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INVESTIGATION OF THE RELATIONSHIP BETWEEN PARAMEDICS' PERCEPTIONS OF SELF-EFFICACY AND MANAGEMENT OF PATIENTS WITH COPD IN THE PRE-HOSPITAL PERIOD

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ABSTRACT

Objective: In this study, it was aimed to examine the relationship between paramedics' COPD (Chronic Obstructive Pulmonary Disease) patient management and their self-efficacy perceptions in the prehospital period.

Materials and Methods: The research was conducted between October and November 2022 in descriptive-relational type. The sample of the research consisted of 120 students studying in the First and Emergency Aid Program of the Vocational School of Health Services of two universities. Socio-Demographic Information Form, COPD knowledge level questionnaire and General Self-Efficacy Scale (GSE) were used in the study.

Results: More than half of the students are women, and approximately 70% have received training on chronic diseases. The COPD knowledge levels of the students were at a medium level and the GSE total score average was low. It was determined that the COPD knowledge level and the school variables had a significant positive effect on GSE (p<0.001).

Conclusion: In our study, it was found that the COPD knowledge of the students was moderate and their self-efficacy was low. It was determined that the COPD knowledge level of the students was an important predictor of the GSE (p<0.001).

Keywords: COPD, Paramedics, Pre-Hospital, Self-Efficacy, Student

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PARAMEDİKLERİN HASTANE ÖNCESİ DÖNEMDE KOAH'LI HASTA YÖNETİMİ VE ÖZ YETERLİK ALGILARI ARASINDAKİ İLİŞKİNİN İNCELENMESİ

ÖZ

Amaç: Bu çalışmada hastane öncesi dönemde paramediklerin KOAH (Kronik Obstrüktif Akciğer Hastalığı) hasta yönetimi ile öz yeterlik algıları arasındaki ilişkinin incelenmesi amaçlandı.

Gereç ve Yöntemler: Araştırma tanımlayıcı-ilişkisel tipte Ekim-Kasım 2022 tarihleri arasında yapıldı. Araştırmanın örneklemini, iki üniversitenin Sağlık Hizmetleri Meslek Yüksekokulu İlk ve Acil Yardım Programı'nda okuyan 130 öğrenci oluşturdu. Araştırmada Sosyo-Demografik Bilgi Formu, KOAH bilgi düzeyi anket formu ve Genel Öz Yeterlik Ölçeği (GÖYÖ) kullanıldı.

Bulgular: Öğrencilerin yarısından fazlası kadın, yaklaşık %70'i ise kronik hastalıklarla ilgili eğitim almıştır. Öğrencilerin KOAH bilgi düzeyleri orta seviyede olup GÖYÖ toplam puan ortalaması ise düşüktü. KOAH bilgi düzeyi ve okul değişkenin GÖYÖ üzerinde pozitif yönde önemli bir etkisi olduğu saptandı (p<0.001).

Sonuç: Çalışmamızda öğrencilerin KOAH bilgisinin orta düzeyde ve öz yeterliklerinin düşük olduğu bulundu. Öğrencilerin KOAH bilgi düzeylerinin GÖYÖ üzerinde önemli bir yordayıcı olduğu saptandı (p<0.001).

Anahtar Kelimeler: KOAH, Paramedikler, Hastane Öncesi, Öz Yeterlik, Öğrenci

INTRODUCTION

Greenhouse gases emitted from factories as a result of the growth of the industrial sector worldwide as well as air pollution, forest fires, use of tobacco products, lack of hygiene in residential areas, elderly age, and malnutrition lead to various problems in terms of human health. These factors, in particular, contribute to a rise in the occurrence of chronic diseases. Chronic diseases are considered the primary cause of death and disability worldwide (Indahningrum et al., 2020b). According to the World Health Organisation (WHO)'s 2018 data; 54% of mortality in 2016 was caused by chronic diseases (cardiovascular diseases, oncological cancers, diabetes, and chronic respiratory diseases) and chronic diseases have been the leading cause of death worldwide in the last 15 years (WHO, 2020). One of the chronic diseases with high prevalence in the world and Turkey is COPD. According to WHO 2015 estimates, 65 million people worldwide suffer from this disease (WHO, 2015; Garvey, 2016). COPD ranks as the third leading cause of death among respiratory system diseases after circulatory system diseases and oncological cancers in the world and Turkey and is the disease with the highest mortality and morbidity rate (Decker, 2017). This information shows that COPD is a remarkable health problem worldwide (Ergin, 2019).

Individuals who experience problems caused by respiratory tract diseases often encounter the emergence of emergency respiratory complications. This increase in incidents

causes more such individuals to be found in Prehospital Emergency Health Services (PHMS). When these rates are carefully analysed, healthcare professionals who work in PHMS should evaluate the patient with respiratory distress, seek out the underlying cause of respiratory distress, and provide appropriate treatment and necessary care to the patient until he/she is admitted to the hospital (Kurland & Siegel, 2016). Paramedics from healthcare professionals working in PHMS are the leading practitioners and among integral pillars of PHMS in the delivery of these services (Celikli, 2016).

The direct relevance of the care provided to the sick or injured at the scene of an incident to human life demonstrates the significance of the paramedic profession. Therefore, paramedic students and professionals should provide services based on their knowledge and abilities within the area of their training and the topics for which they are accountable in the practice and care phases of the health services they will deliver. As Bandura stated, a person's ability to do a task successfully depends on his or her belief in his or her self-efficacy, so working in pre-hospital emergency care cases can successfully demonstrate their level of knowledge and problem-solving skills (Bandura, 1982). To put it differently, possessing strong self-efficacy beliefs has optimistic consequences for the individual. In effect, having a great level of self-efficacy leads to increased interest in activities and greater efficacy in participating (Kurland & Siegel, 2016). The healthcare sector focuses on saving and enhancing human lives, hence the expectation for healthcare professionals to possess high levels of self-efficacy and confidence is highly reasonable. It affects people's physical and psychological well-being and requires a low margin of error. Hence, healthcare workers act judiciously, drawing from their experience and self-assuredness when making decisions and carrying out medical procedures and practices (Tekir et al., 2016).

As far as we have reviewed in the literature, no studies have been found to reveal the correlation between pre-hospital COPD patient management and self-efficacy perceptions in students who attend paramedic departments in vocational schools of health services. Therefore, in this study, it was aimed to determine the relationship between the COPD management and knowledge level of paramedic students and their self-efficacy and to determine the affecting factors.

1. MATERIALS AND METHODS

Study design

The study was conducted in descriptive-relational design.

Sampling

The population consisted of students (N=157) who attended the associate degree programme of the vocational school of healthcare servicesat two universities located in the eastern region of Turkey. Efforts were made to reach the entire population. The study was completed with 120 students (75%). The study included students who volunteered and were active at the time of the research.

Measures

In the study, socio-demographic characteristics, COPD knowledge level questionnaire and General Self-Efficacy Scale prepared by the researchers after the literature review were used.

COPD knowledge level questionnaire

The researchers prepared a questionnaire (Yang et al., 2019; Indahningrum et al., 2020; Heys et al., 2018) according to the literature. Each correct response to each of the questions got"1 point". Total score of the knowledge level questionnaire ranges between 0-13, and the higher the score, the higher the level of knowledge on COPD (Yang et al., 2019).

General Self-Efficacy Scale (GES)

Sherer et al., (1982) developed the scale to determine the general self-efficacy of adults, and Yıldırım and İlhan (2010) conducted its Turkish validity and reliability studies (Yıldırım & Ilhan, 2010). The scale consists of 17 items that are rated in a 5-point Likert-type scale, ranging between 1 (not at all) and 5 (very good). Total score of this scale ranges between 17 and 85 points. The higher the total score on the scale, the higher the self-efficacy belief. The Cronbach's Alpha (α) internal consistency coefficient of the scale was reported to be 0.69. Its Cronbach's Alpha (α) internal consistency coefficient was found to be 0.85 in the present study.

Data collection procedures

The datawere conducted with associate degree students attending two universities between October and November 2022 during out-of-class hours through Google forms online.

Data analysis

The data were analysed using the SPSS 22.0 package programme. Number, percentage distributions, mean and standard deviation were used to demonstrate descriptive characteristics. Kolmogorov-Smirnov Z test was applied to determine whether or not the data were normally distributed. Regression analysis was applied to assess the data that were not normally distributed. The significance level was accepted as $p < 0.05$.

Ethical principles of the study

Ethics committee approval (Decision no: E-47277- 2022/115, Date: 28.09.2022) was received from Sırnak University Clinical Research Ethics Committee. The study was conducted in accordance with the Declaration of Helsinki. The participants granted consent that they were voluntary to participate in the study.

2. RESULTS

Table 1. Distribution of Socio-Demographic Characteristics of the Students

	n(%)
Gender	
Female	76 (63.3)
Male	44 (36.7)
Marital Status	
Single	113 (94.2)
Married	7 (5.8)
University	
A*	68 (56.7)
B**	52 (43.3)
Receiving education on the management of chronic diseases	
Yes	85 (70.8)
No	18 (15.0)
Partially	17 (14.2)
Receiving education on the respiratory tract diseases	
Yes	91 (75.8)
No	12 (10.0)
Partially	17 (14.2)
Receiving education on the diagnosis and management of the pain	
Yes	89 (74.2)
No	13 (10.8)
Partially	18 (15.0)
The adequacy of the content of the theoretical and practical courses for the management of COPD	
Yes	63 (52.5)
No	21 (17.5)
Partially	36 (30.0)
Status of perceiving your self sufficient in using basic and advanced airway instruments	
Yes	55 (45.8)
No	29 (24.2)
Partially	36 (30.0)
Status of perceiving yourself sufficient in providing respiratory support and intubation procedures in the ambulance	
Yes	51 (42.5)
No	26 (21.7)
Partially	43 (35.8)
Age (Mean± SD/years)	20.3± 1.2
TOTAL	120 (100.0)

*Şırnak University, **Bingöl University

This section examines the distribution of demographic characteristics, COPD knowledge levels and general self-efficacy levels of the participants.

When Table 1 was analysed, it was found that 63.3% of the students were female, 94.2% were single, 70.8% received education on chronic diseases, 75.8% were educated about respiratory tract diseases, 74.2% of the students were educated on diagnosing pain, 52.5% perceived the education as adequate, 45.8% of the students perceived themselves sufficient in using basic and advanced airway instruments, and 42.5% perceived themselves sufficient in respiratory support and intubation procedures.

Table 2. Distribution of the Students by Their COPD Knowledge Levels

	Yes	No	I have no idea
	n (%)	n (%)	n (%)
It is characterised by progressive airflow limitation.	53 (44.2)	28 (23.3)	39 (32.5)
The most important symptom of COPD is cough and sputum complaint.	93 (77.5)	18 (15.0)	9 (7.5)
The major cause of COPD is exposure to active or passive smoking in almost all patients.	90 (75.0)	19 (15.8)	11 (9.2)
COPD is a disease characterised by exacerbations.	48 (40.0)	60 (50.0)	12 (10.0)
The initial approach to be applied in a patient with COPD is to evaluate his/her ABC (Airway, Breathing, Circulation).	101 (84.2)	8 (6.7)	11 (9.2)
The patient is placed in the Fowler position to relieve his/her pain and dyspnoea.	49 (40.8)	50 (41.7)	21 (17.2)
Nasal oxygen is supplied at 6-10lt/min.	48 (40.0)	45 (37.5)	27 (22.5)
Salbutamol 2.5 mg nebuliser solution is administered by nebuliser or 2-4 breaths	73 (60.8)	13 (10.8)	34 (28.3)
Treatment is initiated with short-acting bronchodilators.	79 (65.8)	8 (6.7)	33 (27.5)
Analgesics are administered to alleviate chest pain if there is no improvement or regression in symptoms and signs. *	28 (23.3)	82 (68.3)	10 (8.3)
Findings of physical examination in COPD show increase of the anteroposterior diameter of the chest and the increased use of auxiliary respiratory muscles.	90 (75.0)	5 (4.2)	25 (20.8)
The patient is immediately intubated to remedy hypoxaemia. *	8 (6.7)	79 (65.8)	33 (27.5)
The patient is diagnosed with a spirometer device.	82 (67.8)	6 (4.7)	33 (27.5)

* Incorrect responses

When the COPD knowledge levels of the students were analysed; 44.2% of them thought that COPD was a disease characterised by progressive airflow limitation, 77.5% complained of cough and sputum as the major symptoms of COPD, 75.0% stated that the major cause of COPD was exposure to active or passive smoking in almost all of their patients, 40.0% stated that COPD was a disease characterised by exacerbations, 84.2% suggested that the initial approach in a patient with COPD should be evaluation of his/her ABC, 40.8% stated that the

patient should be placed in the Fowler position to relieve his/her pain and dyspnoea, 40.0% of them stated that nasal oxygen should be supplied at 6-10 lt/min during an emergency response to patients with COPD, 60.8% stated that salbutamol 2.5 mg nebuliser solution should be administered by nebuliser or 2-4 breaths, 49.2% stated that if the patient had no respiratory distress and loss of consciousness during an emergency response, the patient should not undergo endotracheal intubation, 65.8% stated that treatment should be initiated with short-acting bronchodilators in emergency response, 68.3% responded that if there were no improvement or regression in symptoms and signs, analgesics would not be administered to alleviate chest pain, 75.0% reported that the physical examination revealed increase of the anteroposterior diameter of the chest and increased use of auxiliary respiratory muscles in case of COPD exacerbation, 65.8% indicated that the patient would not be immediately intubated to remedy hypoxaemia, and 82.7% stated that the patient would be diagnosed with a spirometer device (Table 2).

Table 3. Total Mean Scores of the COPD Knowledge Level and GSE of the Students

	Min.	Max.	Mean±SD
COPD Knowledge	2	13	8.20±2.60
GSE	17	85	46.20±13.28

Table 4. Distribution of GSE of the Students Based on Regression Analysis

Independent Variables	Unstandardised Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	Sig.
(Fixed)	41.923	9.637		4.350	**.000**
Gender	1.420	2.727	.052	.521	.604
Age	2.593	1.104	.065	.632	.529
Marital Status	7.967	2.624	.141	1.417	.160
Educational Level	3.320	1.930	0.069	2.052	**.042**
COPD Knowledge	5.877	0.503	0.022	7.359	**.003**
	R=.479	R Square=.230	Adj R=.102	F=3.791	**p=0.039**
Dependent Variables	GSE**				

*p<0.05, **General Self-Efficacy Scale

When Table 3 was examined, the mean score of the students' COPD knowledge level was 8.20±2.60, the total mean score of the GSE was 46.20±13.28.

Table 4 analyses the factors affecting general self-efficacy. The effect of the variables on general self-efficacy was significant at the level of p<0.05. The impact of characteristics based on qualitative data on general self-efficacy was found to be R=.479, R2=.230. It was

determined that these variables explained 23.0% of the total variance in the dependent variable of general self-efficacy, and the outcome was statistically significant ($p<0.05$).

4. DISCUSSION

One of the most important chronic diseases in Turkey is COPD (Iliman, 2015). COPD, one of the chronic disease groups frequently encountered by pre-hospital emergency health care workers, is known to cause significant mortality and morbidity. The focus on paramedics' responsibility in managing COPD and the provision of treatment services in pre-hospital healthcare services has been highlighted globally (Kelly et al.,2018; Heys et al., 2018; Lindvig et al., 2017; McAuley et al., 2021). However, to our knowledge, no research has been conducted in Turkey that investigates the COPD knowledge level, self-efficacy, and their impact on health professionals' attitudes. For this reason, it was aimed to evaluate the knowledge levels and self-efficacy of health worker candidates who have not done any field work on COPD yet.

In this study, it was examined whether paramedic students at both universities took topics from the vocational education curriculum (Table 1). Since the number of students who responded yes to the courses on which the students were educated was substantially greater than those who replied no, it is understood that all topics in curriculum were covered in the education provided. Likewise, Can et al., conducted a study with the 2nd year paramedic students and found that all topics in curriculum were taught (Yaşar Can & Dilmen Bayar, 2020). Some students in the present study stated that they had not received topics such as respiratory disorders, management of chronic diseases, and pain diagnosis. The findings of the study are consistent with those of previous researches. This may be attributed to factors such as students' low engagement levels during lessons or limited availability of materials in practical laboratories.

Pre-hospital emergency medical services constitute the first link in the survival chain, it is necessary to have sufficient medical device capacity for the early management of the procedure on patients (Bøtker et al., 2018). This is important in terms of mortality outcomes, as the medical equipment required by the prehospital emergency services is limited in the initial phase of care for COPD patients (Putland & McKenzie, 2015; Rochwerg et al., 2017). This is because patients in the acute exacerbation phase of COPD are often transported to the emergency room of the hospital by ambulance. Most of the patients in the emergency room are discharged after a short-term treatment comprising bronchiolitis or, in some cases, corticosteroids and antibiotics (Lindvig et al., 2017). The fact that these patients' short-term hospital visits not only increases the economic cost burden for both emergency medical services

and the hospitals but also impairs the their quality of life. Therefore, pre-hospital evaluation and treatment are of potential importance (Reis et al., 2018). This conclusion may improve the knowledge of healthcare professionals who have not yet done any fieldwork on the management of patients with COPD, particularly the quality of life of patients and public health in general.

The current study revealed that the level of knowledge of COPD among students was moderate. Knowledge of COPD seems to be important when clinical practices are combined with other aetiologies. It is necessary to diagnose correctly in order to initiate the proper treatment, especially in acute exacerbation of COPD, manifested with the same symptoms (increased cough, shortness of breath, and sputum problems, etc), and this is only possible with an adequate level of knowledge (McAuley et al., 2021). Accordingly, when the responses of the students to the knowledge questions were analysed (Table 2), 40.0% of them responded that COPD was a disease characterised by exacerbations and 40.0% of them responded that nasal oxygen should be supplied at 6-10 lt/min. Oxygen therapy is the one of the most crucial treatments for prehospital patients in emergency situations. The current guidelines suggest the targeted oxygen saturation rate. It is important to monitor the patient's response regularly during this process (Corfield et al., 2020; Beasley et al., 2015). Controlled supplemental oxygen in COPD can overcome associated hypoxia and prevent respiratory acidosis and hypercapnic respiratory failure (Brill & Wedzicha, 2014; De Freitas et al., 2018; Hernández-Bou et al., 2017). Studies have shown that supplying only 6 L/min of oxygen to COPD patients provides no benefit and that nebulised bronchodilators should generally be administered through a mask by using oxygen at flows of 6-8 L/min for these patients (Beasley et al., 2015; Andell et al., 2020; Kelly et al., 2018). In the literature, no studies on the knowledge level of paramedic students about COPD or procedures for COPD have been found, but mostly literature studies have been associated with physicians and nurses. When the existing studies were examined, it was stated that the level of knowledge of physicians working in primary care about Asthma-COPD is not sufficient and should be reinforced with in-service training (Günbatar et al., 2014), the level of knowledge of general practitioners about COPD disease after graduation is lacking (Molin et al., 2020), and post-graduation training and seminars are necessary(Koah et al., 2014). A few other studies have reported that the level of knowledge of healthcare professionals about COPD is inadequate (Nazir et al., 2019; Rishipathak et al., 2020). Additionally, in a study on the skills of healthcare professionals on inhaler techniques in the management of patients with COPD it was reported that specialised physicians had significant skills in the use of inhalers compared with other healthcare professionals (family physicians, nurses, pharmacists), however there was not a significant difference among other healthcare professionals (family physicians, nurses, pharmacists) while they had moderate and poor skills in the use of inhalers (Karle et al.,

2020). In their study, Maepa et al., examined the level of knowledge of healthcare professionals and senior medical students about the proper use of inhalers and indicated that both healthcare professionals and senior medical students who participated in the study made mistakes during the use of inhalers and had low levels of knowledge (Maepa et al., 2019). In the study by Swami et al., where the confidence of specialised nurses in inhaler device training and their competence in device use were examined (n=25); it was reported that although they were confident in teaching inhalar techniques, in general, their ability to properly use of the in the administration of inhalar techniques and drugs to patients was low and they seemed to be nervous while practising (Swami et al., 2021). The results of these findings correspond to the literature inhaler and their level of knowledge and the shortcomings of paramedic students may be associated with the lack of detailed information about COPD management in the curricular content of the courses taught in schools.

In the present study, the general self-efficacy levels of the students were found to be low. Eraydın reported 82.07 ± 15.39 (Eraydin, 2021) in his study with nursing students and Göger et al., reported 61.46 ± 11.94 (Göger & Cevirme, 2019) in their study with nursing students. In another study examining the perception levels of students on self-efficacy in the academy of medical sciences, the self-efficacy total mean score of students was 61.08 ± 8.67 and ranged between 25 and 82, and it was stated that students in the rehabilitation and paramedic departments had lower self-efficacy compared to medical students (Seyedi-Andi et al., 2019). People with high self-efficacy try to solve the problems they face in their social and professional lives and empower themselves and their profession (Koyun & Kacaroglu Vicdan, 2020), so our results are compatible with the literature. The perception of self-efficacy acquired by paramedic students in the school setting would make the shift to the concept of professional competence easier after graduation. Being self-confident and feeling sufficient make a person more successful in his/her job. When a person is successful in his or her job, the job satisfaction and motivations rise, and he or she enjoys practising his or her profession (Kilic Aksoy, 2020). Therefore, it is highly significant to increase the self-efficacy levels of students during paramedic education to ensure their professional readiness for the task.

CONCLUSION

This study, in which we aimed to assess the education, knowledge, practice and self-efficacy levels of the students, revealed that the COPD knowledge level of the students was moderate and their GES was low. It was determined that COPD knowledge level was an important predictor on GSE and had an effect of 23% together with the school variable. For this

reason, in order to increase the self-efficacy levels and professional readiness of paramedic students, who are the most affected group in acute processes, additions can be made to the curriculum about COPD patient management. In addition, the materials in the application laboratory can be increased. It can be recommended to carry out realistic simulation trainings both in university education and after graduation, and to conduct studies in which the competencies of these programs are investigated.

Limitations

This study was conducted with a sociodemographically similar sample group. As a result, the study's findings can only be applied to this population. This condition is a shortcoming of our research.

Author Contributions

MK: Study Conception/Design, Data Collection/Analysis, Drafting of Manuscript, Statistical Expertise, Administrative/Technical/Material Support. MHO: Study Conception/Design, Data Collection/ Drafting of Manuscript/ Technical/Material Support.

Conflict of Interest

There is no conflict of interest between the authors.

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