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Üç ayda bir yayımlanan süreli yayındır. International scientific journal published quarterly.

Türk Uyku Tıbbı Dergisi, Türk Uyku Tıbbı Derneği'nin resmi yayın organıdır.
Journal of Turkish Sleep Medicine is an official journal of the Turkish Sleep Medicine Society.

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Amaç ve Kapsam

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi), Türk Uyku Tıbbı Derneği'nin süreli resmi yayını olarak 2014 yılında yayın hayatına başlamıştır. Dergi türkçe ve/veya ingilizce olarak; uyku tıbbını, uyku ile ilgili temel klinik ve sosyolojik konuları ve uyku ve biyolojik ritimleri işleyen olgu sunumu, araştırma yazısı ve derleme türündeki yazıları kabul etmektedir. Yazarlardan hem türkçe hem de ingilizce özet istenmektedir. Dergide yayımlanacak olan makaleler bağımsız ve önyargısız çift-kör hakemlik ilkeleri ile değerlendirilmektedir. Yılda dört sayı (Mart, Haziran, Eylül sayıları ile Aralık kongre özel sayısı) online olarak yayınlanmaktadır.

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi), Web of Science-Emerging Sources Citation Index (ESCI), EBSCO Database, British Library, Index Copernicus, CINAHL Complete Database, DOAJ, ProQuest Health & Medical Complete, Gale, J-Gate, IdealOnline, ROOT INDEXING, Türk Medline, Hinari, GOALI, ARDI, OARE ve Türkiye Atıf Dizini ve Türk Tıp Dizini'nde indekslenmektedir.

Açık Erişim Politikası

Dergide "açık erişim politikası" uygulanmaktadır. Açık erişim politikası, Budapest Open Access Initiative (BOAI) http://www.budapestopenaccessinitiative.org kuralları esas alınarak uygulanmaktadır.

Açık erişim; hakem değerlendirmesinden geçmiş bilimsel literatürün; internet aracılığıyla, finansal, yasal veya teknik engeller olmaksızın, serbestçe erişilebilir, okunabilir, indirilebilir, kopyalanabilir, dağıtılabilir, basılabilir, taranabilir, tam metinlere bağlantı verilebilir, dizinlenebilir, yazılıma veri olarak aktarılabilir ve her türlü yasal amaç için kullanılabilir olmasıdır. Çoğaltma ve dağıtım üzerindeki tek kısıtlama yetkisi ve bu alandaki tek telif hakkı; kendi çalışmalarının bütünlüğü üzerinde kontrol sahibi olabilmeleri, gerektiği gibi tanınmalarının ve alıntılanmalarının sağlanabilmesi için yazarlara verilmektedir.

İzinler

Yazarlara Bilgi

"Yazarlara Bilgi" bölümüne derginin http://jtsm.org internet adresinden ulaşılabilir.

Materyal Sorumluluk Reddi

Yayımlanan yazıların bilimsel ve hukuki sorumluluğu yazarlarına aittir. Yazıların içeriğinden ve kaynakların doğruluğundan yazarlar sorumludur. Türk Uyku Tıbbı Derneği (TUTD), editörler kurulu ve yayıncı; dergide yayımlanan eserler için herhangi bir sorumluluk kabul etmez.

Derginin mali giderleri Türk Uyku Tıbbı Derneği (TUTD) tarafından karşılanmaktadır.

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Aims and Scope

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi) started in 2014 as the official periodic publication of Turkish Sleep Medicine Society. The Journal accepts case reports, research articles and review articles on basic clinical and sociological issues, dealing with sleep medicine in turkish and/or english. The authors are required to provide abstracts in both english and turkish. An independent, unbiased double peer-reviewed principle is used to select manuscripts for publication. Four issues are published online in a year (issues in March, June, September and special congress issue in December).

Journal of Turkish Sleep Medicine is indexed in Web of Science-Emerging Sources Citation Index (ESCI), EBSCO Database, CINAHL Complete Database, DOAJ, Gale, Index Copernicus, ProQuest Health & Medical Complete, British Library, J-Gate, ROOT INDEXING, IdealOnline, Turk Medline, Hinari, GOALI, ARDI, OARE and Turkiye Citation Index.

Open Access Policy

This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge.

Open access policy is based on rules of Budapest Open Access Initiative (BOAI) http://www.budapestopenaccessinitiative.org by "open access" to peer-reviewed research literature, we mean its free availability on the public on internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

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Financial expenses of the journal are covered by Turkish Sleep Medicine Society (TSMS).

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Yazarlara Bilgi

Yazar Kılavuzu

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi) için göndereceğiniz eseri hazırlarken; aşağıda yer alan, size yardımcı olacak yönergeleri dikkatle okumanız önerilir. Herhangi bir sorunuz olması durumunda bizimle iletişime geçmekten çekinmeyiniz. Gözden geçirme ve yayımlanma işlemlerini hızlandırmak amacıyla, yönergelere uymayan makaleler gözden geçirme işleminden önce teknik düzeltmelerin yapılması için iletişim kurulacak yazara geri gönderilir.

İçerik

1. Dergi Hakkında

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi), Türk Uyku Tıbbı Derneği'nin süreli resmi yayın organıdır. Yayın dili türkçe ve ingilizce olan; uyku ile ilgili temel klinik ve sosyolojik konuları ve uyku ve biyolojik ritimleri işleyen özgün araştırma makalelerini, olgu sunularını ve derleme türündeki yazıları yayımlar. Dergide yayımlanacak eserlerde yazar olmak için TUTD üyesi olma şartı aranmaz.
Dergide makale başvuru ücreti veya makale işlem ücreti uygulanmamaktadır.
Sıklık: Yılda dört sayı (mart, haziran, eylül sayıları ve aralık kongre özel sayısı)
E-ISSN: 2757-850X
Dergi Adı Kısaltması: J Turk Sleep Med
Yayıncı: Galenos Yayınevi

2. Editör İncelemesi ve Yayıma Kabul

→ Makale İnceleme Süreci: Dergiye gönderilen makale; konusuna göre, yardımcı editörlerden birine gönderilir. Sorumlu yardımcı editör, makaleyi incelemesi için en az iki adet hakemi görevlendirir ve hakemlerin yorumlarına göre makalenin yayımlanmasına, revizyonuna veya reddedilmesine 4-6 hafta içinde karar verir.

→ Yayıma Kabul: Tüm eserler için yayıma kabul kriterleri arasında; sunulan araştırmanın kalitesi, özgünlüğü ve derginin okuyucuları için dikkate değer olması yer alır. Tüm makaleler sırasıyla gözden geçirilir. Editör herhangi bir materyali yayımlamayı reddetme hakkına sahiptir. Makalenin kabul olması veya reddedilmesi ile ilgili son karar Yayın Kurulu'na aittir.

→ Makalenin Yayımlanmasından Önce: Tüm makaleler açık, öz ve anlaşılır bir biçimde yazılmalıdır; böylece makalenin yazıldığı alanda uzman olmayan profesyonel okuyucular tarafından da anlaşılabilir olması sağlanmalıdır. İçeriği bakımından yayımlanabilir olduğuna karar verilen eserler için editörler, makaledeki anlam belirsizliklerini ve tekrarları gidermek ve yazar ile okuyucu arasındaki iletişimi geliştirmek amacıyla makalede değişiklik yapabilir. Eğer kapsamlı değişiklik yapılması gerekiyor ise eserler düzeltme için yazarlara geri gönderilir.

3. Makale Kategorileri

→ Özgün Makale: Temel veya klinik konular üzerine güncel araştırmaların ayrıntılı bir biçimde sunulmasıdır.

• Kelime Sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 6000 kelime.
• Özet: En fazla 250 kelime, yapılandırılmış (giriş, amaç, gereç yöntem, bulgular, sonuç altbaşlıkları ile).
• Şekiller/Tablolar: En fazla 2 adet.
• Referanslar: En fazla 30 adet.

→ Kısa Yazı: Araştırmaları veya klinik uygulamaları önemli ve hızlı bir şekilde etkileyen yeni buluşları içerir. Olgu sunumlarını içermez.

• Kelime sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 1800 kelime.
• Özet: En fazla 100 kelime, yapılandırılmamış (alt başlıklar kullanılmadan).
• Şekiller/Tablolar: En fazla 5 adet.
• Referanslar: En fazla 10 adet.

Kısa yazılar için destekleyici bilgilere izin verilmemektedir.

→ Olgu Sunumu: Ender görülen, ilginç klinik vakalar ve yenilikler yayımlanmak için dikkate alınır. Editör; uygun görmesi durumunda, yazarlardan olgu sunumunu "Editöre Mektup" formatında tekrar yazılmasını isteyebilir.

• Kelime sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 1200 kelime.
• Özet: En fazla 100 kelime, yapılandırılmamış (alt başlıklar kullanılmadan).
• Şekiller/Tablolar: En fazla 2 adet.
• Referanslar: En fazla 10 adet.

→ Editöre Mektup: Herhangi bir tartışma konusunda yazılmış mektuplar (klinik gözlemler, son çıkan sayılarda yayımlanan yazılara yapılan yorumlar vb.) editöre gönderilebilir. Bu yazılar da editör incelemesine tabidir. Mektuplarda isteğe bağlı bir başlık kullanılabilir. Yazarların söz konusu mektuplara verdikleri yanıtlarda mektubun başlığı belirtilmelidir (Örn. Makalenin Başlığı'na yanıt olarak). Bu, okuyucuların tartışmanın hatlarını takip edebilmelerini sağlayacaktır.

• Kelime sınırı: En fazla 500 kelime.
• Özet: Özet içermez.
• Şekiller/Tablolar: En fazla 1 adet.
• Referanslar: En fazla 5 adet.

→ Derleme Makalesi: Anket, güncel araştırmaların değerlendirmeleri ve eleştirel yorumlamaları, derginin kapsadığı alanlardaki veri ve kavramları içeren derleme makalelerini içerir.

• Kelime sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 8000 kelime.
• Özet: En fazla 250 kelime, yapılandırılmamış (alt başlıklar kullanılmadan).
• Şekiller/Tablolar: Resimler, şekiller veya tablolar başka bir kaynaktan alınarak kullanıldıysa telif hakkı sahibinden (genellikle yayınevi) materyali çoğaltmak için izin verildiğini belirten bir mektubun 'üst yazı' ile birlikte gönderilmesi gerekmektedir.

→ Editör Notu: Bir makale veya bilgi güncellemesi hakkında görüş notu editör tarafından davet edilir.

• Kelime sınırı: En fazla 1500 kelime.
• Özet: Özet içermez.
• Referanslar: En fazla 5 adet.

4. Makale Gönderimi

Makaleler aşağıdaki adresten online olarak gönderilmelidir:
https://www.journalagent.com/jtsm
İnternet sitesini kullanırken veya makale ile ilgili herhangi bir sorun olması durumunda teknik yardım için lütfen Galenos Yayınevi veya Editörler Kurulu ile iletişime geçiniz.
Tüm yazışmalar e-posta yoluyla yapılacağından dolayı yazarlar e-posta adreslerini belirtmelidir.
Makale gönderimi yapılırken sorumlu yazarın ORCID ID (Open Researcher and Contributor ID) numarası belirtilmelidir. ORCID ID edinmek için http://orcid.org adresinden ücretsiz olarak kayıt oluşturulabilir.

→ Dergiye gönderilen tüm makaleler bu kurallara uymalıdır. Aksi takdirde makale yazara geri gönderilir ve yayımlanması gecikir.

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Yazarlara Bilgi

• Bir paragraf içinde satırların sonunda "enter" tuşu kullanılmamalıdır.
• Heceleme seçeneği kapalı tutulmalı, sadece anlam için gerekli olan durumlarda "tire" kullanılmalıdır.
• Türkçe veya ingilizce olmayan karakterleri temsil etmek için kullanılan özel karakterler açıkça belirtilmelidir.
• 1 (bir) yerine I (le), 0 (sıfır) yerine O (büyük harf o) veya β (Yunancada beta) yerine ß (Almanca Eszett harfi) kullanılmamalıdır.
• Tablolarda veri göstergelerini ayırmak için boşluk yerine "tab" tuşu kullanılmalıdır. Tablo düzenleme fonksiyonu kullanıldıysa her bir veri göstergesinin tek bir hücrede olduğundan emin olunmalıdır. (örn. Hücreler içinde satırbaşı komutu kullanılmamalıdır)

→ Yazarlar 'üst yazı'yı başlık sayfasından ayrı olarak hazırlamalıdır. Makalenin içeriğinin bilimsel toplantı veya sempozyumda kısa özet şeklinde sunulmanın haricinde; daha önce başka bir yerde yayımlanmamış veya yayımlanmak üzere gönderilmemiş olduğu bu yazıda beyan edilmelidir. Üst yazıda ayrıca tüm yazarların makalenin içeriği hakkında fikir birliği içinde olduklarının belirtilmesi gerekmektedir. Tüm yazarların makale gönderiminden önce Makale Merkezi'ne kaydedilmesi gerekmektedir.

Yazarlar ayrıca araştırma projesinin bir "Etik Komite" tarafından onaylandığını, onay numarası ile birlikte belirtmelidir (bkz. Etik Konular). Bu bilgi, araştırmanın "Gereç ve Yöntem" bölümünde belirtilmelidir. İnsan deneylerinde yazarlar, 1964 yılı Helsinki Bildirgesi (2013 yılı Edinburg'da revize edilmiş hali ile) hükümlerine uymalıdır ve çalışmanın katılımcılarının bilgilendirilmiş olur verdiklerine dair bir ifade eklemelidir. Hasta kimliğinin gizli kalması sağlanmalıdır. Klinik araştırmalarda yazarlar çalışma kaydının adını ve kayıt numarasını üstyazıda bildirmelidir. Kaydedilmemiş bir klinik deneyde neden kayıt yapılmadığı açıklanmalıdır.

5. Makalenin Yapısı

Makalenin uzunluğu "Makale Kategorileri" bölümündeki şartlara uymalıdır. Belirtilen yönergelere uymayan makaleler, incelemeye başlanmadan önce teknik düzeltmelerin yapılması için iletişim kurulacak yazara geri iletilecek ve makale yayım için gönderilmemiş sayılacaktır.

Makaleler belirtilen sırayla sunulmalıdır: Başlık sayfası, özet ve anahtar kelimeler, metin, teşekkür ve beyanlar, referanslar, resim ve şekiller, tablolar, denklemler. Metine dipnot verilmemelidir, bu tür notlar metinde parantez içinde belirtilmelidir.

→ Başlık Sayfası: Şunları içermelidir;
• Makalenin kategorisi
• Makalenin başlığı
• Makalenin kısa başlığı
• Yazarların tam adları ve kurumları
• Çalışmanın yapıldığı kurumun adresi
• İletişim kurulacak yazara ait tam posta ve e-posta adresleri, faks ve telefon numaraları
• Kelime sayısı

Başlık 120 karakterden az olmalıdır. Başlıkta REM, DNA gibi yaygın kullanılan kısaltmalar dışında kısaltma kullanılmamalıdır. Boşluklar dahil 40 karakteri aşmayacak bir kısa başlık da belirtilmelidir.

→ Özet ve Anahtar Kelimeler: "Makale Kategorileri" bölümündeki koşullara uymalıdır. Özette yaygın kullanılan kısaltmalardan başka kısaltma veya referans yer almamalıdır. Anahtar kelimeler özet bölümünün altında yer almalı ve 3-7 adet olmalıdır.

→ Metin: Yazarlar makalenin bölümlerini belirtilen sıra ile oluşturmalıdır: Giriş, Gereç ve Yöntemler, Bulgular, Sonuç. Lütfen bu koşulların makale tipine göre değişiklik gösterdiğini unutmayınız ve "Makale Kategorileri" bölümünü tekrar gözden geçiriniz.

→Teşekkür ve Beyanlar: Yazarlar çıkar çatışması yaratabilecek herhangi bir finansal destek veya ilişkiyi beyan etmelidir. Finansal bağış veya diğer fon yardımlarının kaynağını bildirmelidir. Yazarlar finansal beyanda bulunmak ve olası çıkar ilişkilerini açıklamak için sunulan seçenekleri rehber olarak kullanabilir: İstihdam/liderlik konumu/danışmanlık rolü, hisse sahibi, patent telifleri/lisans ücretleri, honoraryum (örn. ders ücretleri), promosyon malzemeleri ücretleri (örn. makale ücretleri), araştırma fonu veya diğer (örn. araştırma ile ilgili olmayan gezi, seyahat veya hediyeler).

→ Referanslar: Vancouver sistemi kullanılmalıdır: http://barrington.cranfield.ac.uk/help/vancouver-system-for-citing-references. Metin içinde referanslara üst simge normal rakamlar kullanılarak geçiş sırasına göre atıfta bulunulmalıdır. Eğer sadece tablo veya şekil başlıklarında atıfta bulunuluyorsa tablo veya şeklin metinde ilk geçtiği yere göre numaralandırılmalıdır. Referans listesinde referanslar metindeki geçiş sırasına göre numaralandırılmalı ve listelenmedir. Referans listesinde tüm yazar adları yer almalıdır. Yayımlanmamış veri ve kişisel iletişimler listede yer almamalıdır, bunlara sadece metin içinde atıfta bulunulmalıdır (Örn. Smith A, 2000, yayınlanmamış veri).

1) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Apnea Syndrome in Acromegaly Before and After Treatment. JTSM 2014;1:22-7.
2) Ernstoff M. Urologic Cancer. Black-well Science, Boston,1997.
3) Gilchrist RK. Further commentary: Continent stroma. In: King LR, Stone AR, Webster GD (eds). Bladder Reconstruction and Continent Urinary Diversion. Year Book Medical, Chicago, 1987;204-5.

DOI kullanan standart dergi makaleleri; cilt, sayı veya sayfa sayısı almadan önce online olarak yayınlanan makaleler (DOI hakkında daha fazla bilgi için: http://www.doi.org/faq.html):

4) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Apnea Syndrome in Acromegaly Before and After Treatment. JTSM İnternet ağı üzerinde yayınlandığı tarih 30 Mart 2014; doi: 10.1111/j.1479-8425.2008.00379.x

→ Resim ve Şekiller: Başlıkları resim ve şekilden ayrı olarak belirtilmelidir. El çizimleri ve fotoğraflar dahil tüm çizimler resim veya şekil olarak sınıflandırılır. Resim ve şekillere metinde sırayla atıfta bulunulmalıdır. Her bir resim-şekil ayrı bir dosya olarak hazırlanmalıdır ve resim-şekil numarası dosya adında yer almalıdır. Makale inceleme işlemi sırasında aktarmayı kolaylaştırmak için .jpg veya .bmp olarak kaydedilmiş düşük çözünürlükteki resim-şekillerin gönderilmesi uygundur. Makalenin kabulünden sonra yayın için yazarlardan resim-şekillerin daha yüksek çözünürlüklü halleri talep edilebilir.
• Boyut: Resim-şekil boyutları tek sütuna sığmalı (82 mm), orta boyutta olmalı (118 mm) veya tam metin boyutuna sığmalıdır (173 mm).
• Çözünürlük: Resim-şekiller yüksek çözünürlüklü .eps veya .tif dosyaları olarak hazırlanmalıdır.
• Koşullar: Yarım ton resim-şekiller 300 dpi (dots per inch), renkli resim-şekiller 300 dpi ve RGB (kırmız, yeşil, mavi) modu yerine CMYK (cam göbeği, mor pembe, sarı, siyah) modunda ayarlanmış olarak kaydedilmiş şekilde, yazı içeren resim-şekiller 400 dpi, çizim halindeki şekiller 1000 dpi. şeklinde düzenlenmelidir.
• Çizim şekilleri: Profesyonel olarak veya bir bilgisayar grafik paketi ile çizilmiş keskin siyah veya beyaz grafikler veya diyagramlar şeklinde olmalıdır.
• Resim veya şekillerdeki metin boyutları: Yazı karakteri eklenmelidir. Derginin yazı boyutundan veya 8 puntodan daha büyük olmamalıdır. (Resim-şekillerin indirgenmesinin ardından yazı hala okunabiliyor olmalıdır.)
• Çizgi genişliği: 0,5 ve 1 nokta arasında olmalıdır. (Geniş veya kalın çizgilerden kaçınılmalıdır.)

Çizimlerin hazırlanması ile ilgili daha fazla yardım için link: http://authorservices.wiley.com/bauthor/author.asp

→ Tablolar: Her bir tablo ayrı bir dosya olarak hazırlanmalıdır. Dosya adı tablo numarasını içermelidir. Tablolar; ayrı bir sayfada altyazıları, açıklamaları ve başlıkları ile birlikte belirtilmelidir. Düzenlenebilir metin olarak verilmelidir. Metin içinde normal rakamlar ile numaralandırılmalıdır. PDF halinde sunulmamalıdır. Dikey çizgiler kullanılmamalıdır. Tüm kısaltmalar açıklanmalıdır. Semboller sırasıyla şu şekilde kullanılmalıdır: †, ‡, §, ¶; ve *, **, *** sembolleri p değerleri için kullanılmalıdır. SS ve SEM gibi istatistiksel kısaltmalar açıklama olmadan kullanılabilir.

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Yazarlara Bilgi

→ Denklemler: Normal rakamlarla sıralı olarak numaralandırılmalıdır. Bunlar, parantez içinde sağ tarafta verilmelidir. Tüm değişkenler italik olarak belirtilmelidir. Örn.

dx/dt = c (x – x2/3 + y + z) (1)

DY/DT = –(X + BY – A)/C (2)

Ek Bilgi: Bulgular ile yakından ilgili olan destekleyici bilgiler yer alabilir.

6. Makalenin Biçimi

→ İmla: Kimyasal adları gibi yabancı isim ve terimler orijinal dilinde yazılmalıdır.

→ Birimler: Tüm ölçümler SI birimleri veya SI'dan türetilen birimler ile verilmelidir. SI birimleri hakkında daha fazla bilgi için Bureau International des Poids et Mesures (BIPM) internet sayfasını (http://www.bipm.fr) ziyaret ediniz.

→ Kısaltmalar: Kısaltmalar az miktarda kullanılmalıdır. Öncelikle ifadenin açık hali ardından parantez içinde kısaltması belirtilmelidir. DNA gibi yaygın kullanılan kısaltmalar açıklaması olmadan kullanılabilir.

→ Marka İsimleri: İlaçlar ve kimyasallar marka isimleriyle verilmemelidir. Çalışmada tescilli ilaçlar veya kimyasallar kullanıldı ise jenerik isimleriyle belirtilerek parantez içinde marka adı ve tedarikçi firmanın adı ve yeri belirtilmelidir.

Yayın Politikası ve Makale Yazım Kuralları, International Committee of Medical Journal Editors (ICMJE) tarafından sunulan "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (ICMJE Recommendations)" (http://www.icmje.org) temel alınarak hazırlanmıştır.

Araştırma makalelerinin hazırlığı, sistematik derlemeleri, meta-analizleri ve olgu sunumları ise uluslararası kılavuzlara uygun olmalıdır:

• Randomize çalışmalar için; CONSORT (Moher D, Schultz KF, Altman D, for the CONSORT Group. The CONSORT statement revised recommendations for improving the quality of reports of parallel group randomized trials. JAMA 2001; 285:1987-91) (http://www.consort-statement.org).

• Sistematik derleme ve meta-analizlerin raporlamaları için; PRISMA (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 2009; 6(7): e1000097) (http://www.prisma-statement.org).

• Tanısal değerli çalışmalar için; STARD (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA, Glasziou PP, Irwig LM, et al, for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4) (http://www.stard-statement.org).

• Gözlemsel çalışmalar için; STROBE (http://www.strobe-statement.org).

• Meta-analizleri ve gözlemsel çalışmaların sistematik derlemeleri için; MOOSE (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting "Meta-analysis of observational Studies in Epidemiology" (MOOSE) group. JAMA 2000; 283: 2008-12).

• CARE kılavuzları, olgu sunumlarının doğruluğunu, şeffaflığını ve yararlılığını artırmak için tasarlanmıştır. (Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; the CARE Group. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development.) (http://www.care-statement.org)

7. Düzeltmeler

Sayfa dizgi düzeltmelerini içeren PDF (Portable Document Format) dosyasının indirilebileceği linke ait adresin bildirimi, gerekli formlar ve daha fazla açıklamalar iletişim kurulacak yazara e-posta yoluyla gönderilecektir. PDF düzeltmesinin amacı makalenin düzeninin, tabloların ve şekillerin son kontrolünü sağlamaktır. PDF düzeltmesi aşamasında hataların çok gerekli düzeltmeleri dışındaki değişikliklere izin verilmemektedir.

8. Etik Konular

Yazarlar; araştırma projesini, çalışmanın yapıldığı kuruma ait etik komite tarafından onaylandığını belirtmelidir. Yazılı onam gerekli değildir ancak editör bu tür bir belgeyi talep etme hakkını saklı tutar. Hayvan denekleri içeren herhangi bir deney, kurumsal bir etik komite tarafından onaylanmalı ve bu da metin içinde bildirilmelidir.

9. Klinik Araştırmaların Kaydedilmesi

Tüm klinik araştırmalar kayıt edilmelidir. Yazarlar kayıt detaylarını makalede belirtmelidir. Bir klinik araştırma, medikal girişimler ve bunların sağlık açısından sonuçları arasındaki sebep sonuç ilişkilerini araştırmak için prospektif olarak insan deneklerini girişime veya karşılaştırmalı gruplara dahil eden herhangi bir araştırma projesi olarak tanımlanır.

10. Telif Hakkı

Tüm yazarlar 'Özel Lisans Formu'ndaki hususları kabul etmeli ve bu formu imzalamalıdır veya onların adlarına iletişim kurulacak yazarın imzalamasını kabul etmelidir. Bu formu imzalayarak, yazarların telif hakkına tabi veya daha önceden yayımlanmış herhangi bir materyali kullanmak için izin aldıkları kabul edilir. Form buradan indirilebilir.

11. Makale Kabulü

• Kabulden önce yazarlar, makalelerinin değerlendirme sürecinin hangi aşamasında olduğunu https://www.journalagent.com/jtsm adresinden takip edebilirler.

• Kabulden sonra yazarlar, Galenos Yayınevi'nden makalelerinin işleyiş süreci hakkında bilgi edinebilirler. Bu, yazarlara makalelerinin kabul olduktan sonra internette yayınlanmasına kadar olan sürecini takip etmelerini sağlar. Yazarlara işlemlerin kilit noktalarında otomatik olarak e-posta gönderilir; böylece işleyişi kontrol etmek için editörle iletişime geçmelerine gerek kalmaz. İnternet ağı üzerinde işleyiş takibi hakkında daha ayrıntılı bilgi, sıkça sorulan sorular ve makale hazırlamayla ilgili ipuçları dahil bol miktarda kaynak, makale gönderimi ve daha fazlası için http://www.tutd.org.tr adresini ziyaret ediniz.

12. Erken Çevrimiçi Makaleler

Bir "Erken Çevrimiçi Makale" makale, tam metin bir makalenin sayıda yayınlanmadan önce internet ağında elektronik olarak yayınlanmış halidir. Bu sayede makale hazır olur olmaz görünebilir durumdadır. Erken Çevrimiçi Makaleye bir DOI (Digital Object Identifier) numarası verilir; böylece bir sayıda yer almadan önce bu makaleye atıfta bulunulabilir ve makale takip edilebilir. Yayınlanmadan önce DOI geçerli olarak kalır ve makaleye atıfta bulunmak ve erişmek için kullanılmaya devam edilebilir. DOI hakkında daha fazla bilgi için http://www.doi.org/faq.html adresini ziyaret ediniz.

13. Yazı İşleri

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Instructions to Authors

Author Guide

Please take your time to consult the following instructions to help you prepare your manuscript in the Journal of Turkish Sleep Medicine, and feel free to contact us with any questions. To ensure fast peer review and publication, manuscripts that do not follow the instructions are returned to the corresponding author for technical revision before undergoing peer review.

Contents

1. About The Journal

Scope Journal of Turkish Sleep Medicine is the official turkish and english language journal of the Turkish Sleep Medicine Society (TSMS), and publishes original research articles, articles, case reports and review articles on basic clinical and sociological issues, dealing with Journal of sleep medicine. Both members and non-members of the TSMS are welcome to submit papers to the journal.

The journal does not charge any article submission or processing charges.

Frequency: Four issues per year (issues in march, june, september and congress special issue in december)
E-ISSN: 2757-850X
Journal abbreviation: J Turk Sleep Med
Publisher: Galenos Yayınevi

2. Editorial Review And Acceptance

→ Review process: A submitted paper is assigned to one of the associate editors according to the topics of paper. The responsible associate editor appoints more than two reviewers for evaluating the paper and decides whether the paper should be accepted for publication, revised or rejected, according to the reviewers' comments within four to six weeks.

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• Abstract: 250 words maximum, structured (introduction/aim, material methods, results, discussion).

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Supporting information is not allowed for short papers.

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• References: Maximum 10.

→ Letters to the Editor: Letters may be submitted to the Editor on any topic of discussion: clinical observations, as well as comments on papers published in recent issues. Letters to the Editor are subject to peer review. Letters can use an arbitrary title.

The responses to the letter from authors must cite the title of the letter: e.g. Response to [title of letter]. This ensures that readers can track the line of discussion.

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The ORCID ID (Open Researcher and Contributor ID) number of the correspondence author should be provided while sending the manuscript. A free registration can be done at http://orcid.org.

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→ References: The Vancouver system of referencing should be used:
http:// barrington.cranfield.ac.uk/help/ vancouver-system-for-citing-references. In the text, ref-erences should be cited using superscript Arabic numerals in the order in which they appear. If cited only in tables or figure legends, number them according to the first identification of the table or figure in the text. In the reference list, the references should be numbered and listed in order of appearance in the text. List all authors in the reference list. References to unpublished data and personal communications should not appear in the list but be cited in the text only (e.g. Smith A, 2000, unpublished data).

1) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Ap-nea Syndrome in Acromegaly Before and After Treatment. JTSM 2014;1:22-7.
2) Ernstoff M. Urologic Cancer. Black-well Science, Boston.1997.
3) Gilchrist RK. Further commentary: Continent stroma. In: King LR, Stone AR, Webster GD (eds). Bladder Reconstruction and Continent Urinary Diversion. Year Book Medical, Chicago, 1987;204-5.

Standard journal articles using DOI; articlespublished online in advance without volume, issue, or page number (More information about DOIs: http://www.doi.org/faq.html):

4) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Ap-nea Syndrome in Acromegaly Before and After Treatment. JTSM Published online 30 March 2014; doi: 10.1111/j.1479-8425.2008.00379.x

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Supporting Information: Supporting information closely related to the relevant findings is ac-ceptable.

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• PRISMA statement of preferred reporting items for systematic reviews and meta-analyses (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 2009; 6(7): e1000097.) (http://www.prisma-statement.org),
• STARD checklist for the reporting of studies of diagnostic accuracy (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA, Glasziou PP, Irwig LM, et al., for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4.) (http://www.stard-statement.org),
STROBE statement, a checklist of items that should be included in reports of observational studies (http://www.strobe-statement.org),
• MOOSE guidelines for meta-analysis and systemic reviews of observational studies (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting Meta-analysis of observational Studies in Epidemiology (MOOSE) group. JAMA 2000; 283: 2008-12),
• CARE guidelines are designed to increase the accuracy, transparency, and usefulness of case reports. (Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; the CARE Group. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development.) (http://www.care-statement.org)

7. Proofs

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12. Early View

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13. Editorial Office

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JOURNAL OF TURKISH SLEEP MEDICINE | JTSM

İçindekiler / Contents

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Derleme / *Review*

DOI: 10.4274/jtsm.galenos.2022.63325

Journal of Turkish Sleep Medicine 2023;10:1-4

Uyku ve Bellek Konsolidasyonu Arasındaki İlişki

Relationship Between Sleep and Memory Consolidation

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Öz

Uyku ve bellek tam olarak anlaşılamayan karmaşık fenomenler olmakla birlikte altta yatan mekanizmaları hala tam anlamıyla bilinmemektedir. Uyku uyumsal bir davranış olmasının yanı sıra beyindeki plastisiteyi nöronlar arasındaki sinaptik bağlantılar düzeyinde modüle edebilir ve nöronal plastisite uykuyu etkiler. Uykunun iç ve dış uyaranlar tarafından nasıl modüle edildiğini ve uykunun; hafıza ve plastisiteyi nasıl modüle ettiğini anlamak sinirbilimde anahtar bir sorudur. Uyku, hafıza konsolidasyonunu optimize eden bir beyin durumu olarak nitelendirilmektedir. Bir belleğin ilk kodlaması hızlı bir süreç olmasına rağmen uzun vadeli bakımı; ilgili datayı saatlerce hatta yıllarca değiştirmeye devam eden süreçleri gerektirir. Bu sürecin genel adı bellek konsolidasyonu, mevcut belleklerin değiştirilmesi ise rekonsolidasyon sürecidir. Bellek konsolidasyonu, kararsız yeni oluşturulmuş bellek izlerinin aşamalı olarak uzun süreli anılara dönüştürüldüğü ve daha fazla güncelleme ve modifikasyona duyarlı kalabilmelerine rağmen etkileşime karşı daha dirençli hale geldiği bir süreci ifade eder. Konsolidasyon, yavaş dalga aktivitesi sırasında meydana gelen ve entegrasyon için ilgili temsilleri uzun süreli belleğe dönüştüren, yakın zamanda kodlanmış nöronal bellek temsillerinin yeniden etkinleştirilmesinden kaynaklanır. Devam eden hızlı göz hareketi uykusu ise dönüştürülmüş anıları stabilize edebilir. Son araştırmalara göre, uykuya bağlı konsolidasyon süreçleri, farklı bellek türleri için farklı boyutlara yerleştirilebilir. Onarıcı uyku olan yavaş dalga aktivitesinin yeni edinilen bilgileri işleyerek ve konsolide ederek bellekte önemli bir rol oynadığı varsayılmaktadır. Bu derlemede uyku ve bellek arasındaki ilişkiye dair genel bir araştırma yapılmıştır.

Anahtar Kelimeler: Uyku, bellek, konsolidasyon, rekonsolidasyon, yavaş dalga aktivitesi

Abstract

Sleep and memory are complex phenomena that are not fully understood, and the underlying mechanisms are still not fully understood. Besides being an adaptive behavior, sleep can modulate plasticity in the brain at the level of synaptic connections between neurons and neuronal plasticity affects sleep. Understanding how sleep is modulated by internal and external stimuli and how sleep modulates memory and plasticity is a key question in neuroscience. Sleep is characterized as a brain state that optimizes the memory consolidation. Although the initial encoding of a memory is a fast process, its long-term maintenance requires processes that continue to replace relevant data for hours or even years. The general name of this process is memory consolidation and the replacement of existing memories is the reconsolidation process. Memory consolidation refers to a process in which unstable newly formed memory traces are progressively transformed into long-term memories and become more resistant to interaction, although they may remain susceptible to further updates and modifications. Consolidation results from the reactivation of recently encoded neuronal memory representations that occur during slow-wave activity and transform the relevant representations into long-term memory for integration. Continued rapid eye movement sleep can stabilize transformed memories. According to recent research, sleep-related consolidation processes can be placed in different sizes for different types of memory. Slow wave activity, which is restorative sleep, is hypothesized to play an important role in memory by processing and consolidating newly acquired information. In this review, general research was conducted on the relationship between sleep and memory.

Keywords: Sleep, memory, consolidation, reconsolidation, slow wave activity

Giriş

Uyku

Yaşam boyunca bütün vücut için temel onarıcı işlevlere sahip olan uyku; metabolizma, bağışıklık sistemi, kardiyovasküler sistem ve bilişsel işlevler dahil olmak üzere çeşitli biyolojik sistemler ve işlevlerle ilişkilendirilmiştir (1). Önceki uyanıklık süresine bağlı olan ve yaşla birlikte azalan, yavaş dalga aktivitesi (SWA) olarak tanımlanan derin uyku 0,5-4,5 Hz bandındaki elektroensefalogram (EEG) gücü ile karakterize edilmektedir (2). SWA sürekli uyanıklığın ardından uykuya yönelik homeostatik dürtü ile yakından ilişkilidir. Genç yetişkinlerde SWA, gecenin ilk hızlı olmayan göz hareketi (NREM) döngüsünde en yüksek seviyededir ve ardından, uyku basıncının homeostatik bir dağılımını yansıtan, ardışık NREM uyku döngüleri boyunca katlanarak azalır (3). Uyku hem sirkadiyen bir süreç hem de bir homeostatik süreç tarafından düzenlenir, bu yüzden belki de sirkadiyen ritimleri düzenleyen nöronların da uykuyu

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modüle edebilmesi şaşırtıcı değildir (4). İnsan yaş aldıkça, doğal olarak uykunun makro ve mikro mimarisinde, bilişsel işlevlerde, homeostatik ve sirkadiyen süreçler dahil olmak üzere birçok fizyolojik değişiklikler eşlik eder (3).

Uyku ve Bellek Konsolidasyonu

Konsolidasyon ve yeniden konsolidasyon (rekonsolidasyon) terimleri, bir anı oluşturmaya katılan nöronlarda sinaptik etkinlikte değişiklikler uyguladığı ve böylece zamanla belleği stabilize ettiği ve onu nispeten kalıcı (veya uzun süreli) hale getirdiği düşünülen geçici nörobiyolojik süreçleri ifade eder (5). Konsolidasyon, ilk bellek edinimini takip ederken, rekonsolidasyon; bellek geri çağırma veya geri alma sırasında olduğu gibi halihazırda konsolide edilmiş bir belleğin yeniden etkinleştirilmesini takip eder (5).

Araştırmalar uykunun özelliklerinin hafıza konsolidasyonu sürecinde aktif bir rol oynadığını göstermektedir (6). Özellikle, NREM sırasında yavaş dalga uykusu (SWS), yavaş salınımlar, iğcikler, hipokampal keskin dalga dalgalanmaları ve bunların faz eşleşmesi; yakın zamanda kodlanan ve hipokampusta geçici olarak depolanan bilgilerin neokortekste depolanan uzun süreli belleğe aktarılması ve birleştirilmesi sürecinde yer alır (7). Yeni bilgiler ilk önce uyanıklık halinde kodlanır, ardından sonraki uyku sırasında konsolide edilir. Güncel bir araştırmada, 90 dakikalık bir uykunun hafızayı yeniden stabilize ettiği, belleğin yeni öğrenilen ve potansiyel olarak müdahale eden bilgilerden kaynaklanan değişikliklere karşı koruduğunu bulunmuştur (8). Çalışmalarda yeniden etkinleştirilen prosedürel ve bildirimsel anıların rekonsolidasyonun bir uyku periyodu gerektirdiği, ikinci olarak ise özellikle SWA'ya bağlı olduğu tespit edildi. Epizodik rekonsolidasyon paradigmasına göre belleğin bu çalışmalar tarafından yakalanamayan benzersiz yönü; eski bir belleğin yeni bilgilerle güncellenmesidir. Bu nedenle, tipik olarak belleğin doğru konsolidasyonu ile ilişkilendirilen SWA'nın, güncellemeyi yakalamak için yetersiz olabileceği düşünülmektedir (1). Öte yandan, uyku iğciklerinin, yeni bilgilerin mevcut alanlara entegrasyonunun altında yatan hipokampal-neokortikal iletişimi işaret ettiği ve onları epizodik bellek güncellemesi için mantıklı bir aday haline getirdiği düşünülmektedir (7). Epizodik bellek rekonsolidasyonunun; hipokampal-bağlamsal bağlantının korteksle yeniden etkinleştirilmesini takiben eski bir bellek izinin güncellenmesini yansıttığı ve uykunun bellekle ilgili hipokampal-neokortikal süreçleri kolaylaştırdığı göz önüne alındığında, uykunun rekonsolidasyonu destekleyebildiği düşünülmektedir (1). SWA sırasında anıların ipuçlarıyla yeniden etkinleştirilmesi sol hipokampüsün; anterior ve posterior kısımlarında artan aktivasyon ile ilişkilendirilmiştir (2). Farklı ögelerin ilişkilendirildiği görsel destekli sözel bir öğreti sonrası NREM uykusu sırasında; öğretilen bu sözel bilgilerin çalışmada kullanılmayan öğelere kıyasla bellekte üstün olduğu görülmüştür (6). Aynı zamanda uyku sırasındaki talamus tarafından oluşturulan ve talamokortikal yol boyunca kortekse gönderilen 12-14 Hz'lik aktivitesinin 0,5 saniyelik (veya daha uzun) patlaması olan uyku iğciği aktivitesini (9), bellek ipuçlarının da artırdığı görülmüştür (6). SWA sırasında sistem konsolidasyonu, uzun süreli depolama için seçili bellek izlerinin yeniden etkinleştirilmesini ve yeniden dağıtımını desteklerken, REM'i takip eder (2). Bir başka çalışmada ise eşleştirilmiş bir ortak görevi öğrendikten sonra uyuyan genç yetişkinler, öğrenmeyi takiben eşdeğer bir süre boyunca uyanık oldukları zamana kıyasla üstün hafıza gösterdiği tespit edilmiştir (10). Spesifik olarak hem SWS hem de uyku iğcikleri (nöral aktivite patlamaları, 9-16 Hz, NREM evre 2 uykusunun özelliği), özellikle bildirimsel anılar için yetişkinlerde hafıza değişikliklerini uykuya göre yönlendirir (10). SWA ile bellek performansı arasında gözlemlenen ilişki, SWA sırasında yeni kodlanmış anıların hipokampusta tekrar tekrar yeniden etkinleştirildiğini ve hipokampustan neokortekse bilgi transferini desteklediğini belirten aktif sistem konsolidasyonu hipotezi ile uyumludur (1).

Uyku ve Plastisite

Uyanık halde insan duyusal uyaranları keşif ve tepki verme, diğer bireylerle etkileşim kurma, karar verme, anı oluşturma gibi günlük davranışsal görevlerini yerine getirirken çevreleri hakkında birtakım bilgiler edinir. Bu uyanık deneyimler, öğrenme ve hafızanın davranışsal temelini oluşturur (2). Uykunun birçok olası işlevi arasında, uyku ile plastisite/hafıza arasındaki çift yönlü ilişki kapsamlı bir şekilde belgelenmiştir. Uykunun sinaptik plastisiteyi güçlü bir şekilde modüle ettiği ve uykunun belirli sinaptik bağlantı türlerini hem küçültebileceğini hem de güçlendirebileceğini öne sürülmektedir (4). Ayrıca, genetik, moleküler ve elektrofizyolojik yaklaşımların bir kombinasyonunu kullanarak, uyanma sırasındaki plastisite değişikliklerinin miktarı ile uyku ihtiyacının arttığını ve uykunun öğrenme ve plastisite ile uyarılabileceğini bulmuşlardır (11).

Uykunun işlevini açıklamak için öne çıkan teorilerden biri sinaptik homeostaz hipotezidir (SHY). Bu hipotez temelinde, Tononi ve uzun süredir birlikte çalıştığı Dr. Chiara Cirelli (hem omurgasızlarda, kemirgenlerde hem de insanlarda moleküler ve elektrofizyolojik belirteçler kullanarak) beynin çoğunda sinaptik gücün aslında uyanma sırasında arttığını ve uyku sırasında azaldığını göstermiştir (12). SHY modelinde uykunun işlevi, önceki uyanma deneyimleri sırasında güçlendirilen sinaptik bağlantıların ölçeğinin küçültülmesidir. Bununla birlikte, sinaptik güçlenmenin uyku sırasında da gözlemlendiğini belirtmek önemlidir. SHY uyanmanın, uyku tarafından yeniden normalleştirilmesi gereken birçok beyin devresinde sinaptik güçte net bir genel artışa neden olduğunu belirtir (12) ve uykunun beynin plastisite için ödediği bedel olduğunu öne sürer. Mevcut hipotez, SWA'nın homeostatik düzenlenmesinin, önceki uyanıklık sırasında meydana gelen sinaptik güçlenme miktarına bağlı olduğunu belirtir. Spesifik olarak, uyanıklık sırasında kortikal devrelerdeki sinaptik güçlenme miktarı ne kadar yüksek olursa, sonraki uyku sırasında SWA'daki artış o kadar yüksek olduğu düşünülmektedir (12). Uyku sinirsel aktivite ve plastisiteden önemli ölçüde etkilenir ve nöronlar arasındaki sinaptik bağlantıların gücünde veya sayısında uzun süreli değişiklikler görülebilir (13).

Aktif Sistem Konsolidasyonu

Aktif sistem konsolidasyonu, konsolidasyon adımı için uykuya hayati bir rol atfeder. Özetle, bir anı uyanıklık sırasında öğrenilir, uyku sırasında pekiştirilir ve uyanıklık sırasında tekrar hatırlanır (11). Aktif sistem konsolidasyonu, başlangıçta hipokampus

gibi geçici bir depoda depolanan bellek izlerinin, uyku tekrarı sırasında korteks gibi daha kalıcı depolama alanlarına kademeli olarak yeniden dağıtılmasını sağlar (1). Tamamlayıcı sinaptik homeostaz teorisi, zayıf hafıza izlerinin uyku sırasında rekabetçi bir aşağı-seçim mekanizması aracılığıyla silindiğini ve beynin yeni bilgiler öğrenme kabiliyetini sağladığını öne sürer (11).

Uyanık iken yaşanılan bir olayın neticesinde; neokortikal alanlar bu bilgiyi işler, hipokampus ise bilgiyi epizodik bir temsile bağlayan bir merkez görevi görerek ilişkilendirir. Bu nedenle, hipokampus asıl bilgiyi değil, onun benzersiz kombinasyonunu tutar (1). Sonraki uyku sırasında, hipokampus yavaş öğrenen kortikal ağların kendilerine ait bir çağrışımsal iz oluşturmasına izin veren bu çağrışımsal izi yeniden oynatır. Hipokampus dışında temsiller oluşturmak için, sistem konsolidasyonu işlev olarak temsilin bağlantılarını güçlendirmede bir alt rutin görevi ile (uzun vadeli güçlendirme dahil) sinaptik konsolidasyon süreçlerine dayanır (11). Devam eden sistem konsolidasyonu ile kortikal iz, hipokampüsü devreye sokmadan bilgiyi almak için yeterli hale gelir. Bu çerçevede SHY'nin önerdiği gibi homeostatik süreçler için tamamlayıcı bir rol vardır. Çünkü hipokampal iz, kortikal iz kurulduğunda ve artık ihtiyaç duyulmadığında yeni öğrenmeye yer açmak için kaldırılabilir (12). Bilgi sağlamlaştıktan sonra onu daha verimli hale getiren kortikal izin daha fazla budanması için yer vardır. Ayrıca kortikal iz, epizodik özelliklerinin çoğunu kaybeder ve geriye yalnızca anlamsal içerik kalır (11). Beyindeki öğrenmenin çoğunun bir tür Hebbian plastisitesine, yani öğrenme sırasında nöronlar arasındaki bağlantı gücündeki bir artışa dayandığını belirtir. Bağlantıların bu güçlenmesinin, süresiz olarak sürdürülemeyen artan enerji ve alan taleplerinin bedeli olduğu düşünülmektedir (12). Sinapsların aktif bölgelerindeki glutamaterjik (a-amino-3-hidroksi-5-metil-4-izoksazolepropiyonik asit-AMPA) reseptör yoğunluğunu karşılaştıran deneylerden elde edilen kanıtlar, ekstitatör reseptörler daha uzun uyanıklık fazlarından sonra yukarı regüle edildiğinden ve uykudan sonra aşağı regüle edildiğinden, bu görüşü desteklemiştir (11). Benzer şekilde, güçlenmenin morfolojik bağıntıları olan dendritik dikenler, farelerde uyanıklık sırasında yukarı regülasyon ve uyku sırasında aşağı regülasyon gösterir (10). Yeniden aktivasyonun güçlü belirteçleri olduğu gösterilen keskin dalga dalgalarının, hipokampustaki sinapsların aşağı regülasyonunu da desteklediği tespit edilmiştir. Motor kortekste, öğrenme sırasında aşırı plastisiteyi dengeleyen REM uykusu sırasında ise sinaptik budamanın sonraki öğrenmeyi iyileştirdiği görülmüştür (11). Önemli olarak, bu sonuçlar sinaptik yukarı ve aşağı regülasyonun hem uykuda hem de uyanıklıkta meydana gelebileceğini, ancak her birinin mutlak miktarının farklı olduğunu ve bu da uyku sırasında net bir küçülmeye yol açtığını göstermektedir (11).

Uyku, kesintisiz sinaptik konsolidasyon sağlayarak dönüştürülmüş anıları stabilize etme işlevi görebilir. Sonuçlar uykuya bağlı konsolidasyonun daha güçlü anılara öncelik verebileceğini göstermektedir. Farklı uyku sonrası bellek sonuçları, uyku sırasında daha zayıf anıların budandığı ancak daha güçlü anıların korunduğu sinaptik bir aşağı regülasyon sürecinden kaynaklanabilir (10). Uykunun bellekteki rolüne ilişkin alternatif bir teori, SWA'nın sinaptik güçlerin doygunluğunu önlemek için gerekli olan küresel bir sinaptik küçültmeyi desteklediğini öne sürer. Uyku sırasında meydana gelen süreçler, uzun süreli kalıcılık için yeni öğrenmenin dengelenmesine kritik olarak katkıda bulunur (14).

Uykuyu Etkileyen Faktörler ve Nörogörüntüleme

Nörofizyolojik mekanizmalara ek olarak, bilişsel süreçler de uyku derinliğini değiştirebilir. SWS sağlığı ve esenliği korumak için temel olsa da genellikle stres veya yaşla birlikte azalır. Veriler, uyku miktarında ve kalitesinde azalmanın öğrenme ve hafıza bozukluklarına yol açabileceğini göstermektedir (4). Güncel bir araştırmada gece uykusu çalışmasında uyku yoksunluğu yaşayan grubun zaman içinde olumsuz anıları seçici olarak korurken, nötr anılar önemli ölçüde azalttığı ortaya çıkmıştır (15). Olaya bağlı potansiyel analizlerinde ise uykuya karşı uyku yoksunluğunun, duygusal uyaranlara yeniden maruz kaldığında farklı nörobilişsel süreçleri devreye soktuğunu göstermiştir (15). Ayrıca EEG çalışmaları, uyku yoksunluğu sonrası SWA'daki artışın en yüksek anterior prefrontal bölgelerde olduğunu göstermektedir (16). Son araştırmalara göre REM uykusu, duygusal belleğin işlenmesinde yer alan amigdala, hipokampal ve neokorteksten kaynaklanan teta salınımları yoluyla özellikle duygusal belleği güçlendirdiği ve modüle edebildiği ileri sürülmektedir (15). Uyku sırasında insan EEG'sindeki yavaş salınım limbik-neokortikal etkileşimlerin önemi göz önüne alındığında, yavaş salınımların limbik üretimi ile neokorteksin aşağı durumları (down states) arasındaki ilişki üzerine daha fazla araştırma, bellek konsolidasyonunun spesifik mekanizmaları hakkında fikir verebileceği düşünülmektedir (16). Araştırmacıların göz önünde bulundurması gereken bir çalışmada; insan uyku araştırmalarında ilk gece etkisi olarak adlandırılan ve uyku sırasında tanıdık olmayan çevreyi izlemek için bir gece nöbeti olarak bir yarım kürenin diğerinden daha uyanık olduğu tespit edilmiştir (17). İlk uyku deney seanslarında bölgesel hemisferler arası uyku derinliği asimetrisini içerdiğini bulunmuş olup bu asimetrilerin hiçbiri sonraki uyku seanslarında belirgin olmamıştır (17). Bu kanıtlar, tanıdık olmayan bir ortamda sorunlu uykunun, bir yarı küreyi diğer yarı küreden gece nöbeti olarak kısmen daha uyanık tutarak, tanıdık olmayan ve potansiyel olarak tehlikeli bir ortamda hayatta kalma eylemi olduğu hipoteziyle uyumludur (17). Daha az uyuyan yarıküre tarafından algılanan sapkın dış uyaranların, diğer yarıküre tarafından algılananlardan daha fazla uyarılmaya ve daha hızlı davranışsal tepkilere neden olduğu da tespit edilmiştir (17). Öte yandan olumlu uyaranların uyku sırasında etkisinin incelendiği bir başka çalışmada ise müzik veya hipnotik telkinler kullanarak olumlu düşünceler ve rahatlama sağlamanın gündüz şekerlemeleri ve gece uykusu sırasında SWA miktarını artırdığı ve hipnotik telkinlerin etkilerinin en çok gece uykusunun ilk saatinde görüldüğü ortaya çıkmıştır. Ayrıca SWA süresinin hipnozla arttığı; frontal ve parietal kayıt alanlarınında etkilendiği görülmüştür (18). Çevresel ve dış uyaranların ötesinde, iç uyaranlar da uykuyu düzenleyebildiği ileri sürülmektedir. Örneğin; uyku yoksunluğu, yoksunluğu takiben uyku miktarında ve derinliğinde bir artışla gösterilen, homeostatik bir uyku geri bildirimine yol açar. Uykudaki bu artış, özellikle SWS'deki artıştan kaynaklanmaktadır (4).

Sonuç

Tipik olarak uykudan önce başlayan bilişsel süreçlerin uyku derinliğini uykuya daldıktan dakikalar veya saatler sonra nasıl etkilediği hala bilinmemektedir. Ancak kodlama sonrası uykunun sadece temsilleri güçlendirmekle kalmayıp, anıların belirli temel yönlerini geliştirecek şekilde niteliksel olarak dönüştürdüğüne dair çok sayıda kanıt vardır. Nöronal düzeyde uykunun dönüştürücü işlevinin en iyi aktif sistem konsolidasyon süreci ile açıklanabileceği savunulmaktadır. Zihinsel süreçlerin uyku sırasında az ya da çok aktif oluşu ve bu aktivasyon derecesinin uyku derinliğini etkilediğini düşünülmektedir. Uyku sırasında sistem konsolidasyonu, uyanıklık sırasında kullanılanlara benzer sinaptik konsolidasyon alt rutinlerine dayanıyor gibi görünse de hipokampalden neokortikal ağlara bilgi akışının spesifik yönlendirmesi ve sonuçta kortikal temsillerin artması, uyku sırasında konsolidasyonun bir işaretidir. Uyku iğcikleri de, hipokampal-neokortikal diyalogda yer alır. Bu sayede hipokampusta yeni kodlanmış anıların tekrarı, neokortikal hafıza izlerinin güçlendirilmesini teşvik etmek için iğ olaylarıyla hizalanır. Bu bağlamda rekonsolidasyon, ilk konsolidasyon ile benzer hipokampal-neokortikal etkileşimleri başlatabilir. Ayrıca rekonsolidasyon, daha önce kurulmuş neokortikal temsilin yeniden işlenmesini başlatabilir ve uyku iğ aktivitesi yeniden işlemeyi ayarlayabilir. Epizodik anıların uyku sırasında konsolide edildiği ve hipokampusun özellikle uykuya bağlı hafıza işlemeyle ilişkilendirildiği düşünülürse, uykunun epizodik hafıza güncellemesine ve rekonsolidasyonuna da katkıda bulunabileceği bu düşünceyi desteklemektedir. Bütün anıların uyku sırasında bir konsolidasyon sürecinden geçebileceğini ve hipokampal-kortikal uyku dinamiklerinin farklı anı türlerini konsolide etmek için nasıl farklılaştığı merak uyandıran soruyu gündeme getirmek gerekebilir. Kritik olarak, bu ve diğer soruların nörofizyolojik ve davranışsal düzeylerde paralel olarak incelenmesi gerekir.

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Sleep Health Among School Children in Turkey

Türkiye'de Okul Çağı Çocuklarında Uyku Sağlığı

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Abstract

Objective: This study aimed to determine the prevalence of sleep-related breathing disorders (SRBDs) among school children in Kars, Turkey. A recently published study conducted in Kars province examined the SDBRs among elementary school children. In this study, the socio-demographic characteristics of children and their relationship with SRBDs were also examined. This brief report aims to introduce this published study inland.

Materials and Methods: Six different schools were determined as the universe of the research, and a total of 1,421 children aged 6-13 were included in the study. A fourteen-item data collection form was used to evaluate the socio-demographic characteristics of the participants. An education and information seminar program on sleep disorders was conducted by the researchers before starting the data collection. The Pediatric Sleep Questionnaire (PSQ) was used on parents to determine SRBDs after this training program.

Results: The mean age of the study group's was 9.37±1.91 years (54.2% girls), the prevalence of SRBDs was 17.2%. The PSQ scores were significantly higher in boys and older age groups (9-13 years). Associations were observed between low academic achievement and breathing problems, snoring, morning headache, attention deficit/hyperactivity disorder, growth retardation, nocturnal enuresis, and obesity categories.

Conclusion: Sleep is as crucial as nutrition in children. Children with adequate sleep patterns develop better mental and physical health. Recognizing sleep problems in the early age period and establishing good sleep practices in childhood will enable them to live healthy for many years.

Keywords: Children, pediatric sleep questionnaire, sleep health, sleep related breathing disorders

Öz

Amaç: Bu çalışmanın amacı, Kars ilinde okul çağı çocukları arasında uykuya bağlı solunum bozuklukları (SDBRs) sıklığını belirlemektir. Çalışmada ayrıca, çocukların sosyo-demografik özellikleri ve SRBD'ler ile ilişkileri araştırılmıştır. Bu kısa yazı, yurt dışında yakın zamanda yayımlanmış olan çalışmamızı, yurt içinde tanıtmayı amaçlamaktadır.

Gereç ve Yöntem: Araştırmanın evreni olarak, altı farklı okul belirlenmiş ve araştırmaya 6-13 yaş arası toplam 1,421 çocuk dahil edilmiştir. Katılımcıların sosyo-demografik özelliklerini değerlendirmek için 14 maddelik veri toplama formu kullanılmıştır. Araştırmaya başlamadan önce, araştırmacılar tarafından okullarda, öğrenci ve veliler için uyku bozuklukları ile ilgili bir eğitim ve bilgilendirme seminer programı yapılmıştır. Pediatrik Uyku Anketi (PSQ) ve veri toplama formu, bu eğitim programından sonra çocuklarda uykuya bağlı solunum bozuklukları ve bu durumu etkileyen unsurları belirlemek için ebeveynler üzerinde uygulanmıştır.

Bulgular: Çalışma grubunun yaş ortalaması 9,37±1,91 (%54,2 kız), uykuya bağlı solunum bozuklukları prevalansı %17,2 olarak saptandı. PSQ puanları, erkeklerde ve görece daha büyük yaş grubunda (9-13 yaş) olan çocuklarda anlamlı olarak daha yüksekti. Düşük akademik başarı puanları ile; nefes alma sorunları, horlama, sabah başağrısı, dikkat eksikliği hiperaktivite bozukluğu, büyüme geriliği, gece idrar kaçırma ve obezite arasında oranda yüksek istatistiksel ilişki saptandı.

Sonuç: Uyku, çocuklarda beslenme kadar önemlidir. Yeterli uyku düzenine sahip çocuklar, daha iyi zihinsel ve fiziksel sağlık geliştirirler. Bu nedenle, uyku sorunlarının erken yaşlarda fark edilmesi ve çocukluk döneminde sağlıklı bir uyku alışkanlığı kazandırılması, onların uzun yıllar sağlıklı olarak yaşamalarını sağlayacaktır.

Anahtar Kelimeler: Çocuklar, pediatrik uyku anketi, uyku sağlığı, uyku ilişkili solunum bozuklukları

Introduction

As every living creature feels, sleep is essencial for the body to renew itself, and gather energy. Physical growth and mental development can be possible with adequate sleep in children and adolescents. Sleep directly effects growth, especially in early infancy. Growth hormone is produced when children are asleep. Children during periods of rapid growth often need more sleep. In toddlers, sleep is necessary for motor skill development and executive attention sleep requirements is age-dependent and sleep pattern change as children get older the health, well-being, learning, behavior and even weight of children who do not get enough and quality sleep are adversely affected (1). It has been reported that sleep problems

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in childhood and adolescence impair learning capacity and reduce academic achievement (2,3). Sleep deficiency at an early age can lead to long-term sleep problems in later life. For this reason, it's substantial to comprehend the sleep problems of children, in order to detect in the early period and prevent negative consequences. In addition to harming physical and mental development, sleep deprivation also causes behavioral problems (3). Contrary to popular belief, sleep disorders are not uncommon among children. The prevalence of sleep disorders is between 20% to 40% in children aged 1 to 5 years. Several studies reported that sleep related breathing disorders (SRBDs) are highly prevalent among school children (2-4). A recently published study conducted in Kars province examined the SDBRs among elemantary school children (5). The Kars province, is located in relatively less developed district of Turkey. Social development indicators, such as education, prosperity, and health are rank below national averages. Also schooling rate in elemantary and middle education is less than 70% while in the western area more than 90% (6). It is crucial to assess the frequency and related factors of SRBDs in school-aged children due to their impact on academic achievement, particularly in developing regions of Turkey that need well trained human resources. Besides to evalute prevalance and related factors of SRBDs, this study also aimed to attract attention of parents about children's sleep problems. With this purpose the researches were organised an educational seminary program prior to study for parents and children about sleep disorders at the schools.

Materials and Methods

Six different schools were determined as the universe of the research, and a total of 1,421 children aged 6-13 were included in the study. A fourteen-item data collection form was used to evaluate the socio-demographic characteristics of the participants. An education and information seminar program on sleep disorders was conducted by the researchers before starting the data collection. The Pediatric Sleep Questionnaire (PSQ) was used on parents to determine SRBDs after this training program (7). The respondents were investigated in eight categories [daytime sleepiness, respiratory problems, snoring, nocturnal enuresis, morning headache, growth retardation, attention deficit/hyperactivity disorder (ADHD) and obesity]. Parents were investigated whether their children had a diagnosis of growth retardation and ADHD. Weight and height measurements were determined to calculate the body mass index. Parents answered the PSQ and socio-demographic data form. In addition, data were collected through teachers.

The study was approved by Kars Provincial Education Regional Director and Kafkas University Faculty of Medicine Ethics Committee (protocol number: 80576354-050-99/77), and all participants provided verbal informed consent.

Statistical Analysis

As descriptive statistics, percentage, frequencies, arithmetic means, distributions, and standard deviations were examined. Data were adjusted for gender and age. To compare variables pearson's chi-square and Fisher's Exact tests were performed. Odds ratio values were calculated for risk assessment among categorical variables.

Results

The mean age of the study group's was 9.37±1.91 years (54.2% girls), the prevalence of SRBDs was 17.2%. The PSQ scores were significantly higher in boys and older age group (9-13 years). Associations were observed between low academic achievement and breathing problems, snoring, morning headache, ADHD, growth retardation, nocturnal enuresis, and obesity categories. It has been observed that there is a strong relationship between the ADHD and family's economic status, and education level. The results are boradly summarized in Table 1.

Discussion

According to the PSQ, the prevalence of SRBDs among school-aged children in Kars, Turkey was relatively low compared to results reported worldwide (8-10). The findings of this study showed an association between SRBDs and frequent infections. It has been found that boys had a higher prevalence of SRBD than girls in this study. The most striking association was observed in this study between low academic achievement and ADHD, snoring, respiratory problems, and nocturnal enuresis; these results are in agreement with previous studies (2,3,10). This study also aimed to raise awareness of the importance of sleep disorders in parents, who are responsible for the growth of a healthy generation. Such education with parents was expected to encourage the practice of good sleep hygiene in their children. Due to its negative impact on academic performance, good sleep behavior should be taught to children at an early age. The unique aspects of this study are, to the best of our knowledge, that it is the first study of this issue to be made in this specific region, and even in Turkey. The large sample size was the strength of this study. In this study, it was also aimed to raise awareness about the importance of sleep disorders in the population. Because of its impact on health and academic performance, good sleep behavior should be acquired to children at an early age. For this, parents should be made aware of sleep health and they should be encouraged to provide their children with the necessary sleep hygiene.

Conclusion

It is crucial to know that insufficient or fragmented sleep can impair children's physical and mental health, while adequate sleep could increase their academic success. The most important contribution of this study to the region was to draw the attention of parents about children's sleep problems by organizing a educational seminary program for parents and children about sleep disorders at the schools. Sleep disorders are often neglected among physicians as well as in society. To the best of our knowledge, this is the first study of its kind to be conducted in this specific region in. The findings of our study, which provides data-based evidence, are expected to attract the attention of health care providers.

Table 1. Sleep related breathing disorders and their relationship with socio-demographic characteristics

Characteristics	Age	Gender	MEL*	FEL*	EL*	NS*	HS*	FI*	CD*	RWF*	RWT*	AS*	BMI*
	p	p	p	p	p	p	p	p	p	p	p	p	p
SRBDs*													
Usually snores	0.310	**0.006**	0.170	**0.021**	0.477	0.345	0.095	**<0.001**	**0.020**	0.495	0.432	**0.002**	0.127
Always snores	0.469	0.365	0.277	0.111	0.430	0.309	0.166	**0.005**	**0.003**	0.481	0.309	**0.037**	0.385
Snores loudly	**0.026**	0.244	0.345	0.079	0.349	**0.026**	0.316	**0.001**	**0.015**	0.648	0.154	**0.004**	0.066
Heavy breathing	0.194	**0.022**	**0.006**	**0.002**	0.140	0.534	**0.013**	**<0.001**	**0.006**	0.099	0.355	**0.014**	**0.002**
Trouble breathing	**0.042**	0.531	**0.032**	**0.026**	0.188	0.341	0.216	**<0.001**	**0.001**	0.057	0.106	**0.005**	0.052
Witnessed apneas	0.562	0.397	0.357	0.305	0.168	0.282	0.030	0.090	0.076	0.606	0.547	0.171	0.504
Month open during day	0.233	**0.040**	0.056	**0.003**	**0.049**	0.194	0.130	0.136	0.094	0.183	0.125	0.006	0.243
Dry month on awakening	**0.012**	0.430	**<0.001**	**<0.001**	**0.001**	**0.011**	**<0.001**	**0.001**	**0.002**	0.068	**0.006**	**<0.001**	0.388
Not refreshed in the morning	**<0.001**	**0.006**	**<0.001**	**<0.001**	**0.021**	**0.002**	**0.009**	**0.008**	**0.001**	**0.015**	0.074	0.089	0.281
Problem with sleepiness	**<0.00**1	**0.034**	**0.027**	**0.008**	0.176	**0.019**	**0.005**	0.147	**0.003**	0.088	0.221	0.399	0.320
Sleppy per teachers	**0.022**	**0.026**	0.490	0.367	0.184	0.422	0.090	0.438	**0.008**	0.579	0.385	0.122	0.716
Hard to wake up	**<0.001**	0.384	**0.035**	**0.012**	**0.253**	**0.030**	**0.004**	0.096	0.274	**0.004**	0.212	0.074	0.522
Does not listen	0.373	**0.010**	**<0.001**	**0.003**	**0.001**	0.342	**0.002**	**0.003**	**0.005**	**<0.001**	**0.001**	**0.001**	**0.022**
Difficulty organizing	**0.045**	**0.011**	**<0.001**	**0.016**	**0.001**	0.391	**0.002**	**0.016**	**<0.001**	**0.001**	**<0.001**	**0.001**	0.137
Easily distracted	0.403	0.070	**0.007**	0.313	**<0.001**	0.329	**0.011**	**<0.001**	**0.004**	**0.001**	**0.002**	**0.001**	0.483
Fidgets (fidgetiness)	**0.006**	**<0.001**	0.414	0.241	0.069	**0.004**	**0.022**	**0.002**	**0.024**	**0.004**	**0.015**	**<0.001**	0.109
On the go (restlessness)	**0.049**	**<0.001**	**<0.001**	**0.001**	**<0.001**	0.416	**0.049**	0.069	**0.046**	0.267	**0.007**	**<0.001**	0.115
Interrupt (others)	**0.049**	**<0.001**	**<0.001**	**0.001**	**<0.001**	0.416	**0.049**	0.069	**0.046**	0.267	**0.007**	**<0.001**	0.115
Nocturnal enuresis	**<0.001**	0.309	0.166	0.122	**<0.001**	**0.024**	0.076	0.082	**0.014**	0.083	0.197	**0.010**	0.470
Morning headache	**0.031**	**0.013**	**0.001**	**<0.001**	0.160	0.082	**0.016**	**0.001**	**<0.001**	**0.020**	0.189	**0.025**	0.110
Delayed growth	0.400	**0.040**	**0.001**	**<0.001**	**0.007**	**0.002**	0.228	**0.002**	**<0.001**	**0.001**	**0.017**	**0.00**	0.368
Parents reported obesity	**0.018**	**0.012**	0.128	0.296	0.192	0.224	0.106	0.108	**0.034**	**0.045**	0.475	**0.022**	**<0.001**

*SRBDs: Sleep related breathing disorders, MEL: Mother's education level, FEL: Father's education level, EL: Economic level, NS: Number of siblings, HS: Household smoking, FI: Frequency of infection, CD: Chronic diseases, RWF: Relationship with friends, RWT: Relationship with teachers, AS: Academic success, BMI: Body mass index, p<0.005

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Ethics

Ethics Committee Approval: The study was approved by Kars Provincial Education Regional Director and Kafkas University Faculty of Medicine Ethics Committee (protocol no: 80576354-050-99/77, date: 13.05.2015).

Informed Consent: All participants provided verbal informed consent.

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Authorship Contributions

Concept: H.Ç., S.A., Design: H.Ç., S.A., Data Collection or Processing: H.Ç., Analysis or Interpretation: H.Ç., Literature Search: H.Ç., Writing: H.Ç., S.A.

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Ergenlerde Uyku ve Uyku Alışkanlıklarının Değerlendirilmesi

Evaluation of Sleep and Sleep Habits in Adolescents

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Öz

Amaç: Bu tanımlayıcı araştırma, ergenlerin uyku ve alışkanlıklarının değerlendirilmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Araştırma için gerekli olan veriler 25 Aralık 2021-10 Şubat 2022 tarihleri arasında toplanmıştır. Araştırmanın çalışma grubunu, 12-18 yaş grubu ergenler oluşturmuştur. Araştırma verilerinin toplanılmasında 12-18 yaş arası ebeveyn onayı olan, çalışmaya katılmaya gönüllü olan, olasılıksız örnekleme yöntemlerinden kolayda örnekleme yöntemi ile seçilen 350 ergende, online survey yöntemi ile sosyo-demografik veri toplama formu, Çocuk Uyku Alışkanlıkları Anketi kullanılmıştır. Araştırmada elde edilen verilerin istatistiksel analiz sürecinde SPSS 26.0 veri analiz programı kullanılmış olup, çocukların cinsiyet, yaş, eğitim durumu değerlerine göre uyku alışkanlık düzeylerinin analizinde Mann-Whitney U ve Kruskal-Wallis testleri kullanılmıştır.

Bulgular: Ergenlerin %56,3'ü erkek ve %43,7'si ise kızlardan oluşmaktadır. Eğitim gruplarına göre incelendiğinde %23,7'si üniversite, %42,9'u lise ve %33,4'ü ise ortaöğretim öğrencisidir. Sosyo-demografik özelliklerine (yaş, cinsiyet ve eğitim durumu) göre uyku saatleri "çocuk uyku alışkanlıkları" sıralamalar ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<0,05$). Uyku saati değişkenine göre "yatma zamanı direnci", "uykuya dalmanın gecikmesi", "uyku süresi" "uyku kaygısı", "gece uyanmaları", "parasomniler" ve "uykuda solunum bozulması" boyutları sıralamalar ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<0,05$).

Sonuç: Ergenlerin uyku ve uyku alışkanlıklarının değerlendirilmesinde sosyo-demografik faktörler ve uykuya ilişkin alışkanlıklar önemli bir yer tutmaktadır. Ergenlerin uyku ve uyku alışkanlıklarının değerlendirilmesi için uyku alışkanlıklarını etkileyen faktörlere yönelik biyolojik, psikolojik ve sosyal yönden ayrıntılı bir şekilde sorgulanmasına ilişkin araştırmalar yapılması önerilmektedir.

Anahtar Kelimeler: Uyku, ergenler, uyku alışkanlıkları, değerlendirme

Abstract

Objective: This descriptive study was conducted to evaluate the sleep and habits of adolescents.

Materials and Methods: The data required for the research were collected between December 25, 2021 and February 10, 2022. The study group of the research consisted of adolescents aged 12-18 years. In the collection of research data, online survey method, socio-demographic data collection form, Child Sleep Habits Questionnaire were used from 350 adolescents between the ages of 12-18 who had parental consent, participated voluntarily, and were selected by the convenience sampling method, one of the improbable sampling methods. SPSS 26.0 data analysis program was used in the statistical analysis of the data obtained in the study, and Mann-Whitney U and Kruskal-Wallis tests were used in the analysis of sleep habits of children according to gender, age and educational status.

Results: In the evaluation of sleep and sleep habits of adolescents, 56.3% were boys and 43.7% were girls. When analyzed according to education groups, 23.7% are university students, 42.9% are high school students and 33.4% are secondary school students. The difference between the averages of sleep hours "child sleep habits" rankings according to their socio-demographic characteristics (age, gender and educational status) was found to be statistically significant ($p<0.05$). According to the sleep time variable, the difference between the mean scores of the "bedtime resistance", "delay in falling asleep", "sleep time", "sleep anxiety", "night awakenings", "parasomnias" and "sleep respiratory deterioration" dimensions were found to be statistically significant ($p<0.05$).

Conclusion: Socio-demographic factors and sleep habits have an important place in the evaluation of sleep and sleep habits of adolescents. To evaluate the sleep and sleep habits of adolescents, it is recommended to conduct research on the biological, psychological and social aspects of the factors affecting their sleep habits in detail.

Keywords: Sleep, adolescents, sleep habits, evaluation

Giriş

Uyku, bütün canlıların en önemli bileşeni hava, su ve yiyecek gibi temel fizyolojik bir süreçtir (1). Sağlıklı bir yaşam için gerekli olan uyku, yarı bilinçsizlik hali olarak ifade edilmiş ve insan vücudunun yaşama tekrardan hazırlanması olarak tanımlanmıştır (2). Uyku fizyolojisi ve patolojisi yenidoğan, bebeklik, okul öncesi ve okul çocuğu, adölesan dönemlerinde

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farklılıklar gösterir. Bebekler ilk üç aylık dönemde günlerinin 16-18 saatini uyuyarak geçirir. Bu dönem bir uyku düzeni içinde gece ve gündüz eşit sayıda uyuma ve uyanma dönemlerinden oluşurken okul öncesi dönemde uyku erişkin dönemdeki özelliğini kazanır. Okul çocuğu ve ergenlik döneminde uyku okul yaşamının getirdiği zorunluluklar nedeni ile aslında fizyolojik olmayan yani 24 saatte bir kez uyunan gece uykusuna dönüşür (3). Bireylerde fiziksel büyümenin ve akademik performansın güçlendirilmesinde uykunun yeri önemlidir. Özellikle çocuklarda bilişsel, fiziksel fonksiyonlarının akranlarına göre normal gelişim göstermelerinde yeterli düzeyde uyku uyumaları etkili olmaktadır (4). Uyku fizyolojik, psikolojik, sosyal yönden temel bir ihtiyaç olup ve bu ihtiyaç giderilmediği zaman uyku sorunları ortaya çıkmakta her yaştan bireyin günlük yaşam aktivitelerini ve kalitelerini doğrudan ve dolaylı olarak olumsuz etkilemektedir (5-7). Uyku sorunları, çocukların genelinde görülmekte beraber özellikle ergenlerde aileleri ve bakım verici bireylere fizyolojik, psikolojik boyutlarda büyük bir sorun oluşturmaktadır (8,9). 0-18 yaş grubu Birleşmiş Milletler Raporu'na göre çocuk olarak kabul edilmiş olup ergenlik ise gelişim dönemi olarak ifade edilmektedir. Ergenlik, hem biyolojik hem de sosyal açıdan çocukluk ve yetişkinlik arasındaki duygusal, bilişsel içeren geçiş dönemini oluşturmaktadır. Bu evre önceki yaşam evresiyle çelişen yeni beceriler, içgörü ve beklentilerin ortaya çıktığı bir zamandır (10). Bu dönem, bazı farklılıklar içermekle birlikte, genel olarak erken (11-14 yaş arası), orta (14-17 yaş arası) ve geç (17-20 yaş arası) ergenlik dönemi olarak üç alt sınıfa ayrılmaktadır (11).

Ergenlik dönemi kabaca bireyin çocukluktan erişkinliğe geçiş dönemidir ve bu dönemde bireyde oluşan fiziksel, ruhsal, hormonal değişimlerin yanı sıra uyku fizyolojisinde de değişiklikler meydana gelmesi doğaldır (12).

Uyku, ergen gelişiminin temel noktalarından birisidir. Ergenlik döneminde günlük uyku ihtiyacı 8-9 saat olup çocuk ve erişkinlerden daha fazladır (11). Artmış uyku ihtiyacına karşın bu döneme özgü faktörlerin etkisi ile günlük uyku süresi kısalır ve pek çok sorun yaşanmaktadır (13). Gece sık uyanma, uyanmayı reddetme, gündüz aşırı uyuma, hipersomni (gece uyku süresinin aşırı uzaması), gündüz uyuklamalarının artması, insomia (uykuya dalmada ya da devam ettirmede zorluk), stres ve duygusal olarak sürekli yorgun hissetmelerine, bel ve sırt ağrıları yaşamalarına, yorgunluk, bezginlik, ağrıya karşı duyarlılığın artması, sinirlilik gibi fiziksel ve zihinsel sorunlar yaşadıkları belirlenmiştir (8,9,13).

Uyku sağlığının sürdürülmesinde önemli faktörlerden biri de kaliteli uyku ve uyku alışkanlıklarıdır. Uyku alışkanlıklarının kaliteli olması uykuya yönelik rutinlerinin ve davranışlarının kazandırılması açısından önemlidir (1,14,15). Ergenlerde uyku düşünme, davranış ve duygu yeteneklerini, biliş ve hafızanın güçlendirilmesi, davranış düzenlenmesi, günlük etkinlikler, bireysel faktörler ve çevredeki değişiklikler ve sağlığın sürekliliği açısından önemlilik teşkil etmektedir (11,13,16).

Ergenlerde uyku ve uyku alışkanlıklarını etkileyen faktörlerin belirlenmesi, etkileyen faktörlere yönelik çözüm önerileri sunması açısından önemlilik oluşturmaktadır. Bu çalışma, ergenlerin uyku ve uyku alışkanlıklarının değerlendirilmesi amacıyla yapılmıştır.

Araştırma Soruları

1. Ergenlerin uyku ve uyku alışkanlıklarının değerlendirilmesinde yaş, cinsiyet, eğitim durumu ve uyku saati üzerinde etkisi var mıdır?
2. Ergenlerin uyku ve uyku alışkanlıklarının değerlendirilmesinde uyuma sorunu, uyku davranışı, kalkış zamanı, yatış zamanı, uyanıklık durumu üzerinde etkisi var mıdır?

Gereç ve Yöntemler

Araştırmanın Tipi: Çalışma, ergenlerin uyku ve uyku alışkanlıklarının değerlendirilmesi amacıyla tanımlayıcı olarak yapılmıştır.

Araştırmanın Yeri ve Zamanı: Araştırma 25 Aralık 2021-10 Şubat 2022 tarihleri arasında online olarak hazırlanan anket formu (Google Form) kullanılarak toplanmıştır.

Araştırmanın Evreni ve Örneklemi: Araştırmanın evrenini 25 Aralık 2021-10 Şubat 2022 tarihleri arasında çalışmaya katılmayı kabul eden ve ebeveynleri tarafından onaylanan, soruları cevaplamaya engel teşkil edecek herhangi bir engel durumu olmayan, 12-18 yaş grubunda yer alan ergenlerden Türkiye'de yaşayanların oluşturması planlanmıştır. Ancak Türkiye'de yaşayan her 12-18 yaş aralığında bulunanlara ulaşmanın imkansıza yakın olması nedeniyle çalışma online olarak oluşturulmuştur. Araştırmaya 12-18 yaş aralığında bulunan ve internete ulaşma imkanı olan ergenler dahil edilmiştir. Araştırmada veri toplama tekniği olarak anket kullanılmış olup online olarak hazırlanan anket formu (Google Formlar) sosyal ağlar ve sosyal medya üzerinden yayılmış ve birçok kesime ulaşılmaya çalışılmıştır. Araştırmada örneklem büyüklüğünün belirlenmesinde çok değişkenli veri analizlerinde kullanılan değişken sayısı esas alınarak hesaplanmıştır. Değişken sayısının esas alınarak belirlenmesi araştırma verilerinin aynı zamanda analize uygunluğunun da temel kriterlerindendir. Karagöz (17), Büyüköztürk (18) yapılan araştırmalarda verilerin analize uygunluğunun sağlanabilmesi için değişken sayısının en az 5 ve hatta 10 katı büyüklüğünde katılımcıya ulaşılması gerektiğini belirtmiştir. Bu doğrultuda ankette 33 ifade yer aldığı için 330 kişiye ulaşılması hedeflenmiştir (17,18). Bu kapsamda araştırmanın örneklemini Türkiye'de yaşayan 12-18 yaş grubunda yer alan ergenlerden olasılıksız örneklme yöntemlerinden kolayda örnekleme yöntemi ile seçilmiştir. Araştırmaya katılım şartlarını sağlayan 350 ergenler ile gerçekleştirilmiştir.

Araştırmanın Dahil Edilme ve Dışlanma Kriterleri

Dahil olma

- Araştırmaya katılacak olan ergenlerin 12-18 yaş aralığında olması
- Ebeveyn onayı olan ergenler
- Çalışmaya gönüllü olarak katılmayı kabul eden ergenler

Dışlama kriterleri

- Araştırmaya katılacak olan ergenlerin 12-18 yaş aralığı dışında olması
- Ebeveyn onayı olmayan ergenler
- Çalışmaya katılmayı kabul etmeyen ergenler

Veri Toplama Araçları

Araştırma verileri aşağıdaki veri toplama formları ile toplanmıştır:
- Sosyo-demografik veri toplama formu
- Çocukların uyku alışkanlıkları anketi (ÇUAA) kullanılmıştır.

Sosyo-demografik veri toplama formu: Araştırmacılar tarafından oluşturulan ergenlerin sosyo-demografik özelliklerini (yaş, cinsiyet ve eğitim durumu) belirlemeye yönelik 3 sorudan oluşmaktadır.

Çocukların uyku alışkanlıkları anketi: Araştırmada çocukların uyku alışkanlıklarının belirlenmesi amacıyla Owens ve ark. (19) tarafından geliştirilen ve Fis ve ark. (20) tarafından Türkçeye uyarlanan, geçerlilik ve güvenirlik çalışması yapılan 33 sorudan oluşan "ÇUAA" kullanılmıştır. ÇUAA 3'lü Likert tipinde oluşturulmuş olup "3= genellikle, 2= bazen" ve "1= nadiren" şeklinde seçenekleştirilmiş ve puanlanmıştır. Yapılan doğrulayıcı faktör analizinde 33 maddenin faktör yüklerinin 0,451 ile 0,816 aralıklarında olduğu belirlenmiştir. Araştırmada elde edilen verilen faktör analizine uygun olup olmadığının belirlenmesi amacıyla Kaiser-Meyer-Olkin (KMO) ve Barlett testi yapılmış olup KMO değerinin 0,808 olduğu ve Barlett test değerlerinin (ki-kare= 5989.347; df=528; p<0,05) anlamlı olduğu belirlenmiştir. Yapılan faktör analizinde varyansın %63,34'ünü açıklayan 8 faktör olduğu belirlenmiştir. Bu faktörlerin isimlendirilmesi Owens ve ark. (19) tarafından geliştirilen ölçeğin orijinal formu esas alınarak düzenlenmiştir. Ankette yer alan 1, 3, 4, 5, 6, 8. maddeleri "yatma zamanı direnci", 2. madde "uykuya dalmanın gecikmesi", 9, 10, 11. maddeler "uyku süresi", 5, 7, 8, 21. maddeler "uyku kaygısı", 16, 24, 25. maddeler "gece uyanmaları", 12, 13, 14, 15, 17, 22, 23. maddeler "parasomniler", 18, 19, 20. maddeler "uykuda solunumun bozulması" ve 26, 27, 28, 29, 30, 31, 32, 33. maddeler "gün içinde uykululuk" şeklinde sıralanan sekiz alt boyut tanımlanmıştır. Ankette yer alan 1, 2, 3, 10, 11 ve 26. maddeler ters kodlanmıştır. Araştırmada çocukların uyku alışkanlıkları ölçeğinin Cronbach alfa katsayısı 0,854 olarak bulunmuştur. Toplamda elde edilen 41 puan kesim noktası olarak kabul edilmekte ve bunun üzerindeki değerler "klinik düzeyde anlamlı" olarak değerlendirilmektedir (17,18).

Araştırmanın Değişkenleri

Bağımsız değişkeni: Çocuğun; yaşı, cinsiyeti, eğitim durumu, uyku saati.

Bağımlı değişken: ÇUAA puan ortalamaları (uyuma sorunu, uyku davranışı, kalkış zamanı, yatış zamanı, uyanıklık durumu).

Verilerin değerlendirilmesi: Araştırmada verilerin değerlendirilmesinde ve analizinde SPSS (Statistical Package For Social Sciences) 26.0 paket programı kullanılmıştır.

İstatistiksel Analiz

Araştırmada tanımlayıcı istatistikler için yüzdelik dağılım, ortalama ve toplam puanlar kullanılmıştır. Çocukların cinsiyet, yaş, eğitim durumu değerlerine göre uyku alışkanlık düzeylerinin analizinde Mann-Whitney U ve Kruskal-Wallis testleri kullanılmıştır.

Araştırmanın etik boyutu: ÇUAA kullanımı için Fis ve ark.'ndan (20) e-mail yoluyla izin alınmıştır. Araştırma için Hakkari Üniversitesi Bilimsel Araştırma ve Yayın Etiği Kurulu'ndan (IRB: 2021/81-1) izin alınmıştır. Araştırma kapsamında etik ihlale sebebiyet vermemek için 12-18 yaş grubunda yer alan ergenlere yönelik rıza formu ve ebeveynlerinden bilgilendirilmiş onam formu ile onay alınmıştır.

Bulgular

Sosyo-demografik Özelliklere İlişkin Bulgular

Araştırmaya katılan ergenlerin %56,3'ü erkek ve %43,7'si ise kızlardan oluşmaktadır. Ergenlerin eğitim durumlarına göre incelendiğinde %23,7'si üniversite, %42,9'u lise ve %33,4'ü ise ortaöğretim öğrencisi olduğu, yaş gruplarına göre %17,1'i 12-13 yaş, %21,1'i 14-15 yaş, %30,6'sı 16-17 yaş ve %31,1'i ise 18 yaş oldukları belirlenmiştir. Ergenlerin uyku saatleri verileri incelendiğinde ise %25,4'ü 21:30-22:00, %29,4'ü 22:01-23:00, %28,9'u 23:01-24:00 ve %16,3'ü ise 00:01 ve sonrasında uyudukları saptanmıştır (Tablo 1).

Sosyo-demografik Özelliklere Göre Uyku Alışkanlık Düzeylerine İlişkin Bulgular

Araştırmada ergenlerin sosyo-demografik özelliklere göre uyku alışkanlık düzeylerinin istatistiksel olarak anlamlı bulunmuştur (p<0,05). Yapılan analiz sonucunda ergenlerin "ÇUAA" ortalamaları arasındaki farklılığın sonucunda 21:30-22:00 ile 23:01-24:00 ve 00:01 sonrası uyuyanlar arasında olduğu, 23:01-24:00 ve 00:01 sonrasında uyudukları belirlenmiştir (Tablo 2).

Cinsiyet Değişkenine Göre Uyku Alışkanlık Düzeylerine İlişkin Bulgular

Yapılan analiz sonucunda ergenlerin ÇUAA alt boyutlarından "yatma zamanı direnci" (z=-2.188; p<0,05), "gece uyanmaları", "parasomniler" ve "uykuda solunum bozulması cinsiyete göre farklılaştığı (z=-3.422; p<0,05: z=-4.133; p<0,05: z=-3.763; p<0,05). "uykuya dalmanın gecikmesi", "uyku süresi", "uyku kaygısı" ve "gün içi uykululuk" alt boyutlarının cinsiyete göre farklılaşmadığı saptanmıştır (Tablo 3).

Tablo 1. Sosyo-demografik özelliklere ilişkin bulgular

		n	%
Cinsiyet	Erkek	197	56,3
	Kız	153	43,7
Eğitim durumu	Üniversite (18 yaşında üniversiteye devam eden)	83	23,7
	Lise	150	42,9
	Ortaöğretim	117	33,4
Yaş grubu	12-13 yaş	60	17,1
	14-15 yaş	74	21,1
	16-17 yaş	107	30,6
	18 yaş	109	31,1
Uyku saati	21:30-22:00	89	25,4
	22:01-23:00	103	29,4
	23:01-24:00	101	28,9
	00:01 ve sonrası	57	16,3
	Toplam	350	100,0

Tablo 2. Sosyo-demografik özelliklere göre uyku alışkanlık düzeylerine ilişkin bulgular								
Değişkenler		**n**	**Ort**	**SS**	**Ortalama**	**Z ve H**	**p**	**Fark**
Cinsiyet a: Erkek b: Kız	Erkek	197	54,83	9,69	164,16	-2,381	0,017	a<b
	Kız	153	57,59	11,72	190,09	-	-	-
Eğitim düzeyi a: Üniversite b: Lise c: Ortaöğretim	Üniversite (18 yaşında üniversiteye devam eden)	83	62,25	11,88	231,90	33,907	0,000	a>b, c
	Lise	150	54,10	10,01	156,97	-	-	-
	Ortaöğretim	117	54,10	8,91	159,25	-	-	-
Yaş a: 12-13 yaş b: 14-15 yaş c: 16-17 yaş d: 18 yaş	12-13 yaş	60	55,40	9,47	169,91	36,421	0,000	d>a, b, c
	14-15 yaş	74	51,20	8,09	123,83	-	-	-
	16-17 yaş	107	54,35	8,05	173,86	-	-	-
	18 yaş	109	61,32	12,86	215,27	-	-	-
Uyku saati a: 21:30-22:00 b: 22.01-23:00 c: 23.01-24:00 d: 00:01 ve sonrası	21:30-22:00	89	52,82	7,22	144,37	16,707	0,001	c, d>a
	22:01-23:00	103	56,06	11,95	170,69	-	-	-
	23:01-24:00	101	57,75	12,13	188,98	-	-	-
	00:01 ve sonrası	57	57,96	9,09	208,92	-	-	-
	Toplam	350	56,03	10,69	-	-	-	-
SS: Standart sapma, Ort: Ortalama								

Tablo 3. Cinsiyet değişkenine göre uyku alışkanlık düzeylerine ilişkin bulgular					
		n	**Ortalama**	**z**	**p**
Yatma zamanı direnci	Erkek	197	185,81	-2,188	0,029
	Kız	153	162,22	-	-
Uykuya dalmanın gecikmesi	Erkek	197	177,00	-0,338	0,735
	Kız	153	173,57	-	-
Uyku süresi	Erkek	197	173,53	-0,424	0,671
	Kız	153	178,04	-	-
Uyku kaygısı	Erkek	197	183,80	-1,765	0,078
	Kız	153	164,82	-	-
Gece uyanmaları	Erkek	197	159,43	-3,422	0,001
	Kız	153	196,19	-	-
Parasomniler	Erkek	197	155,93	-4,133	0,000
	Kız	153	200,70	-	-
Uykuda solunumun bozulması	Erkek	197	159,49	-3,763	0,000
	Kız	153	196,11	-	-
Gün içi uykululuk	Erkek	197	171,44	-0,860	0,390
	Kız	153	180,73	-	-

Ergenlerin uyku alışkanlıklarının cinsiyete göre farklılık gösterdiği sonucu ortaya çıkmış olup erkeklerin kızlara göre daha az uyku alışkanlıkları sorunu yaşadıkları belirlenmiştir.

Eğitim Durumuna Göre Uyku Alışkanlık Düzeylerine İlişkin Bulgular

Yapılan analiz sonucunda ergenlerin eğitim düzeyine göre ÇUAA alt boyutlarından "yatma zamanı direnci", "uykuya dalmanın gecikmesi", "uyku kayısı", "gece uyanmaları", "parasomniler", "uykuda solunum bozulması" ve "gün içi uykululuk" boyutları toplam puan ortalamaları arasındaki fark istatistiksel olarak anlamlı ($p<0,05$) olduğu üniversite (18 yaşında üniversiteye başlamayanlar) ile lise ve ortaöğretim öğrencileri arasında eğitim durumu üniversite olan ergenlerin (18 yaşında üniversiteye başlayanlar) lehine gerçekleştiği ($p<0,05$) fakat ergenlerin "uyku süresi" alışkanlıklarının toplam puan ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmamıştır (Tablo 4).

Ergenlerin eğitim durumuna göre uyku alışkanlıklarının farklılık gösterdiği, üniversiteye devam eden ergenlerin lise ve ortaokul öğrencilerine göre daha çok uyku alışkanlıkları sorunu yaşadıkları belirlenmiştir.

Yaş ve Uyku Saati Değişkenine Göre Uyku Alışkanlık Düzeylerine İlişkin Bulgular

Yapılan Kruskal-Wallis H sonucunda yaş gruplarına göre ÇUAA alt boyutlarından "yatma zamanı direnci", "uykuya dalmanın gecikmesi", "uyku kayısı", "uyku süresi", "gece uyanmaları", "parasomniler", "uykuda solunum bozulması" ve "gün içi uykululuk" boyutları sıralamalar ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<0,05$).

Ergenlerin yaş gruplarına göre uyku alışkanlıkları incelendiğinde 18 yaşında olanların 12-13 yaş, 14-15 yaş ve 16-17 yaş gruplarından daha iyi olduğu belirlenmiştir (Tablo 5).

Ergenlerin uyku saatine değişkenine göre göre ÇUAA alt boyutlarından "yatma zamanı direnci", "uykuya dalmanın gecikmesi", "uyku süresi" "uyku kayısı", "gece uyanmaları", "parasomniler" ve "uykuda solunum bozulması" boyutları sıralamalar ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<0,05$). Ancak uyku saati değişkenine göre "gün içi uykululuk" boyutu sıralamalar ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmamıştır ($p>0,05$).

Ergenlerin 23:01-24:00 ve 00:01 ve sonrasında uyuyanların, 21:30-22:00 saatlerinde uyuyanlardan yüksek ve ortalamalarının farklılık gösterdiği belirlenmiştir. Çalışmamızda uyku saati geciktikçe ergenlerin uyku alışkanlıkları sorunu yaşadıkları ortaya çıkmıştır (Tablo 5 devamı).

Tablo 4. Eğitim durumuna göre uyku alışkanlık düzeylerine ilişkin bulgular							
	Yaş	**n**	**Ortalama**	**H**	**df**	**p**	**Fark**
Yatma zamanı direnci	Üniversite (18 yaşında üniversiteye devam eden)	83	253,55	71,199	2	0,000	a>b,c ve b>c
	Lise	150	163,34	-	-	-	-
	Ortaöğretim	117	135,71	-	-	-	-
Uykuya dalmanın gecikmesi	Üniversite (18 yaşında üniversiteye devam eden)	83	122,37	35,298	2	0,000	a<b,c
	Lise	150	188,53	-	-	-	-
	Ortaöğretim	117	196,48	-	-	-	-
Uyku süresi	Üniversite (18 yaşında üniversiteye devam eden)	83	176,77	0,958	2	0,619	Yok
	Lise	150	169,94	-	-	-	-
	Ortaöğretim	117	181,73	-	-	-	-
Uyku kaygısı	Üniversite (18 yaşında üniversiteye devam eden)	83	241,20	52,423	2	0,000	a>b,c ve b>c
	Lise		167,47	-	-	-	-
	Ortaöğretim	117	139,18	-	-	-	-
Gece uyanmaları	Üniversite (18 yaşında üniversiteye devam eden)	83	215,70	19,097	2	0,000	a>b,c
	Lise	150	156,63	-	-	-	-
	Ortaöğretim	117	171,18	-	-	-	-
Parasomniler	Üniversite (18 yaşında üniversiteye devam eden)	83	231,25	35,016	2	0,000	a>b,c
	Lise	150	151,40	-	-	-	-
	Ortaöğretim	117	166,85	-	-	-	-
Uykuda solunumun bozulması	Üniversite (18 yaşında üniversiteye devam eden)	83	202,70	10,385	2	0,006	a>b,c
	Lise	150	163,55	-	-	-	-
	Ortaöğretim	117	171,52	-	-	-	-
Gün içi uykululuk	Üniversite (18 yaşında üniversiteye devam eden)	83	206,19	11,411	2	0,003	a>b,c
	Lise	150	171,95	-	-	-	-
	Ortaöğretim	117	158,28	-	-	-	-
	Toplam	350	-	-	-	-	-
a: Üniversite, b: Lise, c: Ortaöğretim							

Tablo 5. Yaş değişkenine göre uyku alışkanlık düzeylerine ilişkin bulgular							
	Yaş	**n**	**Ortalama**	**H**	**df**	**p**	**Fark**
Yatma zamanı direnci	12-13 yaş	60	160,53	79,355	3	0,000	d>a, b, c ve b<a, c, d
	14-15 yaş	74	101,11	-	-	-	-
	16-17 yaş	107	175,85	-	-	-	-
	18 yaş	109	233,90	-	-	-	-
Uykuya dalmanın gecikmesi	12-13 yaş	60	191,58	24,384	3	0,000	d<a, b, c
	14-15 yaş	74	180,64	-	-	-	-
	16-17 yaş	107	199,14	-	-	-	-
	18 yaş	109	139,95	-	-	-	-
Uyku süresi	12-13 yaş	60	172,27	9,262	3	0,026	b<c
	14-15 yaş	74	147,05	-	-	-	-
	16-17 yaş	107	191,05	-	-	-	-
	18 yaş	109	181,33	-	-	-	-
Uyku kaygısı	12-13 yaş	60	154,63	57,957	3	0,000	d>a, b, c ve b<c
	14-15 yaş	74	114,13	-	-	-	-
	16-17 yaş	107	178,82	-	-	-	-
	18 yaş	109	225,40	-	-	-	-

Tablo 5. (Devamı) Uyku saati değişkenine göre uyku alışkanlık düzeylerine ilişkin bulgular							
	Uyku saati	**n**	**Ortalama**	**H**	**df**	**p**	**Fark**
Gece uyanmaları	12-13 yaş	60	165,22	11,601	3	0,009	c<d
	14-15 yaş	74	162,16	-	-	-	-
	16-17 yaş	107	163,05	-	-	-	-
	18 yaş	109	202,44	-	-	-	-
Parasomniler	12-13 yaş	60	164,02	25,391	3	0,000	d>a, b, c
	14-15 yaş	74	156,10	-	-	-	-
	16-17 yaş	107	154,63	-	-	-	-
	18 yaş	109	215,48	-	-	-	-
Uykuda solunumun bozulması	12-13 yaş	60	176,44	16,452	3	0,001	c<d
	14-15 yaş	74	183,41	-	-	-	-
	16-17 yaş	107	148,00	-	-	-	-
	18 yaş	109	196,61	-	-	-	-
Gün içi uykululuk	12-13 yaş	60	196,54	29,652	3	0,000	b, c<d
	14-15 yaş	74	126,34	-	-	-	-
	16-17 yaş	107	168,78	-	-	-	-
	18 yaş	109	203,89	-	-	-	-
Yatma zamanı direnci	21:30-22:00	89	136,52	23,531	3	0,000	a<b, c, d ve a, b, c<d
	22:01-23:00	103	180,62	-	-	-	-
	23:01-24:00	101	181,74	-	-	-	-
	00:01 ve sonrası	57	216,06	-	-	-	-
Uykuya dalmanın gecikmesi	21:30-22:00	89	203,31	38,049	3	0,000	a, b>c, d ve c>d
	22:01-23:00	103	199,87	-	-	-	-
	23:01-24:00	101	157,08	-	-	-	-
	00:01 ve sonrası	57	120,68	-	-	-	-
Uyku süresi	21:30-22:00	89	142,65	29,341	3	0,000	a, d<b, c
	22:01-23:00	103	202,09	-	-	-	-
	23:01-24:00	101	197,05	-	-	-	-
	00:01 ve sonrası	57	140,55	-	-	-	-
Uyku kaygısı	21:30-22:00	89	148,17	20,483	3	0,000	d>a, b, c
	22:01-23:00	103	170,15	-	-	-	-
	23:01-24:00	101	177,66	-	-	-	-
	00:01 ve sonrası	57	224,02	-	-	-	-
Gece uyanmaları	21:30-22:00	89	161,87	21,407	3	0,000	c, d>a, b
	22:01-23:00	103	146,72	-	-	-	-
	23:01-24:00	101	203,08	-	-	-	-
	00:01 ve sonrası	57	199,91	-	-	-	-
Parasomniler	21:30-22:00	89	138,79	20,598	3	0,000	c, d>a, b ve a<b
	22:01-23:00	103	172,64	-	-	-	-
	23:01-24:00	101	193,02	-	-	-	-
	00:01 ve sonrası	57	206,95	-	-	-	-
Uykuda solunumun bozulması	21:30-22:00	89	162,48	12,455	3	0,006	c>a, b, d
	22:01-23:00	103	164,39	-	-	-	-
	23:01-24:00	101	202,05	-	-	-	-
	00:01 ve sonrası	57	168,84	-	-	-	-
Gün içi uykululuk	21:30-22:00	89	171,88	3,582	3	0,310	Yok
	22:01-23:00	103	167,36	-	-	-	-
	23:01-24:00	101	174,50	-	-	-	-
	00:01 ve sonrası	57	197,63	-	-	-	-
a: 21:30-22:00, b: 22.01-23:00, c: 23.01-24:00, d: 00:01 ve sonrası							

Tartışma

Ergenlerde uyku ve uyku alışkanlıklarının değerlendirilmesinde cinsiyet, eğitim durumu, yaş ve uyku saati değişkenleri önemlilik oluşturmaktadır.

Ergenlerin sosyo-demografik özelliklere göre çocukların uyku alışkanlık düzeylerine ilişkin bulguların sonuçları Saygılı ve ark.'nın (21) üniversite öğrencilerinde uyku kalitesi ve yorgunluk üzerine yaptığı çalışma ile Xu ve ark.'nın (22) 16-20 yaş Çinli adölesanlarda yaptığı çalışma, sonuçlarımızla uyumludur.

Gupta ve ark.'nın (23) ise adölesanlarla yaptığı çalışmada adölesanların uykuya geçişlerinin genel olarak 20:00'dan sonra olduğu sonucuna ulaşılmıştır. Bülbül ve ark.'nın (3) yaptığı adölesanlarda uyku sorunları ve etkileyen faktörler çalışmasında 12-14 yaş grubundaki öğrencilerde gece saat 23'ten sonra yatma oranı %18,5 iken 18 yaş üstü adölesanlarda bu oran %70'e yükselmektedir. 16-18 yaş arası ergenlerin 21:30-22:00 ile 23:01-24:00 ve 00:01 sonrası uyuyanlar arasında olduğu, 23:01-24:00 ve 00:01 sonrasında uyudukları belirlenmiştir. Yaş arttıkça gece yatma saatinin anlamlı bir şekilde arttığı çalışmamızın bulgularıyla uyumludur. Cinsiyet değişkenine göre uyku alışkanlık düzeylerine ilişkin bulgular Epstein ve ark.'nın (24) İsrail'deki ilkokul, ortaokul ve lise öğrencileriyle yaptıkları araştırmada, "uykuya dalmanın gecikmesi", "uyku süresi", "uyku kaygısı" ve "gün içi uykululuk" durumlarının cinsiyete göre farklılaşmadığı, Bharti ve ark.'nın (25) okula giden çocuklarda uyku sorunlarına yönelik çalışmasında ve Fırat ve ark.'nın (26) ergenlerde yorgunluk üzerine etkili faktörlerin yapısal eşitlik modeli ile incelenmesi erkeklerin kızlara göre daha az uyku alışkanlıkları sorunu yaşadıkları belirlenmiştir.

Eğitim durumuna göre uyku alışkanlık düzeylerine ilişkin bulgu sonuçları BaHammam ve ark.'nın (27) ilköğretim okulu çocuklarının uyku sorunları ve alışkanlıkları ile ilgili çalışmasında, Bootzin ve Stevens'in (28) de ergenlerde uykularına ilişkin çalışması ile Zhang ve ark.'nın (29) Çin'de adölesanlarla yaptığı çalışmanın sonuçları ile uyumludur. Bu bulgu Vardar ve ark.'nın (10) yaptığı ergen sporcu kızlarda egzersiz yoğunluğu ve öznel uyku kalitesi ilişkisi çalışmasında lise ve ortaöğretimde öğrenim gören kız öğrencilerin yatma zamanında direnç gösterme ve uyku esnasında yaşadığı stresin uyku kalitelerini etkilediği ve üniversite başlayan ergenlerin lise ile ortaokul öğrencilerine göre daha çok uyku alışkanlıkları sorunu yaşadıkları belirlenmiştir.

Yaş değişkenine göre uyku alışkanlık düzeylerine ilişkin bulgular Joo ve ark.'nın (30) Kore'de lise öğrencilerinin gündüz uyku prevelansı ile arasındak ilişki çalışması ve Chung ve Cheung'un (31) Hong-Kong ve Çinli ergenlerin uyku-uyanıklık düzeni çalışması, Bates ve ark.'nın (32) çocuk ve ergenlerle yaptığı çalışmanın sonuçları bulgularımızla uyumluluk göstermektedir. Johnson ve ark.'nın (33) ergenlikte Amerikan Tanı ve Sınıflandırma Sistemi'nin son versiyonu uykusuzluğunun epidemiyolojisi: Yaşam boyu yaygınlık, kroniklik ve acil cinsiyet farkı çalışmasında ise uyku esnasında uyku sorunlarının yaş dönemlerine göre parallelik gösterdiği ve 18 yaşında olanların 12-13 yaş, 14-15 yaş ve 16-17 yaş gruplarından daha iyi olduğu saptanmıştır.

Uyku saati değişkenine göre uyku alışkanlık düzeylerine ilişkin bulgular Chervin ve ark.'nın (34) yaptığı çalışmada, ergenlerin %30-38'inin uyumada direnç gösterdikleri, uyuduklarında gece uyanmalarının uyku saatine göre farklılaştığı, Luginbuehl ve Kohler (35) in yaptığı çalışma uyku saati geciktikçe ergenlerin uyku alışkanlıkları sorunu yaşadıkları bulgularımızla uyumludur. Tekeli (36) yaptığı lise son sınıf öğrencilerinin uyku kalitelerinin ve sınav kaygılarının değerlendirilmesi çalışması ve Shin ve ark.'nın (37) lise öğrencilerinin uyku alışkanlıkları, performansı, gündüz uyku hali çalışması sonuçları da çalışma sonuçlarımızla benzerlik göstermektedir.

Çalışmanın Kısıtlılıkları

Çalışmaya 12-18 yaş arasında ergenler dahil edilmiştir. Araştırma sonuçları sadece araştırmadaki örneklem grubuna genellenebilir.

Sonuç

Ergenlik döneminde uyku ve uyku alışkanlıklarının değerlendirilmesi özel bir çaba, dikkat ve bilgi birikimi gerektirir. Uyku ve uyku kaliteleri ergenlerin biyo-psikososyal sağlığını, sosyal ilişkilerini, gün içi aktivitelerini ve aile etkileşimini her yönden etkilemektedir. Ergenlerin uyku ve uykularının değerlendirilmesinde yaş, cinsiyet, eğitim durumu ve uyku alışkanlıklarına ilişkin veriler uyku kalitelerini doğrudan ve dolaylı olarak etkilemektedir. Bu yüzden ergenlerin uyku ve uyku alışkanlıklarını etkileyen faktörlerin belirlenerek etkileyen faktörler ile ilişkili araştırmaların ve çalışmaların yapılması önerilmektedir.

Etik

Etik Kurul Onayı: Araştırma için Hakkari Üniversitesi Bilimsel Araştırma ve Yayın Etiği Kurulu'ndan (IRB: 2021/81-1, tarih: 24.12.2021) izin alınmıştır.

Hasta Onayı: Araştırma kapsamında etik ihlale sebebiyet vermemek için 12-18 yaş grubunda yer alan ergenlere yönelik rıza formu ve ebeveynlerinden bilgilendirilmiş onam formu ile onay alınmıştır.

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Yazarlık Katkıları

Konsept: Ç.M.H., D.D.K., Dizayn: Ç.M.H., D.D.K., Veri Toplama veya İşleme: Ç.M.H., D.D.K., Analiz veya Yorumlama: Ç.M.H., D.D.K., Litaratür Arama: Ç.M.H., D.D.K., Yazan: Ç.M.H.

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The Effects of the COVID-19 Pandemic on the Anxiety Levels and Sleep among University Students

COVID-19 Salgınının Üniversite Öğrencilerinin Anksiyete Düzeyi ve Uyku Üzerine Etkisi

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Abstract

Objective: This study was conducted to examine the effects of the Coronavirus disease-2019 (COVID-19) pandemic on the anxiety and sleep levels of university students.

Materials and Methods: The population of this descriptive study consisted of students who studied in health departments. The data were collected with a questionnaire that consisted of the descriptive characteristics form, Beck Anxiety Inventory, and Pittsburgh Sleep Quality Index.

Results: A total of 70.5% of the students who participated in the study were female. 9.0% of the students use drugs and 38.4% of them smoke. The difference between anxiety score averages and having a chronic disease, continuous drug use, smoking, and being a disabled person in the living environment is significant. Sleep quality scores were found to be "elevated" and significant for those who constantly used drugs, had a family member with a disability and/or a person over the age of 65, and those who smoked. It also affected the sleep quality scores of those who were infected with the Coronavirus, those who had family members with Coronavirus in their family, and/or students who had a relative who died from the Coronavirus.

Conclusion: It can be argued that the anxiety frequency of the students increased and their sleep quality deteriorated during the COVID-19 pandemic period. Having a family member over the age of 65, having a disabled person, being infected with the Coronavirus and/or losing one of their relatives to the Coronavirus affected the anxiety and sleep quality scores of the students.

Keywords: University students, COVID-19 pandemic, anxiety, sleep quality

Öz

Amaç: Bu çalışma, Koronavirüs hastalığı-2019 (COVID-19) pandemisinin üniversite öğrencilerinin anksiyete ve uyku düzeyleri üzerine etkilerini incelemek amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı tipte olan araştırmanın evrenini sağlık bölümlerinde okuyan öğrenciler oluşturmuştur. Veriler öğrencilerin tanımlayıcı özellikleri ile Beck Anksiyete Ölçeği ve Pittsburg Uyku Kalitesi Ölçeği'nden oluşan bir anket aracılığıyla toplanmıştır.

Bulgular: Araştırmaya katılan öğrencilerin %70,5'i kadındı. Öğrencilerin %9,0'ı ilaç, %38,4'ü sigara kullanmakta idi. Anksiyete puan ortalamaları ile kronik hastalık öyküsü, sürekli ilaç kullanımı, sigara, yaşadığı ortamda engelli birey olması durumları arasında istatistiksel olarak anlamlı fark saptandı. Sürekli ilaç kullananların, ailesinde engelli birey ve/veya 65 yaş üstü birey olanların ve sigara kullananların uyku kalitesi puanları "yüksek" ve anlamlı bulunmuştur. Koronavirüse yakalananların, ailesinde koronavirüse yakalananların ve/veya koronavirüsten vefat eden yakını olan öğrencilerin uyku kalitesi puanları "yüksek" ve anlamlı bulunmuştur.

Sonuç: Öğrencilerin COVID-19 pandemisi döneminde anksiyete sıklığının arttığı ve uyku kalitesinin bozulduğu söylenebilir. Ailede 65 yaş üzeri bireyin olması, engelli bireyin olması, koronavirüse yakalanmış olması ve/veya yakınlarından birini koronavirüsten kaybetmiş olması, öğrencilerin anksiyete ve uyku kalitesi puanını etkilemiştir.

Anahtar Kelimeler: Üniversite öğrencileri, COVID-19 pandemisi, anksiyete, uyku kalitesi

Introduction

Pandemics and contagious diseases had been among the disasters that affected the social, political, cultural, scientific, and economic conditions of societies, as well as causing human deaths in every period of history (1). The Coronavirus disease-2019 (COVID-19) outbreak, which emerged in Wuhan, China in December 2019 and spread on a global scale in a short time, was declared a pandemic by the World Health Organization on March 11, 2020. Countries applied measures such as the closure of schools and workplaces, social isolation, quarantine of patients and contacts, and calls to stay at home to fight the disease. These and similar measures altered social

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life (2,3). It is estimated that approximately 1.5 billion young people had been out of education during the pandemic process all around the world (4). A study that was conducted among young people who were away from education and work-life showed that young people went to bed late and woke up later, spent more time in bed with lower sleep quality, and therefore, there were changes in the perception of time and the use of electronic devices. Higher levels of depression, anxiety, stress symptoms, and trouble sleeping were detected among these individuals (5).

The pandemic caused not only the risk of death, infection but also psychological disorders. It can be argued that sleep quality deteriorated and the frequency of depression and anxiety increased during the COVID-19 pandemic (3).

Research has focused on COVID-19-related physical and mental health and sleep. Recent studies of the general population in China have found that female gender, being a student, is associated with suggestive COVID-19 symptoms and perceived lower quality of life, and higher rates of anxiety and depression (6-9). Another study showed that posttraumatic stress disorder symptoms were reported by 7% of Wuhan residents after the COVID-19 outbreak, especially by women. It has been reported that people younger than 35 who spend more than 3 hours on news about COVID-19 have higher levels of anxiety (10).

A recent study by the European Academy for Cognitive Behavioral Therapy for Insomnia on sleep problems during quarantine due to the COVID-19 pandemic has drawn attention to sleep and insomnia (11). In a study in which they evaluated changes in sleep patterns, time perception and use of electronic devices involving 1310 young adults, they found that digital media use increased before going to bed in the evening. They also stated that people go to bed and wake up later and spend more time in bed with lower sleep quality (12). In another study, they stated that the prevalence of insomnia increased significantly, the time spent in bed and total sleep time increased, and sleep efficiency decreased significantly during the COVID-19 outbreak (5).

In a study involving 400 students and academic staff in Italy, they found an increase in bedtime, delay in falling asleep and waking time, and worsening sleep quality and insomnia symptoms before and during the COVID-19 emergency. Especially during quarantine, the effect of delay in bedtime and waking up was more pronounced in students. While there was a 24% prevalence of insomnia in employees before COVID-19; this increased significantly during COVID-19, reaching 40%, compared to only 15% for workers who had trouble falling asleep, and this increased to 42%. In the same study, 27.8% of the students showed depressive symptoms, while 34.3% showed anxious symptoms (13). In a study conducted in athletes in Turkey, it was stated that the coronavirus anxiety state of the athletes was positively related to the sleep quality, and therefore, as the coronavirus anxiety levels increased, their sleep quality decreased (14).

Important work has been carried out regarding the fight against the disease since March 10, 2020, when the first case was detected in our country. Suspending face-to-face education in education and training institutions and starting distance education was one of these measures. In parallel with this, compulsory stay at home and curfews caused anxiety, depression, fear, stress and sleep problems, etc. in society. The present study was conducted to investigate the effects of the COVID-19 pandemic on the anxiety and sleep levels of university students.

Materials and Methods

The population of this cross-sectional study consisted of students (n=940) who studied in the health departments of Mardin Artuklu University. The sampling size was not calculated and it was aimed to contact the entire population. Before the study was commenced, the necessary permissions were obtained from the Ministry of Health, Mardin Artuklu University Faculty of Health Sciences Dean's Office, and Mardin Artuklu University Scientific Study and Publication Ethics Commission with the number 34233153-050.06.04 on 11.06.2020. People who studied in any of the healthcare departments of the university and had internet, e-mail addresses, computers, tablets, or smartphones were included in the study. The study was conducted between 20.06.2020 and 15.07.2020. The study was conducted on the students who studied in the health departments of Mardin Artuklu University and gave their consent by filling out the questionnaires sent over the electronic link. Repeated entries of the students were prevented. It was explained on the first page of the link that every question in the study was obligatory, there was no return to the answered question, and that no question would be left blank. The prevention of entering the data again from the same device was ensured by IP and cookie control, then the data increase was followed regularly and the data collection process of the study was terminated as the data increase stopped for one month. A total of 346 people were contacted. Responsiveness rate is 36.80%.

The study, along with its limitations of being a quantitative study, was limited to people who had internet access, used social networks, and agreed to participate in the study. The fact that the study was conducted in a certain period creates a common limitation, especially for such studies. One of the main limitations of the present study was that it is difficult to draw any conclusions regarding its long-term impacts because of the cross-sectional nature of the study. Also, there was the possibility of selection bias as the study was conducted with an online survey. Individuals who did not have internet, could not use smartphones or e-mail, or did not want to participate in the study were not included in the study.

A three-part questionnaire was used as the data collection tool in the study. In the first part, some questions covered the sociodemographic characteristics of the students, in the second part, the Beck Anxiety Inventory (BAI) that was developed by Beck et al. (15) was used. BAI, which was developed by Beck et al. (15) in 1988, is used to determine the frequency of anxiety symptoms. The validity and reliability study of the scale was conducted in 1988 by Ulusoy et al. (16) in our country. The validity and reliability of the scale were found to be Cronbach

alpha: 0.92 for all healthcare professionals. In the present study, the Cronbach alpha reliability coefficient was found to be 0.92. In this Likert-type 21-item scale, each item is scored between 0 and 3. The highest score that can be obtained from the scale is 63. Scores between 8-15 were classified as "mild anxiety", 16-25 points were classified as "moderate anxiety", and 26-63 points as "severe anxiety". BAI is a reliable scale that was prepared to distinguish between anxiety and depression with a high level of validity (16). The reliability of the anxiety scale was found to be high as Cronbach's alpha: 0.856 in the study.
The Pittsburgh Sleep Quality Index (PSQI) was used in the third part. PSQI, was developed by Buysse et al. (17) in 1989. The validity and reliability study for Turkey was done by Agargün et al. (18), and the Cronbach alpha coefficient was found to be 80. The PSQI was developed for several purposes; to establish a reliable, valid, and standardized measure of sleep quality, distinguish between good and poor sleepers, enable clinicians and studies to comment on the sleep of people to whom the scale is administered, and is also used to clinically evaluate and inform various sleep disorders that may affect sleep quality. The scale has a total of 24 questions 19 of which were self-evaluation questions. The remaining 5 questions were answered by the spouse or roommate of the individual. Questions answered by the spouse or roommate were not taken into account when calculating the index score. Each item is scored and evaluated between 0-3 points. The total score is between 0-21. A high total score indicates poor sleep quality. A total score greater than 5 indicates poor sleep quality. There were 7 components in the index; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction. The PSQI score is obtained by summing the scores of all components. An increase in the score indicates a decrease in sleep quality.

Statistical Analysis

The data obtained in the study were evaluated in the computer with the Statistical Package for the Social Sciences (SPSS) 22.0 statistical program. Frequency and percentage analyzes were used to determine the descriptive characteristics of the participants, and mean and standard deviation statistics were used to analyze the scale. According to the relevant literature, to determine whether the sleep quality mean score shows a normal distribution, it is expected that Kurtosis is 0.109 and Skewness is 0.565, and to determine whether the anxiety score mean has a normal distribution, it is expected that Kurtosis is 0.831 and Skewness is 1.231, and if the results of the Kurtosis - Skewness values of the variables are between +1.5 and -1.5 +2.0 and -2.0, it is considered a normal distribution. A normal distribution is considered to be between 1.5 and -1.5 +2.0 and -2.0. The relations between the dimensions determining the scale levels of the participants were examined with correlation and lineer regression analyzes. T-test, one-way Analysis of Variance and post-hoc (Tukey, LSD) analyzes were used to examine the differences in scale levels according to the descriptive characteristics of the participants.

Results

A total of 70.5% of the students who participated in the study were women, 41.6% of their mothers were uneducated, those with equal income to expenses were 56.1%, 72.5% of them lived in a nuclear family, 54.3% of them lived in the city center, 9.0% of them had a disabled person in their family, and 22.5% of them had individuals over the age of 65, 10.4% of the students who participated in the study had a chronic disease, 9.0% used drugs, 38.4% smoked, 9.2% evaluated their health as bad, 28.6% had applied to a healthcare institution in the last

Table 1. Distribution of participants according to descriptive characteristics

Groups	Frequency (n)	Percentage (%)
Gender (n=346)		
Male	102	29.5
Female	244	70.5
Mother's educational status (n=346)		
Illiterate	144	41.6
Literate	50	14.5
Primary school	118	34.1
High school and above	34	9.8
Father's educational status (n=346)		
Illiterate	17	4.9
Literate	45	13.0
Primary school	149	43.1
High school	98	28.3
Undergraduate	37	10.7
Economic status (n=346)		
Income less than expenses	129	37.3
Income equal to expenses	194	56.1
Income more than expenses	23	6.6
Family type (n=346)		
Elementary family	251	72.5
Extended family	95	27.5
Number of individuals in family (n=346)		
1-5	93	26.9
6-10	220	63.6
10 and above	33	9.5
Residence (n=346)		
City	188	54.3
District	115	33.2
Village	43	12.4
Presence of chronic disease (n=346)		
No	310	89.6
Yes	36	10.4
Using continuous medication (n=346)		
No	315	91.0
Yes	31	9.0

Table 1. Continued		
House type (n=346)		
Slum	26	7.5
Flat	210	60.7
Other	110	31.8
Smoking status (n=346)		
No	213	61.6
Yes	133	38.4
Presence of disabled person in family (n=346)		
No	315	91.0
Yes	31	9.0
Heath evaluation (n=346)		
Good	165	47.7
Moderate	149	43.1
Bad	32	9.2
Application to healthcare institution in the last few months (n=346)		
No	247	71.4
Yes	99	28.6
Regular exercise status		
No	271	78.3
Yes	75	21.7
Regular nutrition (n=346)		
No	181	52.3
Yes	165	47.7
Having sleep problems (n=346)		
No	180	52.0
Yes	166	48.0
Presence of individual over the age of 65 at home (n=346)		
No	268	77.5
Yes	78	22.5
Being infected with coronavirus (n=346)		
No	295	85.3
Yes	51	14.7
Being infected with coronavirus in family (n=346)		
No	131	37.9
Yes	215	62.1
Presence of relative dying due to coronavirus (n=346)		
No	261	75.4
Yes	85	24.6
Having undergone coronavirus quarantine (n=346)		
No	281	81.2
Yes	65	18.8

few months, 21.7% exercised regularly, 47.7% ate regularly, and 48.0% said that they had sleep problems (Table 1).

A total of 14.7% of the students who participated in the study were infected with the Coronavirus, the members of the family of 62.1% were infected with the Coronavirus, 24.6% of them had a relative who died from Coronavirus, and 18.8% stated that they had undergone Coronavirus quarantine (Table 1).

The mean "sleep quality" score of the students who participated in the study was found to be 7.370±3.665 (min=1; max=21), and the mean of "anxiety" was 12.725±12.794 (min=0; max=52) (Table 2).

The distribution of the students who participated in the study according to sleep quality scores was greater than 5, with 63.3% "bad sleep", 36.7% of them were 5 or below with "good sleep".

When the correlation analyses between sleep quality and anxiety scores were examined, a positive (r=0.51 89/*p<0.005) correlation was detected between anxiety and sleep quality (Table 3).

The regression analysis that was to determine the cause-effect relation between anxiety and sleep quality was found to be significant (F=124.106; p=0.000<0.05). The total change in sleep quality level was explained by anxiety at a rate of 26.3% (R2=0.263). Anxiety increases the sleep quality score (ß=0.148) (Table 4).

The difference between the mean anxiety scores of the students who participated in the study and the status of being a woman, mother's education status, having a chronic disease, using continuous drugs, smoking, having a disabled person in the living environment, and being 65 years old or older in the family was found to be significant (p<0.05) (Table 5).

The anxiety scores of the students who participated in the study and who perceived their health as "moderate" and "good" and those who applied to a health institution in the last few months were found to be high (p<0.05). The anxiety scores of those who did not exercise regularly, those who did not have regular eating habits, and those who had sleep problems were also found to be high (p<0.05) (Table 5).

The anxiety scores of the students who participated in the study and who were infected with the Coronavirus, who had Coronavirus in their family, and/or who had a relative who died from the Coronavirus were found to be high and significant (p<0.05) (Table 5).

No significant differences were detected between gender, mother's education, father's education, economic status, family

Table 2. The distribution of students' mean scale scores

	n	Mean	SD	Min.	Max.
Sleep quality	346	7.370	3.665	1.000	21.000
Anxiety	346	12.725	12.794	0.000	52.000

SD: Standard deviation, Min: Minimum, Max: Maximum

Table 3. The correlation analysis between scales

		Sleep quality
Anxiety	r	0.515*
	p	0.000

<0.05; *<0.01; correlation analysis

Table 4. The effect of anxiety on the prediction of sleep quality regression analysis							
Dependent variable	**Independent variable**	**ß**	**t**	**p**	**F**	**Model (p)**	**R2**
Sleep quality	Constant	5.493	23.006	0.000	124.106	0.000	0.263
	Anxiety	0.148	11.140	0.000			

Table 5. The differences in sleep quality and anxiety scores according to descriptive characteristics of students			
Demographic features	**n**	**Sleep quality**	**Anxiety**
Gender		Mean ± SD	Mean ± SD
Male	102	7.167±3.820	9.922±10.215
Female	244	7.455±3.603	13.898±13.577
t=	-	-0.666	-2.659
p=	-	0.506	**0.003**
Mother's educational status		Mean ± SD	Mean ± SD
Illiterate	144	7.389±3.436	13.215±13.332
Literate	50	7.000±3.817	12.700±12.578
Primary school	118	7.458±3.711	11.263±11.395
High school and above	34	7.529±4.308	15.765±15.086
F=	-	0.214	1.227
p=	-	0.887	0.300
Father's educational status		Mean ± SD	Mean ± SD
Illiterate	17	6.824±2.834	9.471±13.068
Literate	45	7.111±3.582	15.889±14.573
Primary school	149	7.644±3.716	10.228±10.221
High school	98	7.347±3.888	15.429±14.325
Undergraduate	37	6.892±3.348	13.270±13.688
F=	-	0.515	3.598
p=	-	0.725	**0.007**
Post-hoc=	-	-	2>3. 4>3 (p<0.05)
Economic status		Mean ± SD	Mean ± SD
Income less than expenses	129	7.969±4.123	12.992±13.192
Income equal to expenses	194	7.016±3.328	12.773±12.435
Income more than expenses	23	7.000±3.357	10.826±13.921
F=	-	2.776	0.282
p=	-	0.064	0.755
Family type		Mean ± SD	Mean ± SD
Elementary family	251	7.534±3.676	12.976±13.260
Extended family	95	6.937±3.620	12.063±11.513
t=	-	1.354	0.592
p=	-	0.177	0.554
Number of individuals in family		Mean ± SD	Mean ± SD
1-5	93	7.602±3.557	13.247±13.419
6-10	220	7.377±3.746	12.868±12.763
11 and above	33	6.667±3.425	10.303±11.196
F=	-	0.794	0.681
p=	-	0.453	0.507
Residence		Mean ± SD	Mean ± SD
City	188	7.468±3.688	13.186±13.586
District	115	6.922±3.388	11.652±11.110

Table 5. Continued			
Village	43	8.140±4.178	13.581±13.523
F=	-	1.885	0.621
p=	-	0.153	0.538
Presence of chronic disease		Mean ± SD	Mean ± SD
No	310	7.277±3.615	11.994±12.119
Yes	36	8.167±4.039	19.028±16.471
t=	-	-1.380	-3.163
p=	-	0.169	0.017
Using continuous medication		Mean ± SD	Mean ± SD
No	315	7.178±3.566	11.565±11.564
Yes	31	9.323±4.134	24.516±18.024
t=	-	-3.149	-5.610
p=	-	**0.002**	**0.000**
House type		Mean ± SD	Mean ± SD
Slum	26	7.500±4.236	11.731±10.894
Flat	210	7.462±3.537	12.919±13.292
Other	110	7.164±3.789	12.591±12.320
F=	-	0.256	0.108
p=	-	0.775	0.898
Smoking status		Mean ± SD	Mean ± SD
No	213	7.009±3.567	10.864±9.953
Yes	133	7.947±3.758	15.707±15.943
t=	-	-2.330	-3.480
p=	-	**0.020**	**0.002**
Presence of disabled person in family		Mean ± SD	Mean ± SD
No	315	7.225±3.640	11.794±11.997
Yes	31	8.839±3.652	22.194±16.558
t=	-	-2.354	-4.434
p=	-	0.019	0.002
Heath evaluation		Mean ± SD	Mean ± SD
Good	165	6.436±3.427	9.164±10.144
Moderate	149	7.812±3.412	15.141±14.029
Bad	32	10.125±4.286	19.844±13.777
F=	-	16.904	15.151
p=	-	**0.000**	**0.000**
Post-hoc=	-	2>1. 3>1. 3>2 (p<0.05)	2>1. 3>1 (p<0.05)
Application to healthcare institution in last several months		Mean ± SD	Mean ± SD
No	247	7.117±3.582	11.866±12.413
Yes	99	8.000±3.812	14.869±13.526
t=	-	-2.034	-1.981
p=	-	**0.043**	**0.048**
Regular exercise status		Mean ± SD	Mean ± SD
No	271	7.620±3.572	13.458±12.885
Yes	75	6.467±3.874	10.080±12.177
t=	-	2.429	2.033
p=	-	**0.016**	**0.043**
Regular nutrition		Mean ± SD	Mean ± SD

No	181	8.403±3.537	14.934±13.922
Yes	165	6.236±3.473	10.303±10.969
t=	-	5.742	3.414
p=	-	**0.000**	**0.001**
Having sleep problems		Mean ± SD	Mean ± SD
No	180	5.511±2.723	9.739±11.224
Yes	166	9.386±3.491	15.964±13.613
t=	-	-11.558	-4.655
p=	-	**0.000**	**0.000**
Presence of individual over the age of 65 at home		Mean ± SD	Mean ± SD
No	268	7.116±3.635	10.160±9.900
Yes	78	8.244±3.658	21.539±17.089
t=	-	-2.409	-7.437
p=	-	**0.017**	**0.000**
Being infected with Coronavirus		Mean ± SD	Mean ± SD
No	295	7.000±3.495	10.661±11.218
Yes	51	9.510±3.921	24.667±14.794
t=	-	-4.648	-7.823
p=	-	**0.000**	**0.000**
Being infected with Coronavirus in family		Mean ± SD	Mean ± SD
No	131	6.733±3.739	9.840±11.809
Yes	215	7.758±3.573	14.484±13.076
t=	-	-2.544	-3.322
p=	-	**0.011**	**0.001**
Presence of relative dying due to Coronavirus		Mean ± SD	Mean ± SD
No	261	7.096±3.665	11.065±11.825
Yes	85	8.212±3.556	17.824±14.304
t=	-	-2.456	-4.338
p=	-	**0.015**	**0.000**
Having undergone Coronavirus quarantine		Mean ± SD	Mean ± SD
No	281	7.317±3.670	12.317±12.886
Yes	65	7.600±3.665	14.492±12.329
t=	-	-0.561	-1.236
p=	-	0.575	0.217
SD: Standard deviation			

type, being chronically ill, housing type, and sleep quality of the students who participated in the study (p>0.05) (Table 5). Among the students who participated in the study, the sleep quality scores of those who used continuous drugs, smoked, had a family member with a disability and a family member over the age of 65 were found to be high and significant (p<0.05). The sleep quality scores of those who evaluated their health as "moderate", applied to a health institution in the last few months, did not exercise regularly, and did not eat regularly were found to be "high" and "significant" (p<0.05) (Table 5). The sleep quality scores of the students who were infected with Coronavirus, those who had Coronavirus in their families, and/or those who had a relative who died from the Coronavirus were found to be "high" and "significant" among the students who participated in the study (p<0.05) (Table 5).

Discussion

In the present study, it was found that students experienced "severe anxiety" and had poor sleep quality during the pandemic process. In the study of Kabeloğlu and Gül (3), it was found that sleep quality deteriorated and the frequency of depression and anxiety increased during the COVID-19 pandemic. There were studies in the literature reporting that adults had high perceived stress levels because of the COVID-19 pandemic (19-21). In a study that was conducted by Yüksel Kaçan et al. (22), it was found that students experienced sleep

problems that affected their sleep quality negatively during the COVID-19 pandemic. In the study that was conducted by Kök Eren (23), it was determined that 65.3% of the participants had sleep problems at "bad sleep level" after COVID-19. It was found in studies conducted on the COVID-19 pandemic that the sleep quality of the participants was low (10,7). In the study of Aşılar et al. (24), it was reported that 60.4% of university students had poor sleep quality. It can be said that measures such as staying at home, distance education, mask, social distancing, hygiene, which were put into effect by the administrations of countries after the pandemic, the absence of a definitive cure despite the spread of the disease, information pollution, etc. increased mental disorders such as depression and anxiety and sleep disorders in students.

A positive and significant relation was detected between the anxiety and sleep quality of the students. Similarly, in the study of Kök Eren (23), anxiety levels were found to be higher in those who had sleep problems before and/or after COVID-19. In their study, Kabeloğlu and Gül (3) found a positive correlation between PSQI scores and BAI scores. Studies conducted abroad during the COVID-19 pandemic also reported that there was a significant relationship between sleep quality and anxiety (25,26). In their study, Başkan and Güneş (19) reported that as perceived stress increased, sleep quality decreased. A study that was conducted in China showed that reducing common stress could help improve the sleep quality of individuals (7). The stress caused by the COVID-19 pandemic has not only affected the mood of the students but also caused sleep disturbances.

It was found in the present study that female students experienced more anxiety because of the COVID-19 outbreak than male students, but gender did not affect sleep quality. Similar results were reported in the literature (19,23,27). This may be because women were more sensitive and focused more on details. There were also studies in the literature reporting that there were no relations between gender and sleep quality (23,10,28-30). The fact that anxiety was found to be higher in female students may be related to physiological conditions such as genetic predisposition, hormone, and cortisol levels of women. Gender may not affect sleep quality.

The economic situation does not affect the anxiety and sleep quality of students. Similar to the study found, the studies that were conducted by Ergün et al. (31) and Aşılar et al. (24) also found that there were no relations between economic status and sleep quality (24-31). Poor economic situation may not be a significant risk factor for students to experience anxiety.

The anxiety and sleep quality scores of the students who smoked were found to be elevated. Studies in the literature were also consistent with the results of this study (32,33). This can disrupt night sleep, difficulty and stress in falling asleep, and decrease in sleep quality with the stimulating effect of the nicotine in cigarettes.

In the present study, the mean anxiety and sleep quality scores of the students who had disabled individuals and individuals over the age of 65 in their living environment were higher. It can be argued that students were worried about their relatives because of the problems caused by COVID-19.

The anxiety and sleep quality scores of the students who had sleep problems were found to be elevated. In the study that was conducted by Kök Eren (23), it was determined that 183 people (78.9%) who had good sleep levels did not experience sleep problems after COVID-19, and 113 people (65.3%) who had poor sleep levels experienced sleep problems after COVID-19. A study that was conducted in Italy during the COVID-19 pandemic reported that 57.1% of individuals had poor sleep quality (34). Social isolation and other changes in life, which were applied to protect against the virus, affect sleep duration, sleep delay, bedtime and wake-up time, and impair sleep quality (11,35).

The anxiety and sleep quality scores of the students who were infected with the Coronavirus were found to be elevated. The complexity and uncertainties caused by COVID-19 may have affected students' anxiety and sleep quality directly. The anxiety scores and sleep quality scores of the students whose families were infected with the Coronavirus were found to be higher. The fact that a relative was infected with the Coronavirus may have increased the anxiety of the students decreasing their sleep quality. Anxiety scores and sleep quality scores of students who had a relative who died from Coronavirus were also found to be higher. The loss of a relative because of the disease may cause an increase in health concerns in students, and therefore, a decrease in sleep quality.

Conclusion

It can be argued that the anxiety frequency of the students increased and their sleep quality deteriorated during the COVID-19 pandemic period. Smoking affects sleep quality. Having an individual over the age of 65 in the family and a disabled individual affect anxiety and sleep quality scores. The fact that a relative or the students were infected with the Coronavirus and lost a relative because of the Coronavirus affects the anxiety scores and sleep quality scores of the students. Therefore, it is ensured that anxiety levels are controlled by organizing psychoeducational programs for situations identified as risky in sleep quality, and by planning trainings for effective coping methods in stressful situations that they may encounter in later life. In addition, it is recommended that the negative effects of insomnia on physical and mental health be added to the lessons within the scope of the curriculum. It is recommended that similar studies be conducted in larger populations in terms of evaluating the long-term results of COVID-19 with different studies to be done.

Ethics

Ethics Committee Approval: Ethics approval of the study was taken from Mardin Artuklu University Scientific Study and Publication Ethics Commission with the number 34233153-050.06.04 on 11.06.2020.

Informed Consent: The study was conducted on the students who studied in the health departments of Mardin Artuklu University and gave their consent by filling out the questionnaires sent over the electronic link.

Peer-review: Internally and externally peer-reviewed.

Authorship Contributions

Design: S.Ç., V.B.D., H.K., Data Collection or Processing: S.Ç., V.B.D., H.K., Analysis or Interpretation: S.Ç., V.B.D., H.K., Literature Search: S.Ç., V.B.D., H.K., Writing: S.Ç., V.B.D., H.K.

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Pandemi Döneminde Çocuk ve Ergen Psikiyatrisi Polikliniğine Başvuran Çocuklarda Uyku Bozukluğu ve İlişkili Faktörler

Sleep Disorders and Associated Factors in Children Who Admitted to the Child and Adolescent Psychiatry Outpatient Clinics During the Pandemic

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Öz

Amaç: Bu çalışmada, Koronavirüs hastalığı-2019 (COVID-19) pandemisi kısıtlama sürecinde çocukların uyku bozukluğu yaşayıp yaşamadığının, eğer yaşıyorlarsa uyku ile ilgili hangi alanlarda sorun yaşadıklarının saptanması, ayrıca uyku bozukluğunun kronotip ve Koronavirüs anksiyetesi ile ilişkisinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Nisan-Kasım 2020 tarihleri arasında Kocaeli Üniversitesi Çocuk ve Ergen Psikiyatri polikliniklerine başvuran; ilkokul 1-4. sınıfa giden 98 hasta çalışmaya dahil edilmiştir. Ebeveynlere "Sosyodemografik Bilgi Formu", "Çocuk Uyku Alışkanlıkları Anketi", "Çocukluk Dönemi Kronotip Anketi"; çocuklara ise "Koronavirus Anksiyete Ölçeği Kısa Formu" ve pandemi süreci ile ilgili beş maddeden oluşan bilgi formu uygulanmıştır.

Bulgular: Uyku alışkanlıkları anketi toplam puanına bakıldığında, grubun %70,4'ünün klinik olarak anlamlı düzeyde uyku sorunu yaşadığı saptanmıştır. Çalışmamızda gözlenen en yaygın uyku bozuklukları; yatma zamanı direnci, uykuya dalmanın gecikmesi ve gece uyanmalarıdır. Ailede fiziksel hastalık (p=0,019), sigara kullanımı (p=0,032), pandemide uyku düzen değişikliği (p=0,002), annenin uyku değişimi (p=0,006), babanın uyku değişimi (p=0,035), ve iştah değişimi (p=0,010) ile uyku bozukluğu arasında anlamlı ilişki saptanmıştır. Kronotip ölçeğine göre 66 çocuğun sabahçı, 31 çocuğun ara form, bir çocuğun ise akşamcı olduğu gözlenmiştir. Çocukların Koronavirüse yönelik anksiyetesinin düşük olduğu saptanmıştır.

Sonuç: Çalışmamız, çocuklarda pandemi döneminde uyku bozukluğunun belirgin düzeyde olduğunu ancak bu durumun pandemi ile ilişkili anksiyete ya da kronotip ile ilgili sorunlardan çok, uyku düzenlerindeki değişiklik ve ebeveynlerin uykusundaki değişimlerden kaynaklandığını göstermektedir. Polikliniklere başvuran hastaların uyku ile ilgili sorunları değerlendirilirken bu faktörlerin sorgulanması ve bu yönde düzenlemeler yapılması yararlı olacaktır.

Anahtar Kelimeler: COVID-19, uyku bozuklukları, kronotip, Koronavirüs kaygısı

Abstract

Objective: This study determined whether children have sleep disorders during the Coronavirus disease-2019 (COVID-19) pandemic restriction process, and if they do, to determine in which areas they have problems with sleep, as well as to examine the relationship of sleep disorder with chronotype and coronavirus anxiety.

Materials and Methods: In April-November 2020, 98 patients attending Kocaeli University Child Psychiatry clinics and attending primary school 1-4th grade were recruited. "Sociodemographic Form", "Child Sleep Habits Questionnaire", and "Children's Chronotype Questionnaire" were applied to the parents. The short form of the "Coronavirus Anxiety Scale" and the information form about the pandemic process were applied to the children.

Results: According to the sleep habits questionnaire, 70.4% of the group had clinically significant sleep problems. The most common sleep disorders observed in our study; are bedtime resistance, delayed falling asleep, and nighttime awakenings. A significant relationship was found between physical illness in the family (p=0.019), smoking (p=0.032), sleep pattern change during the pandemic (p=0.002), sleep change of the mother (p=0.006) and/or father (p=0.035), change in appetite (p=0.010), and sleep disorder. According to the chronotype scale, 66 children were morning and children's anxiety toward coronavirus was low.

Conclusion: Our study shows that sleep disturbance in children is marked during the pandemic period, but this is due to changes in sleep patterns and parents' sleep rather than problems related to anxiety or chronotype associated with the pandemic. It will be useful to question these factors and make arrangements in this direction when evaluating the sleep-related problems of patients who apply to outpatient clinics.

Keywords: COVID-19, sleep disorders, chronotype, Coronavirus anxiety

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Giriş

Uyku, farkındalığın ve çevresel uyaranlara yanıtın azaldığı, kolaylıkla geri dönebilen yaşamsal periyodik bir süreçtir (1). Davranışsal ve fizyolojik işlevlerde önemli bir rol oynamaktadır. Uykunun; gelişme, enerji tasarrufu, immün yanıtların modülasyonu, biliş, performans, uyanıklık, hastalık ve psikolojik durum dahil olmak üzere birçok hayati işlev için gerekli olduğu saptanmıştır. Öğrenme ve bellek oluşumu ile uyku arasında olumlu yönde anlamlı bir ilişki bulunmuştur (2). Duygusal aktivite sürecinde de son derece önemli olup emosyonel hafızanın hem kodlanmasını hem de birleştirilmesini artırmaktadır (3).

Uyku bozuklukları önemli düzeyde morbiditeye neden olabilmektedir. Yazında, okul çağı dönemindeki çocuklarda kaliteli ve yeterli uyku uyumanın önemi belirtilmekte olup yetersiz uykunun çocuklarda gündüz uykululuk, dikkatsizlik, dürtüsellik, yıkıcı davranışlar, bozulmuş bilişsel işlev, akademik performans ve sosyal zorluklar gibi çeşitli zorluklar ile ilişkili olduğu ifade edilmektedir. Yetersiz uyku ayrıca bağışıklık sistemini ve metabolik süreçleri de olumsuz yönde etkileyebilmekte olup, çocuklarda daha düşük yaşam kalitesi ile ilişkilendirilmektedir (4,5).

Uyku alışkanlıkları kapsamına gün içindeki toplam uyku süresi ve uykunun özellikleri ile birlikte uyanma, uyku ve uykunun sürdürülmesi ile ilişkili tüm tutum ve davranışlar girmektedir. Bu tutum ve davranışlar; yatma zamanı davranışları, uykunun başlatılması, gece uyanmaları, uyku ile ilişkili solunum bozuklukları, parasomniler, sabah uyanma davranışları ve gündüz uykululuk hali olarak sayılabilmektedir (6). Sağlıklı gelişim gösteren çocuklarda da uyku problemleri sıklıkla bildirilmekte olup kesitsel bir çalışmada, okul çağı çocuklarında %25-45 oranında uyku problemleri gözlendiği rapor edilmiştir (1). Yazında okul çağı çocuklarının %25'inin yatağa yatma, uykuya dalma ve uykuyu sürdürmede güçlük yaşadığı da belirtilmektedir. Ayrıca uyurgezerlik, kabus görme, diş gıcırdatma, horlama, gece korkuları, sesli nefes alıp verme gibi uyku sorunlarının olduğu da saptanmıştır (7).

Çocuk ve ergen yaş grubundaki yaşamsal stresörler, belirgin bir psikiyatrik bozukluğa yol açmasa da öncelikli olarak uyku düzeninde değişikliklere neden olabilmektedir. Uykuya dalmada gecikme günlük yaşamsal stresörlere bağlı endişelerle ilgili olabilmektedir (8). Koronavirüs hastalığı-2019 (COVID-19) pandemisi, 2019 yılının Aralık ayında Çin'in Wuhan kentinde ortaya çıkmış ve ilk olarak şiddetli akut solunum sendromu-Koronavirüsü-2 olarak adlandırılmıştır. Günümüzde COVID-19 salgını ciddi bir yaşamsal stresör olarak karşımıza çıkmaktadır. Hastalık hızlı bir şekilde yayılmış, okulların kapanması, eğitim ve öğretimin uzaktan eğitim ile sürdürülmesi ve zorunlu olmadıkça dışarı çıkılmaması gibi bazı önlemler alınmıştır. COVID-19 pandemisi sürecinin depresyon, anksiyete ve panik atak gibi durumlara yol açarak insanların günlük yaşamlarını etkilediği bildirilmektedir (9). Çocuk ve ergenler de pandemi ve ilişkili değişikliklerden ciddi şekilde etkilenmiş ve kaygıları artmıştır (5). Salgın sürecinde çocuklar sadece enfeksiyon bulaşması açısından kaygı yaşamamış aynı zamanda; uzun süre evde kalma, zorunlu izolasyon, okula gidememe, fiziksel aktivitenin azalması, arkadaş ilişkilerinin kısıtlanması gibi birçok olumsuz durumla da karşı karşıya kalmıştır (9). Pandemi sürecinin getirdiği kaygı ve rutindeki değişiklikler uyku üzerinde olumsuz etkisi olan etmenlerdendir (10). Yazında pandemi döneminde çocuk ve ergenlerde uyku bozukluklarının ve kabusların sık görülen sorunlar arasında olduğu bildirilmektedir (9).

Türkiye'de ilkokul çağındaki çocuklarda COVID-19 pandemisinin uyku bozuklukları üzerindeki etkisi hakkında nispeten az şey bilinmektedir. Bu nedenle, çalışmamızda COVID-19 pandemisi sürecinde uzaktan eğitim, ebeveynlerin esnek çalışma saatleri veya evden çalışma gibi önlemlerin uygulandığı dönemde, ilkokul 1-4. sınıfa giden çocukların uyku bozukluğu yaşayıp yaşamadığının, eğer yaşıyorlarsa uyku ile ilgili hangi alanlarda sorun yaşadıklarının saptanması, ayrıca uyku bozukluğunun kronotip ve Koronavirüs anksiyetesi ile ilişkisinin incelenmesi amaçlanmıştır. Sonuçların yazına katkı sağlayacağı ve sorun görülen alanlarda ailelere ve çocuklara uygun öneriler verilmesi açısından yararlı olacağı düşünülmektedir.

Gereç ve Yöntemler

Çalışma için, Kocaeli Üniversitesi Tıp Fakültesi (KÜTF) Klinik Araştırmalar Etik Kurulu'nun 26.11.2020 tarih GOKAEK-2020/20.20 sayılı kararı ile etik kurul onayı ve Sağlık Bakanlığı'ndan gerekli izinler alınmıştır. Çalışma kesitsel bir çalışma olup Türkiye'de ilk olgunun görüldüğü 11 Mart 2020 tarihinden sonraki 1 ay uyum süreci olarak değerlendirilmiştir. 11 Nisan 2020 - 30 Kasım 2020 tarihleri arasında, KÜTF Çocuk ve Ergen Psikiyatri Anabilim Dalı polikliniklerine birebir veya online olarak başvuran, çalışmaya katılmaya onay veren, ilkokul 1-4. sınıfa giden, verilen formları doldurabilen 98 hasta alınmıştır. Orta ya da ağır mental retardasyon, otizm spektrum bozukluğu ya da konuşma ve anlamayı engelleyecek düzeyde dil sorunu olan veya verilen formları doldurmayı engelleyecek düzeyde akademik becerilerinde yetersizliği olan çocuklar çalışma dışı bırakılmıştır.

Çalışma için her hasta ve ebeveyninden onam alınmış, hastaların ebeveynlerine birebir veya online anket olarak sosyodemografik bilgi formu, çocuk uyku alışkanlıkları anketi, çocukluk dönemi kronotip anketi uygulanmış, çocuklara ise Koronavirüs anksiyete ölçeği kısa formu uygulanmıştır. Çocuklardan ayrıca pandemi süreci ile ilgili 5 maddeden oluşan bir bilgi formunu doldurmaları istenmiştir.

Sosyodemografik Bilgi Formu: Araştırmacılar tarafından hazırlanan bu form çocukların yaş, cinsiyet, pandemi sürecinde evde vakit geçirme şekli, yeme alışkanlıkları, anne babanın yaş, evlilik, sağlık ve eğitim durumu, aynı evde yaşayan kişilerin uyku düzeni ve COVID-19 pandemisinin etkileri ile ilgili bilgilerin alındığı sorulardan oluşmuştur.

Çocuk Uyku Alışkanlıkları Anketi: Ülkemizde ilkokul çağı çocuklarında uyku alışkanlıklarının ve uyku ile ilişkili sorunların değerlendirilmesinde en sık kullanılan ölçeklerden biridir. Ölçek, Owens ve ark. (11) tarafından 2000 yılında geliştirilmiştir. Toplam 33 maddeden oluşmaktadır. Ölçek; yatma zamanı direnci, uykuya dalmanın gecikmesi, uyku süresi, uyku kaygısı, gece uyanmaları, parasomniler, uykuda solunumun bozulması, gün içinde uykululuk alt boyutlarından oluşmaktadır. Ölçek,

anne baba tarafından doldurulmaktadır. Ölçeğin kesim puanı 41 olup, 42 puan ve üzerindeki değerler "klinik düzeyde anlamlı" olarak kabul edilmektedir. Anketin Türkçe geçerlilik ve güvenirlilik çalışmaları 2010 yılında Perdahlı Fiş ve ark. (12) tarafından yapılmıştır.

Çocukluk Dönemi Kronotip Anketi: 2009 yılında Werner ve ark. (13) tarafından çocukluk çağı sirkadiyen ritmi değerlendirmek amacıyla geliştirilmiştir. Aile tarafından doldurulan form, 27 sorudan oluşmakta ve çocukların kronotipinin saptanmasına yardımcı olmaktadır. Anket, boş günlerdeki ortalama uyku miktarını, sabahlık/akşamlık skorunu ve kronotip skorunu belirlemektedir. On altı madde ile uyku/uyanıklık parametreleri, 10 madde ile akşam ve gündüz tercihleri, 1 madde ile de kronotipi sorgulanmaktadır. Yirmi üç ve altında puan alanlar sabahlık form, 24-32 puan alanlar ara form, 33 ve üzeri puan alanlar akşamlık form olmak üzere üç kronotip tanımlanmıştır. Ölçeğin Türkçe geçerlilik ve güvenilirlik çalışması Dursun ve ark. (14) tarafından 2015 yılında yapılmıştır.

Koronavirüs Anksiyete Ölçeği: Lee (15) tarafından 2020 yılında COVID-19 pandemisi ile ilişkili olası disfonksiyonel anksiyete olgularını tanımlamak için geliştirilen bir ölçektir. Ölçeğin puanlanması 0 (hiçbir zaman) - 4 (son iki haftada neredeyse her gün) olacak şekilde 5'li Likert türde olup ölçek 5 soru ve tek boyuttan oluşmaktadır. Ölçeğin 9 puanlık optimize edilmiş bir kesme puanı kullanarak disfonksiyonel kaygısı olan ve olmayan kişiler arasında iyi bir ayrım yaptığı belirtilmiştir. Ölçeğin Türkçe geçerlilik ve güvenilirlik çalışması ise Biçer ve ark. (16) tarafından 2020 yılında yapılmıştır.

İstatistiksel Analiz

İstatistiksel değerlendirme IBM SPSS 20.0 (IBM Corp., Armonk, NY, USA) paket programı ile yapılmıştır. Normal dağılıma uygunluk Kolmogorov-Smirnov testi ile değerlendirilmiştir. Normal dağılım gösteren nümerik değişkenler ortalama ± standart sapma, normal dağılım göstermeyen nümerik değişkenler medyan (minimum-maksimum), kategorik değişkenler ise frekans (yüzde) olarak verilmiştir. İki grup arasındaki farklılık normal dağılıma sahip olmayan nümerik değişkenler için Mann-Whitney U testi ile belirlenmiştir. İkiden fazla grup arasındaki farklılık normal dağılıma sahip olmayan nümerik değişkenler için Kruskal-Wallis testi ile değerlendirilmiştir. İki yönlü hipotezlerin testinde $p<0,05$ istatistiksel önemlilik için yeterli kabul edilmiştir.

Bulgular

Çalışmamıza 62'si erkek, 36'sı kız toplam 98 çocuk dahil edilmiştir. Çocukların yaş ortalaması 8,59±1,10 (minimum - maksimum: 7-11) olup annelerinin 35,53±5,41, babalarının 39,92±5,00 olarak bulunmuştur. Çocukların 58'inde (%58,6) dikkat eksikliği hiperaktivite bozukluğu, 7'sinde (%7,1) anksiyete bozukluğu, 4'ünde (%4) mental retardasyon, 2'sinde (%2) konuşma bozukluğu, 1'inde (%1) obsesif kompulsif bozukluk, 1'inde (%1) özgül öğrenme güçlüğü, 1'inde (%1) otizm spektrum bozukluğu tanısı mevcuttu. Yirmi dört kişi (%24,2) ise döneme özgü veya eşik altı sorunlar ve danışmanlık için başvurmuş olup herhangi bir ruhsal bozukluk tanısı almamakta idi. Gruptaki 45'i (%45,9) metilfenidat, 3'ü (%3,1) selektif serotonin reuptake inhibitörü, 2'si (%2) atomoksetin, 2'si (%2) ise antipsikotik tedavisi olmak üzere toplam 52 çocuk (%53,1) ilaç tedavisi almakta idi.

Uyku alışkanlıkları anketi toplam puanına bakıldığında, grubun %70,4'ünün "klinik olarak anlamlı düzeyde uyku sorunu" anlamına gelen 42 ve üzeri puan aldığı saptanmıştır. Uyku alışkanlıkları anketi toplam puanı ve alt ölçek puanları ile sosyo-demografik özellikler arasındaki ilişkiler Tablo 1 ve 2'de gösterilmiştir.

Grubun kronotip ölçeği toplam puanı 20,41±5,99 bulunmuştur. Çalışmamızdaki 66 çocuğun sabahçı, 31 çocuğun ara form, 1 çocuğun ise akşamcı olduğu gözlenmiş gruplar arasındaki dağılım farkından dolayı uyku bozuklukları ile ilişki değerlendirilememiştir. Çocukların Koronavirüs anksiyete ölçeği toplam puanı 1,66±2,80 olarak saptanmıştır. Çocukların sadece 2'sinin ölçek puanı 9 ve üzeri bulunmuş olup grubun Koronavirüse yönelik anksiyetesinin düşük olduğu gözlenmiştir.

Tartışma

İyi bir gece uykusu, sağlıklı olabilmek için şart olup çocukların hayatında da birçok alanda önemli bir rol oynamaktadır. Çalışmamızda, COVID-19 pandemisine yönelik kısıtlamaların uygulandığı dönemde polikliniklerimize başvuran ilkokul dönemi çocukları arasında uyku bozukluklarının durumu incelenmiş ve grubun %70,4'ünde uyku bozukluğu olduğu saptanmıştır. Pandemi döneminde Türkiye'de 6-14 yaş arası çocuk ve gençlerle yapılan bir çalışmada uyku bozukluğu görülme oranı %59 olarak bulunmuştur (17). İtalya'da COVID-19 pandemisine yönelik uygulanan karantina sürecinin tüm yaş gruplarındaki çocukların uyku/uyanma düzenlerinde büyük bir gecikmeye ve gençler hariç tüm gruplarda uyku bozukluklarında artışa neden olduğu gösterilmiştir (18). Pandemi öncesi çalışmalara bakıldığında, çocuklarda uyku bozukluğu görülme oranlarının %25-50 arasında değiştiği saptanmıştır (19). Bu sonuçlara baktığımızda çalışmamızda, çocuklarda hem pandemi öncesi hem de pandemi döneminde yapılmış çalışmalara göre belirgin düzeyde yüksek oranda uyku bozukluğu saptanmıştır. Bu durum, pandemi döneminde uyku bozukluğu oranının artmasına ek olarak çalışmaların birçoğunun toplum temelli olması, çalışma grubumuzun ise çocuk psikiyatri polikliniğine başvuran hastalardan oluşmasından kaynaklanıyor olabilir. Yazına bakıldığında fiziksel-cinsel istismar, depresyon, anksiyete bozukluğu gibi ruhsal bozuklukların uyku bozukluğu ile ilişkili olduğu bildirilmektedir (20).

Çalışmamıza katılan çocukların kronotip dağılımına bakıldığında çoğunluğunun sabahçı olduğu, sadece 1 çocuğun akşamcı olduğu gözlenmiştir. Bu sonuç grubun tamamına yakınının gece erken saatlerde yatıp, sabah erken kalktığını göstermektedir. Yine grubun Koronavirüs anksiyete düzeyinin düşük olduğu saptanmıştır. Kronotip ve Koronavirüs anksiyetesi ile uyku bozuklukları arasındaki ilişkinin daha geniş katılımlı çalışmalarla incelenmesinin yararlı olacağı düşünülmüştür.

Çalışmamızda gözlenen en yaygın uyku bozuklukları; yatma zamanı direnci, uykuya dalmanın gecikmesi ve gece uyanmaları olarak saptanmış olup bu sonuçlar mevcut yazın ile uyumlu bulunmuştur (18,21). Karantina döneminde yürütülen bir

Tablo 1. Grubun sosyodemografik özellikleri ile çocuk uyku alışkanlıkları anketi toplam puanı arasındaki ilişki					
	Sayı (n)	**Yüzde (%)**	**Ortalama**	**Standart sapma**	**p**
Cinsiyet					
Kadın	36	36,7	48,08	10,55	0,962
Erkek	62	63,3	47,71	9,58	
Ailede fiziksel hastalık					
Yok	93	94,9	47,35	9,88	0,019
Var	5	5,1	57,00	4,58	
Pandemide okula gidiyor mu?					
Hayır	5	5,1	55,40	8,67	0,075
Evet	93	94,9	47,44	9,84	
Pandemide dersi online takip ediyor mu?					
Hayır	12	12,2	52,83	9,46	0,061
Evet	86	87,8	47,15	9,81	
Aile bireylerinde sigara kullanımı					
Yok	34	34,7	45,00	9,54	0,032*
Var	64	65,3	49,36	9,82	
Okul başarı durumu					
Ortalama ve üstü	78	79,6	47,38	9,66	0,469
Ortalama altı	20	20,4	49,65	10,86	
Pandemi öncesi günlük bilgisayar-telefon kullanımı					
0-30 dk	36	36,7	44,17	9,62	0,029*
30 dk-2 saat	40	40,8	49,65	8,64	
2-4 saat	18	18,4	51,39	11,84	
4-8 saat	3	3,1	47,00	6,37	
Ailede işine devam edemeyen var mı?					
Hayır	74	75,5	47,34	10,15	0,266
Evet	24	24,5	49,42	9,11	
Pandemide çocuğun uyku düzeni pandemi öncesine göre değişti mi?					
Hayır	33	33,7	43,15	7,38	0,002*
Arttı	8	8,2	56,13	9,64	
Azaldı	10	10,2	53,80	11,77	
Saat değişti	47	48,0	48,47	9,57	
Pandemide çocuğun uyku öncesi rutini değişti mi?					
Hayır	63	64,3	46,56	9,45	0,070
Evet	35	35,7	50,17	10,39	
Pandemide annenin uykusu değişti mi?					
Hayır	58	59,2	45,50	8,78	0,006*
Evet	40	40,8	51,25	10,53	
Pandemide babanın uykusu değişti mi?					
Hayır	81	82,7	46,90	9,63	0,035*
Evet	17	17,3	52,35	10,19	
Pandemide kardeşinin uykusu değişti mi?					
Hayır	73	74,5	46,77	9,44	0,068
Evet	25	25,5	51,00	10,71	
Tanıdıklarda COVID-19 nedeniyle hastane yatışı var mı?					
Hayır	64	65,3	46,52	8,84	0,100
Evet	34	34,7	50,35	11,36	

Tanıdıklarda COVID-19 nedeniyle vefat eden var mı?					
Hayır	74	75,5	47,80	9,51	0,891
Evet	24	24,5	48,00	11,23	
Arkadaşlarıyla internet ve telefondan görüşme sıklığı değişti mi?					
Hiç	27	27,6	49,59	10,31	0,139
Nadir	49	50,0	46,90	9,71	
Sık	18	18,4	45,72	9,20	
Çok sık	4	4,1	57,25	8,30	
İştahta değişiklik oldu mu?					
Hayır	56	57,1	45,23	9,09	0,010*
Arttı	31	31,6	51,39	10,16	
Azaldı	11	11,2	51,18	9,84	
Tanı					
Yok	24	24,5	50,00	8,67	0.474
Var	74	75,5	47,15	10,23	
Tanı					
Yok	24	24,5	48,79	8,51	0,140
Nörogelişimsel bozukluk	66	67,3	46,80	10,18	
Anksiyete/OKB	8	8,2	53,25	10,34	
İlaç kullanımı					
Yok	46	46,9	48,33	8,97	0,311
Var	52	53,1	47,42	10,73	
İlaç kullanımı					
Yok	46	46,9	47,70	8,79	0,323
MPH	45	46,9	46,87	10,50	
AD	5	5,1	55,80	13,22	
AP	2	2,0	53,50	7,78	

*p<0,05, COVID-19: Koronavirüs hastalığı-2019, OKB: Obsesif kompulsif bozukluk, MPH: Metilfenidat, AD: Antidepresan, AP: Antipsikotik

çalışmada, çocukların yatma ve uyanma saatlerinin daha ileri saatlere kaydığı, uyku düzenlerinin ve uyku kalitelerinin bozulduğu gözlenmiştir. Çalışmacılar, bu durumun, karantina sürecinde çocukların okula gitmek için erken kalkmaları gerekmemesine bağlı olarak yatakta daha fazla zaman geçirmelerinden kaynaklanabileceğini düşünmüştür. Bu etkinin, annesi çalışmayı bırakan veya eğitime uzaktan devam eden çocuklarda daha belirgin olduğu bildirilmiştir. Çalışmada bu değişikliklerin etkilerinin, çocukların yatakta geçirdikleri süreye yansımış olabileceği ifade edilmiştir (22). Çalışmamızda saptanan yatma zamanına direnç, uykuya dalmanın gecikmesi ve gece uyanmaları, çocukların pandemiye yönelik kısıtlama döneminde fiziksel olarak daha az aktif olması, gece daha geç vakitlerde internet üzerinden oyun oynamaları ve sosyal medya kullanımının olması ile ilişkili olabilir. Ayrıca bu dönemde ebeveynlerin esnek çalışma saatleri ve programlarının olması da uyku saatlerindeki bu değişikliklere yol açmış olabilir.

Çalışmamızda, COVID-19 pandemisine yönelik kısıtlamaların uygulandığı dönemde çocukların uyku öncesi rutinlerinin değişimi ile yatma zamanı direnci ve uyku süresi anlamlı düzeyde ilişkili bulunmuştur. Pandemi döneminde yapılan bir çalışmada uykusu bozulan çocukların günlük rutinlerinde daha fazla değişiklik belirtildiği gözlenmiştir (21). Çocuklar için uyku saati ile ilgili rutinler oluşturulması ve sevecen bir şekilde bunların uygulanması pandemi dönemi dışında da önerilmekte olup pandemi dönemi gibi kaygının artabildiği, belirsizliğin yoğun olduğu stresli dönemlerde daha da önem kazanmaktadır. Yatma zamanına direnmenin, uyku saatlerindeki değişiklikler, anne babanın çocuğun uyku ihtiyacını yanlış yorumlaması, çocuğun ihtiyacından fazla uyumasının istenmesi, aile içi sorunlar, çocuğun korku ya da kaygılarının olması gibi bazı nedenleri olabilir (20). Çocukların yatağa gitme ve yatma zamanları düzenlenmeli, okul ve tatil günlerinde yatma ve kalkma saatlerinin aynı olmasına dikkat edilmelidir. Çalışmamızdaki sonuçlar pandemi döneminde uyku rutinlerinin uygulanmaması, uyku saatlerinde televizyon, bilgisayar ve telefon kullanımının olması gibi nedenlerle çocukların alışkın oldukları uyku düzenlerinin bozulmasına, uyumak istememelerine ve daha kısa süre uyumalarına yol açmış olabileceğini düşündürmüştür.

Ailede organik bir hastalık olması ile uyku alışkanlıkları anketi toplam puanı arasında anlamlı bir ilişki saptanmıştır. Ailede organik hastalık bulunması ile uyku bozuklukları arasındaki ilişkiye spesifik olarak bakıldığında uyku kaygısı ve gece uyanmaları ile belirgin ilişki bulunmuştur. Uyku kaygısı, karanlıkta veya yalnız başına uyumaktan korkma, uykuya dalarken anne babanın odada olmasını isteme gibi maddeleri içermektedir. İnsanlar, COVID-19

pandemisinde enfeksiyon bulaşmasına ve kendileri veya aile üyelerinden birini kaybetmeye dair yoğun kaygılar yaşamış, ekranlarda enfeksiyon ve kayıplarla ilgili görüntü ve haberlere sık sık maruz kalmışlardır. Dünya Sağlık Örgütü'nün COVID-19 raporuna göre ölümlerin genellikle ileri yaştaki hastalarda ya da eşlik eden hipertansiyon, diyabet, kardiyovasküler hastalık, kanser, kronik akciğer hastalıkları gibi sistemik hastalığı olanlarda olduğunu bildirmiştir (23). Bu bilginin medya üzerinden yaygın şekilde paylaşılması ya da aile içinde bu konunun konuşulması çocuklarda uyku sırasında ebeveynlerine bir şey olabileceğine dair kaygıları tetiklemiş olabilir. Bu durumlar da çocuklarda uykuya dalma ile ilgili kaygıya ya da sık uyanmalar yaşamalarına yol açmış olabilir. Bununla birlikte çocukların pandemiye yönelik önlemlerin uygulandığı dönemde aileleri ile daha çok birlikte kalmaları, ebeveynlerinin organik rahatsızlıklarına ve bu rahatsızlıkların oluşturduğu işlev kayıplarına ya da yakınmalarına daha çok maruz kalmaları da kaygıların tetiklenmesine yol açmış olabilir.

Çalışmamızda, örgün eğitime devam etmeyen çocuklarda, devam eden çocuklara göre uyku kaygısı ve parasomniler anlamlı düzeyde yüksek çıkmıştır. Örgün eğitime devam etmek çocukların belli bir düzen oluşturmaları, sosyalleşmeleri ve akranları ile bir arada bulunmalarını sağlayarak çocukların kaygısını azaltmış ve daha rahat bir uyku uyumalarını sağlamış olabilir. Uzaktan eğitimi düzenli şekilde takip etmeyen çocuklarda da, takip edenlere göre gece uyanmaları, parasomniler ve uykuda solunum bozukluğu belirgin düzeyde daha fazla bulunmuştur. Bu durum uzaktan eğitim ve eve kapanmaya bağlı olarak derslere girme ve ders çalışma motivasyonu düşen çocukların dersleri takip edememesine, buna bağlı olarak başarı durumları ile ilgili kaygı yaşamaları ve uyku bozukluklarının oluşmasına yol açmış olabileceği gibi uyku bozukluğu yaşayan çocuklar bu soruna bağlı olarak ders saatlerinde uyuyor ve ders saatlerine uyum gösteremiyor da olabilir.

Yapılan çalışmada aile bireylerinde sigara kullanımı olması ile uykuda solunum bozulması arasında anlamlı bir ilişki bulunmuştur. Sigara ev içi veya balkon gibi dış mekanlarda içilse dahi pasif içiciliğe yol açmaktadır. Aile bireylerinin sigara kullanımı da çocukların pasif içiciliğine neden olup uykuda çocukların solunumunun bozulmasına yol açabilir. 2021 yılında ülkemizde 9045 çocukla yapılan bir çalışmada da sigara dumanı maruziyeti ile uykuda solunum bozukluğu arasında anlamlı bir ilişki saptanmıştır (24). Yazında, pasif sigara dumanı maruziyetinin muhtemelen kimyasal kaynaklı faringeal enflamasyon ve obstrüksiyona yol açan ödem nedeniyle horlamaya yol açtığı bildirilmiştir (25).

Gündüz uykululuğu bir hastalık veya bozukluk olmayıp daha çok uyku bozukluğunun veya başka bir hastalığın belirtisi olabilmekte ve gündüz saatlerinde uyku eğilimi olarak gözlenmektedir. Aşırı gündüz uykululuğu kişilerin yaşam kalitesini belirgin olarak etkileyebilmektedir. Çalışmamızda; evde pandeminin konuşulma sıklığının artması ile gün içinde uykululuk artışı arasındaki ilişki anlamlı bulunmuştur. Arkadaşlarıyla internet ve telefondan görüşme sıklığı fazla olan çocuklarda ise parasomniler ve gün içinde uykululukta belirgin bir artış olduğu saptanmıştır. Evde pandeminin sık konuşulması ve uygunsuz saatlerde internet ve telefon üzerinden uzun arkadaş görüşmelerinin olması çocukların uykuya yatma saatini, uyku hijyenini ve uyku kalitesini bozmuş olabilir.

Çalışma sonuçlarına bakıldığında, tanıdıklarında COVID-19 tanısıyla hastane yatışı olan çocuklarda gece uyanmaları, parasomniler ve uykuda solunum bozuklukları oranları belirgin düzeyde yüksek bulunmuştur. Tanıdıklarda böyle bir sorun olması çocuğun kaygısını artırmış, buna bağlı olarak da uyku sorunlarına yol açmış olabilir. Ayrıca ebeveynlerin bu konu ile ilgili yaşadıkları kaygıyı çocuklarına yansıtması veya tanıdıkları ile ilgilenmeleri sonucu çocukları ile yeterince vakit geçirememeleri çocukların uykularında sorun yaşamasına yol açmış olabilir. Çalışma grubumuzun COVID-19'a yönelik kaygı düzeyinin düşük olduğu (%2) gözlenmiş olup uyku bozukluğu ile anlamlı bir ilişki saptanmamıştır. Daha fazla kişiyi dahil ederek yapılacak sonraki çalışmalarda bu ilişkinin incelenmesi devam eden pandemi sürecinde bu konuda önerilerde bulunabilmek açısından yararlı olacaktır.

Çalışmamızda, ebeveynlerde pandemi döneminde uyku düzen değişikliği olması ile çocuklarda uyku bozukluğu gözlenmesi arasında anlamlı bir ilişkili saptanmıştır. Annede uyku düzeni değişimi çocukta yatma zamanı direnci, uyku kaygısı, gece uyanmaları, parasomniler ve uykuda solunum bozulmasını etkilerken; babanın uyku düzeni değişimi parasomniler ve uykuda solunum bozulmasını etkilemiştir. Yazında birçok çocuğun uykuyu başlatma ve sürdürmede zorluk yaşadığı, yatmayı reddetme, yataktan kalkma, yatma zamanı öfke nöbetleri ve çocuğun ebeveynine fiziksel olarak yakın olmakta ısrar etmesi veya gece uyanmaları sonrası tekrar uykuya geri dönmenin bir tür yatma zamanı direnci davranışları olduğu belirtilmiştir (26,27). Ayrıca, çocukların uyku ve uyanıklık alışkanlıklarının genellikle ebeveynlerinin uyku ve uyanıklık alışkanlıklarına benzer olduğu ve ebeveyn uyku sorunlarının genellikle çocukların uykuyu başlatma ve sürdürmedeki sorunları, uyku-uyanıklık geçiş zorlukları ve daha fazla uykululuk hali ile ilişkili olduğu öne sürülmektedir (28). Ebeveynler ve çocukların uyku düzenleri etkileşim içindedir. Çocuklar ebeveynlerinin sorunlu uyku davranışlarına tepki olarak uyku düzenlerini değiştirebilmekte veya ebeveynler çocukların ihtiyaçlarını karşılamak için uyum sağlama davranışlarında bulunarak kendi uyku davranışlarını değiştirebilmektedir (27-29).

Pandemi döneminde ebeveynlerin ve çocukların uyku bozukluklarının incelendiği bir çalışmada, kadın olmak ve çocuğunda uyku bozukluğu olması, ebeveynlerde uyku sorununun önemli belirleyicileri olarak saptanmış ve ebeveynlerde en sık görülen uyku sorununun uykuya dalma sorununun gecikmesi olduğu belirtilmiştir. Bu uyku sorunlarının yetişkinlerde daha çok kaygı ve korku gibi duygusal kaygılara, çocuk ve ergenlerde ise rutindeki değişikliklere bağlı olabileceği ifade edilmiştir (21). Çalışmamızda saptanan ebeveynlerin yaşadığı uyku sorunları; COVID-19 pandemisine ilişkin kaygıları ya da pandemiye yönelik kısıtlamalara bağlı düzen değişikliğinden kaynaklanıyor olabilir. Ayrıca ebeveynlerin uykuya geçişte sorun yaşaması ve başka şekillerde zaman geçirmesi, çocukların da ebeveynleri ile zaman geçirmek istemesine ve yatma zamanına direnmesine yol açmış olabilir. Bir çalışmada, ailelerde COVID-19 sebebiyle artan

Tablo 2. Grubun sosyo-demografik özellikleri, tanıları ve ilaç kullanımları ile çocuk uyku alışkanlıkları anketi alt ölçek puanları arasındaki ilişki

Sosyo-demografik bilgiler	Yatma zamanı direnci		Uykuya dalmanın gecikmesi		Uyku süresi	
	p	r	p	r	p	r
Çocuğun cinsiyeti	0,870	0,019	0,542	-0,057	0,504	-0,038
Annenin eğitim düzeyi	0,167	0,165	0,564	0,063	0,596	-0,086
Babanın eğitim düzeyi	0,343	-0,088	0,815	-0,029	0,110	-0,185
Annenin mesleği	0,270	-0,098	0,603	-0,043	0,180	-0,176
Babanın mesleği	0,864	0,007	0,793	-0,044	0,271	0,184
Kardeş sayısı	0,995	0,049	0,924	-0,52	0,903	0,021
Ailede fiziksel hastalık	0,055	0,200	0,135	0,128	0,310	-0,108
Ailede ruhsal hastalık	0,777	0,014	0,200	0,129	0,114	0,119
Ailenin toplam geliri	0,327	-0,079	0,994	-0,006	0,843	0,017
Çocukta fiziksel hastalık	0,726	-0,033	0,941	-0,019	0,250	-0,088
Çocuğun okula devam durumu	0,102	-0,164	0,854	-0,013	0,710	0,011
Çocuğun pandemide online ders takip durumu	0,056	-0,182	0,622	0,041	0,413	-0,126
Çocuğun okul başarı durumu	0,204	0,071	0,943	-0,014	0,301	-0,050
Aile bireylerinde sigara kullanımı	0,017*	0,222	0,923	-0,009	0,074	0,165
Pandemi öncesi bilgisayar kullanımı	0,045*	0,232	0,273	0,142	0,141	0,142
Pandemide bilgisayar kullanımı	0,334	0,181	0,407	0,091	0,783	0,036
COVID-19 hakkında internetten araştırma yapma durumu	0,977	-0,006	0,951	0,005	0,734	0,047
COVID-19 hakkında arkadaşlarıyla konuşma durumu	0,980	-0,005	0,526	-0,070	0,123	0,153
Pandemide ailede işine devam edememe durumu	0,285	0,111	0,629	0,055	0,185	0,143
Evde pandeminin konuşulma sıklığı	0,511	-0,071	0,181	0,034	0,149	0,068
Pandemide çocuğun uyku düzeni değişimi	0,011*	0,262	0,029*	0,115	0,075	0,080
Pandemide çocuğun uyku öncesi rutin değişimi	0,018*	0,223	0,189	0,147	0,049*	0,234
Pandemide annenin uyku düzeni değişimi	0,011*	0,264	0,707	0,046	0,179	0,180
Pandemide babanın uyku düzeni değişimi	0,066	0,197	0,180	0,139	0,768	-0,047
Pandemide kardeşin uyku düzeni değişimi	0,046*	0,226	0,308	0,090	0,593	-0,043
Tanıdıklarında COVID-19 tanısı ile hastanede yatış durumu	0,204	0,140	0,923	0,009	0,101	0,164
Tanıdıklarında COVID-19 sebebi ile vefat durumu	0,638	0,030	0,629	0,055	0,665	0,027
Arkadaşlarıyla internet ve telefondan görüşme sıklığı	0,628	-0,068	0,428	0,140	0,207	0,129
Çocuğun iştahında değişiklik durumu	0,040*	0,226	0,006*	0,201	0,337	0,030
Psikiyatrik bozukluk tanısı; yok/var	0.160	-0,203	0,592	0,033	0.697	0,006
Psikiyatrik bozukluk tanısı; Yok Nörogelişimsel bozukluk Anksiyete/OKB	0,147	-0,053	0,765	0,025	0,714	0,016
Psikiyatrik ilaç kullanımı; yok/var	0,535	-0,110	0,092	0,145	0.926	0,031
Psikiyatrik ilaç kullanımı; Yok MPH AD AP	0,374	0,006	0,259	0,148	0.409	0,072

*p<0,05, MPH: Metilfenidat, AD: Antidepresan, AP: Antipsikotik

Tablo 2. Grubun sosyo-demografik özellikleri, tanıları ve ilaç kullanımları ile çocuk uyku alışkanlıkları anketi alt ölçek puanları arasındaki ilişki

	Uyku kaygısı		Gece uyanmaları		Parasomniler		Uykuda solunum bozulması		Gün içinde uykululuk	
	p	r	p	r	p	r	p	r	p	r
	0,440	0,058	0,653	0,027	0,793	-0,005	0,773	-0,078	0,360	0,059
	0,125	0,183	0,875	0,046	0,468	-0,057	0,054	-0,016	0,876	-0,102
	0,743	0,013	0,429	-0,082	0,490	-0,078	0,074	-0,224	0,227	-0,169
	0,416	-0,052	1,000	-0,023	0,343	0,021	0,563	-0,136	0,225	-0,084
	0,669	0,023	0,853	-0,067	0,628	0,050	0,026*	0,306	0,987	-0,022
	0,975	0,049	0,653	0,116	0,594	-0,064	0,780	-0,166	0,359	0,166
	0,031*	0,225	0,028*	0,217	0,050	0,139	0,492	-0,016	0,068	0,165
	0,948	0,022	0,365	0,069	0,086	0,187	0,103	0,167	0,762	0,004
	0,506	-0,088	0,971	-0,006	0,987	-0,013	0,397	-0,054	0,121	-0,180
	0,681	0,046	0,660	0,057	0,302	0,067	0,162	-0,014	0,567	-0,073
	0,022*	-0,225	0,061	-0,160	0,036*	-0,139	0,777	0,056	0,303	-0,079
	0,303	-0,085	0,039*	-0,178	0,009*	-0,287	0,003*	-0,222	0,748	0,058
	0,622	0,004	0,672	0,040	0,953	0,108	0,168	0,127	0,134	0,193
	0,455	0,071	0,125	0,130	0,004*	0,281	0,009*	0,247	0,605	-0,053
	0,636	0,119	0,433	0,052	0,819	0,098	0,593	0,176	0,049*	0,151
	0,399	0,129	0,544	0,100	0,413	0,149	0,236	0,205	0,985	0,076
	0,623	-0,069	0,769	0,017	0,811	0,083	0,400	0,183	0,858	-0,021
	0,261	-0,119	0,758	-0,018	0,868	0,023	0,106	0,195	0,287	0,076
	0,452	0,095	0,245	0,112	0,038*	0,187	0,608	-0,052	0,381	-0,088
	0,271	-0,129	0,228	-0,096	0,305	-0,137	0,869	0,047	0,011*	0,253
	0,242	0,146	0,005*	0,224	0,123	0,109	0,256	-0,026	0,319	0,034
	0,569	0,067	0,546	0,033	0,964	0,027	0,155	0,115	0,879	0,049
	0,026*	0,241	0,027*	0,219	0,009*	0,279	0,038*	0,141	0,668	0,045
	0,166	0,146	0,083	0,165	0,023*	0,213	0,044*	0,183	0,373	0,054
	0,049*	0,237	0,302	0,104	0,126	0,137	0,257	0,081	0,611	0,047
	0,735	0,038	0,033*	0,145	0,019*	0,256	0,006*	0,310	0,949	-0,027
	0,749	-0,025	0,608	-0,004	0,635	-0,008	0,047*	0,175	0,420	-0,081
	0,725	-0,103	0,548	-0,083	0,087*	-0,173	0,299	0,050	0,049*	0,098
	0,049*	0,218	0,043*	0,237	0,050	0,242	0,547	0,085	0,203	0,094
	0.197	-0,198	0,236	-0,156	0.393	0,111	0.660	0,052	0,539	-0,118
	0,030*	-0,014	0,169	-0,006	0,311	0,174	0,204	0,124	0,398	0,017
	0.610	-0,106	0,603	-0,105	0,528	0,109	0.385	0,054	0,510	-0,095
	0.040*	0,041	0,164	0,077	0,318	0,208	0,457	0,166	0,933	-0,044

endişe ve korkuların; COVID-19 pandemisi süreci ve sokağa çıkma yasağı ile ilişkili olduğu gösterilmiştir (22). Türkiye'de de bu süreçte alınan yüz yüze eğitime ara verilip uzaktan eğitime geçilmesi, sokağa çıkma yasaklarının uygulanması, ebeveynlerin evden çalışmaya başlaması gibi önlemler benzer şekilde kaygıyı arttırmış olabilir. Çalışmamızda ebeveynlerdeki uyku düzen değişikliğinin aksine çocuklarda kronotip bozukluğu ile uyku bozukluğu arasında anlamlı bir ilişki saptanmamıştır.

Çalışmamızda, iştah artışı ile uyku bozukluklarının ilişkili olduğu gözlenmiştir. Özellikle yatma zamanı direnci, uykuya dalmanın gecikmesi, uyku kaygısı ve gece uyanmaları ile anlamlı düzeyde ilişkili bulunmuştur. Erişkin popülasyonda yapılmış olan bazı çalışmalarda uyku bozuklukları daha fazla gıda tüketimiyle ilişkilendirilmiştir. Erişkinler ile yapılan bir araştırmada, bozulan uyku düzeninin hem homeostatik hem de homeostatik olmayan bir yeme dürtüsünü indüklediği belirtilmiştir. Vücut, artan uyanıklık ve bunun sonucunda harcanan enerjide artıştan kaynaklanan enerji eksikliğini telafi etmeye çalışmakta, uykunun azalması nedeniyle de yemek yemeye yönelik istek artabilmektedir (30).

Sonuç

Türkiye'de COVID-19 pandemisi sırasında çocuk ruh sağlığı polikliniklerine başvuran ilkokul çocuklarında uyku bozukluklarının sık olduğu saptanmıştır. En yaygın uyku bozukluklarının yatma zamanı direnci, uykuya dalmanın gecikmesi ve gece uyanmaları olduğu gözlenmiş, özellikle ebeveynlerin uyku düzenindeki değişim çocuklardaki uyku bozuklukları ile ilişkili bulunmuştur.

Yazında, pandemi öncesi düzene dönüldükten sonra da uyku alışkanlıkları üzerinde kalıcı bir etkiye sahip olma potansiyeli nedeniyle, COVID-19 pandemisinin çocuk ve ergenlerin uyku alışkanlıkları üzerindeki olası etkileri ve bu dönemde gözlenen uyku alışkanlığı değişiklikleri hakkında araştırma yapılması gerekliliği vurgulanmıştır. Çalışmanın pandeminin kısıtlama döneminde yapılması ve bu dönemde hastane başvurularının azalması nedeniyle hasta sayısının görece az olması, çalışmaya polikliniğe başvuran hastaların alınması ve formların bir kısmının online form olarak doldurulması çalışmamızın kısıtlılıkları arasındadır.

Polikliniklere başvuran hastaların ve ebeveynlerinin uyku düzenlerinin değerlendirilmesi ve ebeveyn ve çocuklara uyku kalitesi ve düzeninin önemi hakkında bilgi verilmesi hem mevcut sorunların çözülmesine hem de sorunların kronikleşmesini önlemeye yarayacaktır.

İyi bir uyku için, ebeveynler çocukların fiziksel aktivitelerini desteklemeli ve güneş ışığına maruz kalmalarına teşvik etmelidir. Uyku hijyeni ile ilgili öneriler uygulanmalı, 30 dakikadan fazla farklılık göstermeyen yatma/uyanma saatleri belirlenmelidir. Ebeveynler, çocukları uyumayı reddettiğinde fazladan kitaplar okuyarak, sırtını ovalayarak ve şarkılar söyleyerek onlarla ilgilenebilmekte ve yatma saati gecikebilmektedir. Bu yaklaşım başlangıçta yararlı gözükmekle birlikte çocuk uykuya direnerek sürekli olarak ebeveynlerin dikkatini çektiğini veya başka kazanımlar elde ettiğini fark edebilir. Bu durum da çocuğun uyumaya başlaması ve sürdürmesi konusunda daha fazla probleme neden olabilir. Bu nedenle ebeveynlerin uyku saatindeki yaklaşımlarının sorgulanması, çocuklarla gün içinde kaliteli vakit geçirilmesi ve ilgilenilmesi uyku saatinde yaşanan bu durumu önlemekte yararlı olacaktır. Mavi ışığa maruz kalmayı sınırlamak için dizüstü bilgisayarlar, tabletler, akıllı telefonlar yatma saatinden belli bir süre önce yatak odalarından çıkarılmalıdır. Çocukların kaygı duygularını hafifletmeyi amaçlayan bilgilendirmeler yapılmalı, COVID-19 hakkında gelişimsel olarak uygun eğitim araçları kullanılmalıdır.

Pandemi dönemi, bireylerin ruh sağlığı üzerinde etkilere yol açmış ve açmaya da devam edecektir. Ebeveynlerin de bu süreçte uyku düzenlerini sağlamaları, uyku rutinlerine devam etmeleri, mevcut kaygıları varsa buna yönelik destek almaları çocuklarının ruh sağlığını ve uyku kalitesini olumlu etkileyecektir. Uyku bozukluğu olan çocuklara ve ailelerine özel eğitim programları oluşturulabilir. Çocuklara yönelik müdahaleler, ebeveynler aracılığıyla uyku eğitimi, uykusuzluk için bilişsel davranışçı terapi ve pandemi dönemi sebebiyle olası bir travma sonrası stres bozukluğu varsa bu durumun tedavisi ile ilgili müdahaleler önerilmektedir.

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Hasta Onayı: Çalışma için her hasta ve ebeveyninden onam alınmıştır.

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Validity and Reliability of the Turkish Version of the Parkinson Disease Sleep Scale-2

Parkinson Hastalığı Uyku Ölçeği-2'nin Türkçe Geçerlik ve Güvenirliği

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Abstract

Objective: Sleep problems are one of the most common non-motor symptoms of Parkinson's disease (PD). To better manage sleep problems, they must first be identified and evaluated. The study aimed to evaluate the validity and reliability of the Turkish version of the Parkinson Disease Sleep Scale-2 (PDSS-2).

Materials and Methods: The study was conducted with 135 individuals with PD, between April 2019 and January 2021. The data were collected using the patient information form and the PDSS-2. The confirmatory factor analysis, psycholinguistic evaluation, and content validity testing were conducted to test the construct validity of the scale. Item total score correlation, Cronbach's alpha coefficient, and test-retest analyses were performed to test the reliability of the scale.

Results: The content validity ratio of the scale was calculated as 0.875 and 1. When the model related to the scale was examined with the confirmatory factor analysis, it was observed that the fit indices were at a good level. The Cronbach's alpha was found to be 0.90 for the scale and between 0.71-0.81 for the sub-dimensions, indicating high reliability. The item-total correlations were found to be sufficient (between 0.31 and 0.78). The test-retest reliability coefficient was 0.91, indicating high consistency.

Conclusion: It has been determined that the Turkish version of the PDSS-2 is a valid and reliable measurement tool.

Keywords: Parkinson disease, reliability and validity, sleep, sleep disorder

Öz

Amaç: Uyku problemleri, Parkinson hastalığının (PH) en yaygın motor olmayan semptomlarından biridir. Uyku sorunlarını daha iyi yönetebilmek için ise öncelikle değerlendirilmesi ve tespit edilmesi gerekmektedir. Bu çalışma, Parkinson Hastalığı Uyku Ölçeği-2'nin (PHUÖ-2) Türkçe formunun geçerlik ve güvenilirliğini değerlendirmek amacıyla yürütülmüştür.

Gereç ve Yöntem: Araştırmaya, Parkinson tanısı kesinleşmiş 135 hasta dahil edilmiş ve çalışma Nisan 2019-Ocak 2021 tarihleri arasında yürütülmüştür. Veriler, Hasta Bilgi Formu ve PHUÖ-2 kullanılarak toplanmıştır. Ölçeğin geçerliğini test etmek için; psikodilbilimsel değerlendirme, kapsam geçerliğini analizleri ve yapı geçerliğini için faktörlerin uyumunu değerlendirmek amacıyla Doğrulayıcı Faktör Analizi uygulanmıştır. Ölçeğin güvenirliğini test etmek için ise; madde toplam puan korelasyonu, Cronbach alfa katsayısı ve test-tekrar test analizi uygulanmıştır.

Bulgular: Ölçeğin, kapsam geçerlik oranı 0,875 ve 1 olarak hesaplanmıştır. Ölçeğe ilişkin model Doğrulayıcı Faktör Analizi ile incelendiğinde uyum indekslerinin iyi düzeyde olduğu görülmüştür. Cronbach alfa ölçeğin tamamı için 0,90, alt boyutları için 0,71-0,81 arasında bulunmuştur ve yüksek güvenirliğe işaret etmektedir. Madde-toplam korelasyon katsayısına baktığımızda maddelerin hiçbirinin eşik değer olan 0.30'un altında olmadığı görülmüştür (0,31 ile 0,78 arasında). Test-tekrar test analizinde korelasyon katsayısı 0,91 olarak bulunmuştur ve yüksek güvenirliği göstermektedir.

Sonuç: Bu çalışma ile PDSS-2'nin Türkçe versiyonunun geçerli ve güvenilir bir ölçüm aracı olduğu belirlenmiştir.

Anahtar Kelimeler: Parkinson hastalığı, geçerlik ve güvenirlik, uyku, uyku sorunları

Introduction

Parkinson's disease (PD) is a chronic and progressive neurodegenerative disease caused by an effect on the dopamine-producing neurons in a specific area of the brain (1). PD, which is the second most common neurodegenerative disease, has an increasing incidence with the aging of the population (2,3). PD has numerous motor symptoms such as tremor, bradykinesia, rigidity, and postural instability and non-motor symptoms such as cognitive changes, constipation, fatigue, sensory loss, and sleep disturbances, which increase in severity over time (2,4,5). A Parkinson's patient experiences more than 10 non-motor

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symptoms during the year (5), among which sleep disturbances are noteworthy, given their high prevalence and impact on quality of life (6,7).

Rapid eye movement (REM) sleep behavior disorder (8,9), insomnia (5), restless legs syndrome, periodic limb movements (10), sleep disordered breathing (9), excessive daytime sleepiness, circadian rhythm disorders (8,9), and nocturia are the sleep disorders that can be observed in Parkinson's patients (6,11,12). The literature has revealed that up to 95% of Parkinson's patients experience a wide variety of sleep problems (7), and a meta-analysis including studies with the polysomnography (PSG) device has proven that patients experience abnormal sleep (9). It has been further observed that Parkinson's patients who have sleep problems experience other symptoms more and have a worse quality of life (8,13). In order to better manage sleep problems, which seriously affect the quality of life since the early stages of the disease, they must first be identified and evaluated (6,14,15). Although the use of the PSG device is accepted as the most reliable and objective measurement method in evaluating patients' sleep, its cost and complexity have led to the use of subjective sleep scales as an alternative (16). Although there are numerous scales evaluating sleep in the literature, there are limited number of scales developed specifically for PD and focusing on sleep problems. For this reason, the Movement Disorders Association established a commission to evaluate sleep scales used in Parkinson's patients, and as a result of thorough evaluations, the commission recommended six scales for use in Parkinson's patients by specifying their positive and negative aspects (17). One of these scales, the PD sleep scale (PDSS), is significant in that it was developed specifically for PD (15). However, the scale is in visual analog form and it makes limited evaluations for specific sleep disorders, which have been considered as a limitation and led to revision (17). Six items of the 15-item scale were revised so that it can make a stronger assessment of specific sleep disorders such as REM sleep behavior disorder, restless legs syndrome, and sleep apnea, and its visual analog form was converted into a Likert scale form to be more useful. In this way, the PDSS-2 was developed (18). The PDSS-2 has been adapted to many different cultures and is widely used throughout the world (14,18-20). Our study aimed to investigate the validity, reliability and applicability of the PDSS-2 in Turkish population.

Materials and Methods

Study Design and Participants

This methodological study was carried out to test the validity and reliability of the Turkish version of the PDSS-2. Individuals who had a definitive diagnosis of Parkinson's and place, time and person orientation, who could speak and understand Turkish, and who agreed to participate in the study were included in the study. It was aimed to reach the sample size which was 5-10 times the number of scale items. A total of 135 Parkinson's patients constituted the sample of the study. The data from 79 patients were collected face-to-face in the neurology outpatient clinic of a university hospital between April 2019 and January 2021, in Konya. The data from the other patients were gathered online via the Parkinson's associations located throughout the country since outpatient services were limited due to the Coronavirus disease-2019 (COVID-19) pandemic during the data collection process.

Data Collection Tools Used

The Patient Information Form consisting of 7 questions (age, gender, marital status, education level, with whom the patient lives, duration of illness, having another disease) and the PDSS-2 were used to collect data. The PDSS-2 was developed by Trenkwalder et al. (18) and measures the sleep experience of patients in the last week. The Cronbach's alpha of the PDSS-2 is 0.73 for the whole scale and between 0.47 and 0.66 for the sub-dimensions. The scale consists of 15 items on a 5-point Likert form: Very often-6 to 7 days a week (1 point), often-4 to 5 days a week (3 points), sometimes-2 to 3 days a week (2 points), occasionally-1 day a week (1 point), never (0 point). In the scale, the first item assesses the general night sleep quality, while Items 2 and 3 assess falling asleep and insomnia. Items 4 and 5, 6 and 7, and 8 and 9 assess night restlessness, night psychosis, and nocturia, respectively. Items 10, 11, 12, and 13 evaluate nocturnal motor symptoms. Item 14 assesses rested awakening, and Item 15 evaluates sleep breathing disorder. The scale consists of three sub-dimensions [factor 1: Motor problems at night (questions 4,5,6,12 and 13), factor 2: PD symptoms at night (questions 7, 9, 10, 11, 15), factor 3: Disturbed sleep (questions 1,2,3,8,14)]. PDSS-2 total score ranges from 0 (no disturbance) to 60 (maximum nocturnal disturbance). The scale was developed in three centers (Germany, Austria and the United Kingdom) in two languages (English and German), and then adapted to different cultures (14,16).

Ethics

Permission to use the PDSS-2 was obtained from the author via e-mail. Local Ethics Committee approval was obtained from the Selçuk University's Faculty of Health Sciences (approval number: 2019/109, date: 27.02.2019). Written permission was obtained from the hospital administration and the Parkinson's association. The patients participating in the study were informed about the aim of the study and data collection tools, and their consent was obtained. The stages and analyses recommended by the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) checklist were taken into account in testing the validity and reliability of the scale (21).

Statistical Analysis

SPSS (Statistical Package for Social Sciences) Version 25 and Analysis of Moment Structures Version 23.0 programs were used for data analysis. Psycholinguistic evaluation and content validity testing [content validity index (CVI) and content validity ratio (CVR)] were used to test the validity of the PDSS-2, and the confirmatory factor analysis (CFA) was used to evaluate the compatibility of factors for construct validity. The CFA has several goodness-of-fit indices. In this study, the CFA was performed using the results of chi-square/degree of

freedom [χ^2/standard deviation (SD)], comparative fit index (CFI), root mean square error of approximation (RMSEA), standardized root mean square (SRMR) goodness of fit index (GFI), adjusted GFI (AGFI), incremental fit index (IFI), parsimony normed fit index (PNFI), and Parsimony CFI (PCFI). Item total score correlation, Cronbach's alpha coefficient, and test-retest analysis were performed to test the reliability of the PDSS-2. In addition, descriptive statistics (number, percentage, mean, SD) were used. The level of significance was set at $p<0.05$ for all tests.

Results

Participants' Characteristics

The mean age of Parkinson's patients in the study was 59.96±12.41, the mean time to diagnosis was 9.14±6.81, and the age of diagnosis was 53.47±12.05. The majority of the participants were male (60.7%), married (78.5%), and primary school graduates (38.5%); they were living with their family members (94.1%); they had another chronic disease (57%) Table 1 presents the sociodemographic and clinical characteristics of the PD patients.

Psycholinguistic Evaluation and Content Validity

The psycholinguistic characteristics of the scale were examined in the following order: First, three independent linguists who are fluent in English and Turkish translated the scale into Turkish (1). Then, the original items of the scale and their Turkish equivalents were compared, and another independent language expert was consulted (2). The translations were evaluated by the researchers and the draft form of the scale was created. The draft form was sent to eight academicians who are experts in their fields in order to ensure both language and content validity, with the equivalent of each item in the original language. The Davis technique was used to calculate the CVR and CVI of the scale items. The CVI of the scale items was 0.98. The CVR was found to be 1 for Items 1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, and 15, and 0.875 for Items 4 and 7.

Table 1. Sociodemographic and clinical characteristics of the PD patients (n=135)

Variable	**Mean (SD)**	
Age	59.96 (12.03)	
Disease duration (year)	9.11 (6.71)	
Age at diagnosis (year)	53.49 (12.05)	
Sex	**n**	**%**
Female	53	39.3
Male	82	60.7
Marital status		
Married	106	78.5
Single	29	21.5
Education level		
No literacy	11	8.1
Primary	52	38.5
High	40	29.6
University and over	32	23.7
Living status		
live with family members	127	94.1
Live alone	8	5.9
Having chronic disease		
Yes	77	57
No	58	43

SD: Standard deviation, PD: Parkinson's disease

Confirmatory Factor Analysis

The CFA performed to test construct validity revealed that the model fit index values (χ^2/SD, CFI, RMSEA, SRMR, GFI, AGFI, IFI, PNFI, PCFI) of the three-factor structure were at an excellent and acceptable level. Good fit index values and fit index values obtained from the scale are presented in Table 2. It was also seen that the factor loadings of the items in the model vary between 0.36 and 1.65. The CFA diagram of the scale are presented in Figure 1. In line with these results, it can be said that the measurement tool is valid and feasible.

Reliability Analysis

The internal consistency analysis revealed that the total reliability coefficient (Cronbach α) was 0.905 and the subscale reliability coefficients were α=0.785 for Factor 1, α=0.818 for Factor 2, and α=0.716 for Factor 3. The item-total correlation (ITC) coefficient ranged between 0.31-0.78. No items caused a higher Cronbach's alpha coefficient when deleted. Item analysis of the PDSS-2 are presented in Table 3.

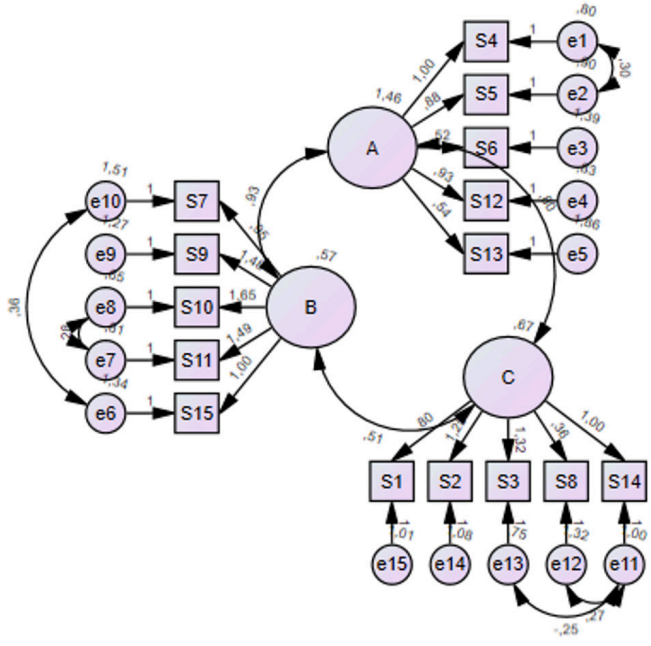

Figure 1. Confirmatory factor analysis diagram of the Parkinson disease sleep scale-2

To assess its invariance over time, the scale was administered to 30 participants in the study group twice, 15 days apart. It was observed that there was a high level of correlation and no significant difference between the mean values obtained in the first and second measurements (r=0.914 t=1.353 p>0.05). Table 4 presents the test-retest results for PDSS-2. Based on these findings, it can be stated that all of the items in the Turkish form of the PDSS-2 have high reliability.

Table 2. Fit indices of the CFA of the PDSS-2 (n=135)

Fit indices	Good fit values	Acceptable fit values	Fit values of PDSS-2
χ^2/SD	<3	<5	2.114
RMSEA	0.00< RMSEA <0.05	0.05< RMSEA <0.08 or 0.10	0.091
SRMR	0.00< SRMR <0.05	0.05< SRMR <0.08 or 0.10	0.068
GFI	0.95< GFI <1.00	0.85 or 0.90< GFI <0.95	0.866
AGFI	0.90< AGFI <1.00	0.80 or 0.85< AGFI <0.90	0.804
IFI	0.95< IFI <1.00	0.90< IFI <0.95	0.906
CFI	0.95< CFI <1.00	0.90< CFI <0.95	0.903
PCFI	PCFI >0.50	-	0.706
PNFI	PNFI >0.50	-	0.652

CFA: Confirmatory factor analysis, χ^2/SD: Chi-square/degree of freedom, CFI: Comparative fit index, RMSEA: Root mean square error of approximation, SRMR: Standardized root mean square, GFI: Goodness of fit index, AGFI: Adjusted GFI, IFI: Incremental fit index, PCFI: Parsimony CFI, PNFI: Parsimony normed fit index, SD: Standard deviation, PDSS-2: Parkinson's disease sleep scale-2

Table 3. Item analysis of the PDSS-2

Items	The average score when the item is excluded	Variance when the item is excluded	Item-total correlation coefficient	Reliability coefficient when the item is excluded
S1	27.59	177.706	0.439	0.904
S2	27.18	169.535	0.565	0.900
S3	26.93	169.316	0.607	0.899
S4	27.33	162.194	0.748	0.893
S5	27.54	165.056	0.712	0.895
S6	27.51	173.759	0.500	0.902
S7	28.12	171.837	0.516	0.902
S8	26.57	181.650	0.316	0.908
S9	27.09	163.455	0.669	0.896
S10	27.49	161.356	0.785	0.892
S11	27.60	164.436	0.720	0.894
S12	27.50	164.834	0.704	0.895
S13	27.86	174.092	0.419	0.906
S14	26.80	171.893	0.575	0.900
S15	28.07	170.502	0.573	0.900

PDSS-2: Parkinson's disease sleep scale-2

Table 4. Test-retest results for PDSS-2 (n=30)

	First evaluation	Second evaluation			
	Mean (SD)	Mean (SD)	t-test	p	r*
Total score	30.00 (12.00)	31.23 (12.10)	-1.353	0.187	0.914
Factor 1	9.16 (4.65)	9.83 (4.31)	-1.836	0.077	0.905
Factor 2	8.33 (5.45)	8.83 (5.01)	1.822	0.079	0.962
Factor 3	12.50 (3.01)	12.56 (3.81)	-0.134	0.894	0.707

*p<0.001, SD: Standard deviation, PDSS-2: Parkinson's disease sleep scale-2

Discussion

Validity is the ability of a measuring instrument to accurately measure what it is intended to be measured without confusing it with any other features (22). While evaluating the validity of the scale, CVI and CVR were calculated and the CFA was performed, unlike the validity and reliability studies conducted in other languages (14,19,23). In the study, first of all, the content validity, which evaluates the extent to which the scale and each item in the scale serve the purpose (24), was tested using the Davis technique. The draft form of the scale was presented to eight experts, consisting of physicians and academician nurses with a PhD degree who have studies on Parkinson's, to receive their opinions on the scale. The experts were requested to evaluate the comprehensibility, language, and relevance of the items to the subject, by rating each item on a four-point scale as (1) "not appropriate", (2) "item needs major revision", (3) "item needs minor revision", and (4) "appropriate". The scores for each item were calculated in accordance with the Davis technique (24). Since the CVR for each item was higher than 0.80, which was accepted as the cut-off point, it was seen that the scale had good content validity and no items were removed from the scale. Necessary adjustments were made in the items by taking the opinions and suggestions of the experts about the language of the scale.

One of the important analyses to be made to test the validity of the scale is the construct validity analysis, which is evaluated using the exploratory factor analysis (EFA) and the CFA. The EFA creates a model by explaining the factor structure of the scale, and the CFA uses to confirm the number of factors and their relationship with items (21,25). During the PDSS-2 development phase, Trenkwalder et al. (18) used the EFA while evaluating the construct validity of the scale and determined that the scale had three sub-dimensions. In scale adaptation studies, the reapplication of the EFA may cause a deterioration in the structure of the scale (26). Therefore, in this study, the CFA was used to assess construct validity, which could examine whether the findings were consistent with the theoretical construct. In addition, COSMIN also states and recommends that the CFA is a high-quality indicator (21). Our study revealed that the model fit and the model fit indices of the 15 items and the three-factor structure of the scale were at an acceptable

level, and the factor loadings of the items in the scale were greater than 0.30 (25) in the path diagram.

In the study, reliability was evaluated using three approaches. The test-retest method (n=30) was used to evaluate the invariance of the scale against time; Cronbach α and the corrected ITC were used to test internal consistency. An internal consistency coefficient above 0.70 indicates that the scale has a very high reliability (22). In the study, it was determined that the internal consistency coefficients of the scale and its sub-dimensions were higher than the original form of the study (18) and its versions in other languages (14,19,27). When the ITC coefficients were examined, it was seen that none of the items were below the threshold value of 0.30 (28), and therefore reliable. The correlation coefficient in the test-retest analysis performed to evaluate the invariance over time was found to be higher than 0.70, which is another important finding showing the reliability of the scale (22).

Study Limitations

There are several limitations of this study. Firstly, the sample size could have been larger. Secondly, the data from some patients were gathered online via since outpatient services were limited due to the COVID-19 pandemic during the data collection process.

Conclusion

The study revealed that the Turkish version of the PDSS-2 is a valid and reliable measurement tool. The new version was made a part of the literature. We believe that the scale will be widely used to detect sleep problems in PD.

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Ethics

Ethics Committee Approval: Local ethics committee approval was obtained from the Selçuk University's Faculty of Health Sciences (decision no: 2019/109, date no: 27.02.2019).

Informed Consent: The patients participating in the study were informed about the aim of the study and data collection tools, and their consent was obtained.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: A.T.K., S.A., Design: A.T.K., S.A., Data Collection or Processing: A.T.K., Analysis or Interpretation: A.T.K., S.A., Literature Search: A.T.K., S.A., Writing: A.T.K.

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Kronik Obstrüktif Akciğer Hastalığı Tanısı Olan Hastalarda Uyku Kalitesinin Değerlendirilmesi ve Uyku Bozukluklarının GOLD Evrelemesine Göre Karşılaştırması

Determination and Comparison of Sleep Quality and Sleep Disorders in Patients with COPD According to GOLD Groups

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Öz

Amaç: Bu çalışmada, Kronik Obstrüktif Akciğer Hastalığı (KOAH) hastalarında, Global Initiative for Chronic Obstructive Lung Disease (GOLD) A,B,C ve D evrelerine göre uyku kalitesinin saptanması, uyku bozukluklarının değerlendirilmesi ve evreler arası karşılaştırma yapılması amaçlanmıştır.

Gereç ve Yöntem: Çalışmamıza, Ocak 2016-2017 tarihleri arasında Pamukkale Üniversitesi Tıp Fakültesi Hastanesi Göğüs Hastalıkları Polikliniği'ne başvuran, GOLD kriterlerine göre KOAH tanısı konulan, başvuru anında KOAH atağı geçirmeyen ve çalışmaya katılmayı kabul eden 94 hasta alınmıştır.

Bulgular: KOAH hastalarında evreler arttıkça ortalama FEV1 değerlerinde azalma tespit edildi ve FEV1 değerleri azaldıkça gece boyunca ölçülen ortalama oksijen değerlerinin de azaldığı görüldü. Evrelere göre; total uyku süresi, uyku etkinliği, uyku latansı, REM uyku süresi ve non-REM uyku süresi arasında anlamlı farklılık saptanmadı. Polisomnografi sonuçlarına göre hastaların %40'ında apne-hipopne indeksi (AHI) <5 idi. AHI değerleriyle evreler arasında istatistiksel olarak anlamlı fark bulunmadı (p=0,581). KOAH evreleri ile AHI değerleri arasında istatistiksel anlamlı fark saptanmadı. Ancak KOAH evreleri arttıkça gece boyunca ölçülen ortalama oksijen satürasyonunda azalma tespit edildi.

Sonuç: Nokturnal oksijen desatürasyonu, KOAH'ta görülen komorbiditelerin başlıca sebeplerinden biri olabilir. İleri evre KOAH hastalarında, gece desatürasyonları konusunda dikkatli olunmalı, komorbidite ve mortalitelerin önlenmesi için gerekli önlemler zaman kaybetmeden alınmalıdır.

Anahtar Kelimeler: KOAH, obstrüktif uyku apne sendromu, uyku bozukluğu

Abstract

Objective: We evaluated and compare sleep quality and disorders according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) A, B, C, D groups in patients with Chronic Obstructive Pulmonary Disease (COPD) and to determine sleep disorders.

Materials and Methods: Our study included 94 patients who applied to Pamukkale University Medical Faculty Hospital Chest Diseases Polyclinic between January 2016 and January 2017, were diagnosed with COPD according to GOLD criteria, were not in a COPD attack at the time of admission and agreed to participate in the study.

Results: In patients with COPD, as the severity of stages increased, a decrease in mean FEV1 values was detected and as the FEV1 values decreased, the mean oxygen values measured during the night decreased. According to the GOLD stage, there was no significant difference between total sleep periods, sleep activity, sleep latency, rapid eye movement (REM) sleep duration, and non-REM sleep duration. According to polysomnography results, apnea-hypopnea index (AHI) was found to be below 5 in 40% of the patients. There was no statistically significant difference between the AHI and COPD stages (p=0.581).

Conclusion: No significant difference was found between the COPD stage and AHI severity. However, as COPD stages increased, a decrease in mean nocturnal oxygen saturation was detected. Nocturnal oxygen desaturation is the main cause of comorbidities observed in patients COPD. As a result, careful attention should be given to night desaturation in advanced patients with COPD, and the necessary procedures must be performed to prevent comorbidities.

Keywords: COPD, obstructive sleep apnea syndrome, sleeping disorder

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Giriş

Kronik obstrüktif akciğer hastalığı (KOAH), genellikle zararlı partiküllere veya gazlara önemli ölçüde maruz kalmanın neden olduğu ve anormal akciğer gelişimi dahil konakçı faktörlerden etkilenen, hava yolu ve/veya alveolar anormalliklere bağlı kalıcı solunum semptomları ve hava akışı sınırlaması ile karakterize, yaygın, önlenebilir ve tedavi edilebilir bir hastalıktır (1).
Sağlıklı insanlarda uyku sırasında solunum sisteminde bir direnç artışı, solunum sayısında ve solunumun ritminde bozukluk görülür (2). Ayrıca reseptör duyarlılığında ve aynı zamanda ventilasyonda da azalma olur (2). KOAH, akciğer hastalıkları arasında uyku ile ilişkisi en çok bilinenidir (3). KOAH olgularında uyku esnasında, gaz değişimi ve ventilasyon bozukluğu meydana gelir ancak bu bozukluk bronkospazm ve hava yolu rezistansından bağımsızdır (4). Sağlıklı bireylerde dakika ventilasyonunun azalması sonrasında hipoksemi ve parsiyel karbondioksit ($PaCO_2$) yüksekliği görülür bu değişim KOAH'lı hastalara göre kıyaslandığında daha düşük düzeydedir (5). Sonuçta; uykuda görülen fizyolojik hipoventilasyon, hipoksemik olan KOAH hastalarında gece ölçülen oksijen düzeylerinde derin düşüşler yaratır ve hastalarda nokturnal oksijen desatürasyonu (NOD) gelişir. Bu hastalarda hali hazırda uyanıklıkta da olan hipoksemi nedeniyle, uyku süresi boyunca oksijen düşük seyretmekte, azalmış ventilasyon sonrasında satürasyon düşüklüğü derinleşmektedir ve bu hastalarda noktürnal desatürasyonlar şiddetlenmektedir. KOAH tanısı olan hastalarda, uyku esnasında, özellikle de uykunun hızlı göz hareketi (REM) döneminde oluşan hipoventilasyonun oksijen seviyesinde düşüklüğe yol açtığı gösterilmiştir (6). REM dönemi hipokseminin en derin olduğu dönemdir bu dönemde alveoler ventilasyondaki azalma %40 düzeyinde olup, parsiyel oksijen basıncında ki görülen düşüklük seviyesinin 20 mmHg düzeyine kadar çıkabileceği bildirilmiştir (7). NOD, KOAH hastalarında morbidite ve mortaliteyi arttıran en önemli uyku sorunudur. NOD'un klinik sonuçlarına bakıldığında uyku KOAH tanısı olan hastalarda uzun süreli oksijen tedavisi gereksiniminin ilerleyen dönemlerde daha fazla olduğu tespit edilmiştir (8). KOAH ve Obstrüktif Uyku Apne Sendromu (OUAS) birlikteliği (Overlap sendromu) klinik pratikte kronik solunumsal bozukluklar ve kardiyovasküler hastalıklar açısından majör komorbiditetin en önemli sebebini oluşturmaktadır (9).
Çalışmamızda; göğüs hastalıkları polikliniğine başvuran, KOAH hastalarında, KOAH İçin Küresel Girişim (GOLD) evrelerine (A, B, C, D) göre uyku kalitesi, uyku bozukluklarının değerlendirilmesi ve bozukluğu tespit edilen hastaların uygun tedaviye yönlendirilmesi, KOAH'lı hastalarda gruplar arasında uyku ile ilişkili parametreleri karşılaştırmayı amaçladık.

Araştırmanın Soruları

1. KOAH'lı hastalarda evrelere göre uyku bozukluğu var mıdır?

Gereç ve Yöntemler

Araştırmanın Amacı ve Tipi

Araştırma, göğüs hastalıkları polikliniğine başvuran KOAH tanısı olan ve atakta olmayan hastaların uyku bozukluklarının belirlenmesi için tanımlayıcı nitelikte yapılmıştır.

Araştırmanın Yapıldığı Yer ve Zaman

Araştırma Pamukkale Üniversitesi Hastanesi'nde Göğüs Hastalıkları Polikliniği'nde Ocak 2016-Ocak 2017 tarihleri arasında başvuran hastalarla yapılmıştır.

Araştırma Evreni ve Örneklemi

Araştırmanın evrenini arasında etik kurul onayı alındıktan sonra belirtilen tarihler arasında göğüs hastalıkları polikliniğine başvuran ve çalışma için onay veren bütün KOAH tanılı hastalar oluşturmaktadır. Evrenin tamamına ulaşılması hedeflenmiş ve KOAH'lı hastaların tamamı ile görüşme sağlanmıştır. Çalışmaya katılmayı kabul eden 94 hasta araştırmamızın örneklemini oluşturmuştur. Doksan bir (%96,8)'i erkek, 3'ü (%) kadındır. Çalışmaya alınma ve dışlanma kriterleri aşağıda belirtilmiştir.
Çalışmaya alınma kriterleri:
- Hastaların KOAH hastalığına sahip olması
- Aktif malignitesi olmaması
- Daha önce polisomnografi (PSG) yapılmamış olması
- Bilinen uyku bozukluğu olmaması

Çalışmadan dışlanma kriterleri:
- Aktif malignite varlığı
- Hastaların KOAH atakta olması.

Verilerin Toplanması

Çalışmaya belirtilen tarihler arasında çalışmaya katılmaya onay veren hastalara bilgi verilerek yazılı ve sözlü onamları alındı.

Veri Toplama Araçları

Araştırmada, veri toplama aracı olarak çalışmaya katılmayı kabul etmiş hastaların tümünün; demografik özellikleri (yaş, cinsiyet, sigara alışkanlığı), antropometrik ölçümleri (boy, kilo, vücut kitle indeksi), hastalık öyküleri (malignite olup olmadığı), ilaç kullanımı, KOAH açısından stabil olup olmadıklarının sorgulandığı kişisel bilgi formu kullanıldı. Semptomlar ile fizik muayene birlikte değerlendirilerek hastaların KOAH atakta olup olmadıkları tespit edildi.
Çalışmaya katılan hastalara spirometri (ZAN pulmonary safe body box) cihazı kullanılarak solunum fonksiyon testi yapıldı. Testin nasıl yapılacağı ayrıntılı olarak anlatılan hastaların, en az 1 saat öncesinden sigara içmemiş, 4 saat öncesinde alkol almamış, dar giysi giymemiş, 2 saat öncesine kadar ağır yemek yememiş, 4 saat öncesinden kısa etkili bronkodilatatör ilaç almamış olmasına dikkat edildi. Test esnasında, hasta 90 derece dik oturur konumda ve burnu mandal ile kapalı iken, cihazın ağız kısmından tidal volümde solutuldu. Hastanın hazır olduğu görüldüğü an derin inspirasyon ardından kuvvetli olarak ekspirayon yapması sağlandı ve ekspirasyon süresinin en az 6 saniye olmasına özen gösterildi. Teknik açıdan kabul edilebilir en az üç manevra yapıldı, elde edilen üç ayrı eğriden en yüksek değerlere sahip olanı seçildi (10).
Solunum fonksiyon testi ve Değiştirilmiş Tıbbi Araştırma Konseyi (MMRC) dispne skalasına göre hastalar 2017 yılı GOLD rehberine göre (A, B, C, D) evrelerine ayrıldı (1).
Tüm hastalara, gündüz uykululuk hallerini değerlendirmek için, sekiz sorudan oluşan Epworth Uykululuk Skalası (ESS) uygulandı (11). Türkçe için geçerlik ve güvenilirliği yapılan ESS'nin sonuçları kayıt altına alındı (12).

Hastaların tümüne, kliniğimizin uyku laboratuvarında PSG yapıldı. PSG yapılan hastalar yaklaşık saat 20:30'da uyku laboratuvarında bulundular ve yaklaşık saat 23:00'da PSG kayıtları başlatıldı. Polisomnografik tetkik tek kişilik, konforlu, sessiz, karanlık, ısı kontrollü odalarda refakatsiz şekilde yapıldı. Polisomnografik tetkikler, 52 kanallı bilgisayarlı ve video kayıtlı Philips - Respironics Alice 6 - Sleep System PSG cihazı ile yapıldı. PSG'de uyku evreleri; altı elektroensefalografi kaydı (F3M2, F4M1, C3M2, C4M1, O1M2, O2M1), iki elektrookülogram kaydı, bir submental elektromiyogram kaydı ile yapıldı. Solunum monitörizasyonu; oronazal hava akım ölçümü (oronazal termistör ile), pulseoksimetre ile hemoglobin oksijen desatürasyonu (SpO2, parmak oksimetri yolu ile), göğüs duvarı (pletismografi ile), karın solunum hareketleri ve vücut pozisyonunun takibi ile yapıldı. PSG kayıtları; uyku bozuklukları ile ilgilenen göğüs hastalıkları uzmanı tarafından skorlandı. Evreleme, 2012 Amerikan Uyku Akademisi Derneği kriterlerine göre yapıldı (13). PSG ile kaydedilen veriler şu şekilde sıralanabilir:

- Total uyku süresi,
- Uyku etkinliği,
- Uyku latansı,
- Uyku evreleri (non-REM Evre I, II, III ve REM evreleri),
- Apne-hipopne indeksi (AHİ),
- Ortalama oksijen satürasyonu,
- Minimum oksijen satürasyonu,
- Arousal indeksi,
- Periyodik bacak hareketleri indeksi,

PSG sonuçlarına göre hastalar hafif (AHİ 5-15/saat), orta (AHİ:15-30/saat) ve ağır (AHİ >30/saat) OSAS olarak sınıflandırıldı (13). PSG sonuçlarının, KOAH hastalarıyla birliktelik oranları tespit edildi ve KOAH evreleri arasında uyku bozuklukları oranı açısından karşılaştırma yapıldı.

İstatistiksel Analiz

Çalışmada elde edilen veriler sosyal bilimler için istatistik paket programıyla analiz edildi. Sürekli değişkenler ortalama ± standart sapma ve kategorik değişkenler sayı ve yüzde olarak verildi. Parametrik test varsayımları sağlandığında bağımsız grup farklılıkların karşılaştırılmasında varyans analizi; parametrik test varsayımları sağlanmadığında ise bağımsız grup farklılıkların karşılaştırılmasında Kruskal-Wallis varyans analizi kullanıldı. Kategorik değişkenlerin karşılaştırılmasında ki-kare analizi kullanıldı. Sayısal değişkenler arasındaki ilişkilerin incelenmesinde spearman korelasyon analizi kullanılmıştır. İstatistiksel anlamlılık açısından $p<0,05$ anlamlı kabul edildi.

Araştırmanın Etik Yönü: Araştırmaya başlamadan önce Pamukkale Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu'ndan 12.01.2016 tarih ve 60116787-020/2651 sayılı karar ile izin alınmış ve araştırmaya katılmaya gönüllü olan katılımcılara araştırma hakkında bilgi verilerek sözlü onamları alınmıştır.

Bulgular

Çalışmamıza, Pamukkale Üniversitesi Tıp Fakültesi Hastanesi Göğüs Hastalıkları Polikliniği'ne başvuran ve çalışmaya katılmayı kabul eden 94 KOAH tanılı hasta alındı.

Çalışmaya alınan hastaların 91 (%96,8) tanesi erkek, 3 (%3,2) tanesi kadındı. Hastaların yaş ortalamaları 64,32±9,76, beden kitle indeksi ortalamaları 30,59±5,79 idi.

Hastaların atak sayıları ve semptom durumuna göre yapılan 2017 yılındaki GOLD rehberi evrelemesinde 26 hastanın (%27,6) GOLD A grubunda, 24 hastanın (%25,5) evre B grubunda, 20 hastanın (%21,2) evre C grubunda, 24 hastanın (%25,5) evre D grubunda yer aldığı tespit edildi.

Hastaların KOAH GOLD evrelerine göre genel tanımlayıcı bilgileri Tablo 1'de özetlenmiştir.

Hastaların GOLD evrelerine göre MMRC skorları ve solunum fonksiyon testi sonuçları Tablo 2'de gösterilmiştir. İstatistiksel olarak bakıldığında GOLD A ile GOLD B aradında ve GOLD A ile GOLD D arasında anlamlı farklılık saptandı (sırasıyla; p=0,001, p=0,001). GOLD A ile GOLD C arasında anlamlı farklılık saptanmamıştır. Hastaların evreleri arttıkça solunum fonksiyon testlerindeki FEV1 değerlerinde anlamlı olarak azalma tespit edildi ($p<0,05$). FEV1 ile ortalama oksijen değerleri arasında kuvvetli korelasyon tespit edildi.

ESS sonucunda toplam 30 hastanın (%31,9) ESS puanı 10 ve üzerinde olarak bulundu. GOLD A, B, C, D evrelerinde ESS skorlarına bakıldığında GOLD A'da 7,46±5,16, GOLD B'de 8,17±4,35, GOLD C'de 7,45±5,59, GOLD D'de 6,75±4,35 olarak saptandı. İstatistiksel olarak 4 grup arasında anlamlı farklılık yoktu.

Hastaların KOAH GOLD evrelerine göre PSG skorlarının karşılaştırılması Tablo 3'de gösterilmiştir. PSG'de bakılan ortalama oksijen satürasyonu, GOLD A grubunda %92,8±2,43, GOLD B grubunda %91,78±2,89, GOLD C grubunda %90,33±3,85, GOLD D grubunda %88,38±6,72 olarak saptandı. Bu açıdan bakıldığında evreler arttıkça ortalama oksijen satürasyonunun azaldığı tespit edildi. Evreler ve ortalama oksijen satürasyonu arasında negatif korelasyon tespit edildi (p=0,001; r=-0,342).

Tablo 1. Hastaların KOAH GOLD evrelerine göre genel tanımlayıcı bilgileri

GOLD evre					
	A	**B**	**C**	**D**	**p**
	n=26	**n=24**	**n=20**	**n=24**	
Yaş (yıl) Ortalama ± SS	62,38±8,59	64,92±10,67	62,1±6,18	67,71±11,79	0,113
BMI [(kg)/boy(m)^2] Ortalama ± SS	30,47±5,34	33,3±5,57	28,24±6,4	29,99±5,22	0,029*

*İstatistiksel olarak anlamlı değer, SS: Standart sapma, KOAH: Kronik obstrüktif akciğer hastalığı, GOLD: KOAH İçin Küresel Girişim

Tablo 2. Hastaların GOLD evrelerine göre MMRC skorları ve solunum fonksiyon testleri				
GOLD evre				
	A	**B**	**C**	**D**
MMRC	0,65	2,41	1,35	2,83
FVC (litre)	3,24±0,74	2,81±0,68	2,15±0,63	1,96±0,48
FVC (pred %)	84,5±14,55	78,88±15,31	55,9±12,7	57,42±12,58
FEV1 (litre)	2,01±0,47	1,75±0,46	1,15±0,33	1,05±0,27
FEV1 (pred %)	66,77±12,93	62,71±13,17	37,9±8,12	39,79±11,67
FEV1/FVC	62,19±6,9	62,42±6,18	54,25±9,89	54±8,13
PEF (litre)	4,84±1,14	4,32±1,07	3,71±1,31	3,14±1,02
PEF (pred %)	61,19±13,98	56,67±11,87	46,75±15,03	42,96±14,76
FEF25-75 (litre)	1,1±0,32	0,94±0,32	0,54±0,21	0,5±0,17
FEF25-75 (pred %)	32,85±8,95	29,21±8,25	15,8±5,29	16,63±6,83
MMRC: Değiştirilmiş Tıbbi Araştırma Konseyi, GOLD: KOAH İçin Küresel Girişim				

Tablo 3. Hastaların KOAH GOLD evrelerine göre PSG değerlerinin karşılaştırılması					
GOLD Evre					
	A	**B**	**C**	**D**	
	n=26	**n=24**	**n=20**	**n=24**	**p**
Total uyku süresi (dakika)	284,66±85,28	240,19±76,5	256,48±113,99	233,77±108,81	0,26
Uyku etkinliği (%)	60,67±17,97	51,32±14,67	52,86±22,81	49,02±22,18	0,183
Uyku latansı (dakika)	29,14±26,11	33,09±27,52	37,25±27,16	28,38±26,69	0,394
Non-REM 1 (dakika)	7,18±3,86	7,71±9,33	7,37±5,37	7,78±6,4	0,582
Non-REM 2 (dakika)	58,55±13,6	66,6±13,91	63,16±18,59	61,88±17,89	0,38
Non-REM 3 (dakika)	27,18±14,94	20,43±15,15	24,15±17,3	23,42±21,32	0,466
REM (dakika)	7,08±6,95	5,23±5,21	5,31±5,6	6,94±9,95	0,784
Ortalama oksijen satürasyonu	92,8±2,43	91,78±2,89	90,33±3,85	88,38±6,72	0,015*
Minimum oksijen satürasyonu	81,28±8,82	77,87±9,77	76,33±12,68	72,65±15,58	0,269
Oksijen desatürasyon indeksi	12,65±16,82	11,96±17,52	20,27±28,8	6,75±4,2	0,351
Arousal	24,07±9,43	26,6±15,49	28,85±15,09	29,48±15,87	0,021
Apne-hipopne indeksi	12,38±12,93	13,35±17,49	13,38±15,5	10,58±16,31	0,581
*İstatistiksel olarak anlamlı değer, KOAH: Kronik obstrüktif akciğer hastalığı, GOLD: KOAH İçin Küresel Girişim, PSG: Polisomnografi, Non-REM: Hızlı göz hareketi olmayan					

İstatistiksel olarak bakıldığında GOLD A ile GOLD D arasında anlamlı farklılık vardı (p=0,015).

Hastalar, uykuda ortalama oksijen satürasyonu ≤%88 ve ≥89 olan olgular olmak üzere 2 gruba ayrıldı. %22,2'sinin gece boyunca olan ortalama oksijen satürasyonu ≤%88 olarak saptandı. Ortalama satürasyon düşüklüğünü evrelere göre değerlendirdiğimizde; GOLD evre A'da hiçbir hastada ortalama satürasyonu ≤%88 çıkmazken, GOLD evre B'de 4 kişide ortalama satürasyonu ≤%88, GOLD evre C'de 8 kişide ortalama satürasyonu ≤%88, GOLD evre D'de 8 kişide ortalama satürasyonu ≤%88 olarak saptandı (p=0,003). Gece boyunca ortalama oksijen satürasyonu ≤%88 olarak seyreden hastaların tamamını %100 olarak kabul edersek, %40'ının GOLD evre C'de, %40'ının GOLD evre D'de seyrettiği görüldü.

Ortalama oksijen satürasyonu ≤%88 olan hastaları, diğer hastaların temel özellikleri açısından karşılaştırdığımızda; yaş, vücut kitle indeksi, MMRC, ESS skorları arasında anlamlı farklılık saptanmadı. Ortalama oksijen satürasyonu ≤%88 olan hastaları, diğer hastaların solunum fonksiyon testi ve PSG değerlerine göre karşılaştırdığımızda; ortalama oksijen satürasyonu ≤%88 olan hastalarda FEV1 (p=0,001), forced vital capacity değeri (p=0,001), uyku etkinliği (p=0,006), total uyku süresi (p=0,013), minimum oksijen satürasyonu (p=0,001) istatistiksel olarak daha düşük, arousal sayısı (p=0,049) istatistiksel olarak anlamlı daha yüksek saptandı.

Tartışma

NOD, vücuttaki neredeyse bütün sistemler üzerine etkilidir. Başta kardiyovasküler sistem üzerine etkileri olmakla beraber nörolojik ve hematolojik sistem üzerine de etkileri büyüktür, ciddi komorbid durumlara sebep olmaktadır. Bu da KOAH'lı hastalarda evre arttıkça gece ortalama oksijen desatürasyonun ne kadar azaldığını ortaya koymaktadır. Çalışmamızda KOAH evresi arttıkça NOD'da artma olduğu görülmüştür.

KOAH'lı hastalarda oksijen satürasyonunda, gece uyku sırasında hızlı olmayan göz hareketi (NREM) döneminde %3-5'lik

dalgalanmaların görülmesinin yanı sıra REM döneminde düzeyi %50'lere varan büyük düşüşler görülebilir ve bu düşüş süreleri birkaç dakika ile yarım saate varan seviyede görülebilir. Oksijen satürasyonunda en fazla görülen düşüklük, en uzun REM döneminin yaşandığı sabahın erken saatlerinde görülür. NREM döneminde görülen oksijen satürasyonundaki düşüklüğün, REM dönemindeki gibi derin olmadığı ve süre olarak da daha kısa olduğu vurgulanmaktadır. NOD epizodları genelde oksijen satürasyonunda en az üç birim görülen düşme olarak kabul edilir. Uykudaki desatürasyonun en iyi indeksi ise desaturasyon ataklarının sayısı değil, gece ölçülen ortalama oskijen satürasyonu ve bu oksijen seviyesinin belli sınırlar altında ne kadar bulunduğunun süresidir (14). Çalışmamızda; KOAH GOLD evresi arttıkça ortalama oksijen satürasyonunun azaldığı tespit edildi. GOLD A grubunda ortalama oksijen satürasyonu GOLD D'ye kıyasla anlamlı olarak yüksekti (p=0,015). Lacasse ve ark. (15) yaptığı bir çalışmada orta-ileri KOAH'ı olan ve gündüz hipoksemisi olmayan hastaların yaklaşık %38'inde gece uyku apnesi olmasa da gece desatürasyonlarının olduğu tespit edilmiş. Lewis ve ark. (16) toplamda 1104 orta-ciddi KOAH'lı hastanın alındığı çalışmada, 59 hastaya gece oksimetresi takılmış ve bunların 29'unda gece desatürasyonları tespit edilmiş. De Angelis ve ark. (17) yaptığı çalışmada; ortalama FEV1 değeri %40 olan 70 hastanın 54'ünde (%77) gece desatürasyonları tespit etmiş. Nokturnal desatürasyonu olan hastalar ile olmayan hastalar kıyaslandığında FEV1 değerinde anlamlı farklılık tespit edilmiş (p<0,05), ayrıca gece minimum oksijen satürasyonlarında da anlamlı farklılık tespit edilmiş (p<0,0001). Yukarıda sözü edilen çalışmalar genelde orta-ileri KOAH'lı hastalarda yapılmakla birlikte bizim çalışmamızda; KOAH'lı ileri evre hastalarda, nokturnal desatürasyonların arttığı sonucuna varılabilir. Gece uykuda oluşan bu desatürasyonlar gündüz hipoksemisini ve hiperkapnisini de etkileyecektir. Aynı zamanda bu durum hastalarda gelişen ventilasyon bozukluğunun veya ventilasyon/perfüzyon dengesizliğinin de bir göstergesidir (18). Bir başka çalışmada; uykuda oksijen satürasyonları düşen KOAH tanısı olan hastalarda ilerleyen zamanlarda uzun süreli oksijen tedavisi ihtiyacının daha fazla olduğu saptanmıştır (8).

NOD'un etkisi, vücutta birçok sistem üzerinde görülebilir. Kardiyovasküler sistem ise bu hipoksiden en çok etkilenen sistemdir. Kardiyak aritmi sıklığının, ciddi hipoksemisi olan KOAH olgularında fazla olduğu saptanmıştır. NOD'un, uyku esnasında koroner oksijenlenmenin bozulması ve sonrasında gelişebilecek aritmiler sebebiyle kardiyak mortaliteyi artırabileceği bildirilmiştir (19). Bunun dışında uyku kalitesi bozukluğu, nörolojik etkilenme ve kas-iskelet sistemine ait bazı etkiler görülebilir. Pulmoner hipertansiyon ve polisiteminin gece desatürasyonları ile şiddetlenmesi mümkün olabilir. Bunların sonucunda da ileri evreli KOAH'lı hastalarda gece desatürasyonları konusunda dikkatli olunmalı, komplikasyonların erken tespiti için gerekli işlemlerin yapılması sonucuna varılabilir.

Nefes darlığı ve halsizlikten sonra uyku bölünmesi KOAH'lı hastalarda en sık görülen üçüncü semptom olarak saptanmış ve bu hastaların bir kısmında uykuya başlamada zorluk saptanmıştır. PSG'de uyku latansında uzama, toplam uyku süresinde ve REM uykusunda azalma, yüzeyel uyku evrelerinde (NREM evre 1-2) artma ve sık tekrarlayan arousallar saptanan bulgular arasındadır (20,21). Sık görülen arousallar ve uyanmalar sonucunda uyku kalitesi bozulmaktadır. Yapılan çalışmada uyku kalitesindeki bozukluğun, B ve D grubu hastalarda, A ve C grubu hastalara göre daha fazla görüldüğü tespit edilmiş (22). Ventilatuar ve arousal yanıt, hipoksiden çok hiperkapniye karşı gelişmekte, PaCO2'deki hafif değişiklikler bile dakika ventilasyonunda azalmaya yol açmaktadır (23). Çalışmamızda; uyku kalitesi açısından gruplar arasında anlamlı farklılık yoktu. Arousal indeksi, GOLD A'da 24,07, GOLD B'de 26,6, GOLD C'de 28,85, GOLD D'de 29,48 olarak saptandı. Evre ilerledikçe ortalama arousal indeksi değerleri artma göstermekteydi, fakat gruplar arasında istatistiksel farklılık yoktu. AHI ile arousal arasında orta dereceli pozitif yönde korelasyon vardı (p=0,363).

Sünnetçioğlu ve ark. (24) 2014 yılında yaptığı bir çalışmada; 42 KOAH'lı hasta çalışmaya alınmış, OUAS oranı %61,9 olarak saptanmış. OUAS'lı olguların %30,7 hafif, %42,30 orta, %26,9 ağır OUAS sınıfındaymış. OUAS saptanan toplamda 26 hasta, KOAH evrelerine göre ayrıldığında 1 hasta hafif KOAH, 20 hasta orta KOAH ve 5 hasta ağır KOAH sınıfındaymış. Dehestani ve ark. (25) yaptığı çalışmada; 40 KOAH'lı hasta (%62,5) çalışmaya alınmış, 23 hastada hafif, 14 hastada orta, 3 hastada ağır OUAS tespit edilmiş ve overlap sendromlu hastaların AHİ sınıflaması ile FEV 1% arasında anlamlı bir ilişki tespit edilmemiş (p=0,55). Soykök ve ark. (26) yaptığı bir çalışmada; KOAH hastalarında evrelerine göre komorbiditeler bakılmış, GOLD 2014 kriterlerine göre toplamda 179 hasta çalışmaya alınmış ve toplam 16 (%8,9) hastada OUAS tespit edilmiş.16 hastanın 1 tanesi evre 1, 5 tanesi evre 2, 9 tanesi evre 3, 1 tanesi evre 4 KOAH'lı imiş ve evreler arasında fark saptanmamış. Çalışmamızda; OSAS oranını %60 olarak saptadık, 29 hastada hafif OUAS, 18 hastada orta OUAS, 7 hastada ağır OUAS tespit ettik ve evreler arasında anlamlı farklılık saptamadık. Sonuçlarımız diğer çalışmalar ile uyumludur.

Çalışmanın Kısıtlılıkları

Çalışmamızda; KOAH evrelerinde uyku etkinliği açısından anlamlı farklılık saptanmasa da, evre arttıkça uyku etkinliğinin azaldığı saptanmıştır. Hasta sayısının artırılması sonucunda anlamlı farklılık elde edilebileceği düşünülmektedir.

Sonuç

KOAH'ı tek başına hava yolu obstrüksiyonu ile giden bir hastalık olarak ele almamak gereklidir, beraberinde birçok komorbidite ile birlikte olabilir. Uyku problemleri de bunlardan birisidir. Bu nedenle KOAH nedeni ile tetkik edilen ya da tanı alan olgulara; PSG ve noktürnal oksimetri incelemesi yapılmasının gerekli ve yararlı olduğu kanaatine varılmıştır. Yapılacak PSG sonrasında saptanacak NOD'un tedavisi ile hipoksiye sekonder etkilenen birçok sistemin etkileniminin önüne geçilmesinin mümkün olduğu düşünülmüştür.

Etik

Etik Kurul Onayı: Araştırmaya başlamadan önce Pamukkale Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu'ndan 12.01.2016 tarih ve 60116787-020/2651 sayılı karar ile izin alınmıştır.

Hasta Onayı: Çalışmamıza dahil edilen tüm hastalardan bilgilendirilmiş onam formu alınmıştır.
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Determination of Chronotype, Quality of Life, Sleep Quality, and Social Jetlag in Shift Working Nurses

Vardiyalı Çalışan Hemşirelerde Kronotip, Yaşam Kalitesi, Uyku Kalitesi ve Sosyal Jetlag'ın Belirlenmesi

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Abstract

Objective: This study determined the effects of chronotypes, social jetlag levels, and sleep quality on the quality of life of shift-working nurses.

Materials and Methods: This descriptive study was conducted on nurses working in shifts at a university hospital in Turkey from 2021 to 2022. The data were collected with the "Descriptive Information Form", "Pittsburgh Sleep Quality Index", "Self-assessment morningness-eveningness questionnaire" and "Professional Quality of Life Scale", Questions Regarding Social Jetlag Periods.

Results: It was determined that 14.2% of the nurses had a chronotype close to the morning type, 68.7% had an intermediate type chronotype, and 17.2% had a chronotype close to the evening type. It was found that the burnout levels of females taking part in the study were statistically higher than those of males. It was determined that nurses working in emergency and intensive care units experienced higher empathy fatigue and sleep latency and daytime dysfunction compared to nurses working in normal services. In the study, it was found that nurses working daytime + on-duty had higher daytime dysfunction than nurses working on permanent duty.

Conclusion: Because of the study, it was determined that the sleep quality of the nurses working in shifts deteriorated, and they also experienced empathy fatigue and burnout professionally. To increase the sleep quality of the employees, the working rest hours International Labor Organization of the nurses working in shifts should be arranged per the criteria of the Nurses Association of other countries.

Keywords: Shift worker, social jetlag, sleep, quality of life, chronotypes

Öz

Amaç: Bu çalışmada, vardiyalı çalışan hemşirelerin kronotipleri, sosyal jetlag düzeyleri ve uyku kalitesinin yaşam kalitesine etkisinin belirlenmesi amaçlanmıştır.

Gereç ve Yöntem: Bu tanımlayıcı çalışmaya, Türkiye'de bir üniversite hastanesinde 2021-2022 yılları arasında vardiyalı olarak çalışan hemşireler dahil edilmiştir. Veriler "Tanımlayıcı Bilgi Formu", "Pittsburg Uyku Kalitesi İndeksi", "Kişisel değerlendirme sabah-akşam anketi", "Profesyonel Yaşam Kalitesi Ölçeği" ve sosyal jetlag dönemlerine ilişkin sorular ile toplanmıştır.

Bulgular: Hemşirelerin %14,2'sinin sabah tipine yakın, %68,7'sinin ara tip, %17,2'sinin akşam tipine yakın kronotipe sahip olduğu belirlendi. Araştırmaya katılan kadınların tükenmişlik düzeylerinin erkeklere göre istatistiksel olarak daha yüksek olduğu bulundu. Acil ve yoğun bakım ünitelerinde çalışan hemşirelerin normal servislerde çalışan hemşirelere göre daha yüksek empati yorgunluğu, uyku gecikmesi ve gündüz işlev bozukluğu yaşadıkları belirlendi. Araştırmada gündüz ve nöbette çalışan hemşirelerin, sürekli nöbette çalışan hemşirelere göre daha yüksek gündüz işlev bozukluğuna sahip oldukları bulundu.

Sonuç: Çalışmada vardiyalı çalışan hemşirelerin uyku kalitelerinin bozulduğu, mesleki anlamda da empati yorgunluğu ve tükenmişlik yaşadıkları belirlenmiştir. Çalışanların uyku kalitesini artırmak için vardiyalı çalışan hemşirelerin çalışma ve dinlenme saatleri diğer ülke Hemşireler Birliği kriterlerine göre düzenlenmelidir.

Anahtar Kelimeler: Vardiyalı çalışan, sosyal jetlag, uyku, yaşam kalitesi, kronotipler

Introduction

Sleep is a state of inactivity that allows the whole body to rest. Sleep is a reversible renewal period in which all the systems of the bodywork, with different phases and regular rhythms (1). The internal rhythm of the sleep-wake cycle is normally synchronized with the alternation of the day-night cycle and social routines. Disruptions in synchronization can cause sleep problems (2). Depending on the internal circadian rhythm of the individuals, there may be differences in the sleep and activity timings they prefer. These differences in sleep and activity times are called chronotypes (3). There are three different chronotypes in humans, namely morning type, intermediate type, and evening type (4). Morning and evening

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types differ in sleep-wake timing and mental-physical activation over 24 hours. Morning types go to bed early and get up early, and their mental and physical performance is high in the early hours of the day (5). Evening types go to bed later and get up late and achieve their best performance in the second half of the day. Intermediate types try to adapt to the cycle (4).

With introducing the definition of social jetlag (SJL) into our lives, it has been noticed that sleep quality changes not only according to the chronotypes of individuals. It has been reported that SJL is because of the mismatch between the person's internal clock (circadian rhythm) and external clock (social working hours), a misunderstanding of the sleep-wake cycle and circadian rhythm (6). The SJL measures the inconsistency between circadian and social clocks that often cause chronic sleep loss (7).

Although the negative effects of shift work on people are known, this is inevitable for nurses. For nurses to monitor their patients continuously and to provide more effective care at all hours of the day, their perceptions must be constantly open. In addition, it is important to adapt nurses' chronotypes regarding SJL and to develop department-specific shift programs in shift departments for interventions that promote sleep quality and life quality of nurses working in shifts. This descriptive study aimed to examine the chronotypes, SJL levels, sleep quality, and quality of life of shift nurses.

Materials and Methods

Study Design, Participants

This is a descriptive study conducted between 1 November 2021 and 1 February 2022. The study was conducted by nurses working in shifts in a university hospital in Turkey. The inclusion criteria for the study are subjects aged 18 years or older, who volunteer to participate in the study, and work for one year or more in 8-hour alternating shifts, including at least two consecutive night shifts. The number of nurses who met these criteria and participated in the study was 134.

This study was carried out by The Code of Ethics of the World Medical Association (Declaration of Helsinki). The study was approved by the Ethics Committee of the Selçuk University (E.155799, date 13.10.2021). All participants provided written informed permission.

Data Collections

The data were collected with the "Descriptive Information Form", "Self-assessment Morningness-eveningness Questionnaire (MEQ)", "Professional Quality of Life Scale (ProQOL R-IV)", and "Pittsburg Sleep Quality Index (PSQI)". Because of the Coronavirus disease-2019 pandemic measures, the questionnaire was applied to the nurses via the link created on the google form. In the data collection form; an informed consent text, including the purpose of the study, was created. Questionnaires were collected through nurse online groups (WhatsApp, Instagram, Telegram).

Descriptive Information Form

There are 10 questions, 7 of which question the sociodemographic characteristics of nurses and 3 questions about their working characteristics.

Self-Assessment Morningness-Eveningness Questionnaire (MEQ)

The MEQ was developed by Horne and Ostberg (8) in 1976. Its Turkish adaptation was done by Pündük et al. (9). The form comprises 19 MEQ items. The score to be got from the form varies between 16 and 86. Individuals with a total score between 70 and 86 are "definitely morning-type" Individuals with a score between 59-69 are "close to morning-type", individuals with a score of 42-58 are "intermediate type", individuals with a score of 31-41 Individuals with a score between 16 and 30 are considered as "definite evening type". The Cronbach's alpha value of the form was calculated as 0.81 and it was valid and reliable (9). In our study, the Cronbach's alpha value of the form was 0.73.

Professional Quality of Life Scale (ProQOL R-IV)

The original name of the scale is the ProQOL R-IV. It was developed by Stamm (10) in 2005. Yesil et al. (11) performed the Turkish validity and reliability of the scale in 2010. Sub-dimensions of the scale are professional satisfaction, burnout, empathy fatigue. The scale consists of three sub-dimensions and 30 items and is in a five-point Likert type. A high score in the professional satisfaction sub-dimension shows the level of satisfaction or satisfaction as a helper. A high score from the burnout sub-dimension shows a high level of burnout. Employees with high scores in the peer fatigue sub-dimension are recommended to receive support or help. The Cronbach's alpha value of the scale was calculated as 0.848. In this study, the Cronbach's alpha value of the scale was calculated as 0.81.

Pittsburg Sleep Quality Index (PSQI)

The PSQI was developed in 1989 by Buysse et al. (12). A Turkish validity and reliability study was connected by Agargun et al. (13). In the PSQI, sleep quality was evaluated according to seven subscales: Subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction in the last month. The final score varied between 0 and 21 (12,13). A total PSQI score higher than five is considered an indicator of poor sleep quality.

Questions Regarding SJL Periods

It comprises 3 questions, including the average light exposure time of the people taking part in the study during the day and the duration of feeling sleepless during the day and night shifts (14).

Statistical Analysis

Statistical analyses were performed using the Statistical Package for Social Sciences 24.0. Descriptive statistics were evaluated with number, percentage, mean, median, and standard deviation. The Kolmogorov-Smirnov and the Shapiro-Wilk tests were applied to test the normality distribution. When the hypothesis of normality was rejected, we used the nonparametric Mann-

Whitney U test. Values of $p<0.05$ were considered statistically significant.

Results

The study was conducted with 134 nurses, 72.4% (n=97) female, and 27.6% (n=37) male. The ages of the nurses taking part in the study ranged from 18 to 50, with an average of 28 years old. It was stated that 46.3% of the nurses taking part in the study were married, 67.2% were educated at the undergraduate level, and 97% lived in the city center. It was stated that 74.6% of the nurses worked for 40 hours or more per week, and 70.9% of them worked daytime + watch (Table 1).

In Table 2, 14.2% of the nurses are close to the morning type, 68.7% to the intermediate type, and 17.2% to the evening type. The average duration of light exposure during the day was found to be 2.5 hours on average, the average feeling of sleeplessness during the day shift was 2.16 hours, and the average duration of feeling sleepless during the night shift was found to be 3.02 hours. The mean PSQI score is 8.95±2.25.

In Table 3, the burnout levels of females taking part in the study were found to be statistically higher than males ($p<0.05$).

Table 1. Findings regarding the sociodemographic characteristics of nurses (n=134)

Age	**Min-max (median)** **Ort ± SD**	**18-50 (25)** **28.94±8.25**
		n (%)
Gender	Woman	97 (72.4)
	Men	37 (27.6)
Marital status	Married	62 (46.3)
	Single	72 (53.7)
Education level	High school	8 (6.0)
	Associate degree	29 (21.6)
	Licence	90 (67.2)
	Master's/PhD	7 (5.2)
Family type	Small family	122 (91.0)
	Extended family	9 (6.7)
	Broken family	3 (2.2)
Living place	Province	130 (97.0)
	District	4 (3.0)
Child status	No children	77 (57.5)
	1 child	22 (16.4)
	2 kids	30 (22.4)
	3 or more children	5 (3.7)
Working unit	Emergency room/intensive care/ operating room	54 (40.3)
	Service	80 (59.7)
Weekly working time	40 hours and below	34 (25.4)
	40 hours or more	100 (74.6)
Mode of operation	Constant night shift	39 (29.1)
	Day + night shift mode	95 (70.9)

SD: Standard deviation

When the sleep quality sub-dimensions were examined in the study, it was determined that male nurses used more sleeping pills ($p<0.05$). When the taking part nurses were compared with the work unit, it was found that the nurses working in the emergency room, intensive care units, and operating rooms experienced higher empathy fatigue than the nurses working in the normal service ($p<0.05$). In addition, it was determined that the nurses working in the emergency room, intensive care, and operating room experienced sleep latency and daytime dysfunction more than the nurses working in the service.

The mean exposure times of the nurses working in the emergency room, intensive care, and operating rooms during the day were statistically higher than the nurses working in the service ($p<0.05$). The duration of feeling sleepless in the day shift was found to be statistically higher in those who worked 40 hours or more per week than those who worked 40 hours or fewer ($p<0.05$). In the study, it was also found that nurses working daytime + on-duty had more daytime dysfunction than nurses working on permanent duty.

Discussion

This study was conducted to determine the chronotypes, SJL status, sleep quality, and quality of life of nurses working in shifts. In the study, the chronotypes of the nurses were 14.2% morning person, 68.7% intermediate type, and 17.2% evening type. There is no definite morning type and no definite evening type in the study. When the chronotypes scores of the nurses are examined, it is seen that most of them are composed of intermediate types, and the morning-lover types make up the least number of groups. Similar to our study, studies have shown that most nurses are intermediate types (15,16). In other studies on the determination of chronotypes, it was found that nurses working in shifts were the most intermediate type and the least evening type (17,18). Our study results are like the literature.

In the study, when the SJL status of the nurses was examined; it was found that the average duration of light exposure during the day was 2.5 hours, an average of 2.16 hours in the day shift, and an average of 3.02 hours in the night shift. When the studies with SJL are examined; it has been found that the SJL duration measured in individuals is greater than 1 hour and 36 minutes, 1 hour and 25 minutes, and close to approximately 2 hours (19-21). The same situation was found among night shift workers (22). The study suggests that the shift work of nurses prolongs the SJL period.

In the study, the total mean score of the nurses' PSQI was 8.95. In a similar study, the mean PSQI total score of nurses working in shifts was 8.30 (23). These averages show that the sleep quality of the nurses working on duty is poor. This situation is attributed to the lack of regular night sleep among nurses working on duty.

In the study, the burnout levels of females were found to be higher than males ($p<0.05$). In the literature, it has been determined that the burnout levels of nurses are affected by gender and that women experience burnout more than men (24,25). Our result is like the literature. That the burnout level

Table 2. Distribution of chronotype, sleep quality and SJL duration in nurses					
		n (%)	Min-max	Ort ± SD	Median
Chronotype	Close to morningish type	19 (14.2)	59-69	62.84±3.23	63
	Close to the evening type	23 (17.2)	31-41	36.60±3.88	38
	Intermediate type	92 (68.7)	43-58	50.44±4.39	50
SJL	Average duration of light exposure during the day (minute) 31-60 min	50 (37.3)	1-4	2.50±1.12	2
	Average time to feel sleepy during the day shift (minute) 31-60 min	60 (44.8)	1-4	2.16±0.94	2
	Average time to feel sleepy during the night shift (minute) 61-90 min	52 (38.8)	1-4	3.02±0.84	3
PSQI total (0-21)		-	4-18	8.95±2.25	8.50
SJL: Social jetlag, PSQI: Pittsburg Sleep Quality Index					

of women is higher than that of men may be, since women are more emotional than men.

In the study, the average male's use of sleeping pills (0.43±0.80) was found to be higher than females. In a study, it was reported that the average sleep medication use among nurses' PSQI sub-components was 0.09±0.38, but no gender comparison was made (26). No study has been found in the literature on gender and the use of sleeping pills. Our research in this area adds new information to the literature.

When the quality of life of the workers was examined, it was found that the level of empathy fatigue of the nurses working in units such as intensive care, operating room, and emergency services was higher than the nurses working in normal services. Another study conducted in the emergency department stated that the vast majority of employees are at high or moderate risk for empathy fatigue (27). We think that working in shifts in specialized units increases the level of empathy fatigue among nurses.

In the study, it was determined that the nurses working in the emergency room, intensive care, and operating room experienced higher sleep latency than the nurses working in the service. In a similar study, it was stated that nurses working in intensive care and emergency units had poor sleep quality compared to nurses working inwards (28). Our findings support the literature in this area.

In the study, the mean exposure times of nurses working in the emergency room, intensive care unit, and operating room during the day were found to be statistically higher than the nurses working in the service ($p<0.05$). There is an increase in daytime sleepiness because of insufficient sleep time and disruption in circadian rhythm in shift workers (29). It is like literature. The duration of feeling sleepless in the day shift was found to be statistically higher in those who worked 40 hours or more per week than those who worked 40 hours or fewer ($p<0.05$). When the study were examined, it was stated that nurses working in shifts experienced daytime sleepiness during the day (30). The results support our study and it was found that shift work increases daytime sleepiness.

Study Limitations

This study is limited to nurses working at a university hospital in Turkey.

Conclusion

It has been determined that the sleep quality of nurses working in shifts is low and affects their quality of life. It has been determined that the nurses have a long SJL life expectancy and have the most intermediate type among the chronotype, but this situation does not have a significant effect on sleep and quality of life. In addition, it was determined that shift work caused nurses' sleep quality, sleep latency, sleep disturbance, and daytime sleep dysfunction, and also impaired their quality of life.

It is recommended to provide training for quality sleep to increase the sleep quality of nurses and, therefore, their quality of life. The working and resting hours of nurses working in shifts should be arranged following the criteria of the International Labor Organization and the Nurses Association of other countries (USA, Australia); the number of nurse staff should be increased; the number of seizures should be reduced; help improve sleep quality.

Table 3. Comparison of the socio-demographic characteristics of the participants with their quality of life, chronotype characteristics, and PSQI scores						
	MEQ			ProQOL R-IV		
	Close to morningish type	Intermediate type	Close to the evening type	Professional satisfaction	Burnout	Companion fatigue
	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD
Gender						
Woman	62.71±3.40	50.97±4.07	36.62±3.55	19.36±5.56	22.38±4.26	21.19±5.69
Male	63.20±3.03	49.04±4.9	36.57±4.85	17.54±4.69	20.67±3.58	20.18±4.52
p**	0.573	0.085	0.814	0.064	**0.017**	0.753
Working unit						
Emergency room/intensive care/operating room	62.00±2.75	49.51±4.63	37.36±3.90	19.66±5.52	22.07±4.75	22.18±5.73
Service	63.23±3.46	51.07±4.14	35.91±3.89	18.31±5.25	21.80±3.69	20.06±5.02
p**	0.521	0.102	0.235	0.123	0.907	**0.020**
Weekly working time						
40 hours and below	63.25±3.94	51.47±4.54	36.00±.4.76	18.61±4.09	21.97±2.82	19.88±4.46
40 hours or more	62.73±3.17	50.10±4.32	36.87±3.57	18.94±5.77	21.89±4.51	21.27±5.66
p**	0.736	0.201	0.769	0.685	0.449	0.134
Way of working						
Constant seizure	64.80±3.34	50.80±4.10	36.50±4.34	18.56±4.90	21.89±3.08	21.35±4.78
Day + night seizure	62.14±3.00	50.30±4.52	36.66±3.77	18.97±5.59	21.91±4.52	20.73±5.64
p**	0.156	0.708	0.975	0.852	0.679	0.116

**Mann-Whitney U test, MEQ: Morningness-eveningness questionnaire, ProQOL R-IV: Professional Quality of Life Scale, SJL: Social jetlag, PSQI: Pittsburg Sleep Quality Index, SD: Standard deviation

Ethics

Ethics Committee Approval: This study was carried out by The Code of Ethics of the World Medical Association (Declaration of Helsinki). The study was approved by the Ethics Committee of the Selçuk University (E.155799, date no: 13.10.2021).
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Authorship Contributions

Concept: B.M., P.T.T., A.Y.K., H.İ.T., Design: B.M., A.Y.K., Data Collection or Processing: B.M., P.T.T., A.Y.K., H.İ.T., Analysis or Interpretation: B.M., P.T.T., A.Y.K., H.İ.T., Literature Search: B.M., P.T.T., A.Y.K., H.İ.T., Writing: B.M., P.T.T., A.Y.K., H.İ.T.
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Table 3. Comparison of the socio-demographic characteristics of the participants with their quality of life, chronotype characteristics, and PSQI scores

	PSQI							SJL		
	Subjective sleep quality	Sleep latency (delay)	Sleep time	Habitual sleep activity	Sleeping disorder	Use of sleeping pills	Daytime dysfunction	Light exposure during the day	Feeling sleepy during the day shift	Feeling sleepy during the night shift
	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD	$\bar{X}$ ± SD
	2.64±0.50	1.85±0.74	1.12±0.38	0.40±0.97	1.15±0.54	0.13±0.39	1.41±0.76	2.50±1.14	2.11±0.92	3.07±0.81
	2.56±0.50	1.83±0.72	1.21±0.47	0.54±1.09	1.29±0.57	0.43±0.80	1.64±0.67	2.51±1.09	2.29±0.99	2.91±0.89
	0.414	0.874	0.189	0.495	0.242	**0.018**	0.087	0.929	0.344	0.394
	2.68±0.46	1.72±0.69	1.10±0.34	0.42±0.96	1.15±0.55	0.21±0.52	1.35±0.71	2.88±1.09	2.35±1.04	3.12±0.91
	2.53±0.53	2.03±0.77	1.22±0.50	0.46±1.07	1.25±0.55	0.22±0.60	1.66±0.75	2.25±1.08	2.03±0.84	2.96±0.78
	0.070	**0.013**	0.094	0.878	0.265	0.855	**0.022**	**0.001**	0.108	0.188
	2.67±0.47	1.73±0.61	1.08±0.28	0.35±0.91	1.08±0.45	0.17±0.45	1.41±0.70	2.23±1.10	1.82±0.83	3.02±0.79
	2.61±0.51	1.89±0.77	1.17±0.45	0.47±1.03	1.23±0.58	0.23±0.58	1.50±0.75	2.60±1.12	2.28±0.95	3.03±0.85
	0.474	0.318	0.413	0.560	0.253	0.811	0.483	0.100	**0.015**	0.959
	2.53±0.50	1.97±0.70	1.10±0.30	0.46±1.02	1.23±0.58	0.23±0.62	1.69±0.76	2.43±1.14	2.23±0.98	3.17±0.82
	2.66±0.49	1.80±0.75	1.16±0.45	0.43±1.00	1.17±0.54	0.21±0.52	1.38±0.71	2.53±1.12	2.13±0.92	2.96±0.84
	0.199	0.212	0.555	0.662	0.787	0.969	**0.031**	0.629	0.662	0.174

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Comparison of Sleep Disturbances Among Women with and without a History of COVID-19 Infection

COVID-19 Enfeksiyonu Geçiren ve Geçirmeyen Kadınlar Arasındaki Uyku Bozukluklarının Karşılaştırılması

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Abstract

Objective: This study was conducted to compare sleep disturbances between women with and without a history of Coronavirus disease-2019 (COVID-19) infection.

Materials and Methods: In this descriptive study, the "Pittsburgh Sleep Quality Index" was used to evaluate sleep problems. The research sample was calculated as 120: 1. group 60 (with a history of COVID-19) and 2. group 60 (without a history of COVID-19) using the G*Power 3.1 method. A total of 141 women were interviewed in case of data loss. Due to the ongoing pandemic, the forms were filled in via google form in the social media environment. The data were analyzed with Statistical Package for Social Sciences for the Windows 22.0 program.

Results: The mean age of the women involved in the study was 22.241±6.593 (min: 18, max: 58). Women with a history of COVID-19 experience occasional sleep problems several times a week and have difficulty falling asleep. Statistically significant differences were found between the sleep quality of women with and without a history of COVID-19. Subjective sleep quality, sleep latency, habitual sleep efficiency, use of sleeping medication, daytime dysfunction, and total sleep quality scores were found to be higher in women with a history of COVID-19.

Conclusion: Sleep quality is lower in women with a history of COVID-19. During the COVID-19 pandemic, sleep quality should be evaluated, and sleep problems should be identified and treated within a short period. It is recommended to develop methods of coping with anxiety and stress experienced, especially during the COVID-19 pandemic and to raise awareness on this issue among people with a COVID-19 history.

Keywords: COVID-19, sleep quality, women

Öz

Amaç: Bu araştırmanın amacı Koronavirüs hastalığı-2019 (COVID-19) geçiren ve geçirmeyen kadınlar arasındaki uyku bozukluklarının karşılaştırılmasıdır.

Gereç ve Yöntem: Tanımlayıcı olarak planlanan bu çalışmada uyku problemlerinin değerlendirilmesi için "Pittsburgh Uyku Kalitesi İndeksi" kullanılmıştır. Araştırma örneklemi G*Power 3.1 yöntemiyle birinci grup 60 (COVID-19 geçiren), ikinci grup 60 (COVID-19 geçirmeyen) olmak üzere 120 olarak belirlenmiştir. Kayıplar göz önüne alınarak toplamda 141 kadın ile görüşülmüştür. Pandeminin devam etmesi sebebi ile formlar sosyal medya ortamında Google form ile doldurulmuştur. Araştırma verileri Statistical Package for Social Sciences for Windows 22.0 programı ile analiz edilmiştir.

Bulgular: Çalışmaya katılan kadınların yaş ortalaması 22,241±6,593 (min: 18, maks: 58) idi. COVID-19 geçiren grup arasında uyku problemlerini haftada birkaç kez sıklıkla ve ara sıra görüldüğü, kadınların uykuya dalmada zorluk yaşadıkları tespit edildi. COVID-19 geçiren ve geçirmeyen kadınlar arasında uyku kalitesinin değerlendirilmesi sonucunda gruplar arasında istatistiksel olarak anlamlı farklar tespit edildi. COVID-19 geçiren kadınlar arasında öznel uyku kalitesi, uyku latansı, alışılmış uyku etkinliği, uyku ilacı kullanımı, gündüz uyku işlev bozukluğu ve toplam uyku kalitesi puanlarının daha yüksek olduğu tespit edildi.

Sonuç: COVID-19 geçiren kadınlar arasında uyku kalitesi daha düşüktür. COVID-19 sürecinde uyku kalitesinin değerlendirilmesi ve uyku problemlerinin kısa sürede belirlenerek tedavi edilmesi önemlidir. Özellikle COVID-19 sürecinde yaşanılan kaygı ve stresle baş etme yöntemlerinin geliştirilmesi ve tanı alan kişilerin bu konuda da farkındalıklarının sağlanması önerilmektedir.

Anahtar Kelimeler: COVID-19, uyku kalitesi, kadın

Introduction

Sleep is defined as the state of temporary, partial, and periodic loss of the organism's communication with the environment (1). People spend an average of 1/3 of their life sleeping. It would not be a correct assessment to consider sleep only as a time outside of daily life because it is a vital necessity that forms the basis of a healthy and long life (1-3). Considering the

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average life expectancy, this ratio is equivalent to the significant years of human life. Recent studies have reported that the average life expectancy in our country is 78.6 (4). This means that a person spends an average of 26.2 years sleeping, which corresponds to a significant period.

Sleep quality is the individual's feeling rested, fit, and ready for a new day after waking up. Sleep quality includes both quantitative aspects of sleep like sleep latency, sleep duration, frequency of waking up at night, and subjective aspects like sleep depth and restfulness (3). In determining sleep quality, there are important criteria such as environmental factors, occupational conditions, stress, presence of disease, and sleep routine of the person. Studies have reported that sleep disorders are more common in people with chronic diseases and occupational groups working on shifts (3,5).

It is suggested that sleep problems may have developed in women after the Coronavirus disease-2019 (COVID-19) pandemic that emerged in Wuhan, China. The reasons for this can be listed as the increase in the workload, uncertainties, worrying about the family, barriers to accessing health facilities, and the increase in the household burden of non-working women due to family members staying at home (6). This increasing workload, social, and health concerns in women turn into a stress factor and eventually lead to sleep disturbances.

The study aims to examine sleep disturbances and affecting factors in women during the COVID-19 pandemic.

Materials and Methods

Research Design and Sampling

The study is in descriptive design. The research sample was determined as 120 people: 1. group 60 (those with a history of COVID-19) and 2. group 60 (those without a history of COVID-19) using the G*Power 3.1 method [ratio var1/var 0: 0.3647827, α=0.03, power (1-β err prob) = 0.95]. The variance rate was determined by calculating the variance analysis values in the reference study (7). The data were collected online due to the ongoing pandemic and high case numbers. Due to the unknown population, the non-probability and easy sampling method was used thanks to being fast and easy. The research was conducted with volunteer participants who approved the information text at the top of the form in accordance with the Helsinki Declaration criteria. Considering the possibility of data loss, 143 people who met the inclusion criteria of the research were reached. Due to the incomplete form, 2 women were excluded from the study, and thus the sample consisted of 141 participants.

Inclusion Criteria

Inclusion criteria for the study were being female between the ages of 20 and 65, speaking and understanding Turkish, having a history of COVID-19 (group 1), not having a history of COVID-19 (group 2), having no sleep problems before the COVID-19 pandemic, not having been diagnosed with any psychiatric disorder before the pandemic, and being a volunteer. In addition, women included in the 1. Group were required to have been infected with COVID-19 a minimum of three and a maximum of 6 months ago.

Exclusion Criteria

Exclusion criteria were withdrawing from the study at any time and filling in the survey forms incompletely.

Data Collection Tools

In this descriptive study, data were collected in two stages using a 30-item "Participant Information Form" and a 24-item "Pittsburgh Sleep Quality Index (PSQI)", which were created by the researchers scanning the literature and consulting experts.

Participant Information Form: The form consists of a total of 33 questions prepared by making use of the literature. Some of the questions are multiple choice and some are open-ended. This form includes: questions to inquire about his sociodemographic history, his status of passing COVID-19, his thoughts on the COVID-19 pandemic, sleep patterns and sleep problems.

The Pittsburgh Sleep Quality Index: PSQI was developed by Buysse et al. (8) and adapted into Turkish by Yücel Ağargün et al. (9). PSQI is a 19-item self-report scale that evaluates sleep quality and disturbance over one month. On the scale consisting of 24 questions, 19 questions are self-report questions, and 5 questions are answered by the spouse or roommate. The 18 questions scored consist of 7 components: Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, daytime dysfunction. Each component is evaluated over 0-3 points, and the total score yields the scale score. The total score ranges from 0 to 21, and a total score greater than 5 indicates "poor sleep quality". The Cronbach's alpha reliability of the scale is 0.875. The Cronbach's alpha reliability of this study was found to be 0.777.

Statistical Analysis

The data form created by the researchers was converted online via Google Forms due to the pandemic. The online form link was forwarded to women via WhatsApp and e-mail. The data were evaluated with the Statistical Package for the Social Sciences (SPSS)-22 program, error controls, tables, and statistical analyzes were made. In statistical evaluations, numbers and percentage values were given, and normality analyzes were made. Normality control of continuous variables was evaluated with the Shapiro-Wilk test. Student's t-test was used to compare the mean of the groups according to the variables conforming to the normal distribution. The Mann-Whitney U test was used to compare the groups in the variables that did not conform to the normal distribution. The statistical significance level was taken as 0.05 in all analyzes.

Ethical Aspect of Research

Prior to the research, ethics committee approval (number: E-46418926-050.01.04--47573 date: 12.07.2021) was obtained from the Non-Interventional Ethics Committee of the

University of Health Sciences, and forms were sent to women who volunteered to participate in the study. Thus, the Helsinki Declaration Principles and Publication Ethics were complied with at all stages of the research.

Results

The mean age of the women in the study was found to be 22.24±6.59 (min: 18, max: 58). The descriptive characteristics of the women in the study are given in Table 1.

According to Table 1, While there was no significant relationship between women's occupation, marital status, education level, perceived income level, alcohol use, presence of chronic diseases, use of medication, and the status of getting infected with COVID-19, a significant relationship was found between smoking and the status of getting infected with COVID-19 (Table 1). The rate of smoking is higher in the group without a history of COVID-19.

According to Table 2, no significant relationship was found between the state of having sleep problems, the frequency of sleep problems, the effect of sleep problems on physical activities, waking up at night, and the status of having a history of COVID-19. However, having sleep problems, the frequency of sleep problems, and the frequency of waking up at night are more common in the group with a history of COVID-19. There is a statistically significant relationship between having difficulty falling asleep and having a history of COVID-19 ($p<0.05$). Difficulty falling asleep is more common among the group with a history of COVID-19.

According to Table 3, evaluation of sleep quality of women according to their status of having a history of COVID-19 revealed significant differences between subjective sleep quality, sleep latency, habitual sleep efficiency, use of sleeping medication, daytime dysfunction, and total sleep quality scores. Sleep problems were found to be more common among women who had COVID-19, and their sleep quality decreased ($p<0.05$).

Discussion

COVID-19 infection was declared a Public Health Emergency by the World Health Organization on January 30, 2020 (10). The crisis experienced in the early stages of the pandemic, the uncertainties about the process, and the lack of a vaccine and a proven treatment caused serious concerns. The ongoing pandemic causes the emergence of many diseases after being infected. The aim of this study is to determine the effects of getting COVID-19 on sleep quality.

The mean age of the women involved in the study was 22.24. Since the number of students participating in the study was high (77.3%), the age group of women was low, most of them were single, and their education level was high. The rate of smoking was higher in those without a history of COVID-19. Studies have revealed a relationship between smoking and respiratory tract infections, hypertension, diabetes, obesity, and chronic obstructive pulmonary disease (11-13). Especially in studies conducted during the COVID-19 period, it is recommended to

Table 1. Distribution of women's socio-demographic characteristics by having a history COVID-19

		1. Group with a history of COVID-19		2. Group without a history of COVID-19		Total		p
		n	%	n	%	n	%	
Occupation	Housewife/retired	5	8.1	3	3.8	8	5.7	-
	Working	11	17.7	13	16.5	24	17.0	X^2=1,287
	Student	46	74.2	63	79.7	109	77.3	p=0.525
Marital status	Married	9	14.5	11	13.9	20	14.2	X^2=0,010
	Single	53	85.5	68	86.1	121	85.8	p=0.554
Education status	Secondary school	2	3.2	1	1.3	3	2.1	-
	High school and equivalent	6	9.7	3	3.8	9	6.4	X^2=2,742
	Bachelor's + master + PhD	54	87.1	75	94.9	129	91.5	p=0.254
Perceived income	Income less than expenses	19	30.6	34	43.0	53	37.6	-
	Income equal to expenses	32	51.6	36	45.6	68	48.2	X^2=2,670
	Income more than expenses	11	17.7	9	11.4	20	14.2	p=0.263
Smoking	Yes	7	11.3	21	26.6	28	19.9	X^2=5,104
	No	55	88.7	58	73.4	113	80.1	**p=0.019**
Alcohol use	Yes	7	11.3	13	16.5	20	14.2	X^2=0.761
	No	55	88.7	66	83.5	121	85.8	p=0.266
Presence of chronic disease	Yes	7	11.3	10	12.7	17	12.1	X^2=0.061
	No	55	88.7	69	87.3	124	87.9	p=0.508
Use of medication	Yes	11	17.7	14	17.7	25	17.7	X^2=0.000
	No	51	82.3	65	82.3	116	82.3	p=0.584

X^2: Chi-square analysis, COVID-19: Coronavirus disease-2019

Table 2. Comparison of sleep problems between groups								
		Group with a history of COVID-19		Group without a history of COVID-19		Total		p
		n	%	n	%	n	%	
Having sleep problems	Never	21	33.9	18	22.8	39	27.7	-
	Occasionally	34	54.8	55	69.6	89	63.1	X^2=3,260
	Always	7	11.3	6	7.6	13	9.2	p=0.196
Frequency of sleep problems	Everyday	6	10.5	3	4.3	9	7.1	-
	Several times a week	35	61.4	38	54.3	73	57.5	X^2=3,586
	Once a month	16	28.1	29	41.4	45	35.4	p=0.166
Having difficulty falling asleep	Yes	31	50.0	25	31.6	5	39.7	X^2=4,888
	No	31	50.0	54	68.4	85	60.3	**p=0.021**
The effect of sleep problem on daily activities	Yes	37	59.7	54	68.4	91	64.5	X^2=1,143
	No	25	40.3	25	31.6	50	35.5	p=0.186
Waking up at night	Yes	39	62.9	45	57.0	84	59.6	X^2=0.509
	No	23	37.1	34	43.0	57	40.4	p=0.295
Believing that sleeping problem will be over when COVID-19 ends	Yes	23	37.1	28	35.4	51	36.2	X^2=0.041
	No	39	62.9	51	64.6	90	63.8	p=0.489

X^2: Chi-square analysis, COVID-19: Coronavirus disease-2019

Table 3. Comparison of sleep quality by having a history of COVID-19							
	Group with a history of COVID-19 (n=62)		Group without a history of COVID-19 (n=79)				
Groups	Mean	SD	Mean	SD	t	SD	p
Subjective sleep quality	2,871	0.338	2,342	0.618	6,067	139	**0.000**
Sleep latency	2,903	0.298	2,570	0.547	4,321	139	**0.000**
Sleep duration	0.081	0.275	0,127	0.335	-0.874	139	0.383
Habitual sleep efficiency	3,000	0.000	2,949	0.221	1,805	139	**0.045**
Sleep disturbance	2,290	0.458	2,152	0.483	1,729	139	0.086
Use of sleeping medication	2,790	0.410	2,367	0.581	4,859	139	**0.000**
Daytime disfunction	2,871	0.338	2,544	1,084	2,286	139	**0.013**
Total sleep quality	16,726	1,439	14,924	2,969	4,389	139	**0.000**

Independent groups t-test, SD: Standard deviation, COVID-19: Coronavirus disease-2019

quit smoking due to the risk of disease (14). In our study, the reason for the high rate of smoking among women without a history of COVID-19 may be due to the low age scale of the participant group and therefore the low incidence of chronic diseases.

Uncertainties in the COVID-19 period, anxiety, isolation, depression, panic attacks, sleep disorders, fear of death, and illness cause many diseases in individuals. Sleep is a biological function and an active behavior and is vital for the brain and body health of individuals of all ages. Quality sleep increases the health, quality of life, bodily functions, autonomy, and safety of individuals (15,16). Sleep problems were reported to cause insomnia, mood disorder, cognitive dysfunction, depression, anxiety, attention deficit, and memory problems (17). In this study, the effects of COVID-19 on sleep problems were evaluated. The women included in the study did not have any sleep problems prior to COVID-19. Although the examination of the sleep problems experienced by women during the COVID-19 period did not reveal significant differences between the groups, sleep problems were more common among women with a history of COVID-19. It was determined that the group with a history of COVID-19 occasionally experienced sleep problems several times a week and had difficulty falling asleep. There was no significant difference between the groups in terms of perceived subjective sleep difficulties (Table 2).

Literature has citations that curfew and isolation process to reduce the spread of infection in the COVID-19 pandemic, uncertainties, fear of being infected, anxiety, boredom, and feelings of uncertainty affect daily living standards and sleep quality (18-20). Some studies have shown a bidirectional relationship between sleep problems and mood changes in terms of anxiety and depression (17,21,22). Although mood fluctuations in the COVID-19, called a public health crisis, are considered normal, they can be the precursors of various clinical

conditions such as psychological distress, anxiety characterized by somatization forms, and major depressive disorders (23). During the COVID-19 period, post-traumatic stress disorder is seen at a rate of 7% in women, the sleep quality of women with stress disorders has increased, and night-waking problems have increased (24). The results of our study, which evaluated the sleep quality between groups with and without a history of COVID-19, showed statistically significant differences between the groups. Subjective sleep quality, sleep latency, habitual sleep efficiency, use of sleeping medication, daytime dysfunction, and total sleep quality scores were found to be higher in women with a history of COVID-19. It is important to detect and treat the complaints seen in individuals after COVID-19 in the early period. Long-term sleep problems reduce the quality of life of individuals and trigger many disorders. It is thought that controlling stress and anxiety, supporting methods of coping with stress, and eliminating sleep problems in the early period will be a significant step in the COVID-19 period.

Conclusion

The study showed that women with COVID-19 had lower sleep quality. COVID-19 infection disrupts sleep quality, and sleep problems trigger many diseases. It is pivotal to evaluate the sleep quality of individuals with a history of COVID-19 and to identify and treat sleep problems in a short time. It is recommended to develop methods of coping with anxiety and stress experienced especially during the COVID-19 pandemic and to raise awareness on this issue among those with a history of COVID-19.

Ethics

Ethics Committee Approval: Ethics committee approval (number: E-46418926-050.01.04--47573 date: 12.07.2021) was obtained from the University of Health Sciences, Hamidiye Scientific Research Ethics Committee.
Informed Consent: Forms were sent to women who volunteered to participate in the study.
Peer-review: Internally peer-reviewed.

Authorship Contributions

Design: S.D., H.Ö., Data Collection or Processing: S.D., H.Ö., Analysis or Interpretation: S.D., H.Ö., Literature Search: S.D., H.Ö., Writing: S.D., H.Ö.
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Retrospective Investigation of Sleep Disorders in Turkish Judicial System

Türk Hukuk Sisteminde Uyku Bozukluklarının Retrospektif Olarak İncelenmesi

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Abstract

Objective: In our study, the extent to which sleep disorders are included in the Turkish Legal System and how the approaches.

Materials and Methods: The study was performed on a web-based basis. Words related to sleep disorders were searched in the jurisprudence program to include the years 1900-2021.

Results: It was seen that there were 1311 cases involving the word sleep, 7 cases involving the word snoring, and 4 case files containing the word sleep apnea. No cases were found that included the words narcolepsy, parasomnia, rapid eye movement behavior disorder, or sleepwalking. The contents of the cases were evaluated from the extent that they were open to access.

Conclusion: Sleeping disorders are a health problem that can have multiple consequences. Because the disease ceases to be a person's sleep problems at night. It can affect the sleep partner at night, it can affect the patient's work during the day, it can affect the people in the working environment, if this person is a driver, it can affect the traffic, if he has a strategic task, it can even affect the society. Of course, diseases that can have such consequences will also have a legal dimension. In our study, the extent to which sleep disorders are included in the Turkish Legal System and how the approaches. According to our research, there were no cases of sleeping sickness as expected yet. However, it is thought that these cases will increase, and based on the approaches in the current cases, physicians regarding sleep should determine behavioral strategies.

Keywords: Sleeping disorders, sleep-related lawsuits, sleep and law

Öz

Amaç: Çalışmamızda uyku bozukluklarının Türk Hukuk Sisteminde ne kadar yer aldığı ve bu konudaki yaklaşımların nasıl olduğunun ortaya konması amaçlanmıştır.

Gereç ve Yöntem: Çalışma web tabanlı olarak yapılmıştır. Ulusal Yargı Ağı Bilişim Sistemi programında 1900-2021 yıllarını kapsayacak şekilde uyku bozuklukları ile ilgili kelimeler aranmıştır.

Bulgular: Uyku kelimesini içeren 1311 olgu, horlama kelimesini içeren yedi olgu ve uyku apnesi kelimesini içeren dört olgu dosyasının olduğu görüldü. Narkolepsi, parasomni, REM davranış bozukluğu ve uyurgezerlik kelimelerini içeren olguya rastlanmadı. Olguların içerikleri erişime açık olduğu ölçüde değerlendirildi.

Sonuç: Uyku bozuklukları, birden fazla sonucu olabilen bir sağlık sorunudur. Çünkü hastalık geceleri kişinin uyku sorunu olmaktan çıkabilmektedir. Gece uyku partnerini etkileyebilir, gündüz hastanın işini etkileyebilir, çalışma ortamındaki insanları etkileyebilir, bu kişi sürücü ise trafiği etkileyebilir, stratejik bir görevi varsa, toplumu bile etkileyebilir. Elbette bu tür sonuçlar doğurabilecek hastalıkların hukuki bir boyutu da olacaktır. Çalışmamızda uyku bozukluklarının Türk Hukuk Sisteminde ne derece yer aldığı ve nasıl yaklaşımlar olduğu ele alınmıştır. Araştırmamıza göre henüz beklendiği gibi uyku hastalığı olgusu yoktur. Ancak bu olguların artacağı düşünülmekte olup, mevcut olgulardaki yaklaşımlardan hareketle hekimlerin uyku ile ilgili davranışsal stratejiler belirlemesi gerekmektedir.

Anahtar Kelimeler: Uyku bozuklukları, uyku ile ilgili davalar, uyku ve hukuk

Introduction

Being able to spend enough time in sleep and having a healthy sleep is very important for both individual health and public health. Sleep disorders caused by any reason can lead to a desire to sleep during the day, resulting in impaired attention and negative consequences (1).

It has been stated that there may be a decision-making disorder related to sleepiness in the workplace in the emergence of events that have led to terrible consequences such as the Bhopal disaster and the Challenger spacecraft accident in history (2). According to the American Sleep Association, approximately 50-70 million people in the United States have some form of sleep disorder (3). In Turkey, according to the data of the TAPES

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study, 15.3% of adults had insomnia, 13.7% had obstructive sleep apnoea syndrome (OSAS) symptoms, 9.6% snored, 5.4% increased daytime sleepiness and 5.2% restless legs syndrome findings were detected (4). We think that awareness about sleep disorders has increased through social awareness activities, media and internet. As awareness increases, the number of patients with sleeping sickness increases and the problems that sleep disorders can cause are better known. Patients or lawyers also learn that sleep disorders have a social aspect. Therefore, in our study, we aimed to learn how much sleep disorders take place in the Turkish justice system. Thus, as physicians dealing with sleep disorders, we wanted to determine better what we should do based on these cases.

Materials and Methods

Study data was scanned through the National Judicial Network Information System (UYAP). The words "sleep", "sleep apnea", "narcolepsy", "parasomnia", "sleepwalking" were searched in the jurisprudence program to include the years 1900-2021. Personal information was kept confidential.

Statistical Analysis

This is a screening study and no statistical analysis was performed. The frequency, causes and consequences of cases related to sleeping sickness were examined.

Results

It was observed that there were 1311 records containing the word sleep in the corpus jurisprudence program integrated with the UYAP system. While 23 of them belong to 2021, there were 554 records between 2016-2020, 602 between 2010-2015, and 132 between 1900-2009. Of the cases involving the word sleep in 2021, 14 belonged to the criminal chamber, 6 of them were the decisions of the civil chamber and 3 of them were the decisions of the general assembly of law. Decisions of the General Assembly of Law concerned the labor courts and were concerned with workplaces with sleeping places. The lawsuits of the legal offices were about the order of working hours to meet the need for sleep in workplaces that work 24 hours a day and the necessity of a 4-hour break in these workplaces. Five of the cases belonging to the penal departments were in the context of ill-treatment, 2 of them were to kill the person who was asleep (being unable to defend oneself), 3 of them were in the defense of being asleep due to drug use, 1 of them was deprivation of liberty by putting sleeping pills. making was involved. In 1 case, it was mentioned as the crime of stealing a sleeping set and in 1 case as a personal name (book name). Other criminal cases are fraud in the form of a solution to the sleep problem on the internet, the person's "sleepiness/somnolence" examination finding in the mal practice case, and finally, failure to comply with the obligation to wear a mask in the administrative fine case file is included as a sleeping sickness (african trypanosomiasis?) in the article of the public hygiene law.

When 554 records were evaluated between 2016 and 2020, 244 of them were lawsuits of the general assembly of law and were related to sleep hours in workplaces that work 24 hours a day. In another case, a worker was fired for sleeping during the daytime shift. In 24 criminal cases, not sleeping was included as ill-treatment for this reason. In one case, there was the crime of threatening to harm while sleeping, in one case, fraud via the internet as a solution to the sleep problem, in one case in the defense file that the pedestrian may be at fault due to the use of sleeping pills in a traffic accident, in one request for custody, it was stated that the child had respiratory problems during sleep, and in 9 cases, he had sleep problems after the incident as a justification for compensation. While scanning the word sleep in 45 cases, it appeared as a sleep set (dowry) in criminal and divorce cases. In 4 cases, the word sleep was encountered as a crime of aiding an armed terrorist organization by buying a sleeping bag. In 35 case files, sleep was used for copyright in a proper noun or in expressions to describe the time or situation. In 28 cases, there was qualified sexual assault, that is, disruption of body integrity while asleep, or assault and willful murder of a sleeping person. In 25 cases, the crime of stealing was committed against people who had fallen asleep naturally or had been put to sleep (with diazepam, quetiapine, inhaler anesthetics). In one case, the word "sleep" was used in the defense of a convict in prison regarding drug possession and detection of benzodiazepines in his urine. In 77 criminal files, the word sleep was used in sentences such as waking up from sleep, alcohol-induced drowsiness, drowsiness, sleepiness due to medication, taking sleeping pills, while in 5 mal practice cases, it was included as an examination finding inclined to sleep. In 8 cases, the expert physicians stated that the person had a sleep disorder while describing the psychiatric findings. In 77 criminal files, the word sleep was used in sentences such as waking up from sleep, alcohol-induced drowsiness, drowsiness, sleepiness due to medication, taking sleeping pills, while in 5 mal practice cases, it was included as an examination finding inclined to sleep. In 8 cases, the expert physicians stated that the person had a sleep disorder while describing the psychiatric findings. Again, in the administrative fine case filed for not complying with the obligation to wear a mask, public hygiene was included as a sleeping sickness in the article of the law.

In 3 civil court cases, the regulation ensuring that drivers do not sleep during the journey was based. This regulation required that drivers who transport cargo or passengers for commercial purposes should work for a maximum of 9 hours in 24 hours and 4.5 hours without interruption in order to ensure that they do not sleep during the journey. In these cases, lawsuits were filed against businesses that acted in violation of the regulation. In one case, it was stated that the person did not declare the diagnosis of chronic obstructive pulmonary disease and OSAS in the life insurance policy made due to a bank loan. Therefore, after his death, the bank requested the cancellation of the policy due to incomplete declaration.

In the case heard in one of the civil courts, the reason for the divorce is that the other party made meaningless noises during sleep and that the plaintiff was not informed about this situation beforehand. In the defense regarding this, it is stated that the person has a health report stating that "the person does not have an obstacle to marriage".

Another civil court case concerned the security guard's napping on the job and his dismissal for that reason. The employer dismissed the employee's employment by describing snoozing while on duty as disrupting the safety of the workplace and therefore not performing his/her duty, and the court found the employer right and rejected the employee's severance pay request. In the case heard in another civil court, a civil servant working as a health technician in the emergency room filed a lawsuit for compensation that he was given night shift despite having a sleep disorder. Although the court of first instance rejected the case, the Regional Court of Justice found the case justified as a result of the appeal.

As for sleep apnea, 4 search results were found. The first of these was an event in the sleep apnea laboratory that only the patient should be in the room. This was supported by the expert report in the case. In one case, mal practice was related to a complication in sleep apnea surgery.

When the Supreme Court decisions containing the word "snoring" were searched, 7 results were found. Four of them were criminal cases and in two of them snoring was used to describe the event. One case was a malpractice case related to a complication in sleep apnea and snoring surgery that we encountered in the search for sleep apnea. The other case was mal practice case related to tonsillectomy performed with complaints of snoring and shortness of breath. The remaining 3 cases were related to the decisions of the Court of Cassation Civil Chamber, and in one divorce case, separation of the beds as a result of snoring was presented as a reason. In the other case, it was about the cartoon magazine claiming that a high-ranking public official was snoring, while the last case was the trademark and patent case regarding the apparatus that was stated to have stopped snoring.

No case files or results containing the word "narcolepsy", "parasomnia" were found in any Supreme Court decision scanned between 1900-2021. No case file or result was found in the case law search for the word "sleepwalking".

Discussion

In a study conducted with patients diagnosed with OSAS, it was shown that the mean vehicle accident risk increased by 3.07% compared to the general population (5). The factors that increase this risk are known as the patient's apnea-hypopnea index (AHI) level, hypoxemia level during sleep, body mass index (BMI) and the severity of daytime sleepiness. However, in recent studies, it was determined that only increased daytime sleepiness among these factors increased the risk of accident even if the patient had severe OSAS. Therefore, the Epworth Sleepiness Score (ESS) is very important in demonstrating this risk. It has been shown that psychomotor vigilance testing and split-attention driving task application can be routinely used to diagnose sleepiness and evaluate response to treatment, especially if more objective testing is required (6). The amendment in the regulation on the health conditions required by the driver candidates and drivers by the Ministry of Interior in Turkey was published in the official gazette issue 29577 on 29 December 2015. According to this regulation, the driver's license is taken back for a period determined according to the severity of the disease, course, disability, and the characteristics of the drugs used in patients with a disease such as sleep apnea or narcolepsy that impairs consciousness. If these conditions become chronic, if the treatment response is low or if there are side effects that cannot be eliminated from the drugs used, the driver's license may not be issued again. If the BMI of the driver/driver candidates is >33 kg/m^2, all night sleep test [polysomnography (PSG)] is requested regardless of any other complaints. If the person has "witnessed apnea" and "daytime sleepiness", an all-night sleep test (PSG) is ordered regardless of BMI. Those with an AHI >30 or those with 30> AHI >15 and increased daytime sleepiness are not allowed to obtain a driver's license without treatment. After receiving the necessary treatment and determining that their diseases are under control, they can get a driver's license/drive with the decision of a 3-person committee consisting of at least one sleep-certified physician (if the 2nd group will get a license, information about the disease and treatment must be entered in the health report). There are not yet any criminal court cases in Turkey involving OSAS or narcolepsy. However, we see more OSAS lately, which is the reason for the increase in awareness of OSAS. For this reason, we should know better the current regulations and laws on this subject. In the evaluation for the driver's license, we first review the diagnosis of OSAS. If the diagnosis is correct, we determine the effectiveness of the treatment. In our own clinic, we want these patients to fill in ESS and question their increased sleepiness during the day, as well as the last 6-month record of the positive airway pressure device they are using. Thus, we are trying to understand whether it is an effective and correct treatment. If a patient with moderate or severe OSAS is going to get a 2nd group driver's license, in addition to these procedures, after sleeping for an effective time with his own device or in his own device settings, we perform the maintenance of wakefulness test (MWT) the next morning. Thus, we make verbal inquiries more objective. Thus, we try to minimize the accidents that may occur with excessive daytime sleepiness in terms of both patients and traffic, and while doing this, we aim to base our legal responsibility on evidence. MWT can help patients with OSAS both to analyze the risk of traffic accidents and to determine the potential for sleepiness that may lead to occupational accidents while issuing a medical report (7). Nevertheless, providing effective treatment of OSAS patients and annual check-ups will be beneficial for both patients and physicians to protect themselves legally. Traffic accidents are one of the leading causes of death in our country. According to the April 2022 data of the Ministry of Interior, General Directorate of Population and Citizenship Affairs, 32 million 321 thousand 21 people have a driver's license. The prevalence of OSAS in the population is 1-5%. In other words, with an optimistic estimation, it is thought that there are 320,000 drivers with OSAS. Therefore, the detection and treatment of these patients will significantly reduce injuries and deaths due to traffic accidents. At this point, it is very important for family physicians, who are the first step of the driver's license examination, to question OSAS symptoms and refer them to the relevant specialist if necessary. On the other hand,

according to Turkish Statistical Institute data, it is seen that there is no medical condition when looking at the faults of the driver or passenger that cause traffic accidents with death and injury. However, this seems far from reality, and at this point, we think that there may be a lack of data transfer between professions or institutions, and deficiencies in authorization and assignment.

A few cases in civil courts also indirectly concerned sleep medicine. One of these cases was related to the fact that a security guard could not receive severance pay by being fired because he fell asleep while working. The case was concluded against the employee, since the drowsiness of a security worker here, of course, caused a security weakness. Another case was about keeping a night shift of a health worker with sleeping sickness, and the plaintiff was justified by way of appeal. So, starting from this point, how should the health reports for those with sleeping sickness be treated? For example, in polyclinics, we often conduct a workplace suitability examination for armed private security candidates. In addition, many workplaces, especially those working in shifts, require a health report on whether the person is suitable to work in the shift system. There is no article related to sleeping diseases in the health conditions regulation of the armed private security regulation numbered 31523 of the Ministry of Interior. However, the lawsuit filed shows that increased daytime sleepiness in armed or unarmed security guards poses a major problem for both the person and the workplace. For this reason, PSG should be requested from suspected patients or it should be determined whether patients with OSAS are under effective treatment. In a study on the relationship between night shift and OSAS, PSG was performed in patients with OSAS after the day shift and after the night shift. In half of these patients, an increase in the sleep AHI was detected after the night shift, and it was concluded that acute sleep deprivation may worsen the obstructive sleep apnea index. However, the fact that only 8 patients were evaluated in this study and these patients were not under treatment and the sleep after night shift in normal individuals was not evaluated does not provide sufficient information about staying in the night shift (8). Today, the American sleep medicine association recommends that only patients with untreated OSAS should not stay on night shifts (9). However, it is recommended that these health problems be stated in the relevant reports and periodic sleep doctor checks are recommended.

In two of the divorce cases within the legal department, snoring was shown as the reason that ended the marriage. In the defense, it was stated in the health report obtained before the marriage that the person was healthy. According to the Turkish Civil Code, it is obligatory for people to get married to obtain a "health report" (10). Before marriage, people are examined by family physicians, this examination primarily includes mental health, as well as infectious diseases and genetically transmitted diseases are investigated and counseling services are provided (11). But it is seen that sleeping disorders can be a reason for ending the marriage. According to the current regulation, premarital sleep disorders do not need to be questioned. Perhaps in the future, it may be possible to provide counseling services by questioning sleeping sickness before marriage. Because sleep disorders often concern the patient as well as the patient's relative.

It is surprising that there are no cases involving the words narcolepsy, parasomnia, and sleepwalking in the criminal chamber files. Article 32/1 of the Turkish Penal Code (TCK) states, a person who, due to a mental illness, cannot perceive the legal meaning and consequences of the act he has committed, or does not have the ability to direct his behavior in relation to this act, cannot be punished. In the content of this article, sleepwalking is also counted among the reasons that abolish criminal responsibility. However, it is accepted that those who commit crimes by not taking the necessary precautions despite knowing that they are sleepwalkers have responsibilities within the framework of negligence provisions (12). The first legal cases involving murder with the presumption of sleepwalking in history were published by Walker in 1968 (13). With the increase in these cases, the current situation has been named as homicidal somnanbulism/sleepwalking (14). Cases covered in more detail in the literature are the 1987 Parks case (Toronto) and 1997 Falater (Arizona) cases. Here, while the sleepwalking defense is mostly based on the way the event occurred and witnesses, with the 2005 Lowe case (Manchester), the sleepwalking evidence was based more on scientific data. In this case, the defendant, who was tried for murder, had a history of sleepwalking in his family. There was heavy alcohol use prior to the sleep period when the event occurred. PSG findings performed on 3 consecutive nights, not on the first night, supported sleepwalking. Lowe was found not guilty, but his excessive drinking was used against him. If we were to adapt this case to Turkey, maybe alcohol use might require those who commit crimes by not taking the necessary precautions despite knowing that they are sleepwalking according to article 32/1 of the TCK, to accept that they have responsibilities within the framework of negligence provisions. In the 2008 Thomas (Aberporth) case, the defendant called the police in the morning and said, "I think I was dreaming and I killed my wife", and he explained his dream in all details. Thomas had a history of parasomnia and Parkinson's diagnoses. Two sleep physicians and 1 psychiatrist agreed on the diagnosis of rapid-eye-movement behavior disorder and Thomas was acquitted (15). As it is seen, parasomnia cases are much more complicated cases and require examining the genetic history of the accused, his medical history, the drugs and substances he used, and his psychiatric condition. It also requires multiple PSG examinations and even multiple sleep physician evaluations.

Conclusion

As a result, sleep medicine is still less involved in the Turkish legal system than in other countries. However, awareness of sleeping disorders is increasing and therefore we will encounter more legal issues. For this reason, following exemplary cases both in Turkey and abroad will better reveal the legal dimension of sleep.

Ethics

Ethics Committee Approval: This study does not require ethics committee approval.
Informed Consent: Retrospective study.
Peer-review: Internally and externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: P.U.U., Concept: P.U.U., Design: P.U.U., Data Collection or Processing: A.T., Analysis or Interpretation: A.B.D., Literature Search: A.B.D., Writing: P.U.U.
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The Relationship Between Caffeine Consumption and Depression, Anxiety, Stress Level and Sleep Quality in Medical Students

Tıp Fakültesi Öğrencilerinde Kafein Kullanımıyla Depresyon, Anksiyete, Stres Düzeyi ve Uyku Kalitesi Arasındaki İlişki

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Abstract

Objective: This study examined the relationship between caffeine use and depression, anxiety, stress level and sleep quality in medical students.

Materials and Methods: This cross-sectional study was conducted between March 1, and April 15, 2022, by applying a face-to-face questionnaire to 700 medical students. Depression Anxiety Stress Scale-21 and the Pittsburgh Sleep Quality Index were used.

Results: In the last month, more than 80% of medical students consumed caffeine as tea, solid foods containing caffeine, and coffee. Female gender, increasing age, class level, smoking, family income and place of residence were the factors affecting the caffeine use among students. Caffeine consumption increased in those with high anxiety and stress scores. 73.1% of medical students had poor sleep quality, and as sleep quality worsened, students' caffeine use increased.

Conclusion: It may be offer medical students other alternatives instead of increased caffeine consumption to cope with anxiety and stress and to improve sleep quality.

Keywords: Medical student, caffeine, depression, anxiety, stress, sleep

Öz

Amaç: Bu çalışmanın amacı tıp fakültesi öğrencilerinde kafein kullanımı ile depresyon, anksiyete, stres düzeyi ve uyku kalitesi arasındaki ilişkinin incelenmesidir.

Gereç ve Yöntem: Kesitsel tipteki bu çalışma 1 Mart 2022-15 Nisan 2022 tarihleri arasında toplamda 700 tıp fakültesi öğrencisiyle yüz yüze anket uygulanarak yürütülmüştür. Çalışmaya katılan öğrencilere sosyodemografik veri formu, Depresyon Anksiyete Stres Ölçeği-21 ve Pitsburg Uyku Kalitesi İndeksi anketleri uygulanmıştır.

Bulgular: Son bir ay içerisinde tıp fakültesi öğrencilerinin %80'inden fazlasının çay, kafein içeren katı gıdalar ve kahve olarak kafein tükettiği görüldü. Kadın cinsiyet, artan yaş, sınıf düzeyi, sigara kullanımı, ailenin gelir düzeyi ve yaşanılan yer, öğrencilerin kafein kullanımını etkileyen faktörlerdi. Artan depresyon puanının kafein tüketimi üzerinde anlamlı bir etkisi yoktu. Fakat anksiyete ve stres puanı yüksek olanlarda kafein tüketiminin arttığı görüldü. Tıp fakültesi öğrencilerinin üçte ikisinden fazlası kötü uyku kalitesine sahipti ve uyku kalitesi kötüleştikçe öğrencilerin kafein kullanımı artmaktaydı.

Sonuç: Tıp öğrencilerine anksiyete ve stresle baş etmek ve uyku kalitesini iyileştirmek için artan kafein tüketimi yerine başka alternatifler sunmak gerektiğini düşünmekteyiz.

Anahtar Kelimeler: Tıp öğrencisi, kafein, depresyon, anksiyete, stres, uyku

Introduction

Caffeine (1,3,7 trimethyl xanthine) is a widely used legal psychostimulant substance that affects the central nervous system (1). Caffeine exerts its pharmacological effect by antagonizing adenosine receptors. The receptors it acts on are associated with sleep, arousal and cognitive parts of the brain (2). A safe dose intake of caffeine is said to be 250 mg (500 mL beverage) per day. It has been shown that consuming more than 1 g of caffeine per day may cause toxic effects (3). The United States Food and Drug Administration, Health Canada, and the European Food Safety Authority (EFSA) have determined that a daily intake of 400 mg of caffeine is unlikely to be associated with a low risk of serious adverse events in the adult population. However, a maximum of 2.5 mg/kg per day

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by Health Canada and a maximum of 3 mg/kg per day by EFSA are recommended doses for children and adolescents (4).

Although coffee is the most widely used beverage containing caffeine, many other caffeine-containing substances are in our lives, consciously or unconsciously. For these, we can give examples such as energy drinks, cold tea, tea, cola and chocolate (3). In the last 2 years, coffee consumption in the world has approached 166.63 million (from 60 kg bags) (5).

High-dose caffeine intake is known to be associated with irritability, insomnia, depression, and anxiety (6-8). Especially in adolescents, caffeine accelerates aggression and reduces sleep hours (8). The decrease in sleep quality also causes a decrease in learning capacity and a decrease in performance (9). In addition to all these, considering its positive effects (increasing attention, relieving insomnia, etc.), caffeine is a very good psychostimulant for the young population studying at a medical school, where education continues and where it is necessary to focus on a desk for a long time (10).

Caffeine use has increased considerably in recent years to reduce the negative effects of depression, anxiety, stress levels and sleep patterns for academic success in medical school and continuing clinical training (10). In a study of medical school students, it was reported that most students use coffee moderately as a source of caffeine, and this amount is only slightly increased in high-stress situations such as exams (11). In a study conducted in 2011, it was shown that the consumption of beverages containing caffeine, such as energy drinks, increased in students under stress (12). Similarly, in a study conducted among second-year medical students in Pakistan in 2010, it was emphasized that the consumption of caffeinated beverages increased during stressful times such as exam times (13). In a survey conducted among 700 university students in Bahyren in 2020, the relationship between psychological symptoms and caffeine was examined and symptoms such as headache, panic attacks, and anxiety due to high caffeine intake were observed (14).

The aim of this study was to determine the amount of caffeine use in medical school students, considering sociodemographic characteristics, and to examine the relationship between caffeine use and depression, anxiety, stress level and sleep quality.

Materials and Methods

This cross-sectional study was carried out between 1 March 2022 and 15 April 2022 with Sivas Cumhuriyet University Faculty of Medicine term 1st, 2nd, 3rd, 4th, 5th, and 6th grade students. According to the information received from the Dean's Office, the total number of students studying in these classes was 1143 for the 2021-2022 academic year. Minimum sample size was calculated as 553 using the formula n=[DEFF*Np(1-p)]/[($d^2/Z^2_{1-\alpha/2}$*(N-1)+p*(1-p)] in OpenEpi (Version 3) (N=1143, the effect value d= 3%, confidence interval= 95%, p=50%). The number of students in each class considered as a stratum was calculated and proportioned to the number of samples. Thus, the number of students from each class to enter the sample was determined. In total, 808 (70.7%) students were reached. Students (108 students-13.4%) who were previously diagnosed with any psychiatric disease and were using medication for this reason were not included in the study (this situation was questioned in the sociodemographic data form). The study was completed with 700 (61.2%) students.

Ethical approval (decision no: 2022-01/16, date: 13.01.2022) was obtained from Sivas Cumhuriyet University Non-Interventional Ethics Committee for the study. Necessary permission for the study was obtained from the Dean of the Faculty of Medicine (number: 134847, date: 21.02.2022). Students who agreed to participate in the study were informed about the study and their written informed consent was obtained. The data collection process was carried out in accordance with the Declaration of Helsinki rules. Data collection tools were applied face-to-face to the participants by the researchers.

Sociodemographic Data Form, Depression Anxiety Stress Scale-21 (DASS-21) and Pittsburgh Sleep Quality Index (PSQI) were used to obtain research data.

The sociodemographic data form was consisted of a total of 17 questions about age, gender, body weight, height, class, smoking, alcohol use, academic achievement, history of psychiatric illness (depression, anxiety, etc.), and beverages containing caffeine (consumed in the last month).

DASS-21 is a four-point Likert-type scale containing 7 questions for each of the depression, stress, and anxiety dimensions. "Not suitable for me" was coded as 0, "somewhat suitable for me" was coded as 1, "usually suitable for me" was coded as 2, and "completely suitable for me" was coded as 3 (15). According to Lovibond S., and Lovibond P., normal scores from three subscales are less than 9 for depression, 7 for anxiety, and less than 14 for stress (16). The validity and reliability study of the Turkish version of the scale was performed by Yılmaz et al. (17) According to the Turkish validity and reliability study, Cronbach's alpha values of DASS-21 subscales were found to be 0.81 for depression, 0.80 for anxiety, and 0.75 for stress (17).

PSQI was used to determine the sleep duration and quality of individuals (18). It consists of 19 items and its score varies between 0-21 points. Sleep quality is good when the score is lower than five, and poor sleep quality when it is five or higher. Sensitivity and specificity were found to be 89.6% and 86% (18). Ağargün et al. (19) revealed the Turkish reliability and validity study of the test.

Statistical Analysis

The data obtained from our study were evaluated with the SPSS 22.0 (IBM Corp., Armonk, NY, USA) package program. Numerical variables were given as mean and standard deviation, categorical variables as numbers and percentages. The normality of the data was checked with the Kolmogorov-Smirnov test. Binary logistic regression analysis was used to determine the relationship between caffeine use and other characteristics. While performing the logistic regression analysis, gender, age, class, body mass index, smoking, alcohol use, monthly family income, place of residence, depression, anxiety, stress, and sleep quality scores were included in the model for each questioned caffeine-containing food. Afterwards, first graders

were excluded, and academic success was included in the same model for each caffeine-containing food. Reliability analysis of the scales used was made. Cronbach's alpha values of DASS-21 subscales were 0.895 for depression, 0.842 for anxiety, and 0.876 for stress. $p<0.05$ was considered significant.

Results

The descriptive characteristics of the participants are presented in Table 1. Most of the students participating in the study were female, most of them did not smoke or drink alcohol, 96.3% of them had an academic grade of over 2. Those staying with families were in the minority. More than one-third of the students had high levels of depression and anxiety, and most had poor sleep quality (Table 1).

Table 2 shows descriptive statistics for caffeine consumption over the past month. In the last month, of the students, 89% had consumed at least one glass of tea, 83% had consumed at least once solid foods containing caffeine, 81.9% had consumed at least one cup of coffee, 44.3% had consumed at least one glass of herbal tea, 37% had consumed at least one glass of cola and 8.1% had consumed at least one glass of energy drink (Table 2).

The logistic regression model estimating the relationship between caffeine-containing beverage/food consumption and other characteristics is given in Table 3. Having a female gender increased the consumption of coffee 2.4 times ($p<0.001$), increased the consumption of herbal tea 4.1 times ($p<0.001$), increased the consumption of solid foods containing caffeine 1.9 times ($p=0.007$) and decreased the consumption of cola ($p<0.001$). Energy drink consumption increased 1.2 times ($p=0.024$) with increasing age. Those in the 2nd, 3rd, 4th, or 5th grade had higher tea consumption (2.2, 2.7, 2.9, and 17.7 times, respectively), while those in the 6th grade had a 3.2 times higher coffee consumption. While the consumption of cola was less in the 2nd ($p=0.006$) or 4th ($p=0.016$) grade students, the energy drink consumption was less in the 5th ($p=0.005$) or 6th ($p=0.001$) graders. Smoking increased the consumption of coffee 3.5 times ($p=0.003$), increased the consumption of cola 1.8 times ($p=0.019$), and increased the consumption of energy drink 7.2 times (<0.001). Increasing family income increased the consumption of herbal tea 1.01 times ($p=0.004$). While staying in dormitory increased the herbal tea consumption 1.8 times ($p=0.011$), staying in student house decreased the consumption of tea ($p=0.013$). Increasing depression score decreased the consumption of energy drink ($p=0.038$). Increasing anxiety score increased the consumption of solid foods containing caffeine 1.1 times ($p=0.041$). Increasing stress score increased the consumption of cola 1.1 times ($p=0.020$). Worsening sleep quality increased the coffee ($p=0.026$), tea ($p=0.032$) and cola ($p=0.014$) consumption 1.1 times.

Discussion

As caffeine use is becoming more and more common among medical students, given the above-average amount of stress in their daily lives (10,11,13,20), this study examined the relationship between medical school students' caffeine use and their depression, anxiety, stress levels, and sleep quality.

In our study, we observed that more than 80% of medical school students consumed caffeine as tea, solid foods containing caffeine, and coffee in the last month. In another study conducted with university students in Turkey, it was determined

Table 1. Descriptive characteristics of the participants (n=700)

	Value
Gender	
Female	395 (56.4)
Male	305 (43.6)
Age (years)	21.6±2.6
Year level	
1	160 (22.9)
2	133 (19.0)
3	84 (12.0)
4	79 (11.3)
5	108 (15.4)
6	136 (19.4)
Body mass index	22.9±3.4
Smoking	
No	568 (81.1)
Yes	137 (18.9)
Alcohol drinking	
No	563 (80.4)
Yes	137 (19.6)
Self-reported academic grades* (n=540)	
1-2	20 (3.7)
2-3	216 (40.0)
3 and over	304 (56.3)
Monthly family income	9912.1±10134.0
Place of residence	
Homestay	195 (27.9)
Dormitory	272 (38.9)
Student house	233 (33.2)
Depression**	
Normal	486 (69.4)
High	214 (30.6)
Anxiety**	
Normal	448 (64.0)
High	252 (36.0)
Stress**	
Normal	621 (88.7)
High	79 (11.3)
Sleep quality***	
Good	188 (26.9)
Poor	512 (73.1)

n: Number of participants. Values are presented as mean ± standard deviation or number (%).

*Except for first year students, **Depression Anxiety Stress Scale-21 results, ***Pittsburgh Sleep Quality Index results.

that the most consumed caffeine source was tea with a rate of 81%, like the one in our study (3). Since Turkey leads the world in terms of annual per capita tea consumption by countries (21), these findings in our country are not surprising. In a recent review, it was reported that the most common stimulant used by medical students was coffee, followed by other types of caffeine such as tea and sugary energy drinks (10). In a study conducted with adolescents, like our study, it was reported that 10.3% of students drank more than one can of high-caffeine energy drink per month (9).

In our study, female gender, increasing age, class level, smoking, family income and place of residence were the factors affecting the caffeine use of students. It was remarkable that coffee consumption was higher only in interns and tea consumption was much higher in fifth and sixth grade students. As a matter of fact, in the study conducted by MacLean et al. (22), it was reported that the stress level of most of the senior medical school students increased, and in the study conducted by Iqbal et al. (23), the highest anxiety level was found in those studying in the fifth grade. As we observed in our study, the increase in students' caffeine consumption with increasing anxiety and stress scores supports this situation. On the other hand, similar to our study, there is a study reporting that caffeine consumption does not affect academic performance among university students, as well as a study showing that it reduces academic achievement (9,24).

Table 2. Descriptive statistics for caffeine consumption (in the last month) (n=700)

	n (%)
Coffee*	
Never	127 (18.1)
1-2 cups a day	484 (69.1)
3 or more cups a day	89 (12.7)
Tea	
Never	77 (11.0)
1-2 glasses a day	412 (58.9)
3 or more glasses a day	211 (30.1)
Cola	
Never	441 (63.0)
1-2 glasses a day	241 (34.4)
3 or more glasses a day	18 (2.6)
Herbal tea	
Never	390 (55.7)
1-2 glasses a day	284 (40.6)
3 or more glasses a day	26 (3.7)
Energy drink	
Never	643 (91.9)
1-2 glasses a day	50 (7.1)
3 or more glasses a day	7 (1.0)
Solid foods containing caffeine**	
Never	119 (17.0)
1-2 times a day	502 (71.7)
3 or more per day	79 (11.3)

n: Number of participants
*Nescafe, filter coffee, Turkish coffee, espresso derivatives. **Milk/dark chocolate, cookies, cake

In our study, increasing depression score did not have a significant effect on caffeine consumption, but as an expected situation, we observed that energy drink consumption decreased as the depression score increased. On the other hand, those with high anxiety and stress scores had an increased caffeine consumption. In some other studies, it was reported that the caffeine consumption of medical students increased as they were under stress (11,13). In addition, it has been demonstrated that high-dose caffeine intake increases the level of stress and may be associated with anxiety and depression (14,25,26). In a study conducted among 10th grade students in Istanbul in 2015, it was shown that substance use or use of caffeinated beverages increased in students with high anxiety levels (27). Likewise, in a study conducted among young people in Austria in 2014, it was found that the tendency to use caffeinated beverages increased in those with high anxiety levels (28).

Sleep deprivation is common among university students, and in a study, it was reported that 71% of university students slept poorly and did not feel rested in at least five of the last seven days (29). In our study, we observed that more than two-thirds of medical students had poor sleep quality. It has been reported that caffeine use has increased in medical students to reduce the negative effects of sleep patterns (10). As a matter of fact, in our study, we found that as the sleep quality deteriorated, the caffeine use of the students increased. In a study conducted in the United States, it was determined that the consumption of energy drinks containing caffeine is a popular practice among university students and that the consumption of these drinks increases especially if the student has insufficient sleep (30). However, it is necessary to be careful about caffeine consumption because there are studies reporting that caffeine consumption worsens sleep quality (9,26,31).

The limitations of our study can be listed as follows. Students' depression, anxiety, stress levels and sleep quality were determined using only scales. The mental status assessments of the participants were not supported by clinical examinations. On the other hand, as far as we know, this study is important in that it is the first study in Turkey to examine the relationship between caffeine use in medical students and their mental state and sleep quality.

Conclusion

As a result, in our study, we found that more than 80% of medical students consumed caffeine in the form of tea, solid foods containing caffeine, and coffee in the last month. Female gender, increasing age, class level, smoking, family income and place of residence were the factors affecting the caffeine use of students. Increasing depression score did not have a significant effect on caffeine consumption, but caffeine consumption increased in those with high anxiety and stress scores. More than two-thirds of medical students had poor sleep quality,

Table 3. Descriptive statistics for caffeine consumption (in the last month) (n=700)						
Characteristics	**Coffee (at least one cup a day)***	**Tea (at least one glass a day)***	**Cola (at least one glass a day)***	**Herbal tea (at least one glass a day)***	**Energy drink (at least one glass a day)***	**Solid foods containing caffeine (at least once a day)***
	OR_a (95% CI), p	**OR_a (95% CI), p**	**OR_a (95% CI), p**	**OR_a (95% CI), p**	**OR_a (95% CI), p**	**OR_a (95% CI), p**
Gender (Ref C= Male)						
Female	2.37 (1.50-3.72), <0.001	1.40 (0.81-2.41), 0.224	0.50 (0.35-0.71), <0.001	4.12 (2.82-6.00), <0.001	0.71 (0.37-1.37), 0.304	1.89 (1.19-3.00), 0.007
Age (years)	0.96 (0.85-1.09), 0.550	0.99 (0.86-1.16), 0.951	1.08 (0.97-1.20), 0.160	1.05 (0.94-1.17), 0.369	1.18 (1.02-1.37), 0.024	0.91 (0.79-1.04), 0.176
Year level (Ref C= 1)						
2	1.54 (0.82-2.89), 0.183	2.19 (1.08-4.44), 0.030	0.48 (0.48-1.04), 0.006	1.20 (0.72-2.02), 0.488	0.53 (0.22-1.28), 0.156	1.96 (0.92-4.16), 0.080
3	1.32 (0.64-2.74), 0.450	2.65 (1.05-6.69), 0.039	0.80 (0.48-1.04), 0.473	0.66 (0.35-1.25), 0.203	0.41 (0.14-1.22), 0.109	0.99 (0.45-2.16), 0.974
4	1.84 (0.79-4.29), 0.161	2.86 (1.03-7.94), 0.044	0.42 (0.48-1.04), 0.016	0.73 (0.36-1.49), 0.385	0.33 (0.09-1.20), 0.093	1.28 (0.53-3.09), 0.577
5	1.59 (0.65-3.89), 0.312	17.73 (3.40-92.51), 0.001	0.53 (0.48-1.04), 0.089	0.72 (0.34-1.53), 0.394	0.15 (0.04-0.57), 0.005	1.70 (0.65-4.41), 0.277
6	3.16 (1.15-8.67), 0.026	4.17 (1.27-13.67), 0.018	0.50 (0.48-1.04), 0.087	0.63 (0.28-1.41), 0.259	0.09 (0.02-0.37), 0.001	2.15 (0.77-6.01), 0.147
Body mass index	1.03 (0.96-1.11), 0.370	0.99 (0.92-1.08), 0.929	1.01 (0.96-1.06), 0.742	1.02 (0.96-1.07), 0.580	0.98 (0.90-1.08), 0.731	0.99 (0.94-1.07), 0.946
Smoking (Ref C= No)						
Yes	3.51 (1.54-7.97), 0.003	1.45 (0.64-3.25), 0.372	1.77 (1.10-2.84), 0.019	1.13 (0.69-1.85), 0.642	7.23 (3.37-15.51), <0.001	0.75 (0.42-1.34), 0.328
Alcohol drinking (Ref C= No)						
Yes	1.30 (0.64-2.61), 0.468	0.77 (0.36-1.65), 0.499	0.84 (0.52-1.36), 0.482	1.58 (0.98-2.57), 0.062	1.19 (0.56-2.55), 0.653	1.08 (0.60-1.96), 0.797
Self-reported academic grades (n=540) (Ref C= 1-2)**						
2-3	1.18 (0.29-4.78), 0.820	0.38 (0.05-3.16), 0.371	1.35 (0.49-3.74), 0.563	3.23 (0.99-10.49), 0.052	32.7 (0.01-99.9), 0.998	1.31 (0.41-4.19), 0.644
3 and over	1.03 (0.26-4.18), 0.965	0.38 (0.04-3.16), 0.367	1.19 (0.43-3.31), 0.736	2.98 (0.92-9.67), 0.070	35.7 (0.01-99.9), 0.998	1.12 (0.35-3.58), 0.844
Monthly family income	1.01 (1.01-1.01), 0.066	1.01 (1.01-1.01), 0.208	1.01 (1.01-1.01), 0.773	1.01 (1.01-1.01), 0.004	1.01 (1.01-1.01), 0.310	1.01 (1.01-1.01), 0.303
Place of residence (Ref C= Homestay)						
Dormitory	1.03 (0.62-1.73), 0.907	0.71 (0.36-1.42), 0.336	1.24 (0.81-1.89), 0.329	1.75 (1.14-2.70), 0.011	1.02 (0.43-2.40), 0.966	1.75 (0.99-3.10), 0.055
Student house	0.78 (0.45-1.36), 0.380	0.39 (0.18-0.82), 0.013	1.05 (0.68-1.63), 0.818	1.47 (0.95-2.28), 0.083	1.10 (0.46-2.64), 0.834	0.74 (0.44-1.25), 0.255
Depression score***	1.01 (0.95-1.06), 0.902	0.97 (0.91-1.03), 0.358	0.98 (0.94-1.02), 0.325	0.99 (0.95-1.05), 0.586	0.93 (0.86-0.99), 0.038	0.96 (0.91-1.01), 0.105
Anxiety score***	1.01 (0.94-1.07), 0.930	0.97 (0.90-1.05), 0.483	0.97 (0.93-1.03), 0.312	1.01 (0.95-1.05), 0.958	1.04 (0.95-1.14), 0.366	1.08 (1.01-1.16), 0.041
Stress score***	1.01 (0.94-1.07), 0.996	1.01 (0.93-1.08), 0.916	1.06 (1.01-1.11), 0.020	1.04 (0.99-1.09), 0.160	1.08 (0.99-1.17), 0.083	1.06 (0.99-1.13), 0.098
Sleep quality score****	1.11 (1.01-1.21), 0.026	1.12 (1.01-1.23), 0.032	1.08 (1.02-1.16), 0.014	0.99 (0.93-1.06), 0.821	1.09 (0.98-1.21), 0.124	0.99 (0.91-1.07), 0.756

*Reference category= Never, **Except for first year students, ***Depression Anxiety Stress Scale-21 results, ****Pittsburgh Sleep Quality Index results

n: Number of participants, OR_a: Adjusted odds ratio, CI: Confidence interval, Ref C: Reference category

and as sleep quality worsened, students' caffeine use increased. We think that it is necessary to offer medical students other alternatives instead of increased caffeine consumption to cope with anxiety and stress and improve sleep quality.

Ethics

Ethics Committee Approval: Ethical approval (decision no: 2022-01/16, date: 13.01.2022) was obtained from Sivas Cumhuriyet University Non-Interventional Ethics Committee for the study.
Informed Consent: Students who agreed to participate in the study were informed about the study and their written informed consent was obtained.
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Authorship Contributions

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Sleep Quality and Related Factors in Surgical Intensive Care Patients

Cerrahi Yoğun Bakım Hastalarının Uyku Kalitesi ve Etkileyen Faktörler

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Abstract

Objective: This study determined the sleep quality of surgical intensive care patients and the affecting factors.

Materials and Methods: This descriptive study was conducted from April 2021 to January 2022 in the surgical intensive care unit of the university hospital. One hundred participants who met the inclusion criteria were included. The researcher completed the patient descriptive form and The Richards-Campbell Sleep Questionnaire (RCSQ) by face-to-face interview.

Results: The RCSQ total score of the patients was 39.3±14.4. Age, type of surgical performed, pain severity, stress score and environmental factors (lights of the intensive care setting, device sounds, ambient odor, ambient temperature, voices of other patients, and conversations of the intensive care unit staff) affected the quality of sleep of patients.

Conclusion: Patients had poor sleep quality in the intensive care unit. Increasing the awareness of nurses and intensive care team members about the factors disrupting sleep quality and possible solutions, transferring the solutions to the clinic, and evaluating the results may improve the sleep quality of patients.

Keywords: Intensive care, nursing, quality of sleep, patient, surgery

Öz

Amaç: Bu çalışmada cerrahi yoğun bakım hastalarının uyku kalitesi ve etkileyen faktörlerin belirlenmesi amaçlanmıştır.

Gereç ve Yöntem: Bu tanımlayıcı çalışma, Nisan 2021-Ocak 2022 tarihleri arasında üniversite hastanesinin cerrahi yoğun bakım ünitesinde gerçekleştirildi. Dahil edilme kriterlerini karşılayan yüz katılımcı çalışmaya dahil edildi. Araştırmacı hasta tanıtım formu ve Richards-Campbell Uyku Anketi'ni (RCSQ) yüz yüze görüşme ile doldurdu.

Bulgular: Hastaların RCSQ toplam puanı 39,3±14,4 idi. Yaş, uygulanan ameliyatın türü, ağrı şiddeti, stres skoru ve çevresel faktörler (yoğun bakım ortamının ışıkları, cihaz sesleri, ortam kokusu, ortam sıcaklığı, diğer hastaların sesleri ve yoğun bakım personelinin konuşmaları) hastaların uyku kalitesini etkilemiştir.

Sonuç: Yoğun bakım ünitesinde yatan hastaların uyku kalitesi kötüydü. Hemşirelerin ve yoğun bakım ekibi üyelerinin uyku kalitesini bozan faktörler ve olası çözümler konusunda farkındalıklarının arttırılması, çözümlerin kliniğe aktarılması ve sonuçların değerlendirilmesi hastaların uyku kalitesinin iyileştirilmesine katkı sağlayabilir.

Anahtar Kelimeler: Yoğun bakım, hemşirelik, uyku kalitesi, hasta, cerrahi

Introduction

Intensive care units (ICUs) are settings where patients face many sources of stress both physically and psychosocially. It is indicated that these negative conditions experienced by patients in the ICU affect the immune system and disrupt sleep patterns (1).

Sleep is a basic need that regulates the immune system and homeostasis and supports cognitive and physiological functions (2). Through the physical and psychological healing effect of sleep, the immune system of patients is supported, the infection rate decreases, and the continuity of cognitive functions is provided (3,4). In the ICU, patients' sleep is interrupted due to sleep disorders (insomnia and parasomnias), medical conditions (chronic pain, respiratory dysfunction, obesity and congestive heart failure, loss of physical activity), patient care and treatment interventions, mechanical ventilation practice, drugs and psychological factors (stress, anxiety). Furthermore, the environmental conditions of ICUs are not considered ideal for healthy sleep (5-9). Due to the existing nature of ICUs, patients rarely complete a full cycle of sleep and usually experience light and disrupted sleep, and both the duration and quality of sleep decrease (4,7,10,11). It is reported in the literature that the sleep quality of patients in the surgical ICU is poor (12,13).

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Sleep problems lead to increased pain sensitivity, decreased respiratory capacity, delayed wound healing, suppression of immunity, disruption of neuroendocrine and metabolic functions, delirium in patients, and increased length of stay in the ICU and mortality (9,14). With regard to surgical patients, sleep problems also delay healing (15). Sleep quality is given importance for the recovery of intensive care patients, and the monitoring and promotion of sleep are considered the standard care components (5,16).

The sleep quality of patients should be determined with valid and reliable tools since it is affected by many factors (6). According to the results of the study evaluating the sleep state of patients objectively or subjectively, it is recommended to take measures for sleep regulation (4,5). This study aimed to determine the sleep quality of surgical intensive care patients and the affecting factors.

Materials and Methods

Study Design and Sample

This descriptive study was conducted between April 2021 and January 2022 with the participation of 100 surgical intensive care patients.

Sample size calculation was performed using the G*Power (3.1.9.4) computer program. Based on the study results of Simons et al. (17) and considering α error =5%, power (1-β) =80%, the effect size of 0.320 and 79 patients were required in this study.

Inclusion and Exclusion Criteria

Adults who declared in writing that they volunteered to participate in the study or were unable to sign themselves and therefore signatures were obtained from their relatives, who were monitored in the surgical ICU after surgery and on postoperative day 2, had no diagnosis of psychological illness, had mental ability, and had no communication problems in Turkish were included in the study.

Patients who were mechanically ventilated, stayed for less than 24 hours in the ICU, underwent cranial surgery, had a glasgow coma scale score of 12<, had diseases that might affect sleep (chronic organ failure, sepsis, sleep disorder, psychiatric illness, drug or substance abuse, etc.), personally reported that they had hearing loss, and used hearing aids were not included in the study.

Setting

Thirty-eight physicians and thirty nurses worked in the ICU of a tertiary care unit with 23 beds, where the research data were collected. Neurosurgery, urological surgery, orthopedics and traumatology, gynecology and general surgery patients are served in the surgical ICU. The institution has separate ICUs for cardiovascular and thoracic surgery patients. The ratio of nurses to patients was 1:2 at night. Lighting was restricted in the intensive care setting at night.

Data Collection Forms

Data on the socio-demographic characteristics of the patients were collected with a patient descriptive form. Sleep quality that patient experienced were evaluated by the Richards-Campbell Sleep Questionnaire (RCSQ), according to self-report of the patient.

Patient Identification Form

It consists of a total of 27 items examining the individual variables of the patient. The survey questions were prepared by the researchers in accordance with the literature (4,5,10,18).

The Richards-Campbell Sleep Questionnaire

RCSQ was developed by Richards (19) for patients intensive care. A study on the validity and reliability of the scale in the Turkish language was conducted by Karaman Özlü and Özer (20). Five 100-mm visual analog scales (VAS) are included in the RCSQ: Sleep depth, sleep latency, awakenings, returning to sleep, and quality of sleep. The better the sleep, the higher the score. Participants must mark a "X" along each VAS to indicate the quality of that sleep domain for the previous night on the questionnaire. The distance from 0 mm to the X along each VAS was measured, and the RCSQ total score was calculated by averaging all 5 scales to arrive at the RCSQ total score, which was then reported as "average sleep score". This questionnaire contained a sixth scale that rated noise levels from very quiet to very loud (20). The RCSQ is considered an appropriate tool for assessing the sleep of patients in the ICU (4). Cronbach's α value of the scale developed by Richards (19) was found to be 0.82 (20). In the study, Cronbach's alpha value of the scale was 0.96.

Data Collection

Patients who met the inclusion criteria for sampling were informed about the study by the researcher (researcher 3, intensive care nurse). The patients who gave written consent to participate in the study were asked questions on the patient information form and RCSQ at the bedside. After recording the patients' responses on the forms and obtaining the necessary medical information from the medical records, the data collection process was terminated. The data were collected by the researcher using the face-to-face interview method between 09:00-10:00 in the morning on postoperative day 2, and the process lasted for approximately 10-15 minutes.

Statistical Analysis

In the study, International Business Machines (IBM) statistical package for the social sciences (IBM, Armonk, NY, USA) version 22.0 was used for data analysis. Descriptive data of the study were analyzed through numbers, percentages, means and standard deviation. Kolmogorov-Smirnov test was used to test the compatibility of the data to normal distribution. Mann-Whitney U, Kruskal Wallis-H test, and spearman correlation analysis were used in analyzing the data. Results were accepted to be statistically significant when p-value was less than 0.05.

Ethical Considerations

The Declaration of Helsinki, Good Clinical Practice guidelines, and the local ethics committee requirements were taken into account during the study process. Permissions have been received from the Trakya University Ethics Committee (date: 01.02.2021 protocol number: 2021/56 and desicion

number: 03/18) and institue (date: 08.03.2021 and number: 2021/30374). Before the study, patients were informed about the study and a written, informed consent has been obtained.

Results

The mean patient age was 58.9±15.6 years, and 71.0% were male. It was determined that 40% of the patients underwent non-oncologic abdominal surgery and 72% of them had at least one chronic disease. It was found that the patients' sleep score at home was 7.8±1.6 (Table 1).

RCSQ total score of patients was 39.3±14.4 (13-81). It was revealed that the type of surgical performed affected the RCSQ total score of patients (p<0.005). A positive and weak correlation was found between age and the RCSQ total score (p=0.033 r=0.213). A negative and weak correlation was found between pain severity and stress score and the RCSQ total score (p=0.455, r= -0.000 and p=0.00, r= -0.523) (Table 2).

It was determined that sleep was adversely affected by factors such as the lights of the intensive care setting, device sounds, ambient odor, ambient temperature, voices of other patients, conversations of the ICU staff, nurse and physician visits, and care and treatment practices (p<0.005) (Table 3).

Table 1. Patients' characteristics (n=100)

Characteristics		**n (%)**
Age_{year}	**Min-max 18-90**	**Mean ± SD 58.9±15.6**
Gender	Female	29 (29)
	Male	71 (71)
Companion support	Yes	96 (4)
	No	96 (4)
Comorbidity*	No	28 (28)
	Hypertension	64 (64)
	Diabetes	34 (34)
	Cardiovascular diseases	12 (12)
Surgery performed	Orthopedic surgery	32 (32)
	Oncological surgery	28 (28)
	Non-oncological abdominal surgery	40 (40)
Type of surgery performed	Emergency	18 (18)
	Elective	82 (82)
Use of analgesic drugs**	No	12 (12)
	Paracetamol	9 (9)
	Opioid	12 (12)
	Paracetamol + opioid	67 (67)
Use of inotropic drugs**	No	12 (12)
	Beta blocker	47 (47)
	Epinephrin	6 (6)
Use of sedative drugs**	No	49 (49)
	Propofol	51(51)
	Min-max	**Mean ± SD**
Pain severity	0-9	5.2±2.0
GCS score	13-14	13.4±0.4
Stress score	0-9	5.4±2.1
Ohers problems (vomiting, dyspnea etc.)	0-10	1.8±2.0
Sleep score at home***	1-10	7.8±1.6

*More than one option is ticked, **Data covers the last 24 hours, ***Visual analog scale (0-10)

ICU: Intensive care unit, GCS: Glaskow coma scale, n: Number of patient, SD: Standard deviation, Min-max: Minimum-maximum

Discussion

The study revealed that patients had good sleep scores at home; however, their sleep quality was poor in the ICU. Likewise, Stewart et al. (21) and Caruana et al. (12) found that the sleep quality of patients in the ICU decreased compared to that at home. Previous studies (22,23) have indicated that the sleep quality of patients in the ICU is disrupted with similar scores (respectively RCSQ=40.47, RCSQ=34.41, RCSQ=33.50). In their study, Seid Tegegne and Fenta Alemnew (24) examined postoperative sleep quality and determined that 64.9% of patients had a poor sleep quality. The study results revealed that the sleep quality of patients was disrupted in the intensive care setting.

A positive and weak correlation was found between age and the RCSQ total score in this study. In their study with patients who underwent cardiac surgery, Navarro-García et al. (13) revealed that patients aged 65 years and older had a higher mean sleep quality score on the first night in the ICU. In their study, Seid Tegegne and Fenta Alemnew (24) reported that patients aged 25-54 years were 15.2 times more likely to have sleep disorders in the postoperative period compared to elderly patients. Contrary to our result, Bernat Adell et al. (25) determined that older age was associated with poorer sleep quality. Liao et al. (26) indicated that age was an individual factor affecting sleep quality in patients undergoing cardiac surgery and that age should be taken into account in studies on sleep. It was determined that as the age of patients increased, they fell asleep more quickly, woke up less frequently and slept better with a shorter duration of staying awake.

It was found that patients operated under elective conditions could sleep better than patients operated under emergency conditions. In the study by Seid Tegegne and Fenta Alemnew (24) in which postoperative patients constituted the sample, it was revealed that operation under emergency conditions caused a higher risk of reduced sleep quality by 2.46 times. It is considered that patients' sleep quality is adversely affected due to acute physiological changes and comorbidities (27), which are more common in patients operated under emergency conditions.

It was found that patients experienced worse sleep as the severity of pain increased. Likewise, it was reported that 32.1% of intensive care patients experienced poor sleep due to pain (21). Previous studies have indicated a negative correlation between pain and sleep quality (10,23,28) and reported that pain was in the first place among the barriers that prevented sleep (13,22,29). In their study, Seid Tegegne and Fenta

Table 2. Comparison of patients' sociodemographic characteristics according to Richards-Campbell Sleep Questionnaire (n=100)						
Variables	**Sleep depth**	**Sleep latency**	**Awakenings**	**Returning to sleep**	**Sleep quality**	**Total score**
Mean ± SD	47.2±15.6	37.0±15.9	36.1±15.0	35.7±15.4	40.6±17.7	39.3±14.4
	Mean rank	**Mean rank**	**Mean rank**	**Mean rank**	**Mean rank**	**Mean rank**
Age$_{year}$	r^S=0.188 p=0.061	r^S=0.241 p=0.016	r^S=0.244 p=0.014	r^S=0.216 p=0.031	r^S=0.165 p=0.100	r^S=0.213 p=0.033
Gender Female Male	43.79	48.53	52.83	53.29	49.17	49.22
	53.24	51.30	49.55	49.36	51.04	51.02
	U=835.00 p=0.135	U=972.500 p=0.662	U=962.000 p=0.603	U=948.000 p=0.536	U=991.000 p=0.768	U=992.500 p=0.779
Companion support Yes No	50.70	50.93	50.78	50.60	50.63	50.80
	45.75	40.13	43.75	47.38	47.38	43.25
	U=173.000 p=0.754	U=150.500 p=0.480	U=165.000 p=0.653	U=179.500 p=0.832	U=179.500 p=0.832	U=163.000 p=0.629
Comorbidity Yes No	44.14	44.95	46.43	46.70	50.13	46.68
	52.97	52.66	52.08	51.98	50.65	52.06
	U=830.000 p=0.167	U=852.500 p=0.229	U=894.000 p=0.375	U=901.500 p=0.410	U=997.500 p=0.935	U=895.500 p=0.388
Surgery performed Orthopedic surgery Oncological surgery Non-oncological abdominal surgery	41.08	46.69	46.19	46.19	45.48	44.80
	52.18	52.04	52.52	54.52	50.70	51.75
	56.86	52.48	52.54	51.14	54.38	54.19
	KW=5.506 p=0.064	KW=0.831 p=0.660	KW=1.069 p=0.586	KW=1.281 p=0.527	KW=1.695 p=0.428	KW=1.937 p=0.380
Type of surgery performed Emergency Elective	29.50	29.53	33.67	30.19	27.14	28.36
	55.11	55.10	54.20	54.96	55.63	55.36
	U=360.000 p=0.001	U=360.500 p=0.001	U=435.000 p=0.006	U=372.500 p=0.001	U=317.500 p=0.000	U=339.500 p=0.000
Use of analgesic drugs Yes No	58.58	59.75	52.08	56.63	58.79	60.79
	49.40	49.24	50.28	49.66	49.37	49.10
	U=431.000 p=0.298	U=417.000 p=0.235	U=509.000 p=0.838	U=454.500 p=0.432	U=428.500 p=0.288	U=404.500 p=0.190
Use of inotropic analgesic drugs Yes No	57.58	53.28	52.96	54.39	54.42	54.51
	42.51	47.36	47.72	46.12	46.07	45.98
	U=870.000 p=0.009	U=1098.000 p=0.304	U=1115.000 p=0.361	U=1039.500 p=0.152	U=1037.500 p=0.148	U=1033.000 p=0.142
Use of sedative drugs Yes No	52.06	49.14	48.98	49.10	47.96	48.66
	48.88	51.92	52.08	51.96	53.14	52.42
	U=1170.000 p=0.580	U=1180.000 p=0.629	U=1172.000 p=0.588	U=1178.000 p=0.620	U=1120.000 p=0.368	U=1155.500 p=0.517
Pain severity	r^S= -0.493 p=0.000	r^S= -0.452 p=0.000	r^S= -0.335 p=0.001	r^S= -0.397 p=0.000	r^S= -0.493 p=0.000	r^S= -0.485 p=0.000
GCS score	r^S=0.050 p=0.623	r^S=0.176 p=0.079	r^S=0.133 p=0.187	r^S=0.150 p=0.136	r^S=0.162 p=0.108	r^S=0.161 p=0.109
Stress	r^S= -0.459 p=0.000	r^S= -0.503 p=0.000	r^S= -0.422 p=0.000	r^S= -0.489 p=0.000	r^S= -0.501 p=0.000	r^S= -0.523 p=0.000
Other problems (vomiting, dyspnea etc.)	r^S=0.115 p=0.256	r^S=0.011 p=0.915	r^S= -0.003 p=0.974	r^S= -0.038 p=0.705	r^S= -0.079 p=0.437	r^S= -0.003 p=0.972
Sleep score at home	r^S=0.187 p=0.063	r^S= 0.009 p=0.928	r^S= -0.061 p=0.549	r^S= -0.014 p=0.890	r^S= -0.002 p=0.980	r^S=0.032 p=0.753

r^S: Spearman correlation analysis, ICU: Intensive care unit, SD: Standard deviation, U: Mann-Whitney U test, KW: Kruskal Wallis-H test

Table 3. Environmental factors affecting sleep quality (n=100)						
Factors	**Sleep depth**	**Sleep latency**	**Awakenings**	**Returning to sleep**	**Sleep quality**	**Total score**
Light	r^S= -0.432 p=0.000	r^S= -0.414 p=0.000	r^S= -0.339 p= 0.001	r^S= -0.371 p=0.000	r^S= -0.418 p=0.000	r^S= -0.429 p=0.000
Device sounds	r^S= -0.427 p=0.000	r^S= -0.504 p=0.000	r^S= -0.377 p=0.000	r^S= -0.355 p=0.000	r^S= -0.447 p=0.000	r^S= -0.483 p=0.000
Ambient odor	r^S= -0.282 p=0.004	r^S= -0.279 p=0.005	r^S= -0.263 p=0.008	r^S= -0.196 p=0.051	r^S= -0.282 p=0.005	r^S= -0.290 p=0.003
Ambient temparature	r^S= -0.237 p=0.018	r^S = -0.280 p=0.005	r^S= -0.158 p=0.118	r^S= -0.193 p=0.054	r^S= -0.305 p=0.002	r^S= -0.274 p=0.006
Voice of other patients (cough etc.)	r^S= -0.440 p=0.000	r^S= -0.380 p=0.000	r^S= -0.354 p=0.000	r^S= -0.323 p=0.001	r^S= -0.370 p=0.000	r^S= -0.402 p=0.000
Conversations of the ICU staff	r^S= -0.462 p=0.000	r^S= -0.499 p=0.000	r^S= -0.399 p=0.000	r^S= -0.451 p=0.000	r^S= -0.497 p=0.000	r^S= -0.530 p=0.000
Nurse and physician visits	r^S= -0.527 p=0.000	r^S= -0.549 p=0.000	r^S= -0.438 p=0.000	r^S= -0.462 p=0.000	r^S= -0.518 p=0.000	r^S= -0.575 p=0.000
Care and treatment practices, diagnostic procedures	r^S= -0.556 p=0.000	r^S= -0.542 p=0.000	r^S= -0.424 p=0.000	r^S= -0.429 p=0.000	r^S= -0.497 p=0.000	r^S= -0.564 p=0.000

r^s: Spearman correlation analysis, ICU: Intensive care unit

Alemnew (24) detected that moderate to severe pain reduced the sleep quality of patients. Mouch et al. (30) indicated in their study that very few of the patients who underwent elective surgery stated that pain affected their sleep quality. They emphasized that this might have occurred since they applied appropriate and long-acting pain management practices. The study results showed that the sleep quality of patients decreased as their pain became more severe and that appropriate pain management might reduce sleep interruptions due to pain.

It was determined that the sleep quality of the participants decreased as their stress scores increased. In the study by Stewart et al. (21), patients reported that stress (26.8%) was a factor that prevented sleep in the ICU. Liao et al. (26) revealed that anxiety after cardiac surgery led to sleep disorders. Due to the nature of the disease (trauma, surgery, etc.), patients may experience stress, and stress may lead to interruptions in sleep (31). Nurses can encourage their patients to sleep by helping them to cope with stress.

It was found that sleep was adversely affected by environmental factors such as the lights of the intensive care setting, device sounds, ambient odor, ambient temperature, voices of other patients, and conversations of the ICU staff. Younis et al. (28) determined that light and sleep quality were negatively correlated. Bani Younis et al. (32) reported in their study that high sound and light levels adversely affected the sleep quality of patients. The study by Stewart et al. (21) determined that patients in the ICU were prevented from sleeping due to noise (53.6%) and light (23.2%). In the study by Simons et al. (17), patients indicated that the factors that made it difficult to sleep were monitor/equipment alarms, the conversations of the staff, etc. In the qualitative study by Astin et al. (18), patients indicated that they could not sleep well due to the coughing, snoring, and vomiting of other patients. Carrera-Hernández et al. (10) found that conversations of the staff and device noises led to an interruption in sleep. The study by Navarro-García et al. (13) reported that the noise caused by the voice of the intensive care staff was among the factors that affected the sleep quality of patients. Many previous studies (22,28,29,33) have determined noise as a factor that negatively affects the sleep quality of intensive care patients. Alsulami et al. (23) indicated that noise was in the first place among the external factors that disrupted sleep quality. Bernat Adell et al. (25) reported that ambient temperature was a factor affecting sleep quality. In the study by Bakr and Ahmed (33), it was revealed that the sleep of 85.7% of intensive care patients was affected by the ambient temperature. It can be said that environmental factors have a dominant effect on sleep. It is important to raise awareness of the intensive care team about environmental measures and practices to ensure sleep quality.

It was determined that patients' sleep was adversely affected due to nurse and physician visits and care and treatment practices. This result is in parallel with the results of the study confirming that care activity and treatment practices (repositioning, breathing exercise etc.) are among the factors that negatively affect sleep quality in ICU patients (22,25,29,33). According to the results of a systematic review, night-time nursing interventions are a minor factor that disrupts sleep quality (34). Younis et al. (28) found that nursing interventions and sleep quality were negatively correlated. Although nurse and physician visits and care and treatments in the ICU are inevitable, it is important to minimize and group the visits and interventions by the intensive care team as much as possible.

Study Limitations

This study has certain limitations. The results of our study cannot be generalized to patients who could not be included in the study due to the exclusion criteria. The study only evaluated sleep quality on postoperative day 2. The results can be interpreted in accordance with these criteria. Patients may

not remember their sleep experiences. However, the patients who developed delirium, underwent neurosurgical surgery, had existing psychiatric diseases and sleep disorders were excluded in order to minimize this bias.

Conclusion

The results of the study reveal the factors affecting the sleep quality of surgical patients. It was determined that sleep quality, affected by many factors, was poor in intensive care patients. Patients who are young, painful, stressed and operated under emergency conditions are at risk of having sleep disorders. Environmental factors, medical visits, and care and treatment practices lead to interruptions in night sleep. Considering that the deterioration in sleep quality negatively affects surgical recovery, solutions can be produced to improve the sleep quality of nurses in light of the study findings. Increasing the awareness of nurses and intensive care team members about the factors disrupting sleep quality and possible solutions (reducing sound and light levels at night, pain control, improving coping skills, etc.), transferring the solutions to the clinic, and evaluating the results may contribute to improving the sleep quality of patients.

Ethics

Ethics Committee Approval: The Declaration of Helsinki, Good Clinical Practice guidelines, and the local ethics committee requirements were taken into account during the study process. Permissions have been received from the Trakya University Ethics Committee (date: 01.02.2021 protocol number: 2021/56 and desicion number: 03/18) and institue (date: 08.03.2021 and number: 2021/30374).
Informed Consent: Before the study, patients were informed about the study and a written, informed consent has been obtained.
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Authorship Contributions

Surgical and Medical Practices: Z.K.Ö., F.D., E.K., Concept: Z.K.Ö., F.D., E.K., Design: Z.K.Ö., F.D., E.K., Data Collection or Processing: Z.K.Ö., F.D., E.K., Analysis or Interpretation: Z.K.Ö., F.D., Literature Search: Z.K.Ö., F.D., E.K., Writing: Z.K.Ö., F.D., E.K.
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Factors Determining the Need For Bilevel Therapy in Obstructive Sleep Apnea Patients

Obstrüktif Uyku Apnesi Hastalarında Bilevel Terapi İhtiyacını Belirleyen Faktörler

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Abstract

Objective: Except for continuous positive airway pressure (CPAP), which is the first choice in the standard treatment of Obstructive Sleep Apnea Syndrome (OSAS), it is recommended to continue treatment with bilevel PAP (BPAP) in patients, who cannot tolerate constant pressure or no success was achieved with this treatment. However, there is a group of patients without complicated OSAS and do not have BPAP indication at the first hospitalization, but for which adequate titration cannot be performed with CPAP. The purpose of this study was to investigate which characteristics of these patients or which data in their polysomnography (PSG) may be indicative of BPAP need.

Materials and Methods: Comorbid diseases [diabetes mellitus (DM), cardiac diseases, pulmonary diseases], body mass index, neck/core/hip circumference measurements the patients evaluated with total sleep time, apnea-hypopnea index (AHI), hourly obstructive/central apnea and hypopnea numbers, mean desaturation index (ODI), rapid eye movement (REM) sleep latency, REM time, AHI in REM and non-REM (REM/non-REM index), average overnight saturation (SaO2), lowest saturation value (min O2%), time when saturation is below 90% overnight (T90), a position dependency in PSG.

Results: Presence of DM, hypertension and cardiac disease, elevation of neck/core/hip circumference measurements, ODI, REM index, T90 values and ODI/SaO2 ratios were found to be statistically significant in the BPAP group, elevation in min O2% and SaO2 levels were found to be statistically significant in the CPAP group ($p<0.05$). It was determined that the probability of BPAP increased with the presence of DM 0.214 times, the presence of heart disease 0.205 times, a one-unit increase in the REM index 1.018 times, and a one-unit increase in T90 1.030 times. The REM index and T90, which were found to be significant in the receiver operating characteristic analysis, were determined as 70.850 and 56.150 cut-off values, respectively.

Conclusion: In this study; it was determined that the probability of CPAP being insufficient and switching to BPAP increases with the presence of DM and heart disease; and that T90 and REM index, and their cutoff values can be used for this purpose. It was also thought that regional adiposity may affect the type of PAP to be used.

Keywords: BPAP, OSAS, CPAP failure, prediction, OSAS treatment

Öz

Amaç: Obstrüktif Uyku Apne Sendromu'nda (OSAS) devamlı pozitif havayolu basıncı (CPAP) ile başarı sağlanamayan ya da sabit basıncı tolere edemeyen hastalarda, bilevel PAP (BPAP) ile tedaviye devam edilmesi önerilmektedir. Bu çalışmanın amacı, ilk yatışta BPAP endikasyonu olmayan ve CPAP ile yeterli titrasyonun yapılamadığı hasta grubunun hangi özellikleri ya da polisomnografilerindeki (PSG) hangi verilerin BPAP ihtiyacı açısından belirteç olabileceğinin belirlenmesidir.

Gereç ve Yöntem: Hastaların komorbid hastalıkları [diabetes mellitus (DM), kardiak hastalık, akciğer hastalığı], vücut kitle indeksi, boyun/göbek/kalça çevresi uzunlukları ile PSG'deki total uyku süresi, apne hipopne indeksi (AHİ), saatlik obstrüktif/santral apne/hipopne sayıları, ortalama desaturasyon indeksi (ODI), hızlı göz hareketi (REM) uyku latansı, REM süresi, REM ve non-REM uykudaki AHİ (REM/non-REM indeksi), gece boyu ortalama saturasyon (SaO2), en düşük saturasyon değeri (min O2%), saturasyonunun gece boyu %90'ın altında kaldığı süre (T90) ve pozisyon bağımlılığı incelendi.

Bulgular: DM, HT ve kardiak hastalık varlığı, boyun, göbek, kalça çevresi uzunluğu, ODI, REM indeksi, T90 ve ODI/SaO2 oranlarının yüksekliği BPAP grubunda; min O2% ve SaO2'nin yüksekliği CPAP grubunda istatiksel olarak anlamlı saptanmıştır ($p<0,05$). DM varlığının 0.214 kat, kalp hastalığı varlığının 0.205 kat, REM indeksinde bir birimlik artışın 1.018 kat, T90'da bir birimlik artışın 1.030 kat BPAP olasılığını artırdığı saptanmıştır. Cut-off değerler REM index ve T90 için sırasıyla 70.850 ve 56.150 olarak belirlenmiştir.

Sonuç: Bu çalışmada; CPAP'ın yetersiz kalıp BPAP'a geçilme olasılığının DM ve kalp hastalığı varlığı ile arttığı, T90 ve REM indeksinin bu amaçla kullanılabileceği belirlenmiş ve bölgesel yağlanmanın kullanılacak PAP tipine etki edebileceği ön görülmüştür.

Anahtar Kelimeler: BPAP, OSAS, CPAP başarısızlığı, tahmin, OSAS tedavisi

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Introduction

Obstructive sleep apnea syndrome (OSAS) is a disease setting that progresses with repetitive interruptions or slowdowns of the respiratory period, reduces sleep quality and causes frequent desaturation. According to the current guide of the American Academy of Sleep Medicine (AASM) (1); continuous positive airway pressure (CPAP) is the first choice of standard treatment in uncomplicated OSAS cases. It is recommended to continue treatment with bilevel PAP (BPAP) in patients in those no success could be achieved with CPAP treatment (continuing low saturation in the routine control at the 3rd month under treatment) or in patients who cannot tolerate constant pressure. BPAP as a first choice, can be used in the presence of a disease that causes difficulty in exhaling against high pressure or alveolar hypoventilation (such as obesity hypoventilation syndrome) (1,2).

In some randomized studies performed, BPAP treatment was similar to CPAP in terms of effectiveness, adaptation, and some endpoints (3,4). In studies in which treatments started with BPAP instead of CPAP were evaluated in order to increase adaptation with uncomplicated patients, no results in favor of BPAP could be achieved (5,6). Among the recommendations for manual titration in the guideline of the AASM, it is stated that switching to BPAP could be performed in cases where CPAP could not be tolerated or is insufficient. However, there is a group of patients who do not have complicated OSAS and do not have BPAP indication at the first hospitalization, but for which adequate titration cannot be performed with CPAP. Repeated hospitalizations of this group and the prolonged access to definitive treatment create problems both in terms of patient health and comfort and the faster and more economical functioning of the health system. There is limited data on which characteristics of such patients or which data in their polysomnography (PSG) may be indicative of BPAP need (7,8).

In this study, it was planned to investigate which characteristics of the patient group who did not benefit from CPAP treatment and were switched to BPAP treatment, and which variables in PSGs could be similar and directing. By this way, pre-recognition of this patient group, providing an advantage in terms of recurrent hospitalizations, cost and time loss were determined as a secondary target.

Materials and Methods

Study Design and Participants

This study was designed as an observational study in which patients hospitalized in the sleep disorders unit of Samsun Training and Research Hospital were retrospectively examined. Patients over the age of 18 who had an apnea-hypopnea index (AHI) >15/h as a result of all-night PSG and were diagnosed with sleep apnea and were deemed suitable for PAP treatment were randomly included in the study.

After the titration study, the data of the patients for whom CPAP treatment was approved and the patients whose CPAP device was insufficient and switched to BPAP titration, were evaluated. Patients with known chronic respiratory failure or sleep-related hypoventilation/hypoxemic syndromes, who started treatment with BPAP or BPAP/ST titration, and who meet the criteria of obesity hypoventilation syndrome [combination of obesity (body mass index (BMI) ≥30 $kg \cdot m^{-2}$), sleep disordered breathing after ruling out other disorders that may cause alveolar hypoventilation and confirmed daytime hypercapnia] were not included in the study.

Study Data

Ethical approval was taken from Samsun University Clinical Trials Ethic Committee (protocol no: SUKAEK-2022/1/5, date no: 18/05/2022).

Demographic data and first hospitalization all-night PSG results of the patients who met the criteria and were hospitalized for titration between January 2019 and March 2022 in the sleep laboratory were examined.

Standard 16-channel PSG (Embla; Medcare Flaga, Reykjavik, Iceland) was applied to all patients. The system consists of four electroencephalography channels, two electrooculography channels, tibial/submental electromyography, and electrocardiography, as well as monitoring of oronasal airflow, thoracic movements, abdominal movements, average overnight saturation (SaO2), and body position. PSGs were scored in accordance with the 2013 AASM guidelines. Manual titration attended to moderate or severe OSAS patients. PAP titration was switched to BPAP, if a patient was uncomfortable or intolerant of CPAP or CPAP was ineffective at controlling respiratory events.

Gender, age, comorbid diseases [diabetes mellitus (DM), hypertension (HT), cardiac diseases, pulmonary diseases], BMI, neck/core/hip circumference lengths of the patients were recorded. In PSG; total sleep time, AHI, hourly obstructive/central apnea and hypopnea numbers, mean desaturation index (ODI), rapid eye movement (REM) sleep latency, REM time, REM and non-REM index, SaO2, lowest saturation value (min O2%), time when saturation is below 90% overnight (T90), whether it is position dependent were evaluated.

Statistical Analysis

In the statistical analysis phase of the study, frequency analysis, descriptive statistics, chi-square relationship tests, mean comparison tests, multiple logistic regression analysis and receiver operating characteristic (ROC) curves were shown. The conformity of numerical measurements to normal distribution was examined with the Shapiro-Wilk test and the independent samples were examined with t-test. Sensitivity, 1-selectivity (solid-phase extraction), positive class prediction rate, cut-off and area under the curve values are provided along with the graph of ROC curves. The entire application was performed with the R-Project program (R Core Team, 2020).

Results

A total of 111 patients, 31 (27.9%) of whom BPAP and 80 (72.1%) of whom CPAP titration was applied, were included in the study. The gender distribution and comorbidity status of the patients are shown in Table 1, and the mean values of the numerical data are shown in Table 2.

When the relationship between gender, positional OSAS, pulmonary disease, DM, HT, presence of coronary artery disease (CAD) or heart failure (HF) and receiving CPAP and BPAP treatment of the patients was compared (Table 3); the presence of DM, HT and cardiac disease was found to be statistically significantly higher in patients in the BPAP group ($p<0.05$).

Table 1. Demographic characteristics		
Variable	**n**	**%**
Gender		
Female	27	24.3
Male	84	75.7
Lung disease	30	27.3
DM	16	14.5
HT	39	35.5
Cardiac disease	16	14.5
Positive airway pressure		
CPAP	80	72.1
BPAP	31	27.9
DM: Diabetes mellitus, HT: Hypertension, CPAP: Continous positive airway pressure, BPAP: Bilevel positive airway pressure		

Table 2. Descriptive statistics		
Variable	**Mean**	**SD**
Age	50.89	10.91
Neck circumference (cm)	42.77	3.90
Core circumference (cm)	118.06	14.26
Hip circumference (cm)	119.79	13.07
BMI (kg/m^2)	38.23	32.48
TST (min)	306.99	69.42
AHI (/h)	53.17	24.49
AI (/h)	19.46	22.08
HI (/h)	31.99	20.76
CI (/h)	0.90	3.74
ODI (/h)	55.88	26.91
REM latency	126.66	104.72
REM period (min)	24.10	21.95
REM index	38.60	35.33
NREM index	53.92	25.98
SaO2%	90.45	4.16
Min O2%	75.52	9.69
T90%	30.75	27.05
Apnea/hypopnea ratio	2.38	7.68
REM index/NREM index	0.79	0.83
ODI/SaO2	0.63	0.33
BMI: Body mass index, TST: Total sleep time, AHI: Apnea-hypopnea index, AI: Obstructive apnea index per hour, HI: Hypopnea index per hour, CI: Central apnea index per hour, ODI: Oxygen distress index per hour, REM latency: Rapid eye movement sleep starting time, REM index: AHI index in REM period, NREM index: AHI in NREM period, SaO2: Average oxygen saturation over the duration of sleep, Min O2%: Lowest oxygen saturation during sleep, T90: Percentage of sleep time in less than 90% oxygen saturation, SD: Standard deviation		

The comparison of the mean values between the variables is provided in Table 4. Accordingly, neck/core/hip circumference measurements, ODI, REM index, T90 and ODI/SaO2 ratio were found to be statistically significantly higher in the BPAP group and, min O2% and SaO2 were found to be statistically significantly higher in the CPAP group ($p<0.05$).

Multiple regression analysis is provided in Table 5. Accordingly, the suitability of BPAP therapy to the patient is increased 0.214 times in the presence of DM and 0.205 times in the presence of CAD. Moreover, it was determined that a one-unit increase in REM index increased the probability of BPAP 1,018 times, and a one-unit increase in T90 increased the probability of BPAP 1.030 times.

REM index and T90% were found to be statistically significant in the ROC evaluation performed on the variables that were significant according to the result of multiple regression analysis (Figures 1 and 2). 70.850 for REM index and 56.150 for T90 were determined as cut-off values.

Discussion

There is a small group of patients with uncomplicated OSAS who did not benefit from CPAP titration and were switched to BPAP. Due to the lack of guiding data in terms of pre-identifying these patients and initiating appropriate treatment quickly, this study was planned and it was concluded that some variables could be used for this purpose. Accordingly, especially after multiple regression analysis, the presence of DM and cardiac disease increased the possibility of transition to BPAP, and T90 and REM index were determined as determinant variables for BPAP, cut-off values were obtained for T90 and REM index.

BPAP is an approach that increases the patient's compliance with PAP treatment by applying different pressures during inspiration and expiration. In studies investigating the reasons for switching to BPAP in OSAS patients, the main reason was often intolerance to CPAP (7,9,10). In the study performed by Schwartz et al. (10), it was reported that treatment with BPAP can be started in OSAS patients with neurological diseases in whom sufficient muscle tone cannot be achieved. However, in

Table 3. Relationship between individuals' gender, comorbidity, and status of being position-related OSAS with BPAP and CPAP treatment					
Variable	**CPAP**		**BPAP**		**p**
	n	**%**	**n**	**%**	
Gender					
Female	18	22.5	9	29.0	0.223^{Y}
Male	62	77.5	22	71.0	
Lung disease	17	21.5	13	41.9	0.054^{Y}
DM	7	8.9	9	29.0	0.014^{F}
HT	22	27.8	17	54.8	0.015^{Y}
Cardiac disease	7	8.9	9	29	0.014^{F}
Positional OSAS	11	86.1	1	3.2	0.173^{F}
^{Y}: Yates correction, ^{F}: Fisher test, DM: Diabetes mellitus, HT: Hypertension, Cardiac disease: Coronary artery disease (CAD) or heart failure (HF), CPAP: Continous positive airway pressure, BPAP: Bilevel positive airway pressure					

Table 4. Comparison of mean values between study groups					
Variable	CPAP		BPAP		p
	Mean	SD	Mean	SD	
Age	50.26	10.66	52.52	11.56	0.331
Neck crcm (cm)	42.01	3.35	44.60	4.54	0.002
Core crcm (cm)	114.61	11.89	126.33	16.17	0.001
Hip crcm (cm)	115.87	9.91	129.07	15.01	<0.001
BMI (kg/m^2)	36.99	37.81	41.44	9.44	0.520
TST (min)	310.63	68.72	297.59	71.48	0.377
AI (/h)	17.49	21.17	24.48	23.87	0.136
HI (/h)	30.50	19.43	35.83	23.75	0.227
CI (/h)	0.59	2.79	1.70	5.46	0.291
ODI (/h)	50.53	24.10	69.69	29.18	0.001
REM latency	125.17	101.02	130.50	115.40	0.811
REM period (min)	23.30	21.55	26.16	23.18	0.540
REM index	32.80	32.86	53.59	37.57	0.005
NREM index	51.06	26.15	61.31	24.41	0.062
SaO2	91.52	2.62	87.68	5.87	0.001
Min O2%	78.00	8.10	69.13	10.62	<0.001
T90	23.74	22.07	48.84	30.51	<0.001
Apnea/hypopnea ratio	1.60	3.96	4.39	12.96	0.248
REM index/NREM index	0.74	0.85	0.91	0.78	0.351
ODI/SaO2	0.56	0.27	0.81	0.39	<0.001

Crcm: Circumference, BMI: Body mass index, TST: Total sleep time, AHI: Apnea-hypopnea index, AI: Obstructive apnea index per hour, HI: Hypopnea index per hour, CI: Central apnea index per hour, ODI: Oxygen distress index per hour, REM latency: Rapid eye movement sleep starting time, REM index: AHI index in REM period, NREM index: AHI in NREM period, SaO2: Average oxygen saturation over the duration of sleep, Min O2%: Lowest oxygen saturation during sleep, T90: Percentage of sleep time in less than 90% oxygen saturation, SD: Standard deviation

Table 5. Analysis of independent variables such as presence of DM/CAD, neck/core circumference, REM index, T90, ODI/SpO2 in case of being in the PAP titration group is the dependent variable			
Variable	**OR**	**95% CI**	**p**
DM	(Ref)	-	-
	0.214	(0.05. 0.917)	**0.038**
Cardiac disease	(Ref)	-	-
	0.205	(0.052. 0.812)	**0.024**
Neck crcm	1.147	(0.936. 1.406)	0.187
Core crcm	1.007	(0.947. 1.07)	0.825
REM index	1.018	(1.001. 1.036)	**0.033**
T90	1.030	(1.005. 1.055)	**0.020**
ODI/SpO$_2$	0.728	(0.081. 6.528)	0.776
Constant	0.001	-	0.049

DM: Diabetes mellitus, Neck crcm Neck circumference, Core crcm Core circumference, REM index: AHI index in REM period, T90 %: Percentage of sleep time in less than 90% oxygen saturation, ODI: Oxygen distress index per hour, OR: Odds ratio, CI: Confidence interval

the guide published by AASM in 2019, it has been suggested that BPAP can be used as an initial treatment or as a subsequent treatment to CPAP on the same night, with the clinician's decision, in suitable patients (11). However, there is a lack of data on which patient should be switched to BPAP using which criteria.

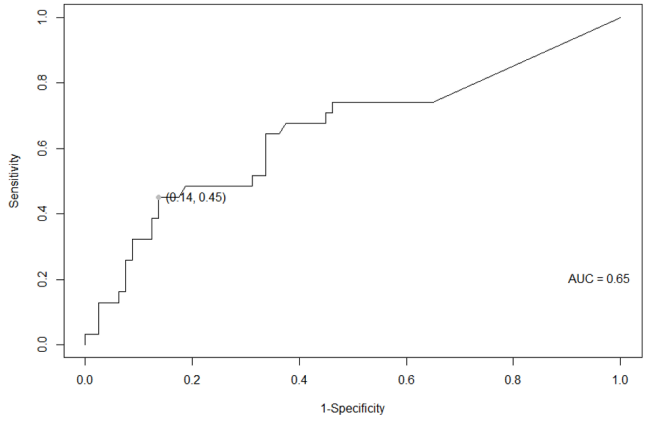

Figure 1. ROC curve performed for the effect of REM index on groups
ROC: Receiver operating characteristic, REM: Rapid eye movement

In this study, in which we investigated BPAP indications, when comorbidities were evaluated with the chi-square relationship test, the presence of DM, HT and heart disease was found to be significantly higher in terms of BPAP treatment (p<0.05). In the multiple regression analysis including other variables, the probability of needing BPAP was found to be 0.214 times higher

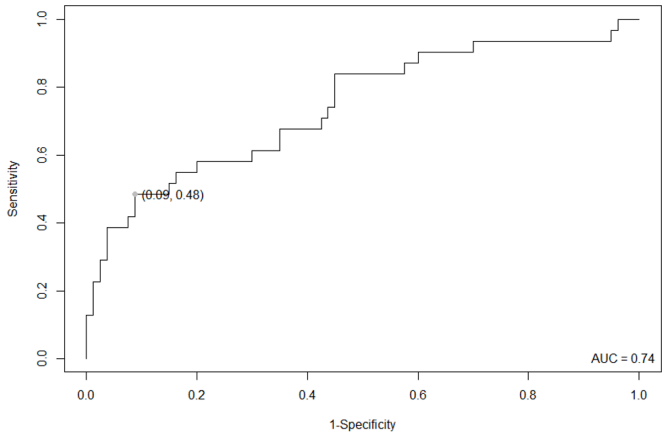

Figure 2. ROC curve performed for the effect of T90% index on groups
ROC: Receiver operating characteristic, AUC: Area under the curve

in the presence of DM and 0.205 times higher in the presence of heart disease. HF is a disease associated with OSAS at a rate of approximately 33%. While CPAP therapy increases the left heart ejection fraction by approximately 5% in patients with systolic dysfunction, no data are available as the use of PAP is contraindicated in the setting of diastolic failure. CPAP therapy reduces major adverse cardiac or cerebrovascular events in CAD patients with OSAS (12). There is no clarity on the effect of CPAP on short- and long-term blood glucose control and diabetes-related complications in DM patients due to inconsistent results (13). If there is no contraindicated condition in this group of patients, randomized controlled studies in which BPAP treatment will be applied after the clinician's evaluation will provide us more data on this subject.

Among the risk factors for OSAS, obesity is the most important one; however, while 70% of OSAS patients are obese, 40% of obese patients have OSAS (14,15), and the reason for this is still unclear (16). It was reported that high BMI worsens the response to treatment due to the patient's general body performance rather than directly affecting CPAP therapy (17). In the study performed by Shah et al. (7), BMI was found to be high in the BPAP group, but this did not make a statistical difference, and it was reported that it was not a factor for CPAP failure. In our study, a significant difference was observed between the groups not in terms of BMI, but in terms of neck/core/hip circumference measurements. We think that the effect of regional adiposity on the absence of OSAS in every patient with high BMI and the lack of similar benefit from CPAP, should be investigated with larger case series.

Slouka et al. (17) reported that AHI, ODI, T90, SpO2 and BMI are significant variables for CPAP failure, but after the ROC analysis, they reported that any one or combinations of those variables were insufficient in modeling and clinical prediction. In another study in which age, AHI, COPD, BMI and min O2% were determined as independent variables for BPAP being the first treatment option (18), there was no significant difference between those who received CPAP treatment in terms of adherence to treatment, AHI under treatment, or symptoms. Schwartz et al. (10) reported that advanced age, high BMI, COPD, increased CO2 level, OSAS severity, and min O2% values could be determinant indicators not only for BPAP use but also for long-term adherence to treatment.

In our study, in terms of PSG variables, significant results were obtained for ODI, REM index, T90, min O2%, SaO2 values and ODI/SaO2 ratios. ODI, T90, min O2% and SaO2 were prominent variables in previous studies in terms of CPAP failure or BPAP indication (10,17,18). In our study, the ODI/SaO2 ratio was used for the first time in terms of BPAP estimation, and it was determined that as this ratio increased, the need for BPAP increased, but a statistically significant numerical ratio could not be obtained.

In the ROC analysis, one of the most determinant variables in terms of the statistical model was T90. A 1-unit increase in this variable increases the probability of BPAP 1,030 times. In another study in which T90 was used for this purpose (7), it was stated that with a 5% increase, the probability of BPAP increases by 28%. We also predict that the value of 56.15 for T90 is considered cut-off, and values above this can be used for BPAP indication.

A commonly used definition for REM-dependent OSAS (REM-OSAS) is AHIREM >5 and AHINREM <5 in the presence of at least 30 minutes of REM sleep (19). However, its prevalence is not clear due to the lack of a standard definition (13). In a study conducted with this patient group (20), it was reported that T90 and min O2% should be included in the definition of REM-OSAS. It was stated in the limited number of studies that they could benefit from CPAP treatment (10,21), but there are no studies conducted with other PAP treatments in this group. The REM index, which indicates the AHI during REM sleep, was another determinant variable in our study. An increase of 1 unit increased the probability of BPAP 1.018 times, and values above 70.85 were found to be significant in terms of BPAP. In our study, which was carried out in accordance with the definition above, there was no patient diagnosed with REM-OSAS.

Not using different criteria for the definition of REM-OSAS was one of the limitations of our study. Because the number of patients diagnosed could have changed, and perhaps data on the use of BPAP in this group would have been available for the first time. In addition, the limited number of BPAP patients and the fact that the study was conducted with data from a single center can be listed as other limitations.

Conclusion

Recurrent hospitalizations in centers where the number of patients who need PSG and the waiting time for the test are high, make it difficult for the patient to access treatment, cause obstruction in the health system and increase costs. The inadequacy of CPAP and the necessity of switching to BPAP is the most important reason for this. In this study, which was designed to predict this group of patients, we determined that especially T90, REM index and the cut-off values obtained for these can be used for BPAP estimation. In addition, we think that there is a need for studies to be performed with more

patients to examine the effect of regional adiposity on the type of PAP to be used.

Ethics

Ethics Committee Approval: Ethical approval was taken from Samsun University Clinical Trials Ethic Committee (protocol no: SUKAEK-2022/1/5, date no: 18/05/2022).
Informed Consent: Retrospective study.
Peer-review: Internally and externally peer-reviewed.
Financial Disclosure: The author declared that this study received no financial support.

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Relation of Sleep Quality to Psychological Well-being in College Students During the COVID-19 Pandemic: Cross-sectional Survey Study

COVID-19 Pandemisinde Üniversite Öğrencilerinde Uyku Kalitesinin Psikolojik İyi Oluşla İlişkisi: Kesitsel Bir Çalışma

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Abstract

Objective: This study aimed to determine the relationship between psychological well-being and sleep quality of university students during the Coronavirus disease-2019 (COVID-19) pandemic.

Materials and Methods: The research was a web-based cross-sectional study conducted with 972 college students. Data were collected using a personal information form, the psychological well-being scale (PWS), and the Pittsburgh Sleep Quality Index (PSQI).

Results: In the study, 92.4% of the students had poor sleep quality (≥6-point) PSQI mean score. The mean PSQI global score of the students was 8.41±2.24 and the mean PWS score was 42.35±8.85. A negative statistically significant strong correlation was found between the PWS and the PSQI scores of the students (r=-0.335; p=0.000; p<0.01).

Conclusion: College students studying with distance education system during the COVID-19 pandemic are at risk in terms of sleep quality and psychological well-being.

Keywords: COVID-19, college students, pandemic, sleep quality, psychological well-being

Öz

Amaç: Bu çalışmada, Koronavirüs hastalığı-2019 (COVID-19) pandemisinde üniversite öğrencilerinin psikolojik iyi oluşla uyku kalitesi ilişkisinin belirlenmesi amaçlanmıştır.

Gereç ve Yöntem: Araştırma 972 üniversite öğrencisi ile yürütülen web tabanlı kesitsel bir çalışmadır. Veriler kişisel bilgi formu, psikolojik iyi oluş ölçeği (PİOÖ) ve Pittsburgh Uyku Kalite İndeksi (PUKİ) ile toplanmıştır.

Bulgular: Araştırmada öğrencilerin %92,4'ünün kötü uyku kalitesi (6 ve üzeri puan) PUKİ puan ortalamasına sahip olduğu belirlenmiştir. Araştırmada öğrencilerin PUKİ puan ortalaması 8,41±2,24, PİOÖ puan ortalaması ise 42,35±8,85 saptanmıştır. Öğrencilerin PİOÖ ile PUKİ puanları arasında güçlü negatif yönlü istatistiksel olarak anlamlı ilişki saptanmıştır (r: -0,335; p=0,000; p<0,01).

Sonuç: COVID-19 salgını sürecinde uzaktan eğitimle öğrenim gören üniversite öğrencilerinin uyku kalitesi ve psikolojik iyi oluş açısından risk altında olduğu bulunmuştur.

Anahtar Kelimeler: COVID- 19, üniversite öğrencisi, pandemi, uyku kalitesi, psikolojik iyi oluş

Introduction

The Coronavirus disease-2019 (COVID-19) outbreak started in Wuhan, China; however, the World Health Organization Emergency Committee declared a global health emergency on January 30, 2020, based on increased cases in China and international regions (1). COVID-19 has deeply affected individuals, as well as societies. Quarantines have caused enormous costs in terms of social, economic, and psychological well-being due to social distance, job losses, financial disruption, loss of lives (2,3). These compulsory isolation periods affect the physical and mental health of individuals and lead to negative consequences on healthy lifestyle behaviors (4,5). New conditions and uncertainties such as domestic and international travel restrictions in many countries, compulsory isolation, concerns about the well-being of family and friends, uncertainty about going back to work and school, and lack of social support cause psychological pressure and contribute to the prevalence of stress, anxiety, and psychological well-being and insomnia on individuals (6,7).

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COVID-19 is spreading rapidly among people and dramatically affects the mental health of the general population and, in particular, students. College students are not among certain risk groups that are often at risk of coronavirus infection, however, they are among the groups most strongly affected by COVID-19 due to uncertainties on academic success, future career, and social life (8). To reduce the spread of COVID-19 among young and adult populations, many countries have decided to discontinue face-to-face education in universities and other educational institutions. After the COVID-19 outbreak started, education was suspended in higher education institutions for three weeks on March 16 2020 in Turkey. At the end of three weeks, an online education system was adopted and started to be implemented (9). However, this process has brought many difficulties both for students/lecturers and students' families and friends. The pandemic period has had a great impact on the practices of higher education students, especially in academic work and life. Conditions such as possible delays in educational institutions, technological concerns in online education, interruptions in internships, delayed graduation of candidate students, and obligation to stay at home during career development stages affect students' psychological well-being (10). Psychological well-being is a state of individuals capable of determining life decisions independently, controlling the environment effectively and positively. They can choose their relationships with others, the direction and purpose of life, self-acceptance (11). In the pandemic process, determining factors affecting sleep quality and psychological well-being in college students, especially studying with distance education is extremely important for taking necessary precautions and planning interventions. No study has been conducted in Turkey to investigate college students' sleep quality and psychological well-being during the COVID-19 pandemic. For this purpose, the study aims to determine the relationship between psychological well-being and sleep quality of university students during the COVID-19 pandemic.

Study Questions

- What are the sleep quality and psychological well-being levels of college students?
- Is there a difference between the personal characteristics and the sleep quality and psychological well-being levels of college students?
- Is there a correlation between the sleep quality and psychological well-being levels of college students?

Materials and Methods

Study Design and Setting

The research was designed as a web-based cross-sectional study covering all college students in Turkey. The population of the study consisted of all students receiving education between June 2020 and November 2020 and the sample consisted of 972 students who agreed to participate in the study.

Inclusion Criteria

Students selection criteria were literate, studying at university, agreeing to participate in research.

Data Collection Tools

The data was collected using the personal information form prepared by the researchers in line with the literature, the Pittsburgh Sleep Quality Index (PSQI), and the Psychological Well-being Scale (PWS).

Personal Information Form

The questionnaire was prepared by the researchers in line with the literature. It consists of 34 questions regarding the socio-demographic characteristics of the students such as gender, age, educational status, marital status, number of children, presence of chronic disease (diabetes mellitus, asthma, chronic obstructive pulmonary disease and obstructive sleep apnea syndrome), their habits that may affect sleep, and social isolation status during the COVID-19 pandemic.

Psychological Well-being Scale

The scale was developed by Diener et al. (12) to evaluate the psychological well-being level of individuals and adapted to Turkish by Telef (13). It has a 7-point Likert-type system and the scoring ranges from "strongly disagree" to "strongly agree". A high total score from the scale indicates that the individual has many psychological resources and power (13). The lowest score obtainable from the scale is 8 and the highest score is 56.

Pittsburgh Sleep Quality Index

The Turkish validity and reliability study of the scale was conducted by Agargun et al. (14). The PSQI provides information on sleep quality and the type and severity of sleep disturbances in the last month. It consists of 24 questions in total; 19 questions are answered by the individual and 5 questions are answered by the individual's bed-mate. The questions answered by the individual are taken into consideration and the other questions are not evaluated. Scores ≥5 indicate significant sleep disturbance (14).

Data Collection

In the data collection process, measurement tools were applied online due to the COVID-19 pandemic. The research was carried out online between June and November 2020 with a total of 972 college students who were receiving education at universities in Turkey and agreed to participate in the research. In this regard, an accessible online data collection link prepared on Google Documents was delivered to the target audience through social networks. It took 15-20 minutes to fill in the forms.

Statistical Analysis

The research data were transferred into a computer environment and analyzed in the IBM SPSS Statistics 21 package program. The Shapiro-Wilk test was used to test the fitness of the data to normal distribution. In the statistical analysis, the sociodemographic variables of the students were presented with number and percentage statistics. The mean PSQI global

and PWS scores of the college students and standard deviations were calculated. The independent samples t-test and one-way ANOVA were used in univariate analyses. Pearson's correlation analysis was used to examine the correlation between the PSQI global and PWS scores of college students. The statistical significance was taken as $p<0.05$.

Ethical Statement

Prior to the study, ethics approval was obtained from the Balıkesir University Clinical Research Ethics Committee (decision date/no:10.06.2020/2020/93) and the research permission was obtained from the Ministry of Health. The participants were informed about the study on the first page of the form and it was stated that filling the form was based on voluntariness. The students who agreed to participate in the research clicked on the "I approve" button on the screen including the online questionnaire. Permissions for the scales were obtained via e-mail.

Results

Evaluation of Scale Scores with Socio-demographic Variables

The mean age of the students in the research group was 20.93±2.50. Table 1 includes the comparison of the individual characteristics of the students and their mean PSQI global and PWS scores. In the research group, the mean PSQI global score was higher in female students compared to male students, in those who did not have a chronic disease compared to those who had a chronic disease, and in those who used a mobile phone/tablet/computer before going to bed at night compared

Table 1. Comparison of students' individual characteristics with PSQI global and PWS mean scores (n=972)

Characteristics	Number	%	PSQI mean ± SD	PWS mean ± SD	PSQI test/p-value	PWS test/p-value
Gender						
Female	779	80.1	8.50±2.26	42.29±8.83	*t=3.252	*t=3.252
Male	193	19.9	8.06±2.11	42.61±8.96	**p=0.010**	p=0.654
Year in the curriculum						
1	281	28.9	8.24±2.11	42.72±8.44	-	-
2	331	34.1	8.42±2.37	42.32±9.21	**F=1.109	**F=0.273
3	179	18.4	8.62±2.15	42.00±9.14	p=0.345	p=0.845
4	181	18.6	8.48±2.26	42.21±8.58	-	-
Department						
Nursing	379	39.0	8.46±2.25	41.82±8.71	-	-
First and emergency aid associate	218	22.4	8.38±2.13	42.26±8.80	-	-
Midwifery	202	20.8	8.33±2.19	43.62±8.43	**F=2.230	**F=2.190
Medical documentation and secretary training	36	3.7	7.27±2.57	45.13±6.72	**p=0.038**	**p=0.047**
Geriatric care	43	4.4	8.88±2.72	40.46±10.95	-	-
Home care service	46	4.7	8.78±2.33	41.52±8.85	-	-
Other (medicine, dentist, engineering, educational sciences,..)	48	4.9	8.62±1.82	42.10±10.58	-	-
Chronic disease						
Yes	91	9.4	9.20±2.49	41.70±9.41	*t=3.300	*t=0.351
No	881	90.6	8.33±2.20	42.42±8.80	**p=0.000**	p=485
Smoking						
Yes	214	22.0	9.07±2.40	40.63±10.07	*t=3.159	*t=12.500
No	758	78.0	8.23±2.16	42.84±8.42	**p=0.000**	**p=0.000**
Alcohol use						
Yes	112	11.5	9.00±2.62	40.22±11.75	*t=7.248	*t=30.348
No	860	88.5	8.34±2.18	42.63±8.37	**p=0.012**	**p=0.037**
Using a cell phone/tablet/TV at night						
Yes	953	98.0	8.44±2.24	42.29±8.88	*t=1.948	*t=1.018
No	19	2.00	6.89±1.79	45.47±6.84	**p=0.001**	p=0.061
Eating at night						
Yes	449	46.2	9.00±2.34	40.77±9.57	*t=13.049	*t=19.547
No	523	53.8	7.91±2.02	43.71±7.95	**p=0.000**	**p=0.000**

*t-test, **One-Way ANOVA, PSQI: Pittsburgh Sleep Quality Index, PWS: Psychological Well-being Scale, SD: Standard deviation

to those who did not use and the difference was statistically significant (p<0.05). No statistically significant difference was found between these variables and the mean PWS score (p>0.05). In the research group, the mean PSQI global score was higher and the mean PWS was lower in the students who were receiving education in the elderly care department, who were smokers and alcohol users, and who had the habit of eating at night and a statistically significant difference was found between these variables and both scales (p<0.05). No statistically significant difference was found between the students' grades and the mean PSQI global and PWS scores (p>0.05).

Evaluation of Scale Scores with Students' Knowledge of the COVID-19

Table 2 includes the comparison of students' knowledge of the COVID-19 with their mean PSQI global and PWS scores. In the research group, no statistically significant difference was found between the place where the student first heard about the COVID-19, the status of knowing transmission routes of COVID-19, and the status of contact with a COVID-19 patient and the mean PSQI global and PWS scores (p>0.05). The mean PSQI global score was higher and the mean PWS score was lower in students who did not know the importance of social distance for the COVID-19 disease and a statistically significant difference was found between this variable and the mean PWS score (p<0.05). The mean PSQI global score was higher and the mean PWS score was lower in students who did not wear a mask when going out and a statistically significant difference was found with both scales (p<0.05).

Relationship Between the PSQI Global Scale Scores and the PWS Scale Scores

In Table 3, a statistically significant negative correlation was found between the students' PSQI global score and PWS score (the PWS score decreased as the PSQI global score increased) (r=-0.335; p=0.000; p<0.01). It was determined that 92.4% of the students had poor sleep quality (≥6-point) PSQI global score.

Discussion

The COVID-19 pandemic has dramatically changed the lifestyles and educational environment of students at all educational levels with unprecedented consequences and has had significant educational and psychosocial effects (8,15). This study was conducted to determine the sleep quality and psychological well-being and affecting factors in college students in Turkey during the COVID-19 pandemic period. The majority of the students (92.4%) had a bad level of sleep quality and moderate psychological well-being. It is thought that distance education, lack of social activities, changes in daily routines may have directly or indirectly affected psychological well-being and

Table 3. Relationship between PSQI global scale and PWS scores

Variables	r	p	n
PSQI PWS	-0.335	0.000	972

*p<0.01, r: Pearson's correlation, PSQI: Pittsburgh Sleep Quality Index, PWS: Psychological Well-being Scale

Table 2. Comparison of students' knowledge of the COVID-19 with PSQI global and PWS mean scores (n= 972)

Characteristics	Number	%	PSQI mean ± SD	PWS mean ± SD	PSQI p-value	PWS p-value
The student first heard about the COVID-19						
Internet	507	52.2	8.43±2.26	42.38±8.89	**F=1.645	**F=1.737
TV	394	40.5	8.30±2.18	42.56±8.56	p=0.177	p=0.158
School	27	2.8	9.07±2.38	38.66±8.08	-	-
Health institution	44	4.5	8.88±2.39	42.47±11.00	-	-
The status of knowing transmission routes of COVID-19						
Respiratory	239	24.6	8.42±2.27	42.12±8.79	-	-
Respiratory and droplet	469	48.3	8.47±2.30	42.54±8.84	**F=0.350	**F=0.767
Close contact	212	21.8	8.39±2.09	42.44±8.76	p=0.789	p=0.513
Respiratory and close contact	52	5.3	7.98±2.12	41.36±9.77	-	-
The status of contact with a COVID-19 patient						
Yes	25	2.6	9.00±2.32	40.48±11.07	*t=0.005	*t=1.618
No	947	97.4	8.40±2.24	42.40±8.79	p=0.217	p=0.396
Knowing the importance of social distance in COVID-19 disease						
Yes	962	99.0	8.40±2.22	42.45±8.73	*t=2.558	*t=2.558
No	10	1.0	10.10±3.17	32.80±2.22	p=0.126	**p=0.045**
Wearing a mask when going out						
Yes	914	94.0	8.37±2.21	42.62±8.59	*t=2.558	*t=12.832
No	58	6.0	9.06±2.56	38.08±11.50	**p=0.049**	**p=0.004**

*t-test, **One-Way ANOVA, PSQI: Pittsburgh Sleep Quality Index, PWS: Psychological Well-being Scale, SD: Standard deviation, COVID-19: Coronavirus disease-2019

contributed to the deterioration in sleep quality of the students. This finding supports the literature indicating that individuals may experience severe sleep problems during epidemics (6,7,16-19). A study conducted with higher education students living in seven different countries reported that poor sleep quality was an urgent concern among higher education students around the world during the COVID-19 pandemic (19). Similarly, some studies conducted with students indicated that the quality of sleeping students got worse during the COVID-19 pandemic (20-25). Unlike the results of the research, a decrease in subjective well-being during the COVID-19 pandemic was reported and 20% fewer students felt extremely tired and sleepy when awakened compared to before restrictions (26). Bhandari and Kaur (27) stated that most of the college students had a healthy sleep pattern during the restrictions and that fewer college students had a severe sleep pattern interval.

In college students, poor sleep quality is associated with alcohol consumption (28) and smoking (29). In the study, there was an increase in poor sleep quality and a decrease in psychological well-being in students who were smoker/alcohol users. In a similar study, smoking students were found to have the worst sleep quality scores among all analyzed groups (23).

According to the results obtained in the study, those who used a mobile phone/tablet/computer before going to bed at night were found to have worse sleep quality. Social media offers an opportunity to improve social isolation, but the use of digital media near bedtime can have a great negative impact on the sleep outcomes of young adults (16). Similarly, some studies reported an increase in technology use before going to bed during the restriction period and a decrease in sleep quality (16,30).

It was determined that the sleep quality of female students was worse than that of male students. A study conducted with nursing students reported that similar total scores were obtained in both genders, but female students had significant changes during the restriction period (23). It was stated that female students may have fewer coping strategies in uncertain and stressful situations (10). In-depth studies are required to detect gender-specific differences.

Students who had a chronic disease (diabetes mellitus, asthma, chronic obstructive pulmonary disease and obstructive sleep apnea syndrome), were found to have poor sleep quality. Insufficient and poor-quality sleep is an independent risk factor for many chronic diseases and chronic diseases can create a mechanism that negatively affects sleep quality (20).

Those eating at night were found to have low sleep quality and psychological well-being. Studies conducted with students showed that those with night eating syndrome had a significant decrease in sleep quality (31,32). No diagnosis was made for eating disorders in the study; however, lower sleep quality rates among students eating at night compared to the others revealed the importance of further research to balance the nutrition of the students during the day, diagnose eating disorders, and plan the necessary interventions.

The place where the students first heard about the COVID-19 virus was the internet by 52.2% and television by 40.5%. Health information provided during an epidemic should be evidence-based to prevent negative psychological reactions. At this point, it is extremely important to improve the health literacy of college students. The majority of the students knew the importance of social distance and wearing masks. This result is important in terms of preventing the spread and transmission of the disease. However, rates regarding the transmission routes were below the expected level. This result emphasizes the lack of knowledge in students and the need for support. In the first stage of the COVID-19 epidemic in China, it was shown that the internet (93.5%) was the primary health information source for the general public and similarly, most of the participants had appropriate behaviors regarding protective measures such as hand washing and wearing masks (33).

In the study, it was seen that the sleep quality and psychological well-being levels of those who did not know the importance of social distance and who did not wear a mask when going out were low. Psychological well-being is a phenomenon that includes being able to look at the bright side of negative situations and difficulties and having the ability to manage them. It is thought that students who do not know the importance of social distance and do not wear masks do not have these skills, so their psychological well-being levels are affected.

A moderate negative correlation was found between the mean sleep quality and psychological well-being scores. Accordingly, the psychological well-being level of the students increased as the sleep quality increased. This result supports the literature findings associating healthy lifestyle behaviors with increased life expectancy and psychological well-being (4).

During the pandemic period, sleep quality is essential for physical health as well as for mental balance to increase immune defense (25). Findings regarding the effect of the pandemic on sleep emphasize that sleep-related problems in students during the pandemic period should be an important component of mental health interventions. Addressing sleep problems in higher education students is an urgent concern, especially during stressful events. These results support the importance of making education and behavior-based sleep programming available to higher education students.

Study Limitations

Our findings cannot be generalized to the entire society since only a limited group of individuals (college students) were evaluated in the study. Furthermore, the use of a web-based questionnaire in the data collection process possibly causing selection bias constitutes the limitations of our study.

Conclusion

It was determined that the majority of the college students had poor sleep quality and moderate psychological well-being levels. The psychological well-being of the students increased, as the sleep quality increased. In this context, during and after the pandemic, it is extremely important to implement individual and social mental health-related public health policies with pandemic intervention strategies. It is recommended to plan additional studies and training programs to increase the psychological well-being and sleep quality of

students, especially those at risk such as female students, those with chronic diseases, smokers/alcohol users, night-eaters, technology users before going to bed.

The resilience of collage students should be reinforced to ensure their capacity to resist possible future emergency situations, such as pandemics. In the pandemic process, determining factors affecting sleep quality and psychological well-being in college students, especially studying with distance education is extremely important for taking necessary precautions and planning interventions. No study has been conducted in Turkey to investigate college students' sleep quality and psychological well-being during the COVID-19 pandemic. It is thought that this study will raise awareness about the sleep behavior of students and the factors affecting sleep, and will shed light on the practices and future studies for students to develop quality sleep habits. Sleep trainings should be organized for family physicians, nurses and psychologists.

Ethics

Ethics Committee Approval: Ethics approval was obtained from the Balıkesir University Clinical Research Ethics Committee (decision no: 2020/93, date: 10.06.2020).

Informed Consent: Permissions for the scales were obtained via e-mail.

Peer-review: Internally and externally peer-reviewed.

Authorship Contributions

Concept: P.P.K., A.K., S.K., Design: S.E., P.P.K., A.K., Data Collection or Processing: S.E., P.P.K., A.K., S.K., Analysis or Interpretation: S.E., P.P.K., A.K., Literature Search: S.E., P.P.K., S.K., Writing: S.E., A.K.

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