rate of participation ranges from 29.5% to 55% in the United States (6, 7). The reasons of this low rate of taking part in CPR are multifactorial. Some of these factors are health systems, providers, programs, and patients (8). Among these factors, referral failure and lack of provider encouragement are the most common reasons. Kim et al. (9) have reported that the most common cause of low participation is the lack of awareness. The development of CPR may be possible with increasing knowledge about this issue. In a recent study it was reported that awareness of the cardiac rehabilitation program was very low (30.2%) in patients with cardiovascular diseases (10). The majority of patients who had heard about it had been informed by a physician (87.5%). In another recent study it was found that the awareness of pulmonary rehabilitation is very low in patients with chronic obstructive pulmonary disease (COPD) (11). The lower rate of awareness about CPR in patients with cardiovascular or pulmonary diseases may be due to insufficient informations given by healthcare professionals. There is no enough data on awareness level of the healthcare professionals about CPR in the available literature. In Turkey studies on the awareness of CPR have been rarely reported (11, 12). To our knowledge this is the first study which compares the awareness level of the healthcare professionals according to occupation and practice setting.

The aim of this study was to determine the awareness level of the healthcare professionals about CPR and to compare the level of CPR awareness according to occupation and practice setting among the healthcare professionals.

2. Material and Methods

This cross-sectional survey study included physicians, nurses and physiotherapists who were working in a university hospital in which CPR service was available at the department of physical medicine and rehabilitation (PMR). All the participants were informed about the study procedure and gave their written informed consents to participate in the study according to Helsinki Decleration. Ethical approval for the study was granted by the Pamukkale University Ethics Committee.

Physicians of different specialties (including PMR, cardiology, thoracic diseases, internal medicine), nurses and physiotherapists were asked to fill out the survey. This survey was developed by CPR study group of PMR association and consisted of three parts (12). The first part included demographic information such as age, gender, occupation, and organization of employment. The second part, filled out only by physicians, asked for information about each physician's field of specialization: specialization type, educational institution where the degree was obtained and time since the degree was obtained. Other healthcare professionals were wanted to skip the second part. The third part of the survey consisted of questions related to CPR such as CPR training received importance, CPR indications, types of specialists responsible for CPR, components and goals of CPR and knowledge of CPR centers.

Statistical analysis

Sample size was calculated as 80 participants with a power 80% or above according to the data obtained from the other study.

All statistical analyses were performed using SPSS version 17.0 for Windows (Statistical Package for the Social Sciences Inc, Chicago, IL, USA). Descriptive statistics were used to describe demographic characteristics. Frequency (n), percentage (%), mean and standard deviation were used as descriptive statistics. Knowledge level of the participants was evaluated based on occupation and practice settings. Chi-square test was used to compare the answers to the items based on occupational group and practice settings. In all analyses, p values <0.05 were considered as statistically significant.

3. Results

A total of 90 volunteers from four different clinics were included in this study. Among the participants, 55.6% were physicians, 27.8% were nurses, 16.7% were physiotherapists, with a mean age of 31.4 years. One third of the participants were male and about a half of healthcare professionals were working in PMR department. The physicians specialized in PMR (40%), thoracic diseases (18%), cardiology (14%), internal medicine (28%). The majority of the physicians had their specialty training in a university hospital. Demographic characteristics of volunteers included in this study are given in Table 1.

Table 1. Demographic characteristics of healthcare professionals

	Healthcare Professionals (n=90)
Gender, n (%)	
Female	60 (66.7%)
Male	30 (33.3%)
Age (years) (mean ± SD)	31.4±8.6
Occupation, n (%)	
Doctor	50 (55.6%)
Nurse	25 (27.8%)
Physiotherapist	15 (16.7%)
The distribution of healthcare professionals according to clinic, n (%)	
Physical medicine and rehabilitation	46 (51.0%)
Thoracic diseases	14 (15.6%)
Cardiology	16 (17.8%)
Internal medicine	14 (15.6%)
Specialty of physicians, n (%)	
Physical medicine and rehabilitation	20 (40%)
Thoracic diseases	9 (18%)
Cardiology	7 (14%)
Internal medicine	14 (28%)
Specialty training of physicians, n (%)	
University	46 (92%)
Training and research hospital	4 (8%)
Duration of specialty for physicians, n (%)	
0-2 years	13 (26%)
3-5 years	24 (48%)
6-10 years	2 (4%)
10 years<	11 (22%)

Responses from the third section of the survey revealed that 84.4% of the participants were familiar with CPR. About a half of participants received CPR lessons in their university education. The majority of participants stated the necessity of CPR in the treatment of cardiac and pulmonary disease. Among participants, 72.2% knew CPR programs or consulting services at their workplace; 27.8% did not know. The percentage of participants who informed their patients about CPR programs was 52.2%,

while 27.9% did not provide any information. Of the participants, 57.9% referred patients to the relevant CPR department, and 18.9% did not know about CPR referrals. Fifty-nine percent of the survey participants knew a CPR center to which they could refer their patients. Survey responses of participating healthcare professionals are given in Table 2.

Table 2. Survey responses of participating healthcare professionals

	Healthcare Professionals (n=90)
I am aware of CPR	
Yes	**76 (84.4%)**
No	**14 (15.6%)**
There is CPR lessons in my university education	**49 (54.4%)**
Yes	**51 (45.6%)**
No	
There is CPR lessons in my specialization training	**30 (33.4%)**
Yes	**20 (22.2%)**
No	**40 (44.4%)**
Absence of specialization training	
Is CPR necessary in the management of cardiac and pulmonary diseases?	**65 (72.2%)**
It is mandatory	**19 (21.3%)**
Have made it better	**2 (2.1%)**
It is not necessary	-
Is unnecessary	**4 (4.4%)**
I have no idea	
Who can apply CPR? (more than one can be selected)	**81 (90%)**
Doctor can apply	**49 (54.4%)**
Nurse can apply	**72 (80%)**
Physiotherapist can apply	**5 (5.6%)**
Other medical proffesionals can apply	
Which applications were used for CPR?	**3 (3.3%)**
Education	**19 (21.1%)**
Exercise	-
Others	**68 (75.6%)**
All of them	
Which specialist can be present in the CPR team? (more than one can be selected)	**84 (93.3%)**
Physical medicine and rehabilitation	**80 (88.9%)**
Thoracic diseases	**80 (88.9%)**
Cardiology	**66 (73.3%)**
Cardiovascular surgery	**42 (46.7%)**
Psychiatry	
CPR information is provided to patients at the institution where I work	
Yes	**47 (52.2%)**
No	**25 (27.9%)**
I have no idea	**18 (20%)**
At my institute, patients are referred CPR related departments	**52 (57.9%)**
Yes	**17 (18.9%)**
No	**21 (23.3%)**
I have no idea	
There is a CPR unit in your hospital	
Yes	**65 (72.2%)**
No	**3 (3.3%)**
I have no idea	**22 (24.4%)**

I know a CPR center to which I can refer my patients	**53 (58.9%)**
Yes	**37 (41.1%)**
No	

CPR: *Cardiopulmonary rehabilitation*

There was a statistically significant difference about receiving CPR lessons in their university education according to occupation (*p*:0.014). The majority of the physiotherapists received CPR lessons in their university education however 44% of nurses and 56% of physicians received CPR lessons in their university education. There was also a statistically significant difference about knowing a CPR center to which they could refer their patients according to occupation (*p*:0.021). Only 36% of nurses knew a CPR center to which they could refer their patients on the other hand 66% of physicians and 73.3% of physiotherapists knew a CPR center to which they could refer their patients. There was no statistical difference about other survey questions according to occupation as shown in Table 3.

Table 3. Survey responses of participating healthcare professionals according to occupation

	Physicians (n=50)	Nurses (n=25)	Physiotherapist (n=15)	*p*
I am aware of CPR				
Yes	40 (80%)	21 (84%)	15 (100%)	**0,172**
No	10 (20%)	4 (16%)	-	
There is CPR lessons in my university education				
Yes	22 (44%)	14 (56%)	13 (86.7%)	0.014
No	28 (56%)	11(44%)	2 (13.3%)	
Is CPR necessary in the management of cardiac and pulmonary diseases?				
It is mandatory	31 (62%)	20 (80%)	14 (93.3%)	
Have made it better	16 (32%)	2 (8%)	1 (6.7%)	**0.113**
It is not necessary	1 (2%)	1 (4%)	-	
I have no idea	2 (4%)	2 (8%)	-	
Which applications were used for CPR?				
Education	0 (0%)	2 (8%)	0(0%)	
Exercise	2 (4%)	4 (16%)	0(6.7%)	**0,144**
All of them	48 (96%)	19 (76%)	14(93.3%)	
CPR information is provided to patients at the institution where I work	24 (48%)	15 (60%)	8 (53.3%)	
Yes	16 (32%)	6 (24%)	3 (20%)	**0.777**
No	10 (20%)	4 (16%)	4 (26.7%)	
I have no idea				
At my institute, patients are referred CPR related departments				
Yes	31 (62%)	10 (40%)	11 (73.3%)	
No	9 (18%)	6 (24%)	2 (13.3%)	**0.252**
I have no idea	10 (20%)	9 (36%)	2 (13.3%)	
There is a CPR unit in your hospital	36 (72%)	15 (60%)	14 (93.3%)	
	2 (4%)	1 (4%)	-	
	12 (24%)	9 (36%)	1(6.7%)	**0.253**
I know a CPR center to which I can refer my patients				
Yes	**33 (66%)**	**9 (36%)**	**11 (73.3%)**	
No	**17 (34%)**	**16 (64%)**	**4 (26.7%)**	0.021

CPR: *Cardiopulmonary rehabilitation*

There was a statistically significant difference about awareness level according to practice setting (p<0.001). 97.8% of the participants who were practice in PMR department were familiar with CPR, however 70.5% of participants who were practice other departments were familiar with CPR. There was a statistically significant difference about application of CPR according to practice setting (p:0.022). The majority of participants who were practice in PMR department were stated all of items should be applied in CPR, while 63.6% of volunteers stated all of items who were practice other departments. Of the participants who were practice in PMR department, 73.9% referred patients to the relevant CPR department, while 40.9% of participants who were practice other departments referred patients to the relevant CPR department (p:0.006). Of the participants who were practice in PMR department, 73.9% knew a CPR center to which they could refer their patients, whereas 43.2% of participants who were practice other departments knew (p:0.003). There was no statistical difference about other survey questions according to practice setting as shown in Table 4

Table 4. Survey responses of participating healthcare professionals acoording to practice settings

	PMR clinic (n=46)	Other clinics (n=44)	*p*
I am aware of CPR			
Yes	45 (97.8%)	31 (70.5%)	<0.001
No	1 (2.2%)	13 (29.5%)	
There is CPR lessons in my university education			
Yes	29 (63%)	20 (45.5%)	**0.094**
No	17 (37%)	24 (54.5%)	
Is CPR necessary in the management of cardiac and pulmonary diseases?			
It is mandatory	39 (84.82%)	26 (59.1%)	**0.055**
Have made it better	5 (10.9%)	14 (31.8%)	
It is not necessary	1 (2.2%)	1 (2.3%)	
I have no idea	1 (2.2%)	3 (6.8%)	
Which applications were used for CPR?	0 (0%)	3 (6.8%)	0.022
Education	6 (13%)	13 (29.5%)	
Exercise	40 (87%)	28 (63.6%)	
All of them			
CPR information is provided to patients at the institution where I work			
Yes	29 (63%)	18 (40.93%)	**0.110**
No	10 (21.7%)	15 (34.1%)	
I have no idea	7 (15.2%)	11 (25%)	
At my institute, patients are referred CPR related departments			
Yes	34 (73.9%)	18 (40.9%)	0.006
No	5 (10.9%)	12 (27.3%)	
I have no idea	7 (15.2%)	14 (31.8%)	
There is a CPR unit in your hospital			
Yes	38 (86.6%)	27 (61.4%)	**0.08**
No	1 (2.2%)	2 (4.5%)	
I have no idea	7 (15.2%)	15 (34.1%)	
I know a CPR center to which I can refer my patients			
Yes	**34 (73.9%)**	**19 (43.2%)**	0.003
No	**12 (26.1%)**	**25 (56.8%)**	

PMR: *Physical medicine and rehabilitation*
CPR: *Cardiopulmonary rehabilitation*

4. Discussion

In this cross-sectional study, we determined the awareness level of the healthcare professionals about CPR and compared the level of CPR awareness according to occupation and practice setting among the healthcare professionals. Our results demonstrated that the majority of the participants were familiar with CPR however about a half of participants were informed their patients about CPR programs and referred patients to the relevant CPR department. Results of the present study revealed that statistically lower rate of nurses knew a CPR center to which they could refer their patients compared to physicians and physiotherapists. On the other hand almost all of the participants who were practice in PMR department were familiar with CPR, however about two third of participants who were practice other departments were familiar with CPR. Furthermore the majority of participants who were practice in PMR department, referred patients to the relevant CPR department and knew a CPR center to which they could refer their patients, while only small amount of participants who were practice other departments referred patients to the relevant CPR department and knew a CPR center.

Although it is known that CPR reduces mortality and morbidity, it is not widely implemented. Awareness of and enrollment into CPR following cardiovascular or pulmonary diseases remains suboptimal. Thus, it is important to identify new approaches to improve these outcomes (13). In recent studies it was found that the awareness of pulmonary rehabilitation is very low in patients with COPD (11, 14). Therefore, the authors suggested to find reasons of this situation, new strategies to increase the awareness of pulmonary rehabilitation in COPD patients. One factor may be lack of demand since the levels of knowledge and awareness among patients who were eligible for CPR seem to be insufficient (15). The results of a multicenter cross sectional survey study revealed that the level of knowledge regarding CPR was insufficient among patients with cardiopulmonary problems, mostly as a result of not being informed adequately by the healthcare staff (15). In this multicenter study, it was concluded that it is important to make an effort to increase the level of liaison between patients and physicians and other healthcare professionals who participate in the treatment of cardiac and pulmonary patients.

It is imperative to furnish patients with information on CPR and to put more effort into running those services effectively. The most prominent factor in the success of referral and participation in CPR was the guidance of the patient's physician (15). In a multicenter study containing 12 centers with a CPR unit and 727 healthcare professionals participants, Sarıkaya et al. found a 79.3% awareness rate (12). In the same study, the authors determined that almost 90% of cardiovascular surgeons, thoracic disease specialists, primary care physicians, and PMR specialists have some knowledge of CPR however, only 70% of these specialists regularly notified their patients about CPR and referred their patients to CPR programs. Moreover the authors reported that 1/3 of the nurses had no knowledge of CPR, and 2/3 of did not know of a rehabilitation center to which they could refer their patients. Similar ratios were obtained by the nurses in our study. Also in accordance with this study, our survey revealed that 84.4% of the participants were familiar with CPR however about a half of participants were informed their patients about CPR programs in participating centers and 57.9% of participants referred patients to the relevant CPR department. In addition we also reported that the majority of participants who were practice in PMR department, referred patients to the relevant CPR department and knew a CPR center to which they could refer their patients, while only small amount of participants who were practice other departments referred patients to

the relevant CPR department and knew a CPR center. Consequently healthcare professionals who were practice other departments then PMR and need to provide information about CPR for patients, are not sufficiently aware of the situation. As a result, patients are unaware of CPR due to the healthcare professionals who provide this awareness are not adequately informed about CPR. Our study suggest that the awareness of CPR program is not high among healthcare professionals who were practice other departments then PMR and nurses have little idea about the availability of CPR program.

The major limitation of the present study is that the results can not be generalized to all healthcare professionals. The present study was performed only in a university hospital, therefore the sample may not be representative of the general healthcare professionals. Moreover, ratios of physicians in different specialties and also ratios of healthcare professionals were not equal in our study. Finally, further data with larger sample size including multicenter clinics are needed to better understand the awareness level of the healthcare professionals about CPR.

In conclusion, this study indicates that healthcare professionals have some knowledge about CPR. However in our opinion it is essential to find out new methods, novel strategies to increase the awareness of CPR in nurses as well as healthcare professionals who were not practice in PMR department. In order to increase the amount of patients that can benefit from CPR services, it is crucial to educate and inform allied healthcare professionals about CPR.

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