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Editorial office:

Ordu University, Faculty of Medicine

Republic Campus

52200, Ordu, TURKEY

Telephone: +90 452 234 50 10
Fax: +90 452 226 52 55
Email: ukaraman@odu.edu.tr
ulkukaraman44@hotmail.com

*****The 2023/3 issue of our journal, which will be published in December, will be published on October 29, in commemoration of the 100th anniversary of the Republic.**

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The aim of the journal is to contribute to the international literature with clinical and experimental research articles, case reports and reviews in the field of health sciences.

The target audience of the journal is all scientists working in the field of health and graduate students and researchers in this field.

Scope: ODU Medical Journal is an open access and independent international journal based on impartial double-blind peer-review principles. The publication languages of the journal are English. The journal is published every four months in April, August and December and a volume is completed in three issues.

ODU Medical Journal adheres to the standards in publication ethics in research in health science and also adopts the ethical publishing principles published by Scientific Research and Publication Ethics Directive of the Council of Higher Education, Committee on Publication Ethics (COPE), Directory of Open Access Journals (DOAJ), Open Access Scholarly Publishers Association (OASPA) and the World Association of Medical Editors (WAME).

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Editorial Office

Faculty of Medicine, Ordu University

Cumhuriyet Campus

52200, Ordu, TURKEY

Phone: +90 (452) 226 52 14-5234

Fax: +90 (452) 226 52 28

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Chapter of an edited book: Hornbeck P. Assay for antibody production. In: Colign JE. Kruisbeek AM, Marguiles DH, editors. Current Protocols in Immunology. New York: Greene Publishing Associates; 1991. p. 105-32.

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Structure

Title

Abstract should be structured (Objective, Methods, Results, and Conclusion) (200-400 words)

Keywords

Introduction

Methods

Results

Discussion

Conclusion

Acknowledgement

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Structure

Title

Abstract (average 100-300 words)

Keywords

Introduction

Case report

Discussion

Conclusion

Acknowledgement

References (up to 20)

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Structure

Title

Abstract (average 150-400 words)

Keywords

Introduction

The review also includes subtitles suitable for the text.

Conclusion

Acknowledgement

References (up to 50)

Except for the references and the English abstract, the full text should not exceed 6550 words.

ODU TIP DERGİSİ

OCTOBER 2023 **VOLUME 10** **NUMBER: 3**

CONTENTS

EDITORIAL

IN THE LIGHT OF THE REPUBLIC…

As we celebrate the 100th anniversary of our Republic, we are extremely happy to share another issue of our magazine, full of brand-new information, with you, our valued physicians, researchers, specialists in all fields, doctorates and medical faculty students.

One of the duties that falls to us and the new generations we will raise is; To progress with more determination every day in the fields of science, technology and medicine, to make groundbreaking inventions in every field and thus to ensure that the Republic of Turkey reaches the level of contemporary civilizations.

We would like to express our sincere gratitude to all the authors who sent their articles to our journal in order to share their studies in all fields of medicine with the scientific world, to our referees who made evaluations with dedication, and to you, our valued readers, who chose to walk with us in the light of civilization.

We hope that we can increase the awareness of scientific research and contribute to the medical literature with each new magazine we publish. On this occasion, we celebrate the 29 October Republic Day and commemorate our martyrs, who devoted their lives for the existence and permanence of the Republic of Turkey since the beginning of our War of Independence, and our veterans, with respect and gratitude.

Prof. ORHAN BAŞ
Owner of ODU Medical Journal

ODU TIP DERGİSİ/ODU MEDİCAL JOURNAL (ODU MED J) October 2023;10(3):111-120

ARAŞTIMA MAKALES/ RESEARCH ARTICLE DOI: 10.56941/odutip.1345551

Establishing a Model for the Classification of Heart Attack and Identification of Associated Risk Factors with Machine Learning Methods

Zekeriya Doğan[1](ID), Zeynep Küçükakçalı[2](ID)

[1]Marmara University School of Medicine, Department of Cardiology, Istanbul
[2]Inonu University, Faculty of Medicine, Department of Biostatistics and Medical Informatics, Malatya, Turkey.

Received: 18 August 2023, Accepted: 20 September 2023, Published online: 29 October 2023

Abstract

Object: Increased survival rates in heart attacks (HAs) depend on early intervention and treatment. In this study, it is aimed to predict the factors that may be associated with HA and to determine which factor is more effective by using Stochastic Gradient Boosting (SGB) method, one of the machine learning methods.

Methods: An open access data set was used in the study. The 5-fold cross-validation method was used in modeling and the data set was divided into training and test data sets as 80%:20%. Accuracy (ACC), balanced accuracy (b-ACC), sensitivity (SE), specificity (SP), positive predictive value (ppv), negative predictive value (npv) and F1 score metrics were used for model evaluation.

Results: The results obtained from the performance metrics with the modeling were 98.9%, 98.7%, 99.4%, 98.0%, 98.8%, 99%, and 99.1% for ACC, b-ACC, SE, SP, ppv, npv, and F1-score, respectively. According to variable importance values, troponin and CK-MB appear to be associated with HA, respectively.

Conclusion: According to the modeling results, factors that may be associated with heart attack were determined with high accuracy by machine learning method. Thanks to these two enzymes, early diagnosis can be made in individuals at risk of having a heart attack, and poor prognosis and deaths can be prevented.

Key Words: Heart attack, classification, machine learning, risk factor

Makine öğrenimi yöntemleri ile kalp krizinin sınıflandırılması ve ilişkili risk faktörlerinin belirlenmesi için bir model oluşturulması

Özet

Amaç: Kalp krizlerinde (KK) hayatta kalma oranlarının artması, erken müdahale ve tedaviye bağlıdır. Bu çalışmada, makine öğrenmesi yöntemlerinden biri olan Stokastik Gradient Boosting (SGB) yöntemi kullanılarak KK ile ilişkili olabilecek faktörlerin tahmin edilmesi ve hangi faktörün daha etkili olduğunun belirlenmesi amaçlanmaktadır.

Yöntemler: Araştırmada açık erişimli veri seti kullanıldı. Modellemede 5 katlı çapraz doğrulama yöntemi kullanılmış ve veri seti %80:%20 olacak şekilde eğitim ve test veri setlerine bölünmüştür. Model değerlendirmesi için doğruluk (ACC), dengeli doğruluk (b-ACC), duyarlılık (SE), özgüllük (SP), pozitif tahmin değeri (ppv), negatif tahmin değeri (npv) ve F1 skoru metrikleri kullanıldı.

Bulgular: Modelleme ile performans metriklerinden elde edilen sonuçlar ACC, b-ACC, SE, SP, ppv, npv, F1 puanı çin %98,9, %98,7, %99,4, %98,0, %98,8, %99 ve %99,1 olmuştur. Değişken önem değerlerine göre sırasıyla troponin ve CK-MB'nin KK ile ilişkili olduğu görülmektedir.

Sonuç: Modelleme sonuçlarına göre kalp kriziyle ilişkili olabilecek faktörler makine öğrenmesi yöntemiyle yüksek doğrulukla belirlendi. Bu iki enzim sayesinde kalp krizi geçirme riski taşıyan bireylerde erken tanı yapılabilmekte, kötü gidişat ve ölümlerin önüne geçilebilmektedir.

Anahtar kelimeler: Kalp krizi, sınıflandırma, makine öğrenmesi, risk faktörü

Suggested Citation: Zekeriya D, Küçükakçalı Z. Establishing a model for the classification of heart attack and identification of associated risk factors with machine learning methods. ODU Med J, 2023;10(3): 111-120.

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E-mail: zeynep.tunc@inonu.edu.tr

INTRODUCTION

HA is one of the leading causes of death worldwide and will cause millions of deaths each year and there will be no end to it. According to the World Health Organization, approximately 17.7 million deaths from cardiovascular disease were estimated in 2015, almost 31% of all deaths worldwide (1, 2). The HA situation is the sudden stop of the heart without any warning, and early intervention is seen as the only way to prevent the mortality and morbidity associated with this condition (3-5). Therefore, it will be able to intervene immediately in patients who have had HA; in order to perform the life-saving treatment that patients need, a system that is very fast, has high accuracy and sensitivity, and most importantly, can diagnose with cheap costs and less equipment is needed.

Physicians and specialists often use electrocardiograms (ECG), echocardiograms, and blood tests to diagnose a HA. The most preferred diagnostic method is ECG and electrical signals passing through the human heart are recorded with the electrodes attached to the patient's chest in the ECG, and these signals are abnormal if there is an unhealthy heart. Therefore, if the patient is having a HA, the signals will be abnormal and this is a late intervention and will be ineffective to save lives. In addition, the specificity of the ECG is affected by individual variations in the anatomy of the heart, as well as by pre-existing heart diseases, injuries, and surgeries such as coronary artery bypass surgery. Therefore, it cannot be an early diagnosis argument (1, 6, 7). Echocardiogram, on the other hand, is used to determine whether any part of the heart is damaged using sound waves and creating images. It has almost the same disadvantages as ECG. Therefore, these disadvantages prevent an echocardiogram from being an early diagnosis method for HA detection (8). Both of these techniques are not preferred because of their disadvantages and the accuracy of identifying HA depends entirely on the doctor's knowledge, and experience with these methods.

Comparatively, detecting HA indicators in the blood is less expensive, faster, and more objective. Some proteins and enzymes, such as brain natriuretic peptide (BNP), troponin myoglobin, and creatine kinase isoenzymes,

which can be identified by blood tests, seep into the blood slowly before a HA. CK-MB isoenzyme, which is a type of creatine kinase, which is especially located in heart muscle cells, increases in the blood, especially in heart diseases. In addition, another cardiac biomarker, troponin, is released when the heart muscle is damaged, as in a HA, and the more damage occurs to the heart, the more it increases in the blood. From the differences in these, it may be possible to determine the risk of HA with high accuracy. Thus, a diagnosis can be made to detect a HA early and to initiate treatment (1).

For this reason, in the current study, modeling was done with ML methods in order to determine the factors associated with HA using an open-access data set of patients with demographic characteristics and blood values. With the modeling, it was aimed to classify the patients with and without a HA and to determine the factors associated with HA.

METHODS

Dataset and Variables

The dataset used in the current study, which consists of the information of individuals who have had and have not had a HA, is a data set collected in the cardiology center of the Erbil region in Iraq in 2018. The dataset includes 1319 patients, and there are eight input and one output variable in the dataset. The variable, which is the output variable, has 2 categories, the negative category indicates no HA, and the positive category indicates a HA. Input variables consist of age, blood glucose, heart rate (impulse), systolic blood pressure, diastolic blood pressure, CK-MB (kcm), and troponin variables (9).

Biostatistics Analysis Phase

In the study, data were summarized as median (95 percent confidence intervals), and number (percentage). The Kolmogorov-Smirnov test was utilized to evaluate if the data was normal or not. The Mann-Whitney U test was used for statistical analysis of non-normally distributed data. $p<0.05$ was considered statistically significant. Analyzes were performed using IBM SPSS Statistics 25.

Modelling Phase

In the modeling phase with the data set, SGB, one of the tree-based methods among the ML techniques, was used to model patients with and without HA and to investigate the effect of input variables on the output variable. SGB is a method invented by Fridman by integrating randomization into the gradient boosting approach. In each iteration of this method, a sub-sample is randomly selected by using the permutation sampling approach. This sub-sample is used to calculate the current state of the model instead of all students, thus reducing the correlation between the established trees (10, 11). Unlike other ensemble learning methods, this method summarizes each tree (approximately 100 to 200 trees) generated as the process runs, rather than creating huge huge trees, and each observation is categorized

according to the most common classification among trees. This form of separation distinguishes the SGB model from other augmentation techniques. In addition, this discrimination method reduces the sensitivity to outliers and unbalanced datasets. This method, which has a very high predictive power compared to other known algorithms, is also 5 times faster. Another and one of the most important features of the model is that it includes a set of regularization methods that can improve overall performance and reduce over-fitting and over-learning (10, 12). The data are separated as 80% training and 20% test data. The n-fold cross-validation method, one of the resampling methods, was utilized in this work to ensure model validity. In The n-fold cross-validation method;

The dataset is first separated into n pieces, and the model is then applied to those pieces.

- In the second step, one of the n parts is used for testing, while the remaining n-1 parts are used for training.

- In the last stage, the cross-validation approach is evaluated using the average of the values collected from the models.

ACC, b-ACC, SE, SP, ppv, npv, and F1-score measures were utilized to assess the modeling performance.

Graphical summary

The graphical summary showing the biostatistical analyses, and modeling process applied in the study is shown in Figure 1.

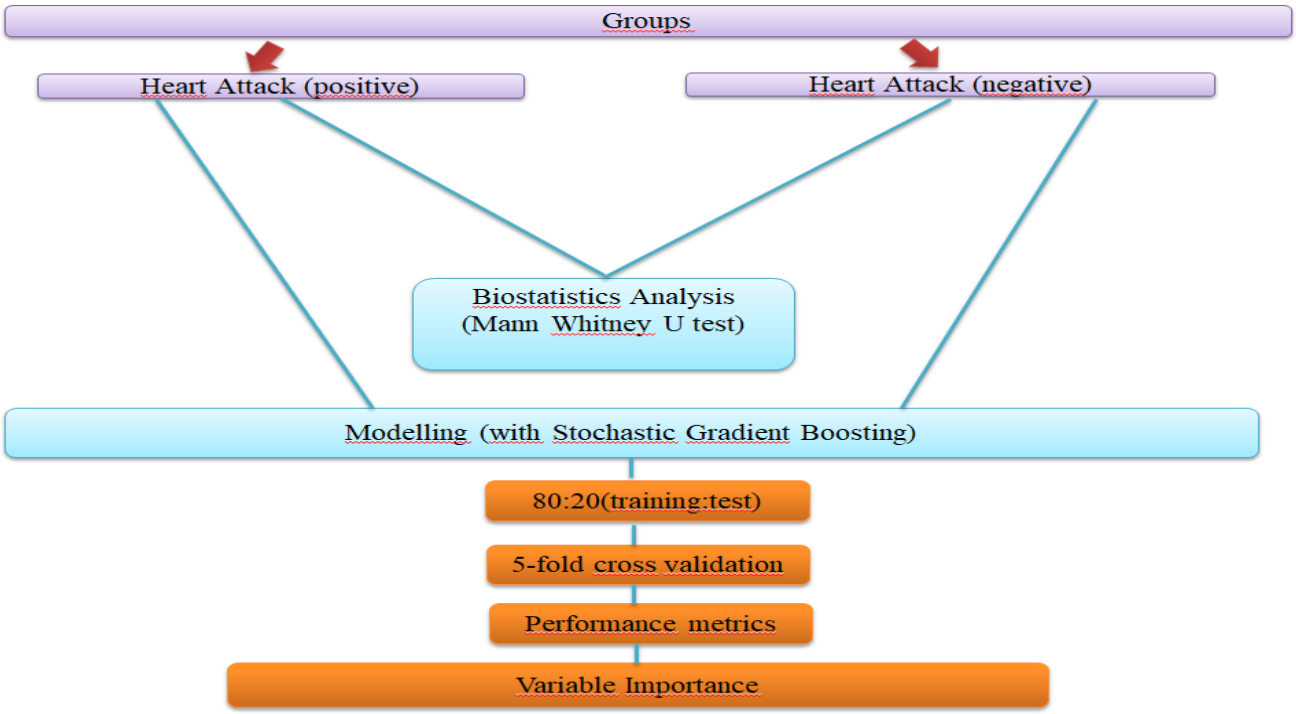

Figure 1. Biostatistical analysis and modeling process

RESULTS

The data set used in the study consists of 1306 individuals, of which 806 had a heart attack while 500 did not. The characteristics of 444 female and 862 male individuals are available. The average age is 56.22.

Biostatistical analysis results

When patients with and without HA were compared in terms of input variables such as age, heart rate, systolic blood pressure, diastolic blood pressure, blood glucose, CK-MB (kcm), and troponin; there was a statistically significant difference between the 2 groups in age, CK-MB (kcm) and troponin variables. However, statistical significance was not found in other variables. The results of the analyzes are given in Table 1

Modelling Results

The values of the performance metrics obtained by modeling with SGB using individuals with and without a heart attack are given in Table 2. Graphics of performance metrics are given in Figure 2. The graph of the variable importance obtained as a result of the modeling is given in Figure 3.

Table 1. Comparison of output variable in terms of input variables

Variables	Group		p*
	HA (-)	HA (+)	
	Median (95,0% Lower CL for Median; 95,0% Upper CL for Median		
age	52(50-55)	60(60-62)	0.000
impluse	75(74-78)	74(74-76)	0.779
systolic blood pressure	125(124-129)	122(120-125)	0.275
diastolic blood pressure	72(71-75)	71(70-74)	0.902
glucose	116.5(111-122)	116(114-122)	0.554
CK-MB	2.31(2.11-2.53)	3.76(3.28-4.29)	0.000
troponin	0.006(0.006-0.007)	0.044(0.037-0.053)	0.000

*: Mann Whitney U test

Table 2. Performance metrics values obtained after modeling

Performance Metrics	Performance Metrics Value (%)
ACC	98.9
b-ACC	98.7
SE	99.4
SP	98.0
ppv	98.8
npv	99
F1-score	99.1

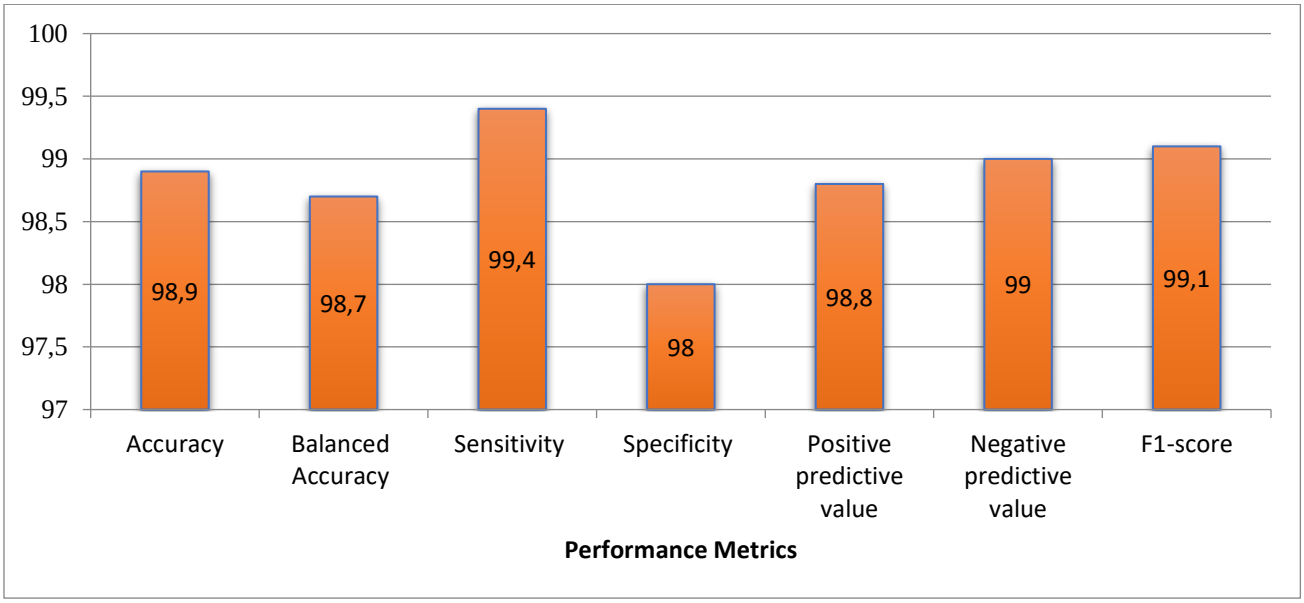

Figure 2. Graph of performance metrics

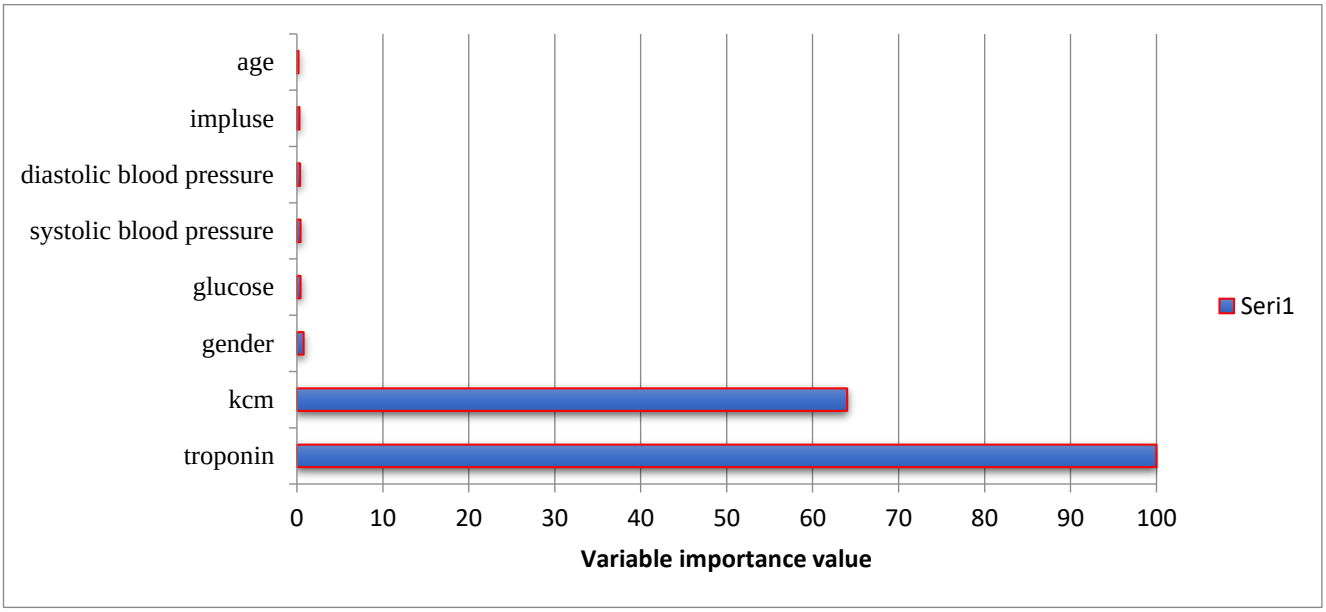

Figure 3. Variable Importance Graph

DISCUSSION

Cardiovascular diseases are among the most common causes of death today and are quite common in Western countries. Studies have shown that the death rate from cardiovascular diseases in the world will increase from 28.9% to 36.3% between 1990 and 2020 (13). The most common cardiovascular disease is a HA. HA is defined as the damage and deterioration of heart muscle cells that cannot receive sufficient

oxygen due to the deterioration of blood supply in any part of the heart (14). In the case of a HA, if the heart muscle is without oxygen for a long time, the outcome will be worse and death will occur. Almost half of deaths from heart attacks occur within the first hour. This mortality rate reaches 80% in the first 24 hours following the HA (15). HA, which is very common, especially in the productive age group of the society and causes serious problems due to complications in the post-acute period, and can even result in death in advanced stages, is an important public health problem. Although there have been developments in diagnosis and treatment methods related to the disease in recent years, it is one of the most important causes of morbidity and mortality in our country and industrialized societies (13).

Evaluation of the incidence and case mortality of HA, which is known as one of the most important components of the cardiovascular disease burden, will be decisive in the reduction of coronary disease mortality (16). For this reason, the need for diagnostic markers to predict HA is increasing. It is known that some isoenzymes tend to increase in the blood before a HA occurs. Therefore, the presence of a diagnostic model based on these enzymes will be able to detect the risk of HA at an early stage and reduce the mortality that may occur. The most commonly used diagnostic methods in the diagnosis of HA are physical examination, Electrocardiography (ECG) containing Q waves, and the results of tests such as creatinine kinase, Myoglobin and Troponin (17). Creatine kinase and troponin enzymes in the data set used in the study have been used reliably in the diagnosis of HA for many years (18). Creatine kinase enzyme starts to rise 4 to 9 hours after myocardial injury and reaches its peak at 24 hours. For this reason, patients with chest pain and signs of HA can be diagnosed by the value of this enzyme in the blood. This enzyme returns to its normal range between 48-72 hours. (19). Troponin, a protein specific to skeletal and cardiac muscle fibers, mixes with blood from the muscle due to damage to the heart in unexpected situations such as a HA. The troponin value begins to rise at the blood level in relation to cardiac, or in other words, damage to the heart. The troponin level, which can be detected in the laboratory test performed in the first hour after the injury, reaches the maximum level in the 24th hour and maintains its positive value for 1 week (20).

It may be possible to detect HA with these cardiac biomarkers. For this reason, a diagnosis system based on these markers can be used for early diagnosis and to predict risk in patients who apply to the hospital with chest pain. For this purpose, in the present study, it was aimed to determine the risk factors that may be associated with HA by making a ML-based model that can detect HA by using the data set of 1306 patients' blood values. In this context, the variable

importance values obtained as a result of the modeling and the variables that most explain the HA were obtained and their relations with the HA were confirmed.

According to the results of the statistical analysis, a statistically significant difference was found between the heart attack (+) and heart attack (-) groups in age, troponin, and CK-MB variables, and no statistical differences were observed in other variables. In the heart attack (+) group, the 0.038-unit increase in the troponin variable and the 1.45-unit increase in the CK-MB variable were found to be significant compared to the heart attack (-) group.

The values of ACC, b-ACC, SE, SP, ppv, npv, and F1-score performance metrics obtained according to the modeling results made with the SGB method were 98.9%, 98.7%, 99.4%, 98.0%, 98.8%, 99%, and 99.1%. According to the results obtained here, the modeling method used classifies the HA situation with a very high rate, and these results showed that the model used was successful in the prediction of HA. In addition, when the variable importance values obtained as a result of the modeling were examined, it was seen that the most important parameters associated with HA were troponin and CK-MB (kcm). Other variables, on the other hand, seem to have a low effect on HA. These results support the literature and the risk of HA can be evaluated with troponin, and CK-MB an isoenzyme of creatin kinase. With this evaluation, the plight of individuals can be prevented and possible deaths can be prevented by intervening early in HA.

Ethics Committee Approval: No required

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REFERENCES

1. Liu Z, Meng D, Su G, Hu P, Song B, Wang Y, et al. Ultrafast Early Warning of Heart Attacks through Plasmon-Enhanced Raman Spectroscopy using Collapsible Nanofingers and Machine Learning. Small (Weinheim an der Bergstrasse, Germany). 2023;19(2):e2204719.
2. Maghdid SS, Rashid T, Ahmed S, Zaman K, Rabbani M. Analysis and prediction of heart attacks based on design of intelligent systems. J Mech Contin Math Sci. 2019;14(4):628-45.
3. Organization WH. Cardiovascular diseases (cvds). http://www who int/mediacentre/factsheets/fs317/en/index html. 2009.
4. https://www.nhs.uk/conditions/heart-

attack/diagnosis/#:~:text=An%20ECG%20machine%20records%20these,about%205%20minutes%20to%20do. [cited 2023 07.04].

5. Arslankaya S, Çelik MT. Prediction of heart attack using fuzzy logic method and determination of factors affecting heart attacks. International Journal of Computational and Experimental Science and Engineering. 2021;7(1):1-8.
6. Zimetbaum PJ, Josephson ME. Use of the electrocardiogram in acute myocardial infarction. New England Journal of Medicine. 2003;348(10):933-40.
7. Gupta V, Mittal M. A novel method of cardiac arrhythmia detection in electrocardiogram signal. International Journal of Medical Engineering and Informatics. 2020;12(5):489-99.
8. Leung DY, Davidson PM, Cranney GB, Walsh WF. Thromboembolic risks of left atrial thrombus detected by transesophageal echocardiogram. The American journal of cardiology. 1997;79(5):626-9.
9. Anshori M, Haris MS. Predicting Heart Disease using Logistic Regression. Knowledge Engineering and Data Science. 2022;5(2):188-96.
10. Friedman JH. Stochastic gradient boosting. Computational statistics & data analysis. 2002;38(4):367-78.
11. Ye J, Chow J-H, Chen J, Zheng Z, editors. Stochastic gradient boosted distributed decision trees. Proceedings of the 18th ACM conference on Information and knowledge management; 2009.
12. Lawrence R, Bunn A, Powell S, Zambon M. Classification of remotely sensed imagery using stochastic gradient boosting as a refinement of classification tree analysis. Remote sensing of environment. 2004;90(3):331-6.
13. Zeynep T, Çiçek İB, Güldoğan E. Performance evaluation of the deep learning models in the classification of heart attack and determination of related factors. The Journal of Cognitive Systems. 2020;5(2):99-103.
14. Halıcı Z, Yasin Bayır HS, Çadırcı E, Keleş MS, Bayram E. Investigation of the Effects of Amiodarone on Serum Eritropoietin Levels in İsoproterenol-induced Acute and Chronic Myocardial Infarct Model of Rats. Avrasya J Med, 2006;38(3): 68-72.
15. Storrow AB, Gibler WB. Chest pain centers: diagnosis of acute coronary syndromes. Annals of emergency medicine. 2000;35(5):449-61.
16. Roger VL. Epidemiology of myocardial infarction. The Medical clinics of North America. 2007;91(4):537-52; ix.
17. Özdemir G, Bilen Ö, Ateş SC. Establishment of a Decision Support System for Determining the Risk Probability of Heart Attack in Hospital Emergency Visitors. Düzce Üniv Bilim ve Tek Der. 2022;10(4):2093-106.

18. Yöntem M, Erdoğdu BS, Akdoğan M, Kaleli S. The Importance of Cardiac Markers in Diagnosis of Acute Myocardial Infarction. Online Türk Sağlık Bilimleri Dergisi. Online Türk Sağlık Bilimleri Der. 2017;2(4):11-7.
19. Lewandrowski K, Chen A, Januzzi J. Cardiac markers for myocardial infarction: a brief review. Pathology Patterns Reviews. 2002;118(suppl_1):S93-S9.
20. Filatov V, Katrukha A, Bulargina T, Gusev N. Troponin: structure, properties, and mechanism of functioning. Biochemistry c/c of Biokhimiia. 1999;64:969-85.

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Determination of Anatomy Self-Efficiency Of 2022-2023 Fall Semester of 2nd Class Ordu University Dentistry Students Taking Distance Education

Halil Yılmaz[1(ID)], Dilber Polat[2(ID)], Selen Yılmaz[1(ID)], Muhammet Değermenci[1(ID)], Adem Tokpınar[1(ID)]

[1]Ordu University, Medical School, Department of Anatomy Ordu, Turkey
[2]Kırşehir Ahi Evran University, Kırşehir, Turkey

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Abstract

Objective: On 6 February 2023, a significant seismic event occurred in Kahramanmaraş, Turkey. The region was hit by strong earthquakes of high intensity. The first powerful earthquake occurred at 04:17 local time. It had a profound impact on the local population and infrastructure. The aim of this study is to investigate the anatomy self-efficacy of the students of the second semester of the Faculty of Dentistry who took a distance learning course after the earthquake in Kahramanmaraş.

Methods: A total of 102 students participated in this cross-sectional study. Students participating in the study were administered the Anatomy Self-Efficacy Scale. The independent samples t-test was used to compare two independent groups of parametric data. For categorical data, the chi-squared test was used for multiple comparisons.

Results: Mean total scale score of males is 78.73±10.64, and the subdimensions are 34.47±4.18, 21.42±3.85 and 22.83±3.78 from 1 to 3. The total score of females is 79.20±9.83, and in the sub-dimensions they are 34.58±3.73, 21.46 ± 3.39 and 23.15±4.35 respectively. For the total and sub-dimension scores, there was no statistically significant difference between the sexes.

Conclusion: In the life of an academic institution, online education has become essential. In this study, whose population was second-year students at Ordu University Dentistry, students who receive online education for basic medical sciences, which includes intensive practical training such as anatomy instruction, can achieve an intermediate level of anatomy self-efficacy. While online education is ideal for improving self-efficacy in anatomy at an intermediate level, it is not sufficient for improving anatomy at a high level.

Key Words: Anatomy, education, scale.

Ordu Üniversitesi Uzaktan Eğitim Gören 2. Sinif Diş Hekimliği Öğrencilerinin 2022-2023 Güz Dönemi Anatomi Öz Yeterliliklerinin Belirlenmesi

Özet

Amaç: 6 Şubat 2023 tarihinde Kahramanmaraş, Türkiye'de önemli bir sismik olay meydana geldi. Bölge, yüksek şiddette güçlü depremlerle sarsıldı. İlk güçlü deprem yerel saatle 04.17'de meydana geldi. Depremin yerel nüfus ve altyapı üzerinde derin bir etkisi olmuştur. Bu çalışmanın amacı Kahramanmaraş depremi sonrası uzaktan eğitim dersi alan Diş Hekimliği Fakültesi 2. dönem öğrencilerinin anatomi özyeterlik düzeylerinin araştırılmasıdır.

Yöntem: Bu kesitsel çalışmaya 102 öğrenci dahil edilmiştir. Araştırmaya katılan öğrencilere Anatomi Öz-Yeterlik Ölçeği uygulandı. Parametrik verilerin iki bağımsız grubunu karşılaştırmak için bağımsız örneklemler t-testi uygulandı. Kategorik veriler için, çoklu karşılaştırmalarda ki-kare testi kullanıldı.

Bulgular: Erkeklerin ölçek toplam puan ortalaması 78.73±10.64, alt boyutlarda ise 1'den 3'e kadar sırasıyla 34.47±4.18, 21.42±3.85 ve 22.83±3.78'dir. Kadınların ölçek toplam puan ortalaması 79.20±9.83, alt boyutlarda ise sırasıyla 34.58±3.73, 21.46±3.39 ve 23.15±4.35'dir. Toplam ve alt boyut puanları için cinsiyetler arasında istatistiksel olarak anlamlı bir fark bulunmamıştır.

Sonuç: Bir akademik kurumun yaşamında online eğitim vazgeçilmez hale gelmiştir. Evreni Ordu Üniversitesi Diş Hekimliği ikinci sınıf öğrencileri olan bu çalışmada, anatomi eğitimi gibi yoğun uygulamalı eğitim içeren temel tıp bilimleri için online eğitim alan öğrencilerin orta düzeyde anatomi öz yeterliliğine ulaşabildikleri görülmüştür**.** Online eğitim, anatomi öz yeterliliğini orta düzeyde geliştirmek için ideal olsa da, anatomiyi yüksek düzeyde geliştirmek için yeterli değildir.

Anahtar Kelimeler: Anatomi, eğitim, ölçek.

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Address for correspondence/reprints:

Halil Yılmaz
Telephone number: +90 (554) 237 59 73

E-mail: halilyilmaz855@gmail.com

INTRODUCTION

The anatomy course is considered the foundation of medical education in terms of forming the infrastructure of self-efficacy of health professionals in their professional life (1). Although anatomy education is based on theoretical and practical training in the laboratory environment, there has been a shift to online platforms as a result of the Covid-19 pandemic (2). Anatomy instructors have also introduced video-assisted and 3D anatomy teaching into the literature (3).

On the 6th of February 2023, the rupture of the East Anatolian Fault Zone with an earthquake of magnitude Mw=7.8 caused great destruction in the south of Turkey and the north of Syria (4). This earthquake, which occurred at a depth of 10 km, killed 57,000 people, including 7,000 in Syria and 50,000 in Turkey, according to data from 20 March 2023 (5). As a result of this natural disaster, more than 13 million people in 11 provinces in the south of Turkey were affected. On 11 February 2023, the university decided to offer distance learning for the spring semester of the 2022-2023 academic year (5,6).

Although the decision to switch to distance learning in the aftermath of the earthquake was criticised by the authorities, it has continued to be implemented in practice (7). The opening of dormitories for earthquake victims was one of the main reasons for the move to online education (7). The impact on social life in the region and on university buildings is another reason for choosing online education (8).

In the decision of the Senate of 21 February 2023, the University of Ordu has decided to switch to online education in the classes of the Faculty of Dentistry Period I-II-III, together with many other programmers (9).

Anatomy courses are given in the first 3 semesters of Ordu University Faculty of Dentistry. Anatomy of the musculoskeletal system is taught in the Anatomy I course in the first semester, Anatomy of the systems in the Anatomy II course in the second semester, and Topographical Anatomy of the head and face in the third semester (10).

The aim of this study is to investigate the self-efficacy of the students of the second semester of the Faculty of Dentistry who took a distance learning course after the earthquake in Kahramanmaraş.

METHODS

Ethical approval

The ethical approval for this study was granted by the Ethics Committee for Clinical Research at the University of Ordu with decision number 2023/173. Informed consent in writing and verbal consent has been obtained from all participants.

Sample determination

The 2nd year students of the Faculty of Dentistry at Ordu University are the population of this study. There are 102 people in the population of the study, the study was designed as a 1/1 cross-sectional study and the population of the study constitutes the sample of the study (n=102).

Exclusion criteria

1- Failure to give written and verbal consent

2- Giving different answers to the distracting questions

3- Declaring withdrawal from the study.

There were no students who were excluded from the study.

Anatomy self-efficacy scale

The Perception of Self-Efficacy Scale for Human Anatomy Lesson developed by Polat D. (2008) was used in the study (11). The reliability coefficient of this scale was determined to be Cronbach's alpha (α) 0.84. The scale consists of 26 questions of the Likert type and each question is given a score of (1-5) points. The scale range is (26-130). The scale has 5 levels, classified as very low (26-43), low (44-60), moderate (61-96), high (97-113), very high (114-130). There are 3 sub-dimensions in the scale;

Sub-dimension 1: anatomy confidence

Sub-dimension 2: anatomy practice and awareness

Sub-dimension 3: was determined as the conversion of anatomical knowledge into a life skill.

Statistical analysis

The data obtained were subjected to a normal distribution analysis with 5 parameters (standard deviation/mean, kurtosis/ skewness, histograms, Q-Q plots, Shapiro-Wilk test). Data were considered to be normally distributed with a score greater than 3. Mean±standard deviation was used for normally distributed parameters. To compare two independent groups of parametric data, the independent samples t-test was used. The categorised data were subjected to the chi-squared test for multiple comparisons (post-hoc Fischer's Exact test: minimum expected value < 5). Pearson's correlation analysis was used to correlate between subdimensions.

RESULTS

Sociodemographic findings

Of the participants, 41.1% (n=42) were male and 58.9% (n=60) were female. The mean age of the males was 20.69±0.89 and the mean age of the females was 20.68±0.72, and there was no statistically significant difference between the groups (p>0.05).

Anatomy self-efficacy scale survey findings

The mean total score for men is 78.73±10.64, with a minimum of 58 and a maximum of 102. The mean total score for women is 79.20±9.83,

with a minimum of 51 and a maximum of 101. Total scores were not statistically significantly different between males and females (p>0.05).

The mean sub-dimension scores for males were 34.47±4.18, 21.42±3.85 and 22.83±3.78 respectively. The mean sub-dimension scores of the female students were 34.58±3.73, 21.46±3.39 and 23.15±4.35, respectively. In none of the sub-dimensions was there a statistically significant difference (p>0.05) between males and females.

Of the 26 questions in the questionnaire, the highest score for both genders was obtained by the 26th question, "As my knowledge of anatomy increases, so does my self-confidence". Among the females, 32 students gave an answer to this question and 16 students always gave an answer to this question. For females, 22 students answered: "often" and 7 students answered: "always".

Sub-dimension 1 (Consequences of confidence in anatomy knowledge) findings

There are 11 questions in this sub-dimension and points can be obtained between (11-55). The average total score of this sub-dimension is 34.53±3.88, and the average score per question is 3.14. The answers to this sub-dimension are summarized in the graph (GRAPH 1) (I26) 'As my knowledge of anatomy increases, so does my self-confidence' received the highest score in this section with a mean score of 3.90±0.83. 7.8% of the participants answered this question rarely, 16.7% sometimes, 52.9% often and 22.52% always.

(I14) 'I know how to behave when I encounter a new situation in anatomy'. It was the item with the lowest score in this sub-dimension. The mean score of this item was 2.85±0.77. This question was answered by 2.9% never, 28.4% rarely, 50.0% sometimes, 17.6% often and 1.0% always.

Sub-dimension 2 (Awareness of anatomy application skills) findings

Consisting of 7 items belonging to this sub-dimension, the average total score is 21.45±3.55 and the average score per question is 3.06. The information on this sub-dimension is summarized in the graph (GRAPH 2).

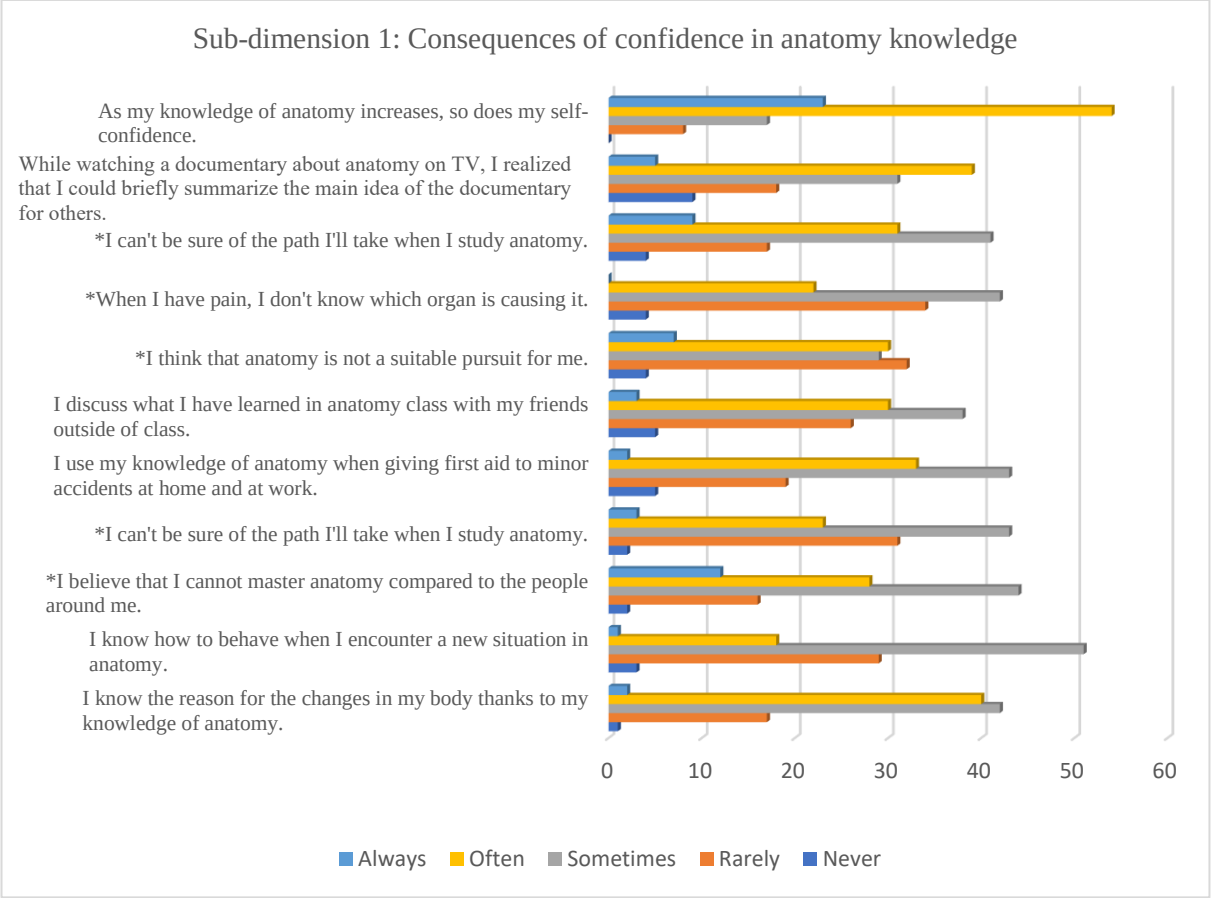
The item with the highest score in this sub-dimension is (I8) 'I think that my view of my body has changed after reading the anatomy course'. To this item, 2% of the students answered never, 13.7% rarely, 25.5% sometimes, 43.1% often, 15.7% always. The item (I19) 'I feel competent in anatomy' received the lowest score of this sub-dimension with 2.62±0.86. 11.8% of the participants never answered this question, 27.5% rarely, 47.1% sometimes, 13.7% often. None of the participants always answered this question.

Sub-dimension 3 (Transforming theoretical knowledge into life skills in anatomy) findings

The information on this sub-dimension is summarized in the corresponding graph (GRAPH 3). There are 8 items in this sub-

dimension and scores can be obtained between (8-40). The average total score for this section is 23.01±4.09 and the average score per question is 2.87. This sub-dimension had the lowest score in the scale.

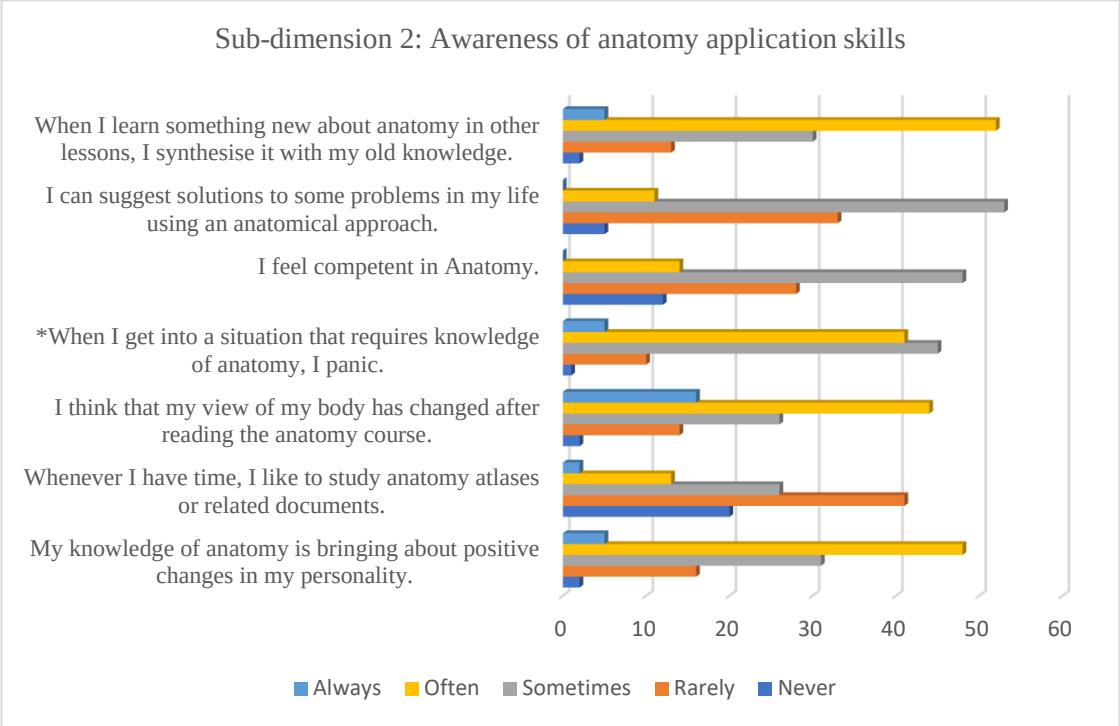
In this sub-dimension, the item (I13) 'I know the reason for the changes in my body thanks to my knowledge of anatomy' received the highest score. The mean score is 3.30±0.76. 1% of the students who answered this question never, 13.7% rarely, 41.2% sometimes, 42.2% often and 2% always.



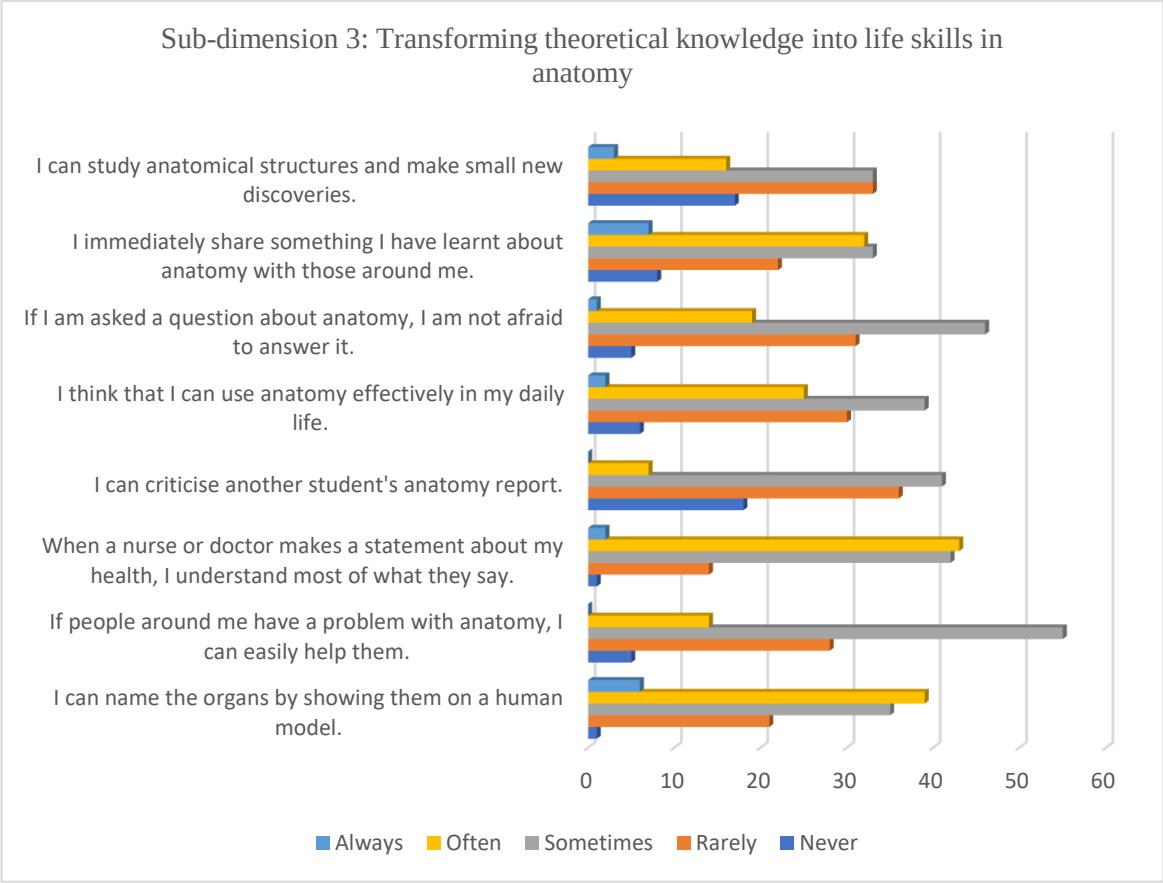
Graph 1. Responses were presented on a Likert scale for sub-dimension 1.

Correlation between sub-dimensions

Pearson correlation was performed between the parametric data, and correlation values were determined in accordance with the reference article (12). The correlation between the sub-dimensions is shown in the table (Table 1). There is a moderate positive correlation between sub-dimension 1 and sub-dimension 2 ($0.5<r<0.7$, $p<0.001$). There is a moderate positive correlation between sub-dimension 1 and sub-dimension 3 ($0.5<r<0.7$, $p<0.001$). There is a high positive correlation between sub-dimension 2 and sub-dimension 3 ($0.7<r<0.9$, $p<0.001$).



Graph 2. Responses were presented on a Likert scale for sub-dimension 2.



Graph 3. Responses were presented on a Likert scale for sub-dimension 3

Table 1. Correlation between anatomy self-efficacy sub-dimensions

		Sub-dimension 1	Sub-dimension 2	Sub-dimension 3
Sub-dimension 1				
	r	1		
	p			
Sub-dimension 2				
	r	0.643	1	
	p	<0.001		
Sub-dimension 3				
	r	0.587	0.882	1
	p	<0.001	<0.001	

Relationship between sex and anatomy self-efficacy

The relationship between sex and anatomy self-efficacy was analysed by cross-tabulation. Of the female students, 2 were classified as low, 57 as medium and 1 as high. Of the male students, 3 were classified as low, 38 as medium and 1 as high. There were no students with very high or very low proficiency in either sex. There was no statistical difference between the sexes in the frequency analysis of anatomy proficiency by sex ($p>0.05$).

DISCUSSION

In the process that began with the Covid-19 pandemic, distance learning has gradually become more popular in recent years. Particularly after the pandemic, interest in distance learning in anatomy increased. A review found that there were 182 records evaluating anatomy and distance learning (13). This review stated that 20 of the academic records were evaluated for detailed qualitative analysis. It was noted that these studies focused on student performance and student feedback (13). In our study, we found it appropriate to evaluate the portfolio to determine student competence rather than performance measures. In our study, we wanted to see how competent they described themselves, rather than student performance. While performance assessment is an instantaneous decision, self-efficacy assessment provides more continuous information.

A study conducted at the University of Genoa compared face-to-face and online anatomy teaching (14). They evaluated the study with short questionnaires and exams. In each academic term, the students took 7 exams. They found that the success rate of students who received online anatomy education was higher than that of students who received face-to-face education. While 83.5% of the students who received online education were successful, 16.5% were unsuccessful (14). Our study has shown that online anatomy training is effective for intermediate competence. The failure rate of about 1/6 of the students in the study conducted

at the University of Genoa is also consistent with the low level of anatomy knowledge in our study.

In another study in the literature, face-to-face training given just before the pandemic and online anatomy and histology training during the pandemic period were compared (15). When the success results in the study were compared, the anatomy exam average in the face-to-face period was 22.62±2.53, the anatomy+histology score average was 24.23±2.76, while the post-pandemic online education exam averages were 27.19±2.92 for anatomy and 27.27±2.87 for anatomy+histology. When the distribution of the scores of the students was examined, it was seen that the scores in the online anatomy group met at the middle-high level in this study. These data are also compatible with the results of our study.

In one of the studies conducted in this period, the most ideal anatomy method was sought. In these studies, on the muscular system (3) and the skeletal system (16), 3D (Three-dimensional), video-assisted online education and classical laboratory anatomy education were compared. In this study, unlike other studies, the assessment exam was administered face-to-face to all participants. According to the results of these studies, the success level of anatomy education specific to the muscular system was determined as conservative education>3D anatomy education>online Anatomy education>control group (no additional education).

In a cross-sectional study aimed at defining the dynamic links between anatomy and 4th year clinical practice courses for physiotherapy students through students' perceptions, it was found that without repeating the anatomy course, students who passed the course had higher scores. The study also found that students who had passed the course and students who had experience of working as a health professional had higher scores (17). We did not find anything similar when we looked at this.

We think that one of the most fundamental differences in the results of online education in the literature is the method of applying the exam. While success is higher in online exams after online education, we determine that the success grade decreases in face-to-face exams after

CONCLUSION

Online education has become an indispensable part of the life of an academic institution. Students who receive online education for basic medical sciences, which includes intensive practical training such as anatomy education, can achieve intermediate-level anatomy self-efficacy in this study, whose population was second-year students at Ordu University Dentistry. However, online education does not seem to be sufficient for a high level of anatomy self-efficacy.

LIMITATIONS

The limiting factor in this study was the inability to conduct face-to-face interviews with students to corroborate the findings.

Ethical Approval: The ethical approval for this study was granted by the Ethics Committee for Clinical Research at the University of Ordu with decision number 2023/173. Informed consent in writing and verbal consent has been obtained from all participants.

Peer-review: Externally peer-reviewed

Author Contributions: Hypothesis: HY, Design: HY, DB, SY, Data collection: HY, MD, AD Analysis: HY, DB, SY, Writing: HY, DB, AD, Editing: HY, MD, AD

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Conflict of Interest: There is no conflict of interest between the authors.

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REFERENCES

1. Iwanaga J, Loukas M, Dumont AS, Tubbs RS. A review of anatomy education during and after the COVID-19 pandemic: Revisiting traditional and modern methods to achieve future innovation. Clinical Anatomy. 2021;34(1):108-114
2. Xiao J, Evans DJR. Anatomy education beyond the Covid-19 pandemic: A changing pedagogy. Anat Sci Educ. 2022;15(6):1138–44.
3. Yilmaz H, Güler H. Can video-assisted and three-dimensional (3D) anatomy teaching be an alternative to traditional anatomy teaching? Randomized controlled trial on muscular system anatomy. Clinical Anatomy. 2023; 10.1002/ca.24088
4. Mavrouli M, Mavroulis S, Lekkas E, Tsakris A. An Emerging Health Crisis in Turkey and Syria after the Earthquake Disaster on 6 February 2023: Risk Factors, Prevention and Management of Infectious Diseases. Healthcare (Switzerland). 2023;11(7).
5. Hussain E, Kalaycıoğlu S, Milliner CWD, Çakir Z. Preconditioning the 2023 Kahramanmaraş (Türkiye) earthquake disaster. Nature Reviews Earth and Environment. Springer Nature. 2023;4:287-9
6. Kocoglu E, Demir FB, Oteles UU, Ozeren E. Post-Earthquake Trauma Levels of University Students Evaluation: Example of 6 February Kahramanmaras Earthquake. Higher Education Studies. 2023;13(2):121.
7. Gündüz Hoşgör D, Güngördü H, Hoşgör H. Investigation of Prospective Medical Secretaries' Perspectives of Online Education: The Example of February 6, 2023 Earthquake. International Journal of Health Management and Tourism. 2023; 8(1):78-91
8. Elhaty IA, Elhadary T. Online education in Turkish universities after the earthquake: the

pros and cons. Journal of Survey in Fisheries Sciences. 2023;10(4): 330-340.

9. https://www.odu.edu.tr/Duyurular/1919/universitemiz-2022-2023-egitim-ogretim-yili-bahar-donemine-iliskin-senato-karari
10. https://oidb.odu.edu.tr/ogrenci/ebp/organizasyon.aspx?kultur=enUS&Mod=1&ustbirim=2&birim=1&altbirim=-1&program=172&organizasyonId=4&mufredatTurId=932001
11. Bahçeci D. The Effects of Portfolio Assessment on Test Anxiety, Study Habit and Attitude. Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 2009;10(1):169-82.
12. Akoglu H. User's guide to correlation coefficients. Turkish Journal of Emergency Medicine, 2018; 18:91-3.
13. Co M, Cheung KYC, Cheung WS, Fok HM, Fong KH, Kwok OY, et al. Distance education for anatomy and surgical training – A systematic review. 2022;20(5):e195-e205
14. Zarcone D, Saverino D. Online lessons of human anatomy: Experiences during the COVID-19 pandemic. Clinical Anatomy. 2022;35(1):121–8.
15. Saverino D, Marcenaro E, Zarcone D. Teaching histology and anatomy online during the COVID-19 pandemic. Clinical Anatomy. 2022;35(1):129–34.
16. Yılmaz H, Güler H. Explaining Skeletal System Anatomy with Classical Method, Video Assisted Method and 3D Imaging Techniques and Comparison of Learning Levels Between Methods Int. J. Morphol. 2023; 41(4):1107-11
17. Kundakçı YM, Bilir A. Opinions of Physiotherapy Students on the Effect of Anatomy Education in Clinical Practice Course: A Preliminary Study. Hamidiye Med J. 2023;4(2):92-102

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Sociodemographic Features and Life Quality of Irritable Bowel Syndrome Patients

Bestegül Çoruh Akyol[1](ID), Dilek Toprak[2](ID)

[1]Ordu University Medicine Faculty, Family Medicine Department, Ordu, Turkey
[2]Istanbul Atlas University, İstanbul, Turkey

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Abstract

Object: Irritable bowel disease (IBS) is common in Turkey, as in the World, but is often mis-diagnosed. In this study, the diagnosis, follow up and wellbeing of the patients with irritable bowel disease and the effects of their complaints on their quality of life, has been aimed.

Methods: 202 patients were joined prospectively (n=146, %72,3). Sociodemographic status, Rome III Criteria and WHOQOL quality of life index were recorded by face-to-face questionnaire. Analysis was applied using q-square, t-test, Oneway Annova tests and descriptive statistical methods in SPSS20,0programme.

Results: Most of the participants were women. The only statistically significant association between sociodemographic characteristics was between gender and types of irritable bowel disease. The only statistically significant relationship between sociodemographic characteristics was between gender and types of IBS. Accordingly, constipation (IBS-C) was more common in women and diarrhea (IBS-D) was more common in men (p=0.018). Scores in the physical and environmental quality of life domains of the WHOQOL index and total scores were higher in men (p=0.04, p=0.002, p=0.007). There was a significant relationship in the physical domain scores of housewives and blue-collar workers compared to other occupational groups (p<0.001).

Conclusion: IBS is a disease that can be confused with other events and can affect the quality of daily life. It should be known that there are not only physical complaints in this disease, but also social, environmental and mental complaints.

Key Words: Irritable bowel syndrome, life quality, primary care

İrritabl Bağırsak Sendromu Hastalarının Sosyodemografik Özellikleri ve Yaşam Kalitesi

Özet:

Amaç: İrritabl bağırsak hastalığı (İBS) tüm dünyada olduğu gibi Türkiye'de de yaygın olarak görülmekte, ancak sıklıkla atlanmaktadır. Bu çalışmada irritabl bağırsak hastalığı olan hastaların tanı, takip ve iyilik halleri ile şikayetlerinin yaşam kaliteleri üzerine etkilerinin araştırılması amaçlanmıştır.

Yöntem: Şişli Hamidiye Etfal Hastanesi Aile Hekimliği polikliniklerine gastrointestinal sistem şikayeti ile başvuran 202 gönüllü hasta çalışmaya dahil edildi. Çalışma prospektif bir çalışmaydı. Katılımcıların sosyodemografik durumları, Roma III Tanı Kriterleri ve WHOQOL yaşam kalitesi indekslerinden oluşan değerlendirme formu araştırmacı tarafından yüz yüze anket yöntemi kullanılarak kaydedildi. Analizler yapılarken ki-kare, t-testi, Oneway Annova testleri ve tanımlayıcı istatistiksel yöntemler kullanılarak yapıldı. SPSS20,0 paket programı analizler sırasında kullanıldı.

Bulgular: Katılımcıların büyük çoğunluğu kadın populasyondan oluşmaktaydı (n=146, %72,3). Sosyodemografik özellikler arasında istatistiksel olarak anlamlı tek ilişki cinsiyet ile irritabl bağırsak hastalığı tipleri arasındaydı. Bu sonuca göre kadınlarda kabızlık (IBS-C), erkeklerde ise diyare (IBS-D) daha fazlaydı (p=0.018). WHOQOL indeksinin fiziksel ve çevresel yaşam kalitesi alanlarındaki puanları ve toplam puanları erkeklerde daha yüksekti (p=0.04, p=0.002, p=0.007). Ev kadınlarında ve mavi yakalılarda fiziksel alan puanlarında diğer meslek gruplarına göre anlamlıydı. (p<0.001).

Sonuç İBS başka klinik olaylarla karıştırılabilen ve günlük yaşam kalitesini etkileyebilen bir hastalıktır. Bu hastalıkta sadece fiziksel şikayetleri olmadığı, aynı zamanda sosyal çevresel ve ruhsal şikayetleri de olabileceği bilinmelidir.

Anahtar Kelimeler: İrritabl bağırsak sendromu, yaşam kalitesi, birinci basamak.

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Address for correspondence/reprints:

Bestegül Çoruh Akyol

Telephone number: +90 (532) 584 99 38

E-mail: bestegulcoruh@yahoo.com

INTRODUCTION

Irritable Bowel Syndrome (IBS) is a common, non-life-threatening, functional bowel disease that impairs quality of life and causes serious economic losses. It is a functional bowel disease that occurs or increases during periods of high stress or emotional tension without any biochemical or organic disorder, progresses with changes in defecation habits such as diarrhea and constipation, especially abdominal pain, and is defined by many different symptoms (1). Despite the studies conducted around the world for many years, its pathophysiology has not been fully revealed. IBS describes medically unexplained bidirectional disorders between the gut and the brain (2).

IBS is a chronic disease characterized by attacks of abdominal pain, bloating - indigestion. The pain is usually located in the hypogastrium, the right and left sides of the abdomen, and sometimes in the epigastrial area. The severity of the pain varies, as does the location (1). This variable process impairs the quality of life by reducing daily activities, weakening in self-care and even making it difficult to comply with treatment. Patients with IBS may complain of diarrhea, constipation, alternating periods of diarrhea and constipation, or alternating bowel habits with a normal bowel habit as sequential diarrhea or constipation (3). In a study conducted in the USA, it was found that IBS had an effect on anxiety, sleep status, sexual life, leisure time, travelling, working order and diet, and it was determined that these individuals had a low quality of life due to these effects (1).

There is no laboratory test and/or clear physical examination findings that we can use to diagnose IBS. After excluding the organic-related diseases that may be caused by abdominal pain, abdominal bloating, changes in defecation habits and/or indigestion complaints, the patient is diagnosed with IBS after the patient has the criteria, which have now been revised as the final version of the ROMA IV symptom criteria (4).

The World Health Organization (WHO) Quality of Life (WHOQOL) group includes quality of life; It is defined as the patient's personal perception of his/her situation in life, both in the context of the cultural structure and value system in which he/she lives and in terms of his/her own goals, expectations, standards and concerns (5).

In this study, IBS, which has been proven by many studies to affect a significant percentage of the world's population regardless of geographical difference, is evaluated in patients who apply to primary health care institutions in our country, to evaluate the condition of being affected by the complaints of patients with or without diagnosis, to determine the frequency and characteristics of other accompanying diseases, if any. It is aimed to determine the effect of IBS on the quality of life of patients, whether they are accompanied by diseases or not.

METHODS

202 people who applied to the outpatient clinic with gastrointestinal system complaints were included in the study. The study was conducted prospectively on outpatients in the Family Medicine Outpatient Clinic. A questionnaire form prepared for the study was filled by the coordinator by interviewing the patients one-on-one. The survey consisted of 58 questions and took approximately 20 minutes to answer. In the study, sixteen questions about sociodemographic characteristics, eight questions about patients' nutritional habits and physical activity habits, seven questions about clinical findings, complaints status and Rome III criteria, and the Turkish version of the short form of the quality of life scale developed by WHO (WHOQOL-BREF TR) were composed of twenty-seven questions. A structured questionnaire form was used. In order according to the Rome III diagnostic criteria; Pain relief with defecation, change in stool frequency, change in stool shape or appearance were questioned.

The Turkish adaptation of the WHOQOL-BREF TR scale and its validity and reliability study were performed by Eser et al. SPSS for statistical analysis of data (Statistical Package for Social Sciences for Windows) 20.0 program was used. While evaluating the study data, in addition to descriptive statistical methods (Mean, Standard deviation, Frequency, Percentage), Chi-Square, T test and Oneway Annova test were used to compare qualitative data.

RESULTS

The majority of the participants were female (n=146, 72.3%). When looking at age groups, there were 113 people (55.9%) in the 18-39 age group, with 112 (60.4%) married and 80 (39.6%) single people. The majority of the participants had a high level of education. (n=134, 66.3%). When the occupational groups are examined in our study, the number of participants in the white-collar group is 86 (42.6%), 49 people (24.3%) in the blue-collar group, 39 people (19.3%) in the housewife group, 28 people in other professions (13.9%). Among the participants, those with chronic diseases had the most gastrointestinal system disease (n=48, 41%) and the least food allergy (n=4, 3.4%). The patients had more than one chronic disease. Eighty-eight (43.6%) of the participants had

insomnia problems. Of those who stated that they had sleep disorders, 26 (29.5%) stated that they had insomnia continuously, while 60 (68.2%) stated that they had intermittent insomnia. 72 (35.6%) of the participants were smokers. The average smoking of smokers was 10 (Min:1-Max:75) pack/year. The median alcohol use of the participants who took alcohol was 2 (Min:1-Max:12) days/month. The weekly consumption amounts of basic foodstuffs such as bread, vegetables, fruits, legumes and yoghurt were questioned. Consumption percentages of bread types were close to each other when the consumption amounts were classified as never consuming, consuming every day and consuming between 1 and 6 days. There were obvious differences in the consumption status of other food types.

178 (88.1%) of the participants had constipation problems. While 19 (10.7%) of the constipated patients stated that they were constipated continuously, 157 (88.2%) intermittently, 58 (28.7%) had diarrhea problem. Of those with diarrhea, 10 (17.2%) stated that they experienced diarrhea continuously, while 48 (82.8%) stated that they experienced diarrhea intermittently. Of the participants, 63 (31.2%) had bloating, 128 (63.4%) had pain, 88 (43.6%) had insomnia.

When the relationships between constipation, diarrhea, bloating and sleep disturbance of the participants were examined according to demographic characteristics, constipation and sleep disorder were more common in women, and this situation was statistically significant (p=0.009, p=0.008) Constipation and sleep disorder status by demographic characteristics Table 1 and Table 2 is given.

Constipation rates were found to be lower in the participants in the group with three main meals compared to those who had two meals (p= 0.006). There was no significant difference between the number of meals and the complaint of diarrhea (p= 0.067).

Table 1. Distribution of retention constipation distribution by demographic expansion

Constipation			Positive		Negative		p[1]
			n	%	n	%	
Gender	Female		134	91.8	12	8.2	0.009
	Male		44	78.6	12	21.4	
Age	18-39 yo		100	88.5	13	11.5	0.852
	40-64 yo		78	87.6	11	12.4	
Marital status	Married		105	86.1	17	13.9	0.265
	Single		73	91.2	7	8.8	
Education status	Low education level		56	82.4	12	17.6	0.071
	High education level	122	91	12	9		

[1] Chi-square test

Table 2. Distribution of the presence of sleep disorder according to demographic characteristics

Sleep disorder		Positive		Negative		p[1]
		n	%	n	%	
Gender	Female	72	49.3	74	50.7	0.008
	male	16	28.6	40	71.4	
Age	18-39 yo	43	38.1	70	61.9	0.075
	40-64 yo	45	50.6	44	49.4	
Maritial status	Married	52	42.6	70	57.4	0.739
	Single	36	45	44	55	
Education status	Low education level	32	47.1	36	52.9	0.476
	High education level	56	41.8	78	58.2	

[1] Chi-square test

When the distribution of IBS types was examined, it was found that 140 (69.3%) IBS-C, 20 (9.9%) IBS-D, 38 (18.8%) IBS-M. There was a statistically significant relationship between IBS types and sociodemographic characteristics only according to gender. Accordingly, IBS-C was more common in women and IBS-D in men. (p = 0.018) Sociodemographic characteristics according to IBS types are shown in Table 3. 98 (48.5%) of the participants stated that they used drugs. Of the drug users, 71 (72%) took motility-regulating drugs, 61 (62%) non-motility-regulatory drugs (such as PPI, antacids, herbal cures) and 34 (34%) both motility regulators and non-motility regulators. was using the drug together.

Table 3. Sociodemographic characteristics according to IBS types

		IBS - C		IBS - D		IBS - M		p[1]
		n	%	n	%	n	%	
Gender	Female	109	75.7	10	6.9	25	17.4	0.018
	Male	31	57.4	10	18.5	13	24.1	
Age	18-39 yo	81	74.3	9	8.3	19	17.4	0.437
	40-64 yo	59	66.3	11	12.4	19	21.3	
Maritial status	Married	81	67.5	15	12.5	24	20.0	0.319
	Single	59	75.6	5	6.4	14	17.9	
Education status	Low education level	44	65.7	11	16.4	12	17.9	0.108
	High education level	96	73.3	9	6.9	26	19.8	
Occupation	White collar	63	75.0	6	7.1	15	17.9	0.216
	Blue collar	30	61.2	5	10.2	14	28.6	
	Housewife and others	47	72.3	9	13.8	9	13.8	

[1] Chi-square test

Table 4. WHOQOL scale and total scores

WHOQOL	Average	SD	Minimum	Maximum
Physical	12.92	2.04	5.14	17.71
Mental	13.95	2.43	6.67	20.00
Social	13.64	3.14	4.00	20.00
Enviromental	13.26	2.32	7.11	19.11
Total	88.97	12.63	42.00	116.00

SDS. Standard deviation

In Table 4, the scores of the areal calculations of the WHOQOL-Bref scale are given. When the total scores of the scale were examined, the mean score of the participants was 89 ± 13 (Min 42-Max: 116).

When the scale scores were examined according to gender, the scores obtained in both groups were similar. However, the physical and environmental quality of life domains and total scores of the scale were higher in males, and this result was statistically significant (p=0.041, p=0.002, p=0.007). Scale scores by gender are shown in Table 5.

Table 5. Scale scores by gender

WHOQOL	Female		Male		p[1]
	Average	SD	Average	SD	
Physical	12.74	1.96	13.39	2.17	0.041
Mental	13.77	2.33	14.40	2.63	0.097
Social	13.44	3.10	14.17	3.19	0.142
Enviromental	12.94	2.31	14.09	2.15	0.002
Total	87.49	12.26	92.80	12.89	0.007

[1] T test SD. Standart deviation

As shown in Table 6, when the scores of the domains of the WHOQOL scale were examined according to the Rome III diagnostic criteria, no statistically significant difference was found according to the positivity of the first and third criteria of Rome III. (p>0.05 for all fields). In the second criterion of the Rome III criteria, the environmental area score was found to be lower and this result was statistically significant (p=0.036).

When the scores of the domains of the WHOQOL scale were examined according to the occupational groups, the physical and mental quality of life scores of housewives were found to be lower than the other groups, but only the physical quality of life score was statistically significant (p<0.001). In addition, physical and mental quality of life scores were found to be higher in the blue-collar group compared to all other groups, but the physical quality of life score

alone was statistically significant (p<0.001). Scores according to occupational groups are shown in Table 7.

Table 6. Scale area scores according to Rome 3 criteria

WHOQOL	Yes Average	Yes SD	No Average	No SD	p[1]
	ROME 3.1				
Physical	12.85	2.05	13.28	1.95	0.296
Mental	13.96	2.43	13.89	2.46	0.887
Social	13.59	3.19	13.96	2.86	0.556
Enviromental	13.14	2.36	13.91	1.99	0.095
	ROME 3.2				
Physical	12.84	2.04	13.37	1.96	0.208
Mental	13.85	2.44	14.52	2.28	0.176
Social	13.49	3.06	14.62	3.45	0.076
Enviromental	13.12	2.33	14.11	2.08	0.036
	ROME 3.3				
Physical	13.05	2.00	12.41	2.11	0.069
Mental	14.02	2.42	13.65	2.45	0.375
Social	13.72	3.04	13.33	3.50	0.473
Enviromental	13.27	2.30	13.21	2.44	0.870

[1] T test SD. Standard deviation

Table 7. Scores of scale according to occupational groups

WHOQOL	White Collar Average	White Collar SD	Blue Collar Average	Blue Collar SD	House wife Average	House wife SD	Other Average	Other SD	p[1]
Physical	12.55	2.01	13.90	1.85	12.40	2.14	13.04	1.75	<0.001
Mental	13.94	2.36	14.61	2.72	12.85	2.09	14.33	2.06	0.043
Social	13.74	3.08	13.82	2.86	12.38	3.49	14.81	2.80	0.720
Enviromental	13.21	2.33	13.42	2.67	12.76	2.02	13.81	1.98	0.849

[1] Oneway ANOVA test SD. Standard deviation

DISCUSSION

The most common complaints in our study participants were intestinal gas, abnormal stool frequency and abnormal stool shape, respectively. In Özgen K's study, the most common problems were inability to empty completely during defecation, excessive gas in the intestine, and the need to strain during defecation (1). Although the textbooks list the complaints for IBS as abdominal pain, intestinal

gas, abnormal stool and bloating, they also mention that these symptoms may be in different orders and in different severity in patients (6). We attribute the reason for the different ordering of the data in our study to the different personal perceptions of the complaints of a sociopsychological disease such as IBS.

In treatment planning, priority should be given to the patient's education and symptomatic treatment. Fibrous and osmotic laxatives for constipation, opioids for diarrhea, antispasmodics for pain, and management of associated psychological disorders are required (7). 98 (48.5%) of the participants in our study stated that they were using drugs and our participants were using antispasmodic agents much more in line with the literature. In Özden K's study (1), it was determined that 90% of people tried to regulate their complaints with diet without using medication, while this rate was 51.5% in our study. We think that this difference between the rates of fighting the disease with diet alone is due to the socio-cultural differences of the participants.

Considering the studies on IBS subtypes in the literature, it was determined that IBS - C, IBS - D, IBS - M and IBS - U subtypes were dominant at different rates in different geographical regions (8). In studies conducted in our country, Özden et al. found the IBS-C subtype in university students in 32 different provinces, Çelebi et al. in Elazığ and Baysoy et al.; Yılmaz et al. found the IBS-D subtype to be higher in Diyarbakır (9). In the study of Varlı M. (10), the subtype with the highest prevalence in both genders was IBS-M. The second subtype is IBS-C in women and IBS-D in men, and this difference was statistically significant. In Özden K's study (1), this rate was determined as 4.6% diarrhea, 53.2% predominant constipation, 21.8% mixed type and 20.3% unidentified type. In our study, when the distribution of IBS types of the participants was examined, IBS-C was dominant (n=140, 69.3%). We attributed these differences between studies primarily to the fact that the nutritional habits of the regions where the studies were conducted were very different from each other. In addition, the fact that different criteria were used as diagnostic criteria in these studies (Rome II, Rome III) may have caused such different results. In a study by Ersryd et al., it was shown that the agreement between Rome II and III criteria in categorizing IBS subtypes was weak (11). Today, Rome IV diagnostic criteria are used instead of these criteria (4). When the relationship between occupation and IBS prevalence was investigated, housewives and workers were the group with the highest prevalence of IBS in the study in Sivas, and this difference was found to be significant. In studies in Elazig and Diyarbakir, housewifes constitute the occupational group with the highest prevalence of IBS. In a study conducted in the USA, the prevalence of IBS was found to be

higher in unemployed people. (8). In our country, Özden et al. in their study, a significant relationship was found between having a job and the distribution of IBS (9). In the same study, housewives constitute the occupational group with the highest prevalence of IBS. In our study, when the occupational groups were examined, there were 86 (42.6%) participants who were mostly in the white-collar group. Accordingly, while Özden et al.'s study and our study reached similar results, we cannot express the same results for other studies in the literature. This may be due to the fact that the study was conducted in different geographical regions and there were changes in business concepts according to the regions. In addition, according to our study, we can say that occupations that require mental strength are more prone to IBS.

In the study of Heliawi M (12), it was found that 84.3% (n=183) all patients had insomnia while lying down and had difficulty waking up easily at night and sleeping again. This problem those with IBS (89.5%. n=136) than those without IBS complaints (72.3%. n=47) found higher (RR=1.24). Our study had similar resultsEighty-eight (43.6%) of the participants had insomnia problems and 68.2% of them had this problem intermittently. With these results, we can predict that insomnia is among the secondary problems caused by IBS. Since insomnia generally affects the body balance for multiple reasons, it may be one of the main reasons for the vicious circle especially in IBS patients. Or, from another point of view, the appearance of insomnia and IBS in people with high stress can be explained by similar personality types or lifestyles. In the study conducted by Uzan et al., approximately 25% of the participants were diagnosed with IBS, and stress (17.85%) was the second reason for outpatient clinic admission (13). This result proves that insomnia problems can be seen in stressed people.

In the field of health research, there has been an intense interest in the evaluation of “Quality of Life” in recent years. There are studies that found that the quality of life in patients with IBS decreased depending on the presence and severity of symptoms and the presence of different accompanying disorders (1). In the study of Si et al. (14), all sub-scores were significantly reduced in patients with IBS, except for the SF-36 Quality of Life physical sub-score. In studies conducted with the same scale in the USA and England, differences were found in patients with IBS in all parameters (15).

In our study, it was observed that the mean scores of the four subgroups of the WHOQOL quality of life scale were the lowest in the physical and highest mental areas. Accordingly, it was determined that IBS patients were mostly affected by somatic complaints. In Özgen K's study (1), the total scores were close to our study, and the physical domain scores were low and the

social domain scores high in subscale scores. This may be due to the fact that patients perceive the severity of IBS symptoms at different levels and reflect them on their quality of life in different ways.

In our study, we determined that women with IBS were affected more than men in physical, social areas and total score. In the literature, no information could be found in the available sources regarding this result. We attribute this to the fact that women express their complaints more than men, apply to the hospital more often, and are more sensitive about this issue.

Anxious and/or depressive states may occur in individuals with IBS, and individuals who continue to be followed up and treated for this group of diseases may have undiagnosed IBS patients (16). In the study conducted by Keskin et al. with 1475 people, where the distribution of psychiatric disorders by gender was evaluated, all disorders except possible alcohol abuse were found to be more common in female gender (17). In our study, there were no psychiatric diseases among the chronic diseases declared by the participants. However, this does not indicate that our participants do not have any psychiatric disorders. Our participants should be evaluated for any psychiatric illness that could masquerade as IBS.

IBS, which is etiologically caused by multifactorial reasons, causes changes in the dynamics of people's quality of life (18). In our study, quality of life scale scores were compared according to gender. Accordingly, although the average scores were close to each other in both genders, statistical significance was detected in men in the total score and in both physical and environmental subgroups. These findings in our study are compatible with the literature. The fact that material resources are evaluated in the environmental subgroup evaluation may have affected our study results in favor of men due to our patriarchal social structure.

IBS is a disorder that affects the quality of life of individuals and is a very common condition that can often be confused with other diseases. In the studies conducted in our country, as in other countries, female dominance draws attention. It will increase the chances of diagnosis and treatment if physicians are aware of IBS criteria and symptoms regarding Irritable Bowel Syndrome, which is a disease that can be diagnosed easily by differential diagnosis in primary health care services. In addition, it should be considered that patients may have not only physical but also social, environmental and spiritual complaints with these complaints, and a biopsychosocial holistic approach to the disease should be displayed.

Ethics Committee Approval: Ethics committee approval for this study Istanbul Şişli Hamidiye Etfal Training and Research Hospital Clinical Research Ethics Committee obtained from the

University Clinical Research Ethics Committee (ethics committee date and no:17/12/2015, 2577)

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REFERENCES

1. Özgen K. Prevalence of Irritable Bowel Syndrome and Characteristics of Patients who applied to Çanakkale Region Family Health Center, Master's Thesis. Canakkale: T.C. Çanakkale Onsekiz Mart University Faculty of Medicine, Department of Family Medicine. 2013.
2. Hillestad E M R, van der Meeren A., Nagaraja B H, Bjørsvik B R, Haleem N, Benitez-Paez A, et al. Gut bless you: The microbiota-gut-brain axis in irritable bowel syndrome. World journal of gastroenterology, 2022; 28.4: 412.
3. Alhan C. Quality of Life in Patients with Irritable Bowel Syndrome, Interaction of the Disease with Mental Status and Psychiatric Comorbidities, M.Sc., T.C. Abant İzzet Baysal University Faculty of Medicine, Department of Mental Health and Diseases, Bolu; 2012.
4. Kaya M, Kaçmaz H. Re-evaluation of functional bowel diseases according to Roma IV criteria. Current Gastroenterology, 2016; 20.4: 393-407.
5. Müezzinoğlu T. Quality of Life Bulletin of Urooncology 2005:1;25–29.
6. Rakel R, Rakel D. Textbook of Family Medicine. 9th Edition, Saunders, 2015.
7. Camılleri M. Diagnosis and treatment of irritable bowel syndrome: a review. Jama, 2021; 325.9: 865-877.
8. Pangal M. Determination of Irritable Bowel Syndrome Prevalence and Related Factors in Primary Health Care Workers, Specialization Thesis. Izmir: T.C. Erciyes University Faculty of Medicine, Department of Family Medicine. 2012.
9. Özden A, Köksal AS, Dilek O, Çiçek B, Yılmaz U, Dağlı Ü. The incidence of irritable bowel syndrome in primary health care institutions in Turkey. Academic Journal of Gastroenterology 2006; 5(1):4-14.
10. Varlı M. Common Gastrointestinal Problems in the Elderly. Journal of Clinical Development 2012; 25:56-65.

11. Ersryd A, Posserud I, Abrahamsson H, Simren M. Subtyping the irritable bowel Syndrome by predominant bowel habit: Rome II versus Rome III. Aliment Pharmacol Ther 2007; 26:953-61.
12. El-Heliawi's M. Association and Possible Factors of Irritable Bowel Syndrome in Patients with Gastroesophageal Reflux Complaints in Turkey, Specialization Thesis. Ankara: T.C Hacettepe University Faculty of Medicine, Department of Internal Medicine. 2013.
13. Uzan M M, Polat A O, Uzan G S, Toprak D et al. Irritable Bowel Syndrome Prevalence and Sociodemographic, Clinical and Lifestyle Features of Patients Admitted to Family Medicine Policlinic. Ankara Medical Journal. 2018; 18(4):690-698.
14. Si J M, Wang L J, Chen S J, Sun L M, Dai N. Irritable bowel syndrome consulters in Zhejiang province: the symptoms pattern, predominant bowel habit subgroups and quality of life. World J Gastroenterol. 2004; 10:1059-64.
15. Gralnek I M, Hays R D, KIlbourne A, Nalıboff B, Mayer E A. The impact of irritable bowel syndrome on health–related quality of life. Gastroenterelogy. 2000; 119: 654-660.
16. Enck P, Aziz Q, Barbara G, Farmer AD, Fukudo S, Mayer EA et al. Irritable bowel syndrome. Nat Rev Dis Primers. 2016; 2:16014.
17. Keskin A, Ünlüoğlu İ, Bilge U, Yenilmez Ç. The Prevalence of Psychiatric Disorders Distribution of Subjects Gender and its Relationship with Psychiatric Help-Seeking. Archives of Neuropsychiatry. 2013; 50: 344-351.
18. Böhn L, Störsrud S, Törnblom H, Bengtsson U, Simrén M. Selfreported food-related gastrointestinal symptoms in IBS are common and associated with more severe symptoms and reduced quality of life. The American journal of gastroenterology. 2013; 108(5):634.

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COVID-19 Infection and Guillain Barré Syndrome Case Report

Arzu Ayraler[1(ID)]

[1]Doctor Faculty Member. Giresun University, Department of Family Medicine, Giresun, Turkey

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Abstract

The coronavirus pandemic (COVID-19) has caused global changes by affecting the whole world, starting from the Chinese city of Wuhan in December 2019. Acute respiratory syndrome is defined as coronavirus 2(SARS-CoV-2). SARS-CoV-2 has been reported to be associated with neurological signs such as headache, nausea, dizziness, anosmia, agusia, and peripheral nervous system symptoms. Guillain-Barré syndrome (GBS) is an inflammatory disease of the peripheral nervous system. Neurological symptom has reported, emphasizing the importance neurological effects of the disease. GBS can occur after various infections. The patient was admitted to the hospital with complaints of widespread muscle pain, skin itching, rash and difficulty in movement. Symptoms included the inability to walk and difficulty eating by lifting his arm. We aimed to review the case report that may be related to COVID-19 infection.

Key Words: COVID-19, Guillain-Barré syndrome, Neurological finding

Klinik Veriler Kullanılarak Veri Madenciliği Yöntemleriyle Koroner Kalp Hastalığının Tespiti

Özet

Coronavirüs pandemisi (COVID-19) Aralık 2019'da Çin'in Wuhan kentinden başlayarak tüm dünyayı etkisi altına alarak küresel değişikliklere yol açtı. Akut solunum sendromu koronavirüs 2(SARS-CoV-2) olarak tanımlanmaktadır. SARS-CoV-2'nin baş ağrısı, mide bulantısı, baş dönmesi, anosmi, aguzi ve periferik sinir sistemi semptomları gibi nörolojik bulgular ile ilişkili olduğu bildirilmiştir. Guillain-Barré sendromu (GBS), periferik sinir sisteminin enflamatuar hastalığıdır. Hastalığın nörolojik etkilerinin öneminin vurgulandığı nörolojik belirtiler rapor edilmiştir. GBS'nin çeşitli enfeksiyonlar sonrası ortaya çıkabilir. Olguda yaygın kas ağrısı, deride kaşıntı, döküntü ve hareket etmede zorluk şikayeti ile hastaneye başvurdu. Semptomlar arasında yürüyememe ve kolunu kaldırarak yemek yemede zorluk yer alıyordu. Bu doğrultuda COVID-19 enfeksiyonu ile ilişkili olabilecek olgu sunumun gözden geçirmesini amaçladık.

Anahtar Kelimeler: COVID-19, Guillain-Barré sendromu, Nörolojik bulgu

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Address for correspondence/reprints:

Arzu Ayraler

Telephone number: +90 (506) 735 41 05

E-mail: ayraler7@hotmail.com

INTRODUCTION

Wuhan, China, is associated with an increasing number of neurological symptoms and COVID-19; although the coronavirus disease is a challenging world problem, COVID-19 patient primarily develops respiratory symptoms. Associated symptoms have been observed (1). The incidence of Guillain-Barré syndrome (GBS), especially in the elderly, is approximately 1 in 100,000 per year, and an increase of 20% is expected in 10 years at all ages (2). At least one subjective neurological symptom has been reported in more than 90% of COVID-19 patients, emphasizing the importance neurological effects of the disease (1).

CASE

A 55-year-old woman presented to the emergency department with complaints of widespread muscle pain, skin itching, rash and difficulty moving. Symptoms included inability to walk and difficulty eating by raising her arm. It was learned that she had essential hypertension for 20 years and type 2 diabetes mellitus for ten years but had been taking oral antidiabetic drugs for the last two years and smoked 30 packs of cigarettes per year

On physical examination, the patient's general condition was moderate; body temperature, pulse and arterial blood pressure were 120/80mmHg, respiratory rate was 18/minute and oxygen saturation was 95% in room air. There was no dyspnea on examination. Muscle weakness was

Figure 1. Electromyography revealed electrophysiological findings consistent with sensorimotor polyneuropathy with dominant axonal involvement in the lower extremities

3/5 in proximal, 2/5 in distal extremities, 3/5 in proximal and 2/5 in distal upper extremities according to the Medical Research Council (MRC) scale. Deep tendon reflexes were decreased. Vibration and tactile sensation were decreased in the distal parts of the extremities and facial paralysis areas.

Laboratory results serum Glucose: 138 mg/dl, Urea: 86 mg/dl, Creatinine: 3.6 mg/dl, Low: 28 IU/L, Ast: 14 IU/L, Na: 143 mmol/L, Potassium: 4.8 mmol/L, Wbc: 16.8 10^9L (neutrophils = 82.7%; lymphocytes = 10.4%); Neutrophils/Lymphocytes: 7.95, Erythrocyte sedimentation rate 72 mm/h, C-reactive protein 16. 51 mg/l, hemoglobin 11.6 g/dL, D-Dimer:

448 ng/ml, Ferritin: 397.5 µg/L, Procalcitonin: 0.09 and urinalysis showed no glucose and ketones. E. coli was grown in urine culture. COVID-19 polymerase chain reaction (PCR) test was ordered.

Chest tomography showed areas of ground glass density in both lungs. Ground glass densities on lung tomography associated with COVID-19 (Figure 1). Cranial tomography showed structures secondary to cerebellar atrophy. Peripheral and central CSF spaces were enlarged secondary to cortical-subcortical atrophy. Electro-diagnostic parameters of EMG (Electromyography) were compatible with sensorineural polyneuropathy. Neurology was consulted and appropriate cranial sparing medical treatment was given for polyneuropathy and facial paralysis. Infectious diseases were contacted and Favipravin, Prednol, Ultramex, Degastrol, Clexan, Neruda, Hitrizine Tablet treatment and chronic medications were organized.

After four weeks, the patient's complaints regressed and she was discharged with the recommendations of the Neurology and Physical Therapy and Rehabilitation departments.

DISCUSSION

In December 2019, the virus, which started in Wuhan, China and spread around the world, was identified as SARS-CoV-2, and in February 2020, the World Health Organization (WHO) named the disease coronavirus disease 2019 (COVID-19) (3). Various neurological symptoms have been reported in hospitalized patients with COVID-19(4). In this context, COVID-19 has been associated with many neurological findings such as confusion, anosmia and ageusia (5). According to neuropathologic studies, immune-mediated inflammation, cytokine

storm, systemic inflammation and hemodynamic disturbance resulting in neurological symptoms (6). The concept of direct viral neurotoxicity, where the pathogen directly targets the immune system, or the antibodies formed by activating it in another way, targeting peripheral nerves and spinal roots has also been discussed (7). Therefore, it should be evaluated early regarding neurological symptoms, including pathological signs. Our patient had a history of respiratory tract infections lasting two weeks. Guillain-Barre Syndrome; It is an acute, inflammatory, demyelinating neuropathy. It can also be seen after gastroenteritis or respiratory tract infections. The first case was reported from China. SARS-CoV2 was isolated in the nasopharyngeal swab of a 61-year-old patient who first developed severe fatigue and weakness in the lower extremities, followed by fever and cough. Since most cases had respiratory symptoms and coincided with the epidemic period, the causative agent was demonstrated in the nasopharyngeal swab sample taken (8). But data on GBS patients associated with COVID-19

infection are scarce (9). When we look at the literature, prevalence was estimated at 15 cases per 100,000 SARS-CoV-2 infections (10). Our case report is COVID-19 without respiratory or general symptoms. Patient with GBS. It highlights that it induces immunological processes independent of the absence of prodromic symptoms. Great attention should be paid to neurological complications such as GBS, early detection of symptoms and diagnosis is important.

CONCLUSION

International cohort studies are needed to establish an association of outcome to reveal the possible causal relationship between the virus and developing neurological disorders.

Ethics Committee Approval: Consent form was obtained from the patient. An informed consent form was signed by the patient/relatives for the case presentation and applied by the Helsinki principles.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept: AA. Design: AA . Literature search: AA . Data Collection and Processing: AA . Analysis or Interpretation: AA . Written by: AA .

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REFERENCES

1. Harapan BN, Yoo HJ. Neurological symptoms, manifestations, and complications associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease 19 (COVID-19). J Neurol. 2021;268(9):3059-3071. doi:10.1007/s00415-021-10406-y
2. Mirian A, Nicolle MW, Budhram A. Guillain-Barré syndrome. CMAJ. 2021;193(11):378. doi:10.1503/cmaj.202710
3. Mao L, Jin H, Wang M, Hu Y, Chen S, He Q, et al. Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China. JAMA Neurol. 2020;77(6):683–690. doi:10.1001/jamaneurol.2020.1127
4. Gençler OS. Neurological Symptoms in Hospitalized Patients with COVID-19 Diagnosis and theRelationship with Disease Severity. YIU Saglik Bil Derg. 2021;2:76-82. doi.org/10.51261/yiu.2021.00037
5. Niazkar HR, Zibaee B, Nasimi A, Bahri N. The neurological manifestations of COVID-19: a review article. Neurol Sci. 2020;41(7):1667-1671. doi:10.1007/s10072-020-04486-3
6. Topçuoğlu MA, Öztürk Ş. Neurological Spectrum of COVID-19: A Practical Review. Turk J Neurol 2021;27(1):6-8. doi:10.4274/tnd.2021.92891
7. Ünlütürk Z, Öncel ÇH, Haytı B, Erdoğan Ç.

Different Guillain-Barré Syndrome Variants Associated with COVID-19: Report of 4 Clinical Cases. Turk J Neurol. 2022; 28(1):51-54

8. Zhao H, Shen D, Zhou H, Liu J, Chen S. Guillain-Barré syndrome associated with SARS-CoV-2 infection: causality or coincidence? Lancet Neurol. 2020;19(5):383-384. doi:10.1016/S1474-4422(20)30109-5
9. El Otmani H, El Moutawakil B, Rafai MA, Benna NE, Kettani CE, Soussi M. et al. Covid-19 and Guillain-Barré syndrome: More than a coincidence! Rev Neurol (Paris). 2020;176(6):518-519. doi:10.1016/j.neurol.2020.04.007
10. Palaiodimou L, Stefanou MI, Katsanos AH, Fragkou PC, Papadopoulou M, Moschovos C. et al. Prevalence, clinical characteristics and outcomes of Guillain-Barré syndrome spectrum associated with COVID-19: A systematic review and meta-analysis. Eur J Neurol. 2021;28(10):3517-3529. doi:10.1111/ene.14860

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Optic Nerve Hypoplasia; Case Report

Zekeriya Çetinkaya[1] (ID), Kuddusi Erkiliç[2] (ID)

[1]Elbistan State Hospital Ophthalmology Department, Kahramanmaraş
[2]Erciyes University School of Medicine, Department of Ophthalmology, Kayseri

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Abstract

Optic nerve hypoplasia (ONH) is a rare neurodevelopmental disorder described by the optic disc is abnormally small regardless of sex or race. Imaging methods are frequently used in the diagnosis. In our case, a 17-year-old male patient, came to the clinic because of a deviation in his left eye, the examination showed hypoplasia of the optic nerve in the left eye. In ON hypoplasia, reported cases may include severe Central nervous system (CNS) malformations. However, we recommend periodic systemic examinations along with occupational rehabilitation, parental education and mobility training for these unique children.
Key Words: Hypoplasia of optic nerve, congenital optic nerve anomaly, optic nerve

Optik sinir hipoplazisi;Olgu sunumu

Özet

Optik sinir hipoplazisi, cinsiyet veya ırktan bağımsız olarak optik diskin anormal derecede küçük olması ile tanımlanan nadir bir nörogelişimsel bozukluktur. Tanıda görüntüleme yöntemleri sıklıkla kullanılmaktadır. Olgumuzda 17 yaşında erkek hasta sol gözünde kayma şikayeti ile kliniğe başvurdu, yapılan muayenede sol gözde optik sinir hipoplazisi saptandı. Optik sinir hipoplazisinde, bildirilen vakalar ciddi Santral sinir sistemi (SSS) malformasyonlarını içerebilir. Ancak bu çocuklar için mesleki rehabilitasyon, ebeveyn eğitimi ve hareket eğitimi ile birlikte periyodik sistemik muayeneleri önermekteyiz.
Anahtar Kelimeler: Optik sinir hipoplazisi, konjenital optik sinir anomalisi, optik sinir

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Address for correspondence/reprints:

Zekeriya Çetinkaya

Telephone number: +90 (532) 056 04 90

E-mail: zekeriyacetinkaya@hotmail.com.tr

INTRODUCTION

Optic nerve hypoplasia (ONH) is a very rarely occuring congenital condition that can affect one or both eyes. ONH is often associated with other eye disorders. These include punched-out chorioretinal abnormalities, retinal dystrophy, sclerocornea, microphthalmia, cataracts and

coloboma (1). Bilateral cases commonly occur in association with serious congenital anomalies of the brain (2). However, unilateral and bilateral optic nerve aplasia have also been reported in otherwise healthy children (3). Optic nerve aplasia may occur in isolation or in combination with congenital eye disease or other non-ocular abnormalities. These abnormalities include congenital heart disease, corpus callosum hypogenesis and bilaterally hypoplastic ovaries (4).

CASE REPORT

A 17-year-old male born of a nonconsanguineous marriage had an occasional deviation of the left eye since birth. He was the first child of his parents and there was no significant history of eye disorder in the family. On examination, he had no behavioural response to bright light in the left eye and the pupils in the left eye were non-reactive. Both corneas were clear. The dilated fundus was examined and a hypoplastic optic nerve was seen in the left eye. (Fig. 1). The fundus of the right eye was within normal limits (Fig. 2). The neurological examination was normal except for vision.

The ultrasound B-scan showed no shadowing of the optic nerve in the left globe. The intraorbital course of the left optic nerve was absent in the retinal segment. A thin cord was visible in the posterior segment. There were no significant abnormalities of the brain (Fig. 4).

Figure 1: Severe hypoplasia of the optic nerve in the left eye. The left optic disc appeared quite small. The left optic disc was slightly pale and surrounded by a double ring.

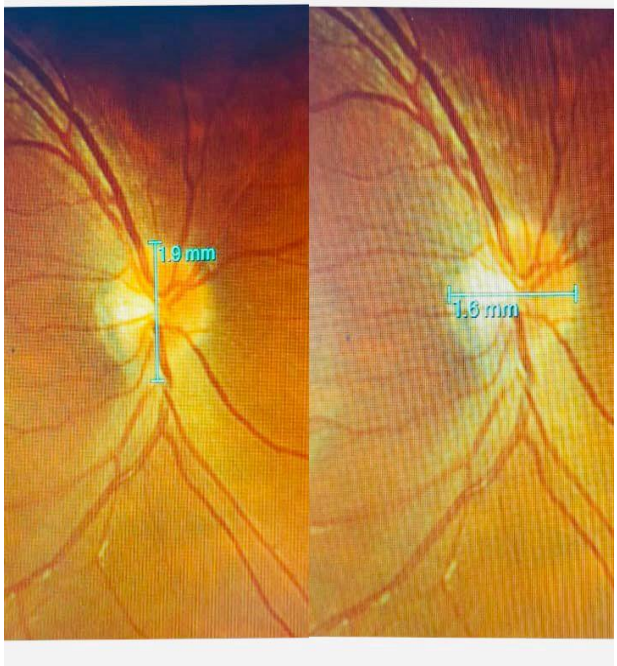

Figure 2: Right eye is normal

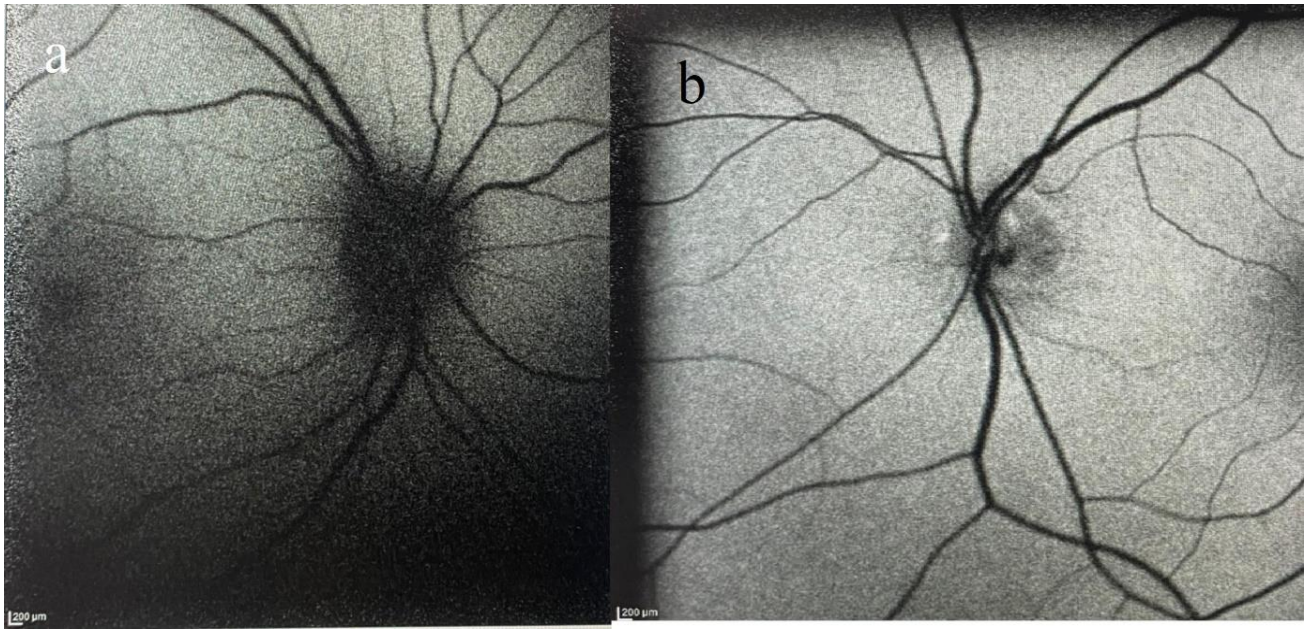

Figure 3: a) Photo of the right optic disc, b) Photo of the left optic disc. The fundus autofluorescence image of the right eye shows no autofluorescence signal in the disc area, but there is hyperautofluorescence in the disc area of the left eye.

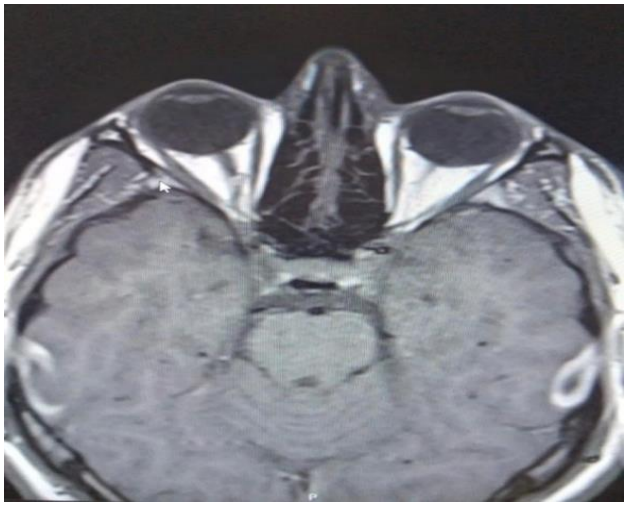

Figure 4: The Magnetic resonance imaging (MRI) scan shows a narrow stalk that represents the presumed left optic nerve in the orbit.

DISCUSSION

Optic nerve aplasia is the total absence of the optic nerve head, nerve fibre layer, ganglion cells and retinal vascular structures. Histopathologically, only a dural sheath can be seen penetrating the sclera in its normal position, together with characteristics of retinal dysplasia in the form of rosetting (3). Clinical features of true Optic nerve aplasia include blindness (no light perception), absence of the optic disc, absent central and branch retinal vascular structures, and an afferent papillary defect (5,6). There was no light perception and the optic disc was hypoplasia in the left eye of this case. Neuroimaging of the brain and orbit of the left eye showed optic disc hypoplasia. Thus, this case had ON hypoplasia in the left based on clinical, Magnetic resonance imaging (MRI) and USG findings. The left eye of the child in our case had all the clinically and radiologically features of ON hypoplasia. The histopathology to look for the absence of ganglion cells and nerve fibre layer together with the presence of a rudimentary dural sheath may be helpful in differentiating true

ON aplasia from severe ON hypoplasia (4). However, this is not possible in this case. Because of the lack of light perception, the absence of pupillary reflex, the hypoplasia of disc on fundus examination, the hypoplasia of ON on MRI and USG of the left eye, we assumed that this was also a case of ON hypoplasia in the left eye.

In the past, eyes with ON aplasia have been reported to lack optic nerve fibres, ganglion cells and retinal blood vascular structures (5,7). One-sided ON aplasia is usually related to normal brain development, whereas most two-sided forms are associated with CNS dysfunction (8). There have been some reports of cardiovascular, gastrointestinal and vertebral abnormalities in ON aplasia (9).

CONCLUSION

The diagnostic procedures for optic nerve abnormalities in children require a thorough ophthalmic examination and appropriate ancillary tests. Some neuroimaging techniques like MRI may be of diagnostic significance in demonstrating optic nerve abnormalities and related disorders. MRI is a useful imaging technique for confirming the disease and identifying other neurological abnormalities. Parents are mainly advised on educational, occupational and physical rehabilitation for blind children. ON hypoplasia is rarely seen, but cases may include severe central nervous system abnormality. However, we advocate periodic systemic assessment along with occupational rehabilitation, parent counselling and movement education for these unique cases.

Ethics Committee Approval: Consent form was obtained from the patient. An informed consent form was signed by the patient/relatives for the case presentation and applied by the Helsinki principles.

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REFERENCES

1. Taylor D. Optic nerve axons: life and death before birth. Eye (Lond) 2005;19:499–527.
2. Taylor D. Developmental abnormalities of the optic nerve and chiasm. Eye (Lond) 2007;21:1271–84.
3. Sanjari MS, Ghasemi Falavarjani K, Parvaresh MM, Kharazi HH, Kashkooli MB. Bilateral aplasia of the optic nerve, chiasm, and tracts in an otherwise healthy infant. Br J Ophthalmol. 2006;90:513–4.
4. Rajan RP, Deb AK, Kannan NB, Ramasamy K. Bilateral optic nerve aplasia with corpus

callosum hypogenesis in an otherwise healthy child: Report of a rare case. Indian J Ophthalmol. 2019;67(7):1231-1233.

5. Meire F, Delpierre I, Brachet C, Roulez F, Van Nechel C, Depasse F, et al. Non-syndromic bilateral and unilateral optic nerve aplasia: First familial occurrence and potential implication of CYP26A1 and CYP26C1 genes. Mol Vis. 2011;17:2072–2079
6. Sadasivan KS, Pawar N, Ravindran M, Rengappa R. Optic nerve aplasia: A case series. Indian J Ophthalmol. 2018;66:717–9.
7. Caputo R, Sodi A, Menchini U. Unilateral optic nerve aplasia associated with rudimental retinal vasculature. Int Ophthalmol. 2009;29:517–519.
8. Brodsky MC, Atreides SP, Fowlkes JL, Sundin OH. Optic nerve aplasia in an infant with congenital hypopituitarism and posterior pituitary ectopia. Arch Ophthalmol. 2004;122:125–126.
9. Alqahtani J. Optic nerve aplasia: A case report and literature review. J Pediatr Neurosci. 2008;3:150–153.

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Sacroileitis Developing in Irregularly Treated Brusellosis

Enes Telli[1](ID) Emsal Aydın[1](ID)

[1]Giresun Üniversitesi Tıp Fakültesi, Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Anabilim dalı, Giresun

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Abstract

Brucellosis; Fever, also known as corrugated fever, is a zoonotic disease charactarized by chills and muscle aches. It can be seen endemic in many countries including our country. Consumption of unpasteurized dairy products is the most common mode of transmission. Diagnosis is made by culture of the organism and increase in antibody titer in serum samples. Complications affecting many systems, mostly osteoarticular, are seen in the disease. In our case, a case of sacroileitis developed as a result of irregular treatment in a patient who was engaged in animal husbandry and was diagnosed with brucellosis is presented. In our case, it was started that osteoarticular involvement could develop under treatment and the importance of regular treatment at correct doses was emphasized.

Keywords: Brucellozis, Complication, Sacroiliitis

Düzensiz Tedavi Edilen Brusellozda Gelişen Sakroileit

Özet

Bruselloz; Ondülan ateş olarak da bilinen ateş, terleme ve kas ağrıları ile seyreden zoonotik bir hastalıktır. Endemik olarak ülkemizin de içinde bulunduğu birçok ülkede görülebilmektedir. Pastörize edilmemiş süt ürünleri tüketimi en sık bulaş yoludur. Tanısı organizmanın kültür ile üretimi ve serum numunelerinde antikor titre artışı ile konulur. Hastalıkta en çok osteoartiküler olmak üzere birçok sistemi etkileyen komplikasyonlar görülür. Olgumuzda hayvancılıkla uğraşan ve brusellozis tanısı alan hastada düzensiz tedavi sonucu gelişen sakroileit vakası sunulmuştur. Olgumuzda osteoartiküler tutulumun tedavi altında da gelişebileceği ifade edilmiş ve doğru dozlarda düzenli tedavinin önemi vurgulanmak istenmiştir.

Anahtar Kelimeler: Bruselloz, Komplikasyon, Sakroileit

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Address for correspondence/reprints:

Enes Telli **E-mail:** enestelli1996@gmail.com

Telephone number: +90 (506) 809 19 85

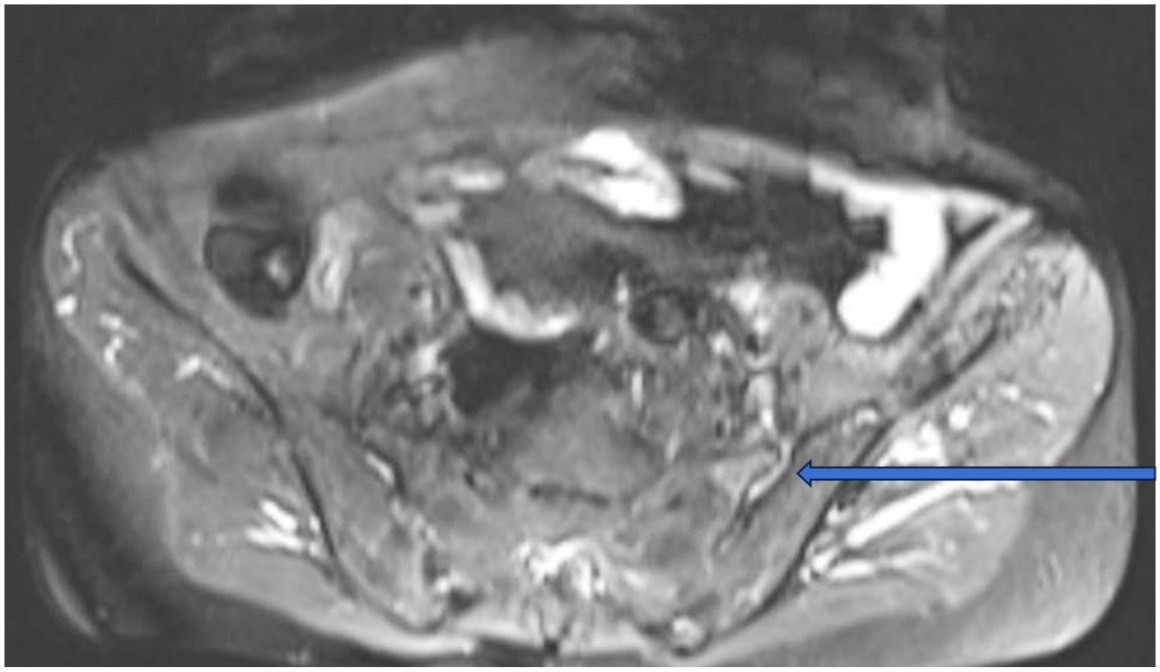
INTRODUCTION

Brucellosis, also known as Undulant Fever, Malta Fever, or Mediterranean Fever, is a zoonotic disease characterized by various clinical symptoms such as fever, sweating, muscle and joint pain. It is endemic in the Mediterranean basin, including Turkey, as well as in the Middle East, Central Asia, sub-Saharan Africa, and some regions of Central and South America (1). Brucella spp. non-motile, facultative, intracellular aerobic coccobacilli in structure (2). Four species that cause the disease in humans have been identified. Worldwide, Brucella melitensis is the most common cause of the disease (3). The disease is transmitted through the consumption of infected unpasteurized animal products, contact with mucous membranes and secretions from infected animals, and inhalation of infected aerosol particles. The consumption of unpasteurized dairy products is the most common mode of transmission. Diagnosis is made by serological tests based on the culture of the organism from blood, body fluids or tissue and the detection of an increase in Brucella antibody titers in serum samples (4). The spread and severity of the infection depend on the balance between the microorganism's virulence and the host's defenses (5). Since Brucella resides intracellularly, antibiotics that penetrate cells and are effective in an acidic environment are used in its treatment (6). Complications affecting various systems can develop in the disease. In this case, a case of sacroiliitis developed under irregular Brucellosis treatment is presented.

CASE REPORT

A 52-year-old female patient with no known comorbidities, who is engaged in animal husbandry, presented to the outpatient clinic with complaints of night sweats, high fever, fatigue, muscle and joint pain lasting for the past 2 weeks. She had no history of consuming unpasteurized milk or dairy products. Initial investigations revealed a white blood cell count of 5000/mm3, neutrophils at 3007/mm3, platelet count of 202.000/mm3, hemoglobin at 12.5 gr/dL, CRP (C-reactive protein) at 32 mg/L (0-5 mg/L), positive Brucella agglutination and a positive result at a titer of 1/640 on the standard tube agglutination test for Brucella. Blood cultures were obtained from the patient, and she was diagnosed with brucellosis. She was initiated on oral treatment with Doxycycline 2*100 mg and Rifampicin 1*600 mg. On the 14th day of treatment, the patient presented again with persistent muscle and joint pain and the development of lower back pain. Laboratory tests showed a white blood cell count of 5400/mm3, neutrophils at 2930/mm3, CRP of 1.5 mg/L, and an ESR (erythrocyte sedimentation rate) of 15 mm/h (0-20 mm/h). In the blood culture taken at the beginning of the treatment, Brucella spp. growth was detected. It was determined that the patient had been using the prescribed treatment

with inadequate dosage and incompleteness. The patient was admitted for further evaluation and supervised treatment to investigate complications. Physical examination revealed tenderness in the left sacroiliac joint. An MRI of the sacroiliac joint confirmed active sacroiliitis on the left side (Figure-1). Gentamicin was added to the patient's treatment regimen at a dose of 5 mg/kg/day, administered parenterally. The parenteral treatment was completed over 14 days. She was discharged and received outpatient follow-up. Her treatment was continued at an effective dose for a total of 120 days. In her final follow-up visits, there was no evidence of elevated acute-phase reactants, and the patient reported complete resolution of back pain and myalgia. She remained asymptomatic.



Şekil.1. In the STIR sequence, there is an increase in signal intensity in the anterior aspect of the left sacroiliac joint, adjacent to the joint and within the joint space

DISCUSSION

Osteoarticular involvement is the most common complication of brucellosis, occurring in 10% to 85% of patients (7). Magnetic resonance imaging (MRI) and bone scintigraphy are used for diagnosis. The sacroiliac and spinal joints are the most commonly affected regions (7). Sacroiliitis or inflammation of the sacroiliac joint is observed in approximately 80% of patients with focal complications, more commonly in adults (8). The clinical manifestations of sacroiliitis closely resemble those of acute lower back pain and lumbar disc herniation. Although lower back pain is a significant symptom, a study conducted in Egypt screened 100 brucellosis patients for sacroiliitis using extended rheumatological examination and

imaging methods, revealing asymptomatic sacroiliitis in 24% of patients (9).

Our case underscores the significance of complications that arise due to irregular and incorrect dosing of treatment. However, a review of the literature reveals a noteworthy prevalence of osteoarticular complications in asymptomatic brucellosis cases. This raises the notion of routine complication screening in brucellosis cases, but further research is required to explore this concept thoroughly.

CONCLUSION

Osteoarticular involvement is the most common complication in brucellosis and may require detailed physical examination and imaging. Reporting cases of sacroiliitis that can also have an asymptomatic course further emphasizes the importance of clinical suspicion. Another significant aspect that clinicians should pay particular attention to is the importance of providing regular and accurate dosage of treatment to prevent complications and the treatment from becoming complex.

Ethics Committee Approval: Consent form was obtained from the patient. An informed consent form was signed by the patient/relatives for the case presentation and applied by the Helsinki principles.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept: Design: Literature search:. Data Collection and Processing: Analysis or Interpretation: Written by**:** ET, EA.

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REFERENCES

1. The new global map of human brucellosis. Pappas G, Papadimitriou P, Akritidis N, Christou L, Tsianos EV, Lancet Infect Dis. 2006;6(2):91
2. From the discovery of the Malta fever's agent to the discovery of a marine mammal reservoir, brucellosis has continuously been a reemerging zoonosis, Godfroid J , Cloeckaert A, Liautard JP, Kohler S, Fretin D, Walravens K, et all. 2005 May-Jun;36(3):313-26
3. Brucellosis, Pappas G, Akritidis N, Bosilkovski M, Tsianos E, N Engl J Med. 2005;352(22):2325
4. Acute Febrile Illness Caused by Brucella abortus Infection in Humans in Pakistan, Saddique A, Ali S, Akhter S, Khan I, Neubauer H, Melzer F, ett all. Int J Environ Res Public Health. 2019;16(21) Epub 2019 Oct 23.
5. Doganay M, Aygen B, Human brucellosis: an overview. Int. J. Infect. Dis. 2003;7:173-182
6. Şimşek S, Göktaş P, Coşkun D. The in vitro effect of some antibiotic combinations

including Ofloxacin and Ciprofloxacin against Brucella melitensis. Marmara Medical J 1998; 11 (3);152-5.

7. Osteoarticular manifestations of human brucellosis: A review. Esmaeilnejad-Ganji SM, Esmaeilnejad-Ganji SMR, World J Orthop. 2019;10(2):54. Epub 2019 Feb 18
8. Musculoskeletal brucellosis. Arkun R, Mete BD, Semin Musculoskelet Radiol. 2011;15:470–479
9. Gheita TA, Sayed S, Azkalany GS, El Fishawy HS, Aboul-Ezz MA, Shaaban MH, et all. Subclinical sacroiliitis in brucellosis. Clinical presentation and MRI findings. Z Rheumatol. 2015;74:240–245.

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Perioperative Nursing Care for Patients Undergoing Coronary Angiography using the Transradial Approach

İsmail Aşatır[1](ID), Atiye Erbaş[2](ID)

[1]Duzce Univesity, faculty of the health science, department of nursing, 81620, Düzce, Turkiye

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Abstract

Cardiovascular diseases contribute to the deaths of millions of individuals each year. Among these diseases, coronary artery disease stands out as a condition that requires urgent treatment and can lead to sudden death. Coronary angiography remains the gold standard for the diagnosis and treatment of coronary artery disease, benefiting from advancements in science and technology. In recent years, there has been a growing emphasis on the use of the radial artery for coronary artery disease diagnosis and treatment within the field of coronary angiography. Compared to femoral and brachial arteries, the radial artery offers several advantages in accessing the coronary vessels. Nurses, as integral members of the multidisciplinary healthcare system, play a crucial role in all stages of the process, from pre-transradial angiography to the procedure itself and post-procedure care, contributing to the quality of patient care and the healthcare system. This review aims to elucidate the roles of nurses in the increasingly utilized transradial angiography method worldwide and provide an overview of perioperative nursing care based on the latest literature.
Keywords: Nursing, Nursing Care, Angiography, Transradial Angiography

Transradial Yöntem ile Koroner Anjiyografi Olan Hastaların Perioperatif Hemşirelik Bakımı

Özet

Kardiyovasküler hastalıklar her yıl milyonlarca insanın ölümüne neden olmaktadır. Koroner arter hastalığı kardiyovasküler hastalıklar içerisinde acil tedavi edilmesi gereken ve ani ölüme sebep olan hastalıklar arasındadır. Koroner anjiyografi, koroner arter hastalığının tanı ve tedavisinde altın standart olarak yerini korumaktadır. Bilim ve teknolojinin sağladığı gelişmelerle beraber koroner anjiyografide, radial arter aracılığı ile koroner damar hastalığının tanı ve tedavisi son yıllarda önem kazanmaktadır. Femoral ve brakial arterlere nispeten radial arter aracılığı ile koroner damarlara erişilmesinin daha avantajlı olduğu bilinmektedir. Multidisipliner sağlık sisteminin ayrılmaz bir parçası olan hemşireler, transradial anjiyografi öncesi, sırası ve sonrasında sürecin tüm aşamasında bulunarak hasta bakım kalitesine ve sağlık sistemine fayda sağlamaktadır. Bu derlemede, son yıllarda tüm dünyada kullanımı yaygınlaşan transradial anjiyografi yönteminde hemşirenin rolleri ve perioperatif hemşirelik bakımının son literatür ışığında açıklanması amaçlanmaktadır.
Anahtar Kelimeler: Hemşirelik, Hemşirelik Bakımı, Anjiyografi, Transradial Anjiyografi

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Address for correspondence/reprints: **Telephone number:** +90 (532) 561 36 81

İsmail Aşatir **E-mail:** ismailasatir@duzce.edu.tr

INTRODUCTION

According to the data from the World Health Organization (WHO), approximately 17.9 million people lose their lives each year due to cardiovascular diseases (1,2). Among these diseases are coronary artery disease, cardiomyopathy, heart failure, hypertensive heart disease, heart valve diseases, cardiac arrhythmias, and peripheral vascular diseases (3). While advanced age, gender, and family history are considered non-modifiable risk factors for cardiovascular diseases in the literature, smoking, hypertension, hyperlipidemia, diabetes mellitus, obesity, stress, and sedentary lifestyle are categorized as modifiable risk factors (4,5). Controlling risk factors, early screenings, and implementing medical and surgical treatments contribute to reducing mortality rates from cardiovascular diseases. Among them, coronary artery disease significantly impacts mortality and morbidity, frequently leading to death. Coronary artery disease occurs as a result of changes in vascular lumen due to atherosclerosis, leading to stenosis and blockages in the lumen (3,5,6). Patient history, physical examination, electrocardiography, exercise stress test, and blood tests (CK, CK-MB, and Troponin) are important diagnostic methods for this disease. However, coronary angiography (CAG) is considered the gold standard for the diagnosis and treatment of this disease (7). CAG has been used for many years in the visualization and treatment of coronary arteries. CAG involves creating an access route to the target organ through a catheter from peripheral or main arteries to visualize the heart's vessels and, if necessary, restore blood flow in the coronary arteries using coronary stents (8). The choice of artery for catheter placement varies based on the patient's clinical condition and the doctor's clinical experience, but during CAG, femoral, radial, brachial, and axillary arteries are used to access the heart vessels. The femoral artery has been the most commonly used route for CAG for many years. However, the radial artery approach has gained a place in the literature as an alternative method in recent years due to the advantages it offers over the femoral artery. When examining several randomised controlled studies, the radial artery approach provides significant advantages over the femoral artery in terms of vascular complications such as bleeding risk, pseudoaneurysm, vasculitis, hematoma, vascular thrombosis, and emboli. It also offers important benefits such as increased patient satisfaction, reduced costs, and decreased mortality rate (9–14). Despite all these advantages, the transradial CAG procedure has some disadvantages, including prolonged exposure of healthcare professionals and the patient to radiation, requiring a longer learning curve, limited availability of suitable catheter sizes, the risk of hematoma, arteriovenous fistula, radial artery spasm, radial artery perforation, and

a high incidence of radial artery occlusion after the procedure (11,15,16). The use of the radial artery as a graft in coronary artery bypass surgery becomes challenging when transradial CAG is applied. Additionally, although rare, complications such as infection, mycotic aneurysms, pseudoaneurysm, limb ischemia, nerve damage, and regional pain can occur after transradial CAG (17,18).

Nurses play crucial roles in preventing, minimizing, monitoring, and providing patient care regarding all the complications mentioned above during transradial CAG, both before, during, and after the procedure. This review aims to elucidate the roles of nurses at every stage of transradial CAG, a procedure that is becoming increasingly popular worldwide and requires more specialized care compared to femoral artery angiography, and to provide perioperative care to patients undergoing transradial CAG based on the latest literature.

Responsibilities of Nurses Prior to Transradial Angiography Dataset

Nurses play critical and professional roles in the holistic healthcare system. Just like in other fields, nurses carry out healthcare services in a professional manner with modern nursing roles, such as caregivers, educators, researchers, managers, decision-makers, advocates, rehabilitators, comforters, healers, and consultants, both before, during, and after transradial CAG (19). Nursing care in transradial CAG should be based on evidence-based nursing care (20). Nurses should have a checklist to ensure quality care and standardization. This checklist should include evaluating procedural indications, the patient's medical history, physical examination, informed consent form, analgesia status, as well as information on complete blood count measurements, serum electrolyte levels, renal function status, and anticoagulation status. In the clinical setting, patient monitoring, oxygen saturation monitoring, and oxygen support should be provided. The patient's 12-lead electrocardiography (ECG) should be obtained before the CAG procedure, and their allergy status, previous heparin treatment, and radial artery evaluation should also be included in the checklist (21). The time between the patient's arrival at the hospital and achieving vascular clearance in the angiography laboratory for those with acute myocardial infarction symptoms (Door to balloon time) improves the procedure's success and reduces the risk of possible complications after the procedure. Moreover, it reduces the patient's length of hospitalization and extends their lifespan (22,23). Adequate preparation should be made for the patient before the procedure, and their safe transfer to the cardiac catheter laboratory should be ensured. Nurses should coordinate and collaborate with the entire team to provide the best care as

efficiently as possible during all these preparations and procedures mentioned above.

The nursing education process begins with the admission of the patient to the hospital and becomes an integral part of the treatment. During this education process, discharge education should also be initiated. Prior to the procedure, the patient and their family should be informed, and psychological and emotional support should be provided. Additionally, information about the procedure, physical activity limitations, general physical condition, management of coexisting diseases, regulation of post-procedural medication, potential complications, and the next follow-up appointment should be communicated to the patient (21,24). Nurses should conduct patient education before interventional CAG using various educational materials to reduce patient stress and enhance patient satisfaction. Nurses are encouraged to utilize different educational models for patient education. The use of educational methods that appeal to multiple sensory modalities is recommended for lasting behavior change (25). Studies in the literature have shown that video-based education provided to patients prior to transradial CAG reduces their stress levels (26,27). Minimizing medical errors and ensuring optimal post-treatment quality of life for patients requires educating both the patients and their families, which holds significant importance (28). Therefore, meeting the educational needs of patients and their families is believed to enhance the quality of patient care (29).

The Role and Importance of Nurses During Transradial Angiography

Nurses are an integral part of the team in the cardiac catheter laboratory and play a crucial role during transradial angiography. Throughout the procedure, they provide support to the team and ensure the assessment, monitoring, and delivery of optimal healthcare during significant complications such as myocardial ischemia, vascular access site complications, and contrast-induced nephropathy. Additionally, nurses should support the patient's comfort within the angiography unit, ensuring proper positioning and preserving patient privacy. Nurses are responsible for various tasks during the procedure, including the initial reception of the patient in the angiography unit, patient identification, monitoring of vital signs, consciousness assessment, and continuous monitoring of these parameters throughout the procedure (21). Before commencing the procedure, nurses must verify the patency of the vascular access, prepare and administer medications, ensure the availability of laboratory supplies, and carry out necessary checks. During the procedure, it is essential to be cautious not to obstruct the procedure area and the operator's workspace with equipment, such as equipment used for patient monitoring and peripheral venous catheters or sets. In case of the need for a

switch to femoral access due to unforeseen circumstances (persistent arterial spasm, vascular injury, severe pain, or tortuous vessel structure), nurses should have the necessary materials and catheters ready.

Before transradial angiography, local anesthetic agents are used to numb the procedure area. Subsequently, the wrist is placed in dorsiflexion position, and the arterial puncture is performed by the operator. This position facilitates arterial puncture and aids the advancement of guide wires and catheters. To prevent vessel injury and radial artery occlusion (RAO), a hydrophilic catheter with a size of 6F or smaller is selected for puncture and placed into the artery. Administration of verapamil/nitroglycerin to prevent arterial spasm and heparin to prevent thrombosis during the procedure is recommended (14,30). In emergency situations, nurses play a critical role in interventions that may require surgical vascular repair or involve massive bleeding. They should check the patient's blood group and prepare for transfusions if necessary. Furthermore, nurses should monitor for potential allergic reactions to contrast media and local anesthetic agents. During the procedure, blood clots dislodged from the heart or blood vessels can cause stroke and embolism in other vital organs, therefore, nurses should periodically evaluate the patient's consciousness and respiration (31). Nurses working in the angiography unit should be competent in managing hemodynamic instability, arrhythmias, resuscitation, and the use of medical devices, as well as in providing respiratory support and utilizing mechanical ventilators until the anesthesia team arrives (32).

Continuous verbal communication with the patient during the procedure and informing the patient and their family about the procedure are essential. After the procedure, nurses should assess the patient's blood pressure, pulse, bleeding, radial artery closure device, urinary output, pain, and consciousness. Patients should be transferred to the clinic in a monitored state with necessary equipment, such as defibrillators readily available for emergency situations. Information regarding the duration of the procedure, treatment administered to the patient, medications used during the procedure, the patient's vital signs during the procedure, and input-output monitoring should be communicated to the clinic nurse during the handover.

Post-procedural Nursing Care and Patient Follow-up after Transradial Coronary Angiography

One of the most important complications that can occur in the early and late post-procedural periods of patients undergoing transradial CAG is Radial Artery Occlusion (RAO). RAO can develop depending on the amount of anticoagulant used during the procedure, the size

of the sheath catheter, the duration of catheter placement in the artery, multiple catheter insertions, vascular injury, vascular structure, and the time and intensity of pressure applied to the puncture site after the procedure (33). Therefore, it is recommended to check radial artery flow post-procedure and before discharge from the clinic (34). Nurses should be knowledgeable about post-procedural anticoagulant use and stay in communication with the physician to monitor the patient's treatment. Checks on the closure device used to stop bleeding at the puncture site should be conducted, and it is recommended to elevate and keep the arm used for the procedure visibly elevated at 30 degrees with slight flexion for at least 6 hours after the procedure (35). Any circulatory disturbances in the extremity used for the procedure, such as color, temperature, tenderness, numbness, tingling, capillary refill time, and pain, should be carefully observed and assessed. Moreover, the puncture site should be monitored for bleeding, hematoma, and infection. The frequency of observation should be determined according to the patient's condition, and it should be understood that complications are not limited to just a few hours after the procedure. The patient should be monitored, and vital signs (pulse, rhythm, pain, blood pressure, and temperature) should be checked every 15 minutes in the first 2 hours, and the obtained data should be recorded (21,24,36). After transradial CAG, patients can mobilize immediately. If sedation was administered during the procedure, patients can mobilize once the effects of sedation have worn off (21). The patient should be informed about the closure device, and both the patient and their family should be educated about how to communicate with the nurse in case of a warm sensation or possible bleeding at the procedure site. The nurse should check the puncture site, monitor the pulse, remove the radial artery closure device, and then perform follow-up and dressing of the site.

Immediately after the procedure, the patient's 12-lead ECG should be taken and compared with the pre-procedural ECG. The patient should be observed for any arrhythmias. Acute occlusion of the vessel (acute closure) can occur during the procedure and within the first 24 hours after the procedure. Monitoring the patient's pain is of great importance after the procedure. If the patient complains of unstable chest pain, the 12-lead ECG should be repeated, compared with the baseline ECG, and the doctor should be informed. Oxygen, nitroglycerin, and analgesic treatments should be initiated with the doctor's request if deemed necessary (8,36).

The patient should be encouraged to drink plenty of fluids after the procedure to facilitate the elimination of the contrast medium from the body. Signs of contrast-induced nephropathy, such as urea, electrolytes, glomerular filtration rate, and urine output, should be monitored and

compared with pre-procedural values. Patients should be monitored for urinary retention for 6 hours after the procedure, and those experiencing difficulty or discomfort in urination should undergo urinary catheterization for continuous intake-output monitoring.

After the CAG, patients should be informed about their condition and risk factors, and discharge education should be provided comprehensively in cognitive, sensory, and behavioral aspects (14,37,38). In discharge education, to minimize and prevent the risk of radial artery complications, patients should avoid driving for the first 24 hours, refrain from heavy activities involving lifting, pushing, or pulling objects weighing more than 2.2 kilograms with the arm that underwent the procedure for at least 3 days, and avoid deep flexion-extension movements involving the operated wrist, including activities such as lifting chairs and beds, for 48 hours. Showering is allowed, but activities such as dishwashing and swimming should be avoided for 3-4 days. Patients working in office and desk jobs can return to work 3 days after transradial CAG, while those involved in heavy labor are recommended to rest for 2 weeks (30). Despite the successful treatment achieved by opening the narrowed or fully occluded vessel during the CAG, the patient should adopt a lifestyle that includes proper nutrition, exercise, quitting smoking, reducing anxiety, fear, and stress factors, improving sleep quality, medication management, and controlling high blood pressure and cholesterol levels to prevent re-narrowing of the vessel (14,39).

CONCLUSION

The procedure of accessing coronary arteries through the radial artery is increasing worldwide with each passing day. Alongside the advancements in science and technology, the nursing profession is also being influenced and evolving. One of the crucial steps to improve the quality of nursing care is to standardize care, keep up with the literature, and provide optimal care to patients based on scientific knowledge. Nurses, as essential members of the multidisciplinary healthcare system, have independent and collaborative roles with other healthcare professionals. Through these roles, nurses play a significant part in all stages of the process before, during, and after transradial CAG, contributing to the quality of patient care and the healthcare system. It is believed that preventing potential complications during transradial CAG, reducing healthcare costs, shortening hospital stays, and increasing patient satisfaction can be achieved through quality nursing care.

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REFERENCES

1. World Health Organization, "Cardiovasculer dieseases" erişim: 12 Marc 2023, https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1
2. Naghavi M, Wang H, Lozano R, Davis A, Liang X, Zhou M, et al. Global, Regional, and National Age-Sex Specific All-Cause and Cause-Specific Mortality For 240 Causes of Death, 1990-2013: A Systematic Analysis for the Global Burden of Disease Study 2013. The Lancet. 2015;385(9963):117–71. http://dx.doi.org/10.1016/S0140-6736(14)61682-2
3. Gülhan Güner S, Nural N. Koroner Arter Hastalığı: Etiyoloji ve Patogenez. Nural N, editör. Kalp Damar Hastalıkları Hemşireliği. 1. Baskı. Ankara: Türkiye Klinikleri; 2020. p.1-6.
4. Duggan JP, Peters AS, Trachiotis GD, Antevil JL. Epidemiology of Coronary Artery Disease. Surgical Clinics of North America. 2022;102(3):499–516. DOI: 10.1016/J.SUC.2022.01.007
5. Malakar AK, Choudhury D, Halder B, Paul P, Uddin A, Chakraborty S. A Review on Coronary Artery Disease, Its Risk Factors, And Therapeutics. Journal of Cellular Physiology. Wiley-Liss Inc.; 2019. p. 16812–23. DOI: 10.1002/jcp.28350
6. Mendis S, Puska P, Norrving B, World Health Organization., World Heart Federation., World Stroke Organization. Global Atlas on Cardiovascular Disease Prevention and Control. World Health Organization in collaboration with the World Heart Federation and the World Stroke Organization; 2011. p.155. ISBN: 9789241564373
7. Grech ED. Pathophysiology and Investigation of Coronary Artery Disease. ABC of Interventional Cardiology 2003;326:1027–30.
8. Khan SQ, Ludman PF. Percutaneous Coronary Intervention. Revascularization. 2022;50(7):437–44.
9. Jin C, Li W, Qiao SB, Yang JG, Wang Y, He PY, et al. Costs and Benefits Associated with Transradial Versus Transfemoral Percutaneous Coronary Intervention in China. J Am Heart Assoc. 2016;5(4). DOI: 10.1161/JAHA.115.002684
10. Xu Y, Chen J, Qiao S, Wu Y, Yan H, Dou K, et al. Intervention in Chinese Women Based on A Propensity Score Analysis. Korean Circ J. 2018;48(8):719–27. https://doi.org/10.4070/kcj.2018.0040

11. Lee CW, Cho SC. The Transradial Approach for Coronary Intervention: More Comfort, Better Outcome. Korean Circulation Journal. Korean Society of Cardiology; 2018. p. 728–30. https://doi.org/10.4070/kcj.2018.0118
12. Kolkailah AA, Alreshq RS, Muhammed AM, Zahran ME, Anas El-Wegoud M, Nabhan AF. Transradial Versus Transfemoral Approach for Diagnostic Coronary Angiography And Percutaneous Coronary Intervention in People With Coronary Artery Disease. Cochrane Database of Systematic Reviews 2018. DOI: 10.1002/14651858.CD012318.pub2.
13. Jolly SS, Yusuf S, Cairns J, Niemelä K, Xavier D, Widimsky P, et al. Radial Versus Femoral Access for Coronary Angiography and Intervention in Patients with Acute Coronary Syndromes (RIVAL): A Randomised, Parallel Group, Multicentre Trial. The Lancet. 2011;377:1409–20. DOI:10.1016/S01406736(11)60404-2
14. Lawton JS, Tamis-Holland JE, Bangalore S, Bates ER, Beckie TM, Bischoff JM, et al. 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. J Am Coll Cardiol. 2022;79(2):21–129. https://doi.org/10.1016/j.jacc.2021.09.006
15. Jhand A, Atti V, Gwon Y, Dhawan R, Turagam MK, Mamas MA, et al. Meta-Analysis of Transradial s Transfemoral Access for Percutaneous Coronary Intervention in Patients with ST Elevation Myocardial Infarction. American Journal of Cardiology. 2021;141:23–30.
16. Tatli E, Buturak A, Cakar A, Vatan BM, Degirmencioglu A, Agac TM, et al. Unusual Vascular Complications Associated With Transradial Coronary Procedures among 10,324 Patients: Case Based Experience and Treatment Options. J Interv Cardiol. 2015;28(3):305–12. DOI: 10.1111/joic.12206
17. Sandoval Y, Bell MR, Gulati R. Transradial Artery Access Complications. Circulation: Cardiovascular Interventions. Lippincott Williams and Wilkins; 2019;12:1-14 DOI:10.1161/CIRCINTERVENTIONS.119.007386
18. Bhat T, Bhat H, Teli S, Rajiv B, Akhtar M, Gala B. Pseudoaneurysm a Rare Complication of Transradial Cardiac Catheterization: A Case Report. Vascular. 2013;21(5):331–4. DOI:10.1177/1708538113478745
19. Aydemir Gedük E. Hemşirelik Mesleğinin Gelişen Rolleri. Sağlık Bilimleri ve Meslekleri Dergisi. 2018;5 (2):253-258. DOI: 10.17681/hsp.358458
20. Parach A, Sadeghi-Ghahroudi M, Saeid Y, Ebadi A. The Effect of Evidence-Based Care Guidelines on Outcomes After Removal of Arterial Sheath in Patients Undergoing Angioplasty. ARYA Atheroscler.

2018;14(6):237–41. DOI: http://dx.doi.org/10.22122/arya.v14i6.1380

21. Banning AP, Baumbach A, Blackman D, Curzen N, Devadathan S, Fraser D, et al. Percutaneous Coronary Intervention in The UK: Recommendations for Good Practice. Heart. BMJ Publishing Group; 2015. p. 1–13. DOI:10.1136/heartjnl-2015-307821
22. Namdar P, YekeFallah L, Jalalian F, Barikani A, Razaghpoor A. Improving Door-to-Balloon Time for Patients With Acute ST-Elevation Myocardial Infarction: A Controlled Clinical Trial. Current Problems in Cardiology. 2021;46(3):1-18. DOI: https://doi.org/10.1016/j.cpcardiol.2020.100674
23. Wimmer NJ, Cohen DJ, Wasfy JH, Rathore SS, Mauri L, Yeh RW. Delay in Reperfusion With Transradial Percutaneous Coronary İntervention for ST-Elevation Myocardial İnfarction: Might Some Delays Be Acceptable? Am Heart J. 2014;168(1):103–9. DOI:10.1016/j.ahj.2014.02.013.
24. Zhu L, Xu J, Wang Q, Xu F, Chen J. Nursing Care of Transradial Angiography and İntervention in A Tertiary Hospital in Shanghai: A Best Practice Implementation Project. JBI Database System Rev Implement Rep. 2016;14(5):286–94. DOI: 10.11124/JBISRIR-2016-002509
25. Cutilli CC. Excellence in Patient Education: Evidence-Based Education that 'Sticks' and Improves Patient Outcomes. The Nursing clinics of North America. NLM (Medline); 2020. p. 267–82. DOI:https://doi.org/10.1016/j.cnur.2020.02.007
26. Oshvandi K, Movaheditabar E, Naghshtabrizi B, Mohammadi Y, Shamsizadeh M. The Effect of Video-Based Educational Program on Satisfaction and Comfort in Patients Undergoing Transradial Coronary Angiography: A Single-Blinded, Randomized Controlled Trial. Journal of Vascular Nursing. 2021;39(2):27–32. DOI: https://doi.org/10.1016/j.jvn.2021.01.001
27. Habibzadeh H, Milan ZD, Radfar M, Alilu L, Cund A. Effects of Peer-Facilitated, Video-Based and Combined Peer-and-Video Education on Anxiety Among Patients Undergoing Coronary Angiography: Randomised Controlled Trial. Sultan Qaboos Univ Med J. 2018;18(1):61–7.
28. Kim YS, Kim HA, Kim MS, Kim HS, Kwak MJ, Chun J, et al. How to Improve Patient Safety Literacy? Int J Environ Res Public Health. 2020;17(19):1–12. DOI:10.3390/ijerph17197308
29. Walker JA. What Is the Effect of Preoperative Information on Patient Satisfaction? British Journal of Nursing. 2007;16(1):27–32.
30. Schueler A, Black SR, Shay N. Management of Transradial Access for Coronary Angiography. Journal of Cardiovascular

Nursing. 2013;28(5):468–72. DOI: 10.1097/JCN.0b013e3182648351

31. Turk Kardiyoji Derneği. Perkütan Koroner Girişimler www.tkd.org.tr. erişim tarihi: 13 Mayıs 2023.
32. White K, Macfarlane H, Hoffmann B, Sirvas-Brown H, Hines K, Rolley JX, et al. Consensus Statement of Standards for Interventional Cardiovascular Nursing Practice. Heart Lung Circ. 2018;27(5):535–51. DOI: https://doi.org/10.1016/j.hlc.2018.05.001
33. Tehrani DM, Seto AH. Heparin, compression, and radial artery occlusion: Less is more. Catheterization and Cardiovascular Interventions. John Wiley and Sons Inc; 2021. p. 1377–8. DOI:10.1002/ccd.29764
34. Rao S V., Tremmel JA, Gilchrist IC, Shah PB, Gulati R, Shroff AR, et al. Best Practices for Transradial Angiography and Intervention: A Consensus Statement from The Society for Cardiovascular Angiography and Intervention's Transradial Working Group. Catheterization and Cardiovascular Interventions. 2014;83(2):228–36. DOI: 10.1002/ccd.25209
35. Zhang WJ, Yan JC, Wang ZQ. Application of The Interventional Limb Raising Management Strategy (ILRMS) At Radial Vascular Access Sites in Coronary Angiography and Percutaneous Coronary İntervention: A Randomized Trial. Int J Nurs Sci. 2016;3(1):54–7. DOI:http://dx.doi.org/10.1016/j.ijnss.2016.02.005
36. Bowden T. Evidence-Based Care for Patients Undergoing Coronary Angiography. British Journal of Nursing. 2009;18(13).
37. Qu B, Hou Q, Men X, Zhai X, Jiang T, Wang R. Original Article Research and Application of KABP Nursing Model in Cardiac Rehabilitation of Patients with Acute Myocardial Infarction After PCI. Am J Transl Res. 2021;13(4):3022-3033. ISSN:1943-8141
38. Liu X, Zou Y, Huang D, Lu H. Original Article Effect of Evidence-Based Nursing Combined with Exercise Rehabilitation in Patients with Acute Myocardial Infarction After Percutaneous Coronary Intervention. Am J Transl Res. 2022;14(10):7424-7433. ISSN:1943-8141
39. Mishra M, Chavda A, Kumar SN, Menaria K. International Journal of Nursing and Medical Investigation. International Peer Reviewed Journal. 2018;3(2):52–6. ISSN: 2456-4656