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Aims and Scope

The owner of the journal is Turkish Society of Public Health Specialists. The Turkish Journal of Public Health is a peer reviewed, bilingual (English/Turkish) research journal published online three times a year and serving a broad audience in the field of public health and community medicine both nationally and internationally. Turk J Public Health aims to provide a medium for the rapid communication of advances and new knowledge in this field. We welcome manuscripts on theory and practice of public health.

The editors anticipates receiving manuscripts from the following areas of public health: Health policy and management, biostatistics, epidemiology, environmental health, health economics, demography, social sciences for health, health education, health promotion, , community nutrition, infectious diseases, disaster management, injuries, women's health, reproductive health, child health, chronic diseases, and occupational health. Turkish Journal of Public Health is a member of Committee on Publication Ethics (COPE). Turk J Public Health is covered following national international indexing services: DOAJ, EBSCO, ProQuest, Turkiye Atıf Dizini, ULAKBIM and Google Scholar.

Open Access Policy

Turkish Journal of Public Health is an online and an open access journal. All the manuscripts are fully accessible via a link at their relevant pages. Turkish Journal of Public Health do not ask any kind of author fees.

Peer-Review Policy

Turk J Public Health aims to publish the top-quality articles related to the theoretical and practical application of public health sciences. A qualified peer review process to achieve this goal is very crucial for Turk J Public Health. Objectivity, accuracy, and fairness are basic principles during the peer review and publishing stages for Turk J Public Health. The trust of all readers, authors, researchers, referees, public health experts, physicians, funding bodies that support the research and public health managers are very important to us. All of the manuscripts have been sent to at least two reviewers and reviewers are blind to authors identities. Authors are also blind to reviewers identities. (Double Blind Peer-Review)

Instructions for Authors

Instructions for authors page of the journal is available in the journal content and at https://dergipark.org.tr/en/pub/tjph

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Orjinal Makale/Original Article

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Editörden,

Dergimizin 2021 yılındaki son sayısını sunuyoruz. Bu sayımızda Derginin bazı göstergelerini sizlerle paylaşmak istedik. Bu göstergelerin özet tablo ve şekillerini yazının sonunda bulabilirsiniz. Dergimize son iki yılda başvuran yazı sayısı artma eğilimindedir. 2020 yılında 137, 2021 (Kasım ayına kadar) 130 başvuru yapılmıştır. Bu sayı 2018 ve 2019 da sırasıyla 110 ve 74 olmuştur (Şekil 1). Dergiye gönderilen yazılarda İngilizce dilinde olanların oranı da artma eğilimindedir (Şekil 2). 2021 yılında başvuran yazıların %47'sinin yazım dili İngilizcedir. Başvuran yazıların türüne göre dağılımı Tablo 1'de özetlenmiştir. Yazıların büyük çoğunluğu araştırma yazılarından oluşmaktadır. Araştırma dışı yazılarda (Tablo1'de diğer seçeneği) yıllar içinde azalma olduğu gözlenmektedir. Önemli bir gösterge de başvuran yazıların yayınlanma oranlarıdır. 2021 yılında Dergimize başvuran yazıların %20 si yayına kabul edilmiştir. Başvuran yazıların yaklaşık yarısı (%49) baş editör tarafından %23'ü bölüm editörü ve hakem değerlendirmesi sonucunda ret edilmiş %8'i ise yazar tarafından geri çekilmiştir. Buna göre değerlendirmeye alınan yazıların %46'sı kabul edilmiş %54'ü yayımlanmaya uygun bulunmamıştır (Şekil 5). Bildiğiniz gibi dergi editörleri ve yazarlar için en önemli konulardan birisi de hakem değerlendirme süreçleridir. Dergimizce hakem değerlendirmesi teklif edilen ancak değerlendirme yapmayan hakem oranı %41 olarak hesaplanmıştır (Şekil 6). Bu göstergeler Dergimizin gelişmeye devam ettiğini göstermekle birlikte hakem değerlendirme süreçlerinde sorunlar olduğunu da göstermekte. Yayınlanma oranları açısından standartların giderek artması Dergi için olumlu bir gelişme olarak görülebilir. Ancak, yazarların beklentilerinin karşılanamaması da bir sorun olarak görülebilir. Bu veriler ışığında HASUDER Türkçe dilinde yeni bir dergi çıkarma politikası da geliştirebilir.

Bu sayımızda 8 araştırma makalesi ve 2 rapor sunuyoruz. Birinci makale önemli bir halk sağlığı sorunu olan trafik kazaları ile ilgili. Öztürk ve ark. Türkiye'deki 81 il verisini değerlendirmişler. Yazarlar trafik kazalarının incelenmesinde ve politika geliştirilmesinde, faz ve faktörlerin birleşiminden oluşan Haddon Matrisi'nin kullanışlı bir araç olduğunu bildirmekteler.

İkinci araştırma makalesi yine küresel bir sorun olan obezite ile ilgili. Gültekin ve ark. obezite kontrolünde önerilen farklı kilo verme yöntemlerini ve yöntemlere uyumu değerlendirmişler. Araştırmacılar bireysel düzeyde ve risk gruplarına uygulanan farklı diyet yöntemlerinin etkili olmadığı sonucuna ulaşmışlar. Bu sonuç, toplumun bütününe yönelik planlanan girişimlerin, risk gruplarına yönelik girişimlerden daha etkili olduğuna yönelik bilgiyi destekler niteliktedir. Üçüncü araştırma makalesinde Afganistan'daki sözleşmeli sağlık çalışanlarında tükenmişlik sendromu ile ilişkili yaygınlık ve risk faktörleri incelenmiş. Araştırmacılar tükenmenin farklı boyutlarını değerlendirmişler ve en yüksek oranı (% 26.6) kişisel başarı eksikliği için saptamışlar. Dördüncü araştırma makalesinde pandemi ile birlikte artan oranda uygulanan e-öğrenme konusunda tıp fakültesi öğrencilerinin algıları incelenmiş. Hindistan, Kerala'da yapılan çalışmada, öğrencilerin yaklaşık olarak ¾ ünün e-öğrenme deneyimi ile ilgili olumlu görüşler bildirdiği saptanmış. Diğer araştırma makalesinde Yıldız ve ark. 28148 kişinin Human papillomavirus tarama sonuçlarını değerlendirmişler. Araştırmacılar toplam pozitiflik oranını %4.16 olarak saptamışlar. Diğer araştırma makalesi yine bir küresel salgın olan tütün kullanımı ile ilgili. Çalışmada Küresel Yetişkin Tütün Araştırması verileri kullanarak, tütün kullanım davranışlarının tahmin edilmesi amaçlanmış. Araştırmacılar, bir bireyin gelecekte sigara içme olasılığının hesaplanmasında bu bilginin yardımcı olabileceğini önermekteler. Shayan ve ark. Dünya Sağlık Örgütü yaşam kalitesi ölçeğini Afgan Dari dilinde güvenirlik ve geçerlilik analizlerini yapmışlar. Araştırmacılar ölçeğin Afgan toplumunda yaşam kalitesini

değerlendirmek için klinik ve nüfus tabanlı çalışmalarda güvenle kullanılabileceğini ancak kullanıcıların sosyal ilişkiler alanı ile ilgili değerlendirmeleri dikkatle yorumlanmaları gerektiğini vurgulamışlar. Son araştırma makalesinde COVID-19 pandemi döneminde genç erişkinlerin psikolojik özellikleri incelenmiş. Araştırma sonuçlarına göre 18-20 yaş grubu, kadınlar, yalnız yaşayanlar ve kronik hastalığı olanlar psikolojik olarak daha fazla etkilenmişler.

Bu sayımızda iki rapor sunuyoruz. İlk raporda önemli bir halk sağlığı sorunu haline gelen göçmenlere sunulan sağlık hizmetleri ile ilgili. Sevil ve ark. göçmenlerin sağlık hizmetlerine ulaşmasının önündeki en büyük engellerden birinin iletişim ve dil sorunları olduğunu saptamışlar. Yazarlar bu sorunun aşılmasında çevirmen sayısının artırılması ve mevcut çevirmenlerin sağlık ve iletişim becerilerinin geliştirilmesi gerektiğine vurgu yapmışlar. Diğer raporda son yıllarda artan ve pandemi ile hızlanan teletıp uygulamaları, halk sağlığı bakış açısıyla ele alınmış. Raporda teletıp uygulamalarıyla ilgili standardizasyon sorunlarının, hasta hekim iletişiminde problemlerin ve ucuz iş gücü gibi sınırlılıkların altı çizilmiş. Yazarlar, teletıp uygulamalarında halk sağlığı ve koruyucu hizmetler bakışının önemine dikkat çekmekteler.

2022 yılının eşitlik ve toplumsal refah getirmesini umar, keyifli okumalar dileriz.

Yücel Demiral

From the Editor,

We present the last issue of TJPH in 2021. In this issue, we wanted to share some indicators of the Journal with you. You can find the summary tables and figures of these indicators at the end of the editorial. First of all, the number of articles submitted to our journal in the last two years tends to increase. In 2020 and 2021 (until November), 137 and 130 applications were received, respectively. This number was 110 and 74 in 2018 and 2019, respectively (Figure 1). The proportion of articles submitted to the journal in English also tends to increase (Figure 2). 47% of the articles submitted in 2021 are in English. The distribution of the articles by type is summarized in Table 1. Most of the articles consist of research articles (87%). It is observed that there has been a decrease in the number of non-research articles (other option in Table 1) over the years. An important indicator is the publication rate of the submitted articles. In 2021, 20% of the articles applied to our journal were accepted for publication. Nearly half (49%) of the submitted manuscripts were rejected by the editor-in-chief, 23% of them were rejected by the section editor and/or as a result of the referee evaluation, and 8% were withdrawn by the author. Accordingly, 46% of the evaluated articles were accepted and 54% were not found suitable for publication (Figure 5). As you know, one of the most important issues for a journal editors and authors is the peer evaluation processes. The rate of referees who were offered a peer evaluation by our journal but did not accepted the evaluation was calculated as 41% (Figure 6). While these indicators show that our Journal continues to develop, they also show that there are problems especially in the peer review processes. Low publication rates may indicate increased Journal standards, and this can be seen as a positive development for the Journal. However, failure to meet the expectations of the authors can also be seen as a problem. In the light of these data,

HASUDER can develop a policy to publish a new journal in Turkish.

In this issue, we present 8 research articles and 2 reports. The first article is about traffic accidents, which is an important public health in the World. Ozturk et al. evaluated the data of 81 provinces in Turkey. The authors report that the Haddon Matrix, which is a combination of phases and factors, is a useful tool in the study of traffic accidents as well as in policy development. The second research article is about obesity, which is also a global problem. Gultekin et al. evaluated different weight loss methods and adherence to methods recommended for obesity control. Researchers have concluded that different dietary methods applied at the individual level and risk groups are not effective. This result supports the information that the interventions planned for the whole society are more effective than the interventions for risk groups. In the third research article, the prevalence and risk factors associated with burnout syndrome in contracted health workers in Afghanistan were examined. Researchers evaluated different dimensions of burnout and found the highest rate (26.6%) for lack of personal accomplishment. In the fourth research article, the perceptions of medical school students about e-learning, which has been increasingly applied during the pandemic, were examined. In this study conducted in Kerala, India, it was found that approximately ¾ of the students reported positive opinions about the e-learning experience. In another research article, Yıldız et al. evaluated the Human papillomavirus screening results of 28148 people. The researchers reported the total positivity rate to be 4.16%. The other research article is about tobacco use, which is also a global epidemic. In the study, it was aimed to predict tobacco use behaviors using data obtained from the Global Adult Tobacco Survey. The researchers suggest that this information could be helpful in calculating an individual's probability of smoking in the future. Shayan et al. analyzed the reliability and validity of the World Health Organization Quality of Life Scale in Afghan Dari language. The researchers emphasized

that the scale can be used safely in clinical and population-based studies to evaluate the quality of life in Afghan society, but the measurements related to the field of social relations should be interpreted with care. The latest research article examines the psychological characteristics of young adults during the COVID-19 pandemic. According to the results of the research, those in the 18-20 age group, women, those who live alone and those with chronic diseases are more affected psychologically. In this issue, we present two reports. The first report is about health services offered to immigrants. Sevil et al. determined that one of the biggest obstacles to immigrants' access to health services is communication and language problems. The authors emphasized that in order to overcome this problem, the number of translators should be increased and the health and communication skills of existing translators should be improved. In the other report, telemedicine applications, which have increased in recent years and accelerated with the pandemic, are discussed from a public health perspective. In the report, standardization problems related to telemedicine applications, problems in patient-physician communication and limitations such as cheap labor were underlined. The authors draw attention to the importance of public health and preventive services perspective in telemedicine practices.

We hope that 2022 will bring equality and social welfare and wish you pleasant reading.

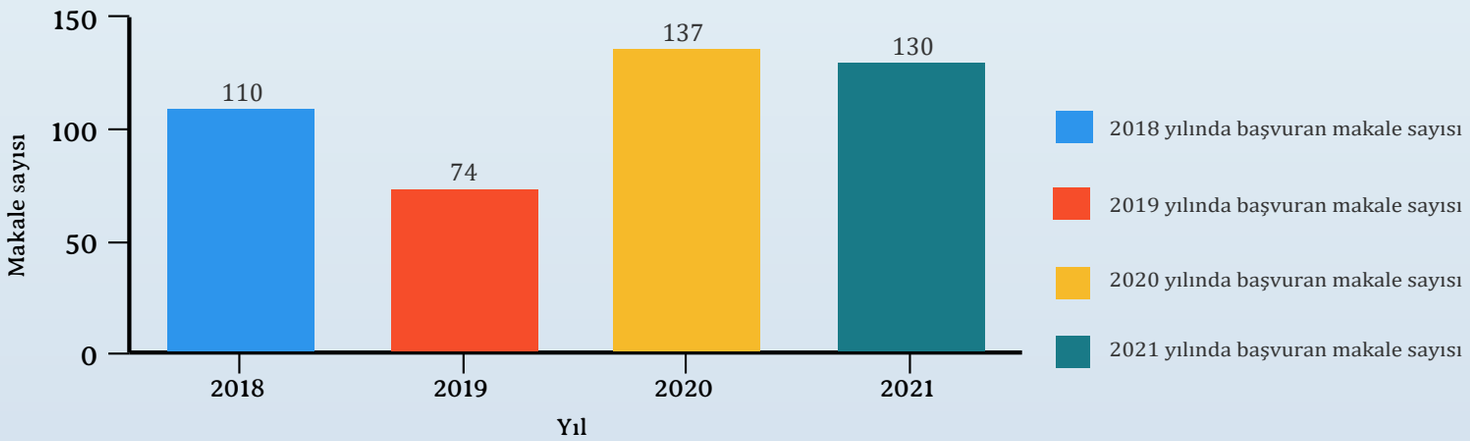
Yücel Demiral

Türkiye Halk Sağlığı Dergisi

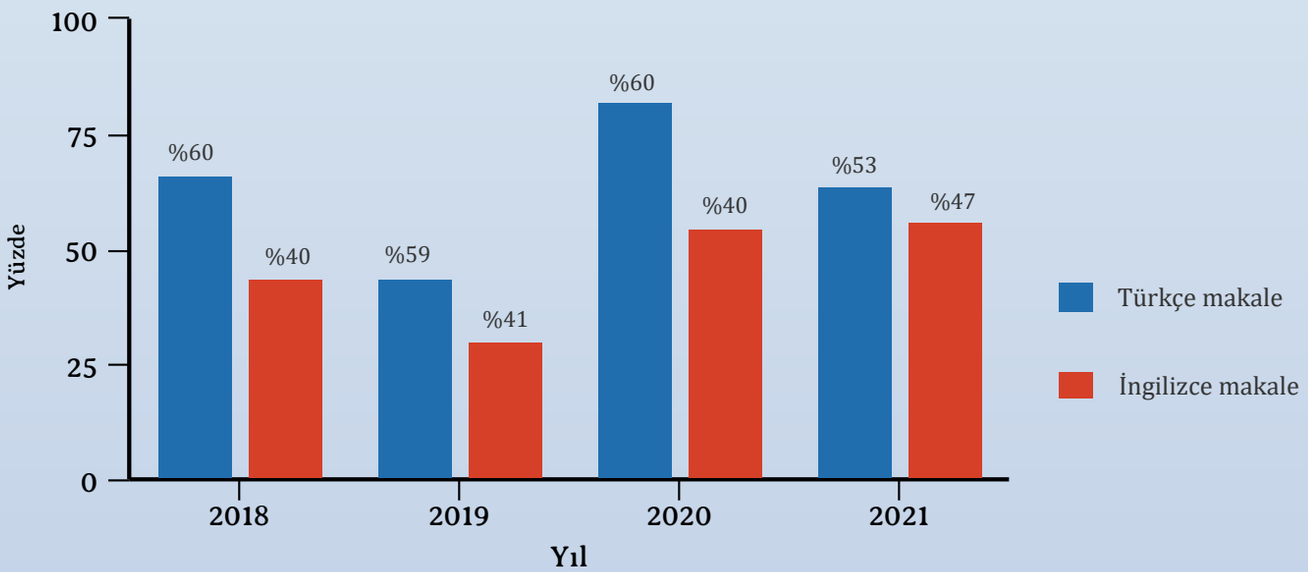
2021 Yılı Dergi İstatistikleri

Türkiye Halk Sağlığı Dergi'sine 2021 yılında (Kasım ayına kadar) başvuran yazı sayısı, yazıların türlerine ve dil seçeneğine göre dağılımları, değerlendiren hakemlerin ve makalelerin kabul/red durumlarına göre dağılımı tablo ve grafiklerle özetlenmiştir.

Şekil 1. Dergiye 2018-2021 yılları arasında başvuran makalelerin sayılarına göre dağılımları



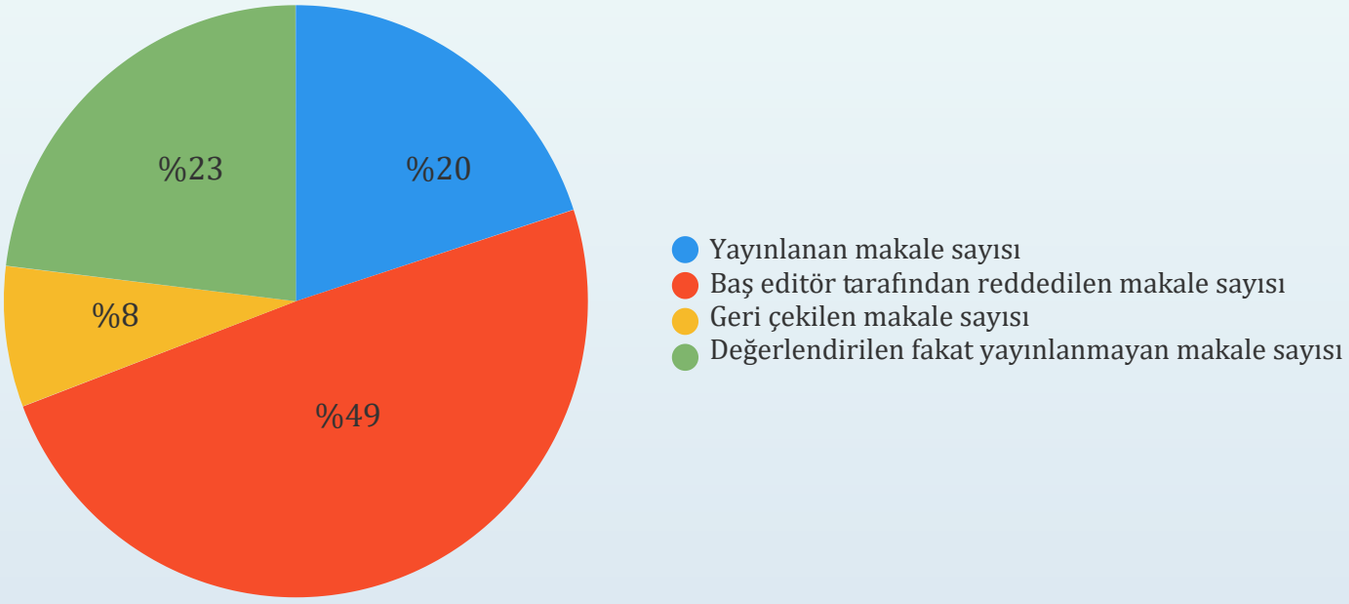
Şekil 2. Dergiye 2018-2021 yılları arasında başvuran makalelerin sayılarına göre dağılımları



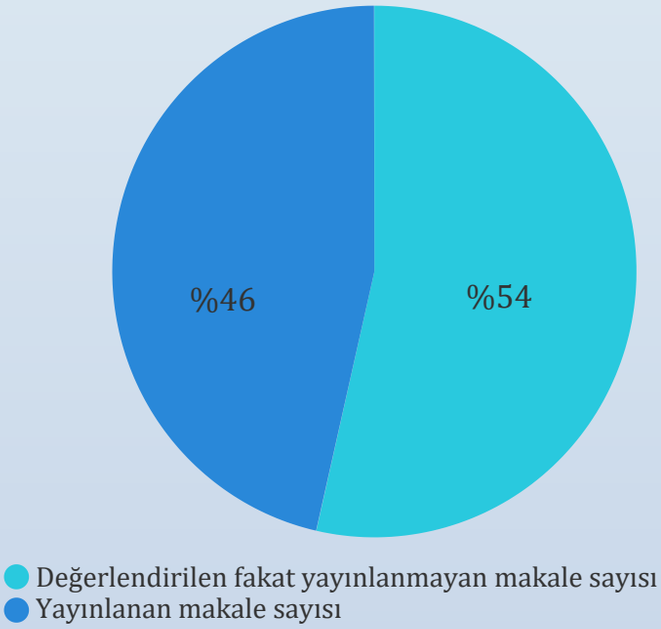
Tablo 1. Dergiye 2018-2021 yılları arasında başvuran makalelerin sayılarına göre dağılımları

	2018		2019		2020		2021	
	Sayı	Yüzde	Sayı	Yüzde	Sayı	Yüzde	Sayı	Yüzde
Araştırma makalesi	81	74	58	78	102	75	104	87
Derleme	6	5	8	11	14	10	5	4
Sistematik derleme ve meta analiz	0	0	1	1	0	0	2	2
Diğer	23	21	7	10	21	15	9	7
Toplam	110		74		137		130	

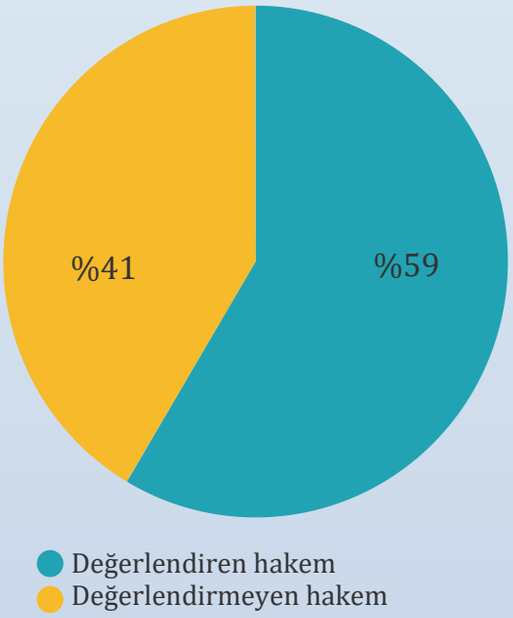
Şekil 3. Dergiye 2021 yılında başvuran makalelerin son durumlarına göre dağılımı



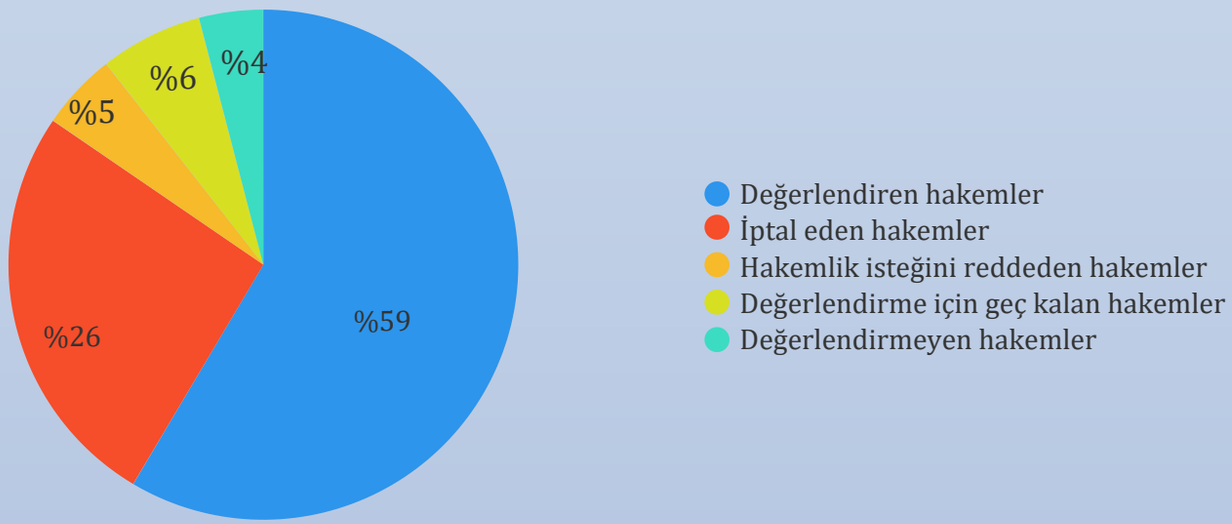
Şekil 4. Dergiye 2021 yılında başvurup değerlendirilen makalelerin yayınlanan makalelere oranı



Şekil 5. Dergiye 2021 yılında başvuran makaleleri değerlendiren ve değerlendirmeyen hakemlerin dağılımı



Şekil 6. Dergiye 2021 yılında başvuran makaleleri değerlendirmek amacıyla atanan hakemlerin durumlarına göre dağılımı



Turkish Journal of Public Health

Journal Statistics for 2021

The number of manuscripts submitted to the Turkish Journal of Public Health in 2021 (until November), the distribution of manuscripts according to their types and language options, the distribution of the reviewers and the acceptance/rejection of the manuscripts are summarized in tables and graphics.

Figure 1. Distribution of manuscripts referred to the journal between 2018-2021 by number

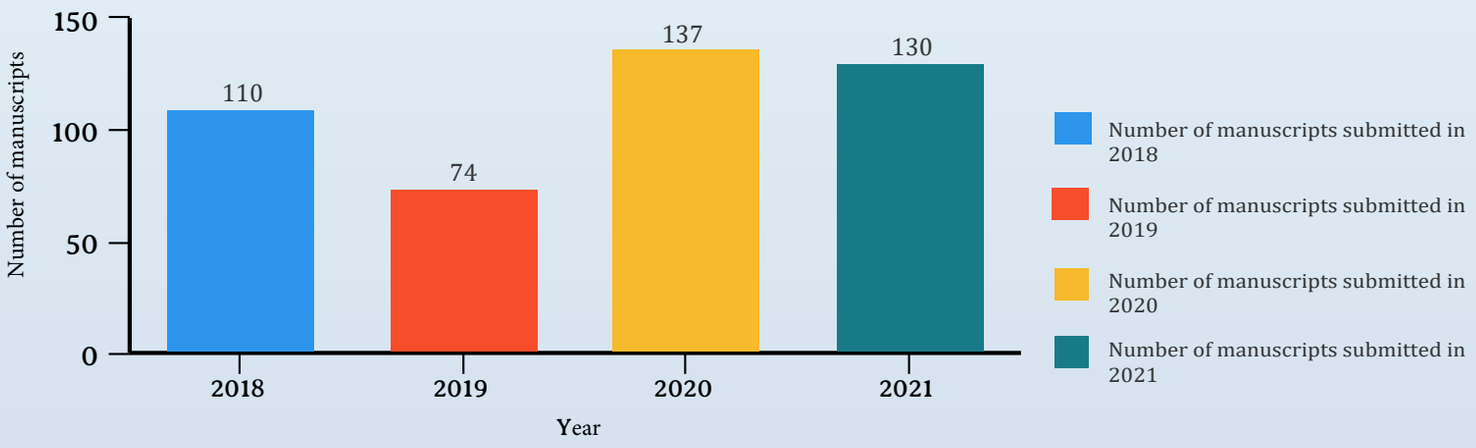


Figure 2. Distribution of manuscripts referred to the journal between 2018-2021 by number

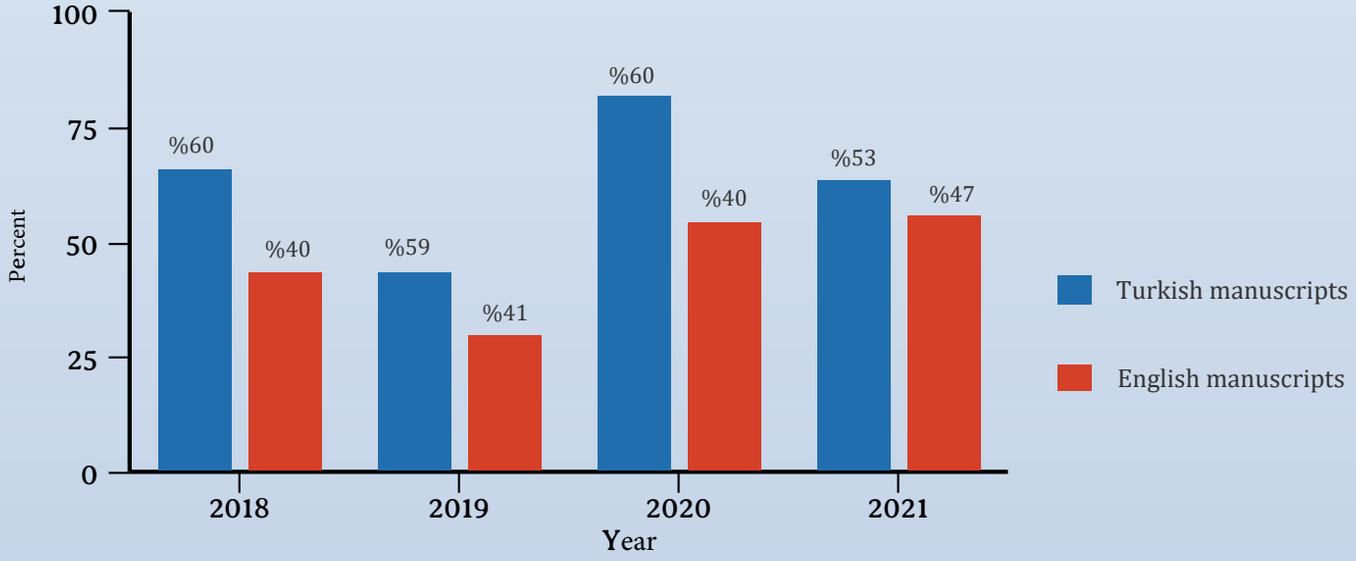


Table 1. Distribution of manuscripts referred to the journal between 2018-2021 by number

	2018		2019		2020		2021	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Original research	81	74	58	78	102	75	104	87
Review	6	5	8	11	14	10	5	4
Systematic reviews and meta-analysis	0	0	1	1	0	0	2	2
Other	23	21	7	10	21	15	9	7
Total	110		74		137		130	

Figure 3.The distribution of the manuscripts applied to the journal in 2021 by status

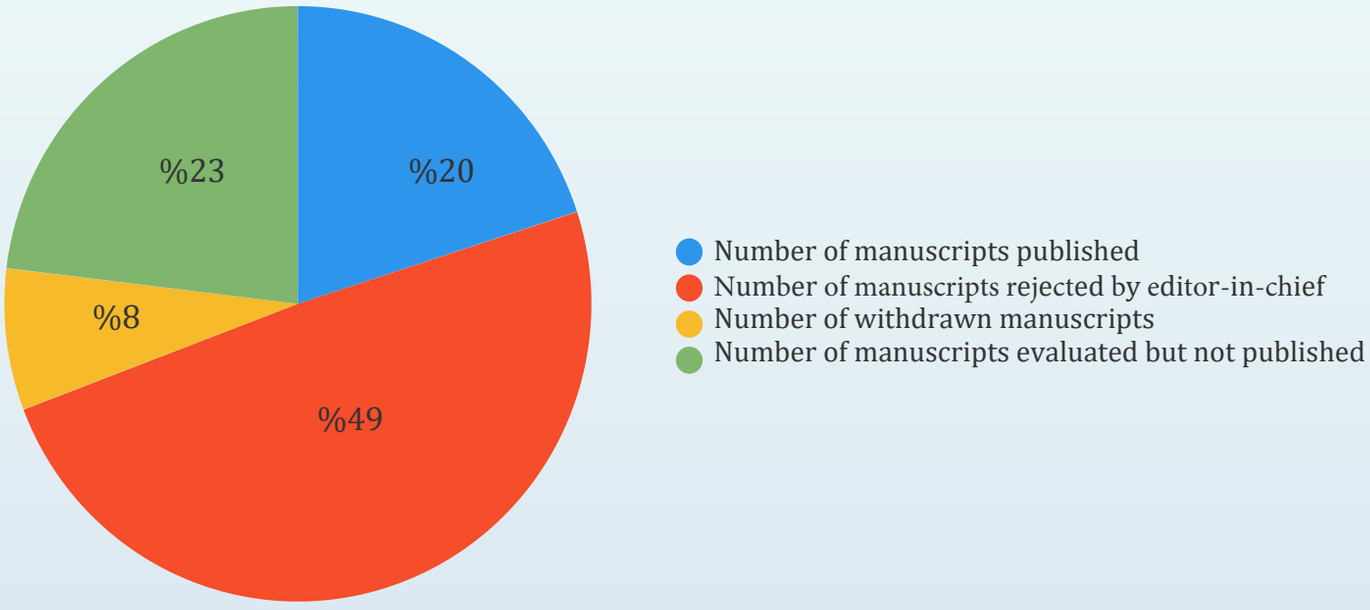


Figure 4. Ratio of manuscripts applied and evaluated to the journal in 2021 to manuscripts published

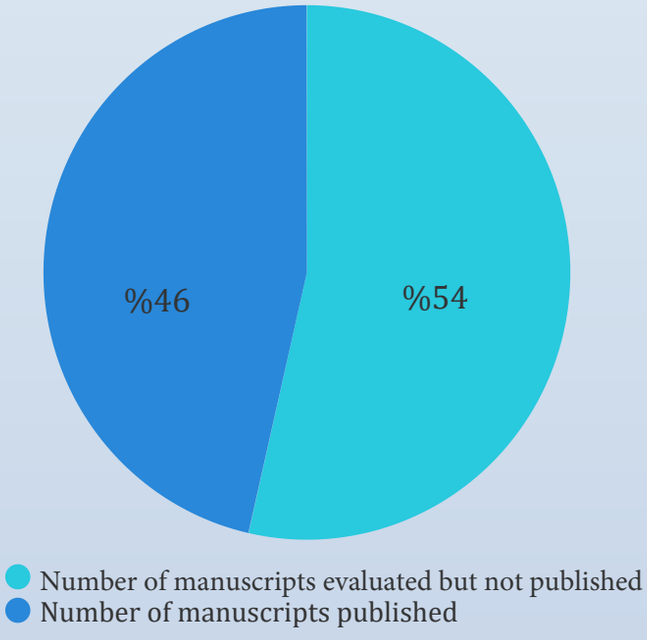


Figure 5. Distribution of referees who evaluated and couldn't evaluate manuscripts applied to the journal in 2021

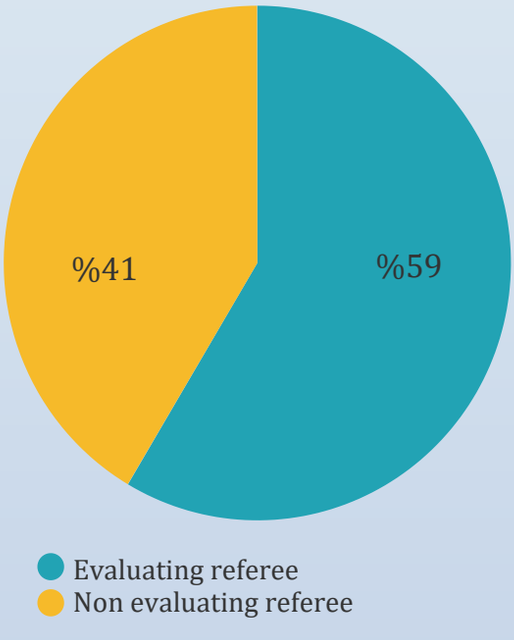
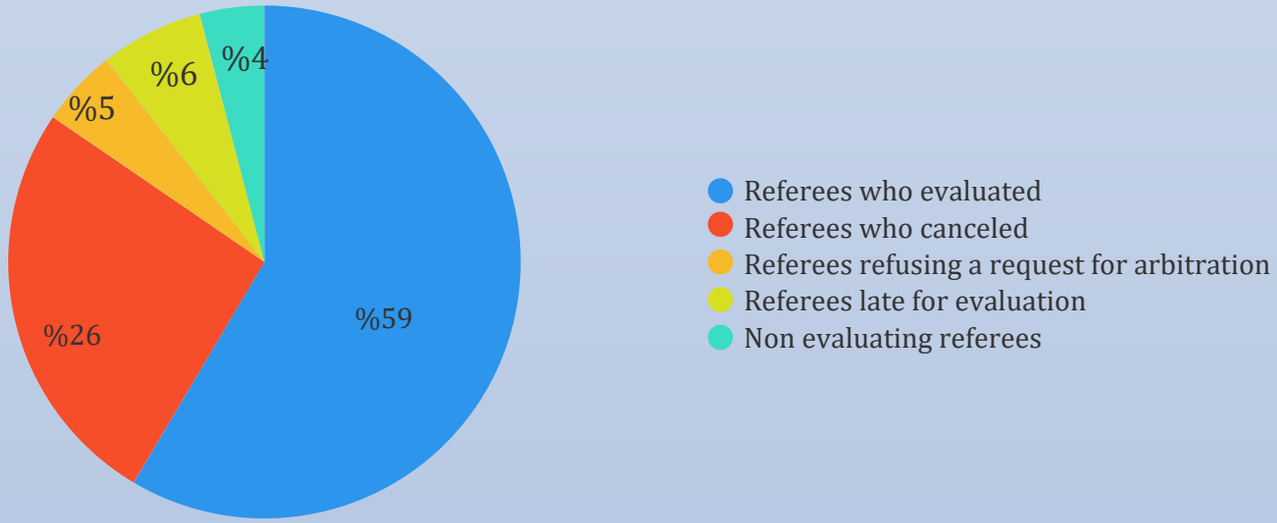


Figure 6. Distribution of referees appointed to evaluate manuscripts referred to the journal in 2021 by status



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TURKISH JOURNAL OF PUBLIC HEALTH

ORIGINAL ARTICLE / ORİJİNAL MAKALE

The investigation of Turkey's road safety decisions by Haddon Matrix and 7Es

Türkiye'deki yol güvenliği kararlarının Haddon Matrisi ve 7Es ile incelenmesi

İbrahim Öztürk[a], Pınar Bıçaksız[b], Yeşim Üzümcüoğlu[c], Türker Özkan[d]

[a] PhD Student, Department of Psychology, Middle East Technical University, Ankara, Turkey.
[b] Assist. Prof., Department of Psychology, Hacettepe University, Ankara, Turkey.
[c] Assist. Prof., Department of Psychology, TOBB University of Economics and Technology, Ankara, Turkey.
[d] Prof. Dr., Department of Psychology, Middle East Technical University, Ankara, Turkey.

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ABSTRACT

Objective: Road traffic crashes are one of the crucial public health problems in Turkey and all over the world. Various human, vehicle, and environment factors have been associated with road traffic crashes and different policies, strategies, and interventions have been applied to decrease adverse outcomes such as deaths. Strategies adopted and applied by authorities play a crucial role in road safety. **Methods:** In the present study, the road safety decisions taken by the Road Traffic Safety Province Coordination Board of each of the 81 provinces of Turkey were analysed by using two frameworks, the Haddon Matrix and Es of road safety. **Results:** The classification procedure resulted in 8840 decisions in different cities and 652 unique decisions across Turkey. These decisions were classified based on the Haddon Matrix and Es of road safety. The majority of the decisions focused on the pre-crash phase and education, enforcement, engineering and evaluation activities. **Conclusion:** In line with the strategic decisions, practical implications were discussed, and suggestions have been introduced for the future of road safety. The study provides both methodological and practical implications for road safety research and agenda. It is believed that the use of the Haddon Matrix and 7Es of road safety for policy development will result in significant improvements in public health interventions.

Keywords: Road safety decision, policy analysis, Haddon Matrix, policy development, public health

Correspondence: İbrahim ÖZTÜRK, PhD Student, Department of Psychology, Middle East Technical University, Ankara, Turkey. **E-mail:** ozturki@metu.edu.tr. **Tel:** +90 507 999 70 62.
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ÖZ

Amaç: Karayolu trafik kazaları, Türkiye'de ve tüm dünyada önemli halk sağlığı sorunlarından biridir. Çeşitli insan, araç ve çevre faktörleri karayolu trafik kazaları ile ilişkilendirilmekte ve ölümler gibi olumsuz sonuçları azaltmak amacıyla farklı politikalar, stratejiler ve müdahale programları uygulanmaktadır. Yetkililer tarafından benimsenen ve uygulanan stratejiler karayolu güvenliğinde kritik bir rol oynamaktadır. **Yöntem:** Bu çalışmada, Türkiye'nin 81 ilindeki Karayolu Trafik Güvenliği İl Koordinasyon Kurulları tarafından alınan yol güvenliği kararları, Haddon Matrisi ve yol güvenliği E'leri olmak üzere iki çerçeve kullanılarak analiz edilmiştir. **Bulgular:** Sınıflandırma prosedürü, farklı şehirlerde toplam 8840 kararla ve Türkiye genelinde 652 farklı kararla sonuçlanmıştır. Bu kararlar, Haddon Matrisi ve yol güvenliği E'lerine göre sınıflandırılmıştır. Kararların çoğunluğu kaza öncesi aşama ve eğitim, denetimler, mühendislik ve değerlendirme faaliyetlerine odaklanmıştır. **Sonuç:** Stratejik kararlar doğrultusunda, pratik uygulamalar tartışılmış ve karayolu güvenliğinin geleceği için öneriler sunulmuştur. Mevcut çalışma, karayolu güvenliği araştırmaları ve gündemi için hem yöntemsel hem de pratik çıkarımlar sağlamaktadır. Politika geliştirmede Haddon Matrisi ve yol güvenliği E'lerinin kullanımının halk sağlığı müdahalelerinde önemli iyileştirmelerle sonuçlanacağına inanılmaktadır.

Anahtar kelimeler: Karayolu güvenliği kararları, politika analizi, Haddon Matrisi, politika geliştirme, halk sağlığı

Introduction

Larsson, Dekker and Tingvall defined a road transport system as a complex socio-technical system that includes many elements as road users, vehicle and environment. Moreover, countless interactions between these elements of the system establish a complex system in which safety is a product of these interactions.[1] In this complex system, different factors have been associated with outcomes and goals.[2] For example, Scott-Parker et al. highlighted umpteen factors related to young driver crashes from road users to the social environment. From this point of view, road safety can be discussed from a systems theory point of view.[3] Larsson et al. discussed that, in this socio-technical system, governments are the management level of the organisation which are responsible for strategy and policy development and implementation.[1] Özkan and Lajunen modelled traffic regulations as a part of the origins of macro-level, and these regulations are related to crashes and fatalities.[2] In this context, it is believed to be important to examine the decisions of the top management level. With respect to this, the aim of the present study is to elaborate on the road safety decisions taken by the Road Traffic Safety Province Coordination Board of each of the 81 provinces in Turkey based on previous technical report[4] by using the Haddon Matrix and Es of road safety.

1.1. The Haddon Matrix

The Haddon matrix is a tool for analysing existing information about any public health problem such as road traffic crashes and used to develop future countermeasures.[5-6] It is one of the models for injury prevention and has been used in many public health-related areas such as public health readiness and response planning,[7] floods,[8] children falling on playgrounds[6] and investigation of road traffic crashes and injuries.[5, 9] Moreover, it has also been used as a general perspective of road traffic safety.[10-12]

The Haddon Matrix consists of two dimensions (see Table 1.); phases and factors. Any event or crash is divided into three phases; pre-event, event, and post-event; and four factors, namely human, vehicle/equipment, physical environment and socio-economic environment. For

Table 1. *The Haddon Matrix*[10]

Factors					
		Human	Vehicle and Equipment	Physical Environment	Socio-Economic Environment
Phases	Pre-Crash				
	Crash				
	Post-Crash				

road traffic crashes, the phases are named as pre-crash, crash, and post-crash.[5,10,13-14] The phases approach a crash as a continuum of an event from preventing a crash to preventing injuries and deaths and sustaining life. The phase structure of the matrix enables the applications of particular interventions to decrease road traffic crashes and outcomes of these crashes at different phases.[8-9,11-12,15]

Human factors represent different groups of road users involved in a crash as drivers, passengers, pedestrians, motorcyclists, bicyclists or others. Vehicle/equipment factors as physical characteristics, movement, and location are the channels or agents of impact. Physical environment factors constitute the setting of a crash. Finally, socio-economic factors are the factors related to the social environment.[10-11]

The matrix provides theoretical knowledge and practical applications by determining the contributory factors that could be used to develop preventive public strategies.[8-12] For example, changes in the vehicle/equipment factors could reduce the risk of a crash or the consequences of a crash by focusing on different phases.[16] Moreover, emergency response is one of the factors affecting the post-crash stage. In the literature review conducted by Üzümcüoğlu et al., it has been found that emergency response can significantly reduce the number of seriously injured people in a road traffic crash.[17] (For an example of a road traffic crash investigation, please see Albertsson et al.[3] and pedestrian injury due to automobiles, please see Barnett et al.[7]).

In addition to being used as an investigation tool for road traffic crashes, the Haddon Matrix could also be used to evaluate the effectiveness of particular national-level agents such as the health department. The public health system could be examined for readiness for certain types of public health problems. The matrix could identify areas that need improvements and serve as a tool for policy and emergency response development.[7] Moreover, Short et al. suggested that interventions related to road traffic crashes should focus on different factors of the Haddon Matrix, and evaluations should be done for each factor. The intervention programs should involve different agents from the community level and national level.[18] In light of these, the Haddon Matrix is used to evaluate road safety decisions in Turkey.

1.2. Es of Road Safety

In addition to determining phases and factors using the Haddon Matrix, it would also be important to identify the scope of road safety decisions and interventions by using Es of road safety. The earliest versions discussed three Es; education, enforcement, and engineering.[19] Groeger classified factors of road safety into 7 Es; education, enforcement, engineering, exposure, examination of competence and fitness, emergency response, and evaluation. According to their definitions from the road safety perspective, *education* aims to transfer knowledge and skills as a means of driver education or public education.[19] The content and structure of road safety educations are also crucial for their effectiveness. It is also stated that even though education does not provide quick results, it is necessary to have a comprehensive road safety policy.[20]

Enforcement, including traditional and electronic traffic controls such as speed or alcohol controls, was evaluated as one of the most critical factors affecting undesired behaviours.[21] *Engineerin*g focuses on vehicle, road, and environment design. Road and environment-related factors such as curvature, infrastructure, and roundabout design are found to be important engineering related factors for road safety.[21] *Exposure* is related to the interaction of road users with traffic (risk) based on certain variables such as time of the day or amount of travel.[19, 22] *Examination of competence and fitness* aims to control competence related structures such as driver license. *Emergency response* focuses on the response after a crash occurred, such as delivering necessary first aid. Finally, the last one is *evaluation* which focuses on reviewing interventions based on outcomes such as decreasing the number of crashes.[19]

1.3. The Aim of the Present Study

In the literature, various studies have used the Haddon Matrix and Es in order the evaluate different aspects of road safety interventions. For example, Bui et al. reviewed the intervention programs towards emergency service vehicle incidents from other sectors. Vehicle and environmental- and policy-related interventions were the leading types of intervention, and driver training and educations were also effective, indicating the importance of different Es of road safety in the post-crash phase.[23] In another study, Scholtes et al. addressed that, out of 27 interventions for road safety targeting children, 17 of them were related to pre-crash, 9 of them were related to crash, and one of them was related to the post-crash phase.[24]

Considering the significance of the Haddon Matrix and Es for road safety, in the current study, the road safety decisions taken by the Road Traffic Safety Province Coordination Board of each province in Turkey were analysed by using the Haddon Matrix and Es of road safety. The Haddon Matrix is used to classify the decisions based on the targeted phase and factor. In addition to that, the decisions were also differentiated based on the method corresponding Es of road safety.[19] In this way, the Haddon Matrix and Es of road safety were used to categorise the road safety decisions of Turkey into factors, phases, and methods.

To the authors' best knowledge, the study is the first study analysing the national road safety decisions by using the Haddon Matrix and Es of road safety. The two methods complement each other both methodologically and contextually. By using these methods, it is expected that researchers and policymakers will be able to evaluate at which stages of a crash (phases of the Haddon Matrix) a decision will intervene in which elements of the traffic (factors of the Haddon Matrix) by using which methods (Es of road safety).

Methods

2.1. Procedure

In the scope of the Road Traffic Safety Strategy and Action Plan, Road Traffic Safety Province Coordination Boards hold regular meetings. The governor chaired the board, which involves different agents such as mayors, administrative chiefs, decision-makers, and non-governmental organisation representatives. Based on the former report[4], the 8840 decisions taken at the meetings from 81 provinces were analysed by using the Haddon Matrix and Es of Road Safety. Before placing the decisions into the Haddon Matrix and Es of road safety, a list of decisions taken in 545 meetings between 2012 and 2015 was prepared. The number of meetings per province ranged between 0 to 22 (M = 6.73, SD = 5.79). Decisions including more than one action plan (such as public education and planning new campaigns) were divided into sub-decisions that include only one action plan (for details, please see the former report[4]). In this way, each decision was organised to fall into only one cell in the Haddon Matrix and contains only one dimension from the road safety Es.

A total of 8840 decisions and 654 different decisions were determined. In the results sections, first, the distributions of the total number of decisions were presented. Secondly, 654 different decisions were determined by removing repeated decisions

from the 8840 decisions. Two decisions were excluded from the further classifications because of not being directly related to road safety, such as protecting catchment basins. After the final forms of decisions were set (8840 total and 652 different decisions), each decision was associated with one factor and one phase of the Haddon Matrix and one E of road safety. For example, traffic training for drivers and pedestrians concerns only the pre-crash phase and human factors in the Haddon Matrix and education in Es of road safety. The distributions of the decisions were discussed concerning the combined version of the Haddon Matrix and 7Es of road safety at the country level. All examination and distribution of decisions were carried out by authors separately.[4]

Then, group discussion sessions were held to reach a consensus on the classifications of the itemised decisions (for sample decisions for each classification, please see Table 2).

The majority of the researchers (at least three out of four votes) have sought a consensus on the final forms of each item and classification of decisions.Moreover, examples of decisions based on Es of road safety could be listed as followed:

- Education: "traffic education for public transportation drivers".
- Enforcement: "speed controls".
- Engineering: "road maintenance".
- Exposure: "regulation of certain groups such as truck in city traffic".
- Examination of competence and fitness: "education of driver educators and examiners".
- Emergency response: "establishing first-aid centres in institutions".
- Evaluation: "preparation and follow-up of road safety action plans".

Results

3.1. The Distributions of Total Number of Decisions

3.1.1. Total Decisions based on the Haddon Matrix

In this section, the distributions of 8840 decisions were presented based on the Haddon Matrix (see Table 3).

Table 2. *Sample Decisions based on the Haddon Matrix*

	Human Factors	**Vehicle/Equipment Factors**	**Physical Environment Factors**	**Socio-Economic Environment Factors**
Pre-Crash Phase	General traffic educations, speed and alcohol control	Control of school services and tires	Road and roadway elements' maintenance	Regular meetings and workshops
Crash Phase	Seat belt and helmet use	Control of seat belt and child-restraints	Safety rails and barriers	Seat belt at official cars, Seat belt and helmet projects
Post-Crash Phase	First-aid educations	Increasing numbers of ambulances and control of ambulances	Control of emergency roads and meeting places	Sub-commissions about ambulance services

Table 3. *Distribution of Total Decisions on the Haddon Matrix*

		Factors				
		Human	Vehicle and Equipment	Physical Environment	Socio-Economic Environment	*Total*
Phases	Pre-Crash	2545	646	2539	2135	7865
	Crash	404	36	29	60	529
	Post-Crash	167	14	88	177	446
	Total	3116	696	2656	2372	8840

The 8840 decisions were divided into the factors of the Haddon Matrix as 3116 to human factors (35.25%), 696 to vehicle/equipment factors (7.87%), 2656 to physical environment factors (30.05%) and 2372 to socio-economic environment factors (26.83%). In terms of the Haddon Matrix's phases, out of 8840 decisions, 7865 of them (88.97%) were related to the pre-crash phase, 529 of them (5.98%) were related to the crash phase, and 446 of them (5.05%) were associated with the post-crash phase.

Finally, 8840 decisions distributed into the cells of Haddon Matrix as 2545 (28.79%) human/pre-crash, 404 (4.57%) human/crash, 167 (1.89%) human/post-crash 646 (7.31%) vehicle-equipment/pre-crash, 36 (0.41%) vehicle-equipment/crash, 14 (0.16%) vehicle-equipment/post-crash, 2539 (28.72%) physical environment/pre-crash, 29 (0.33%) physical environment/crash, 88 (1.00%) physical environment/post-crash, 2135 (24.15%) socio-economic/pre-crash, 60 (0.68%) socio-economic/crash, and 177 (2%) socio-economic/post-crash decisions.

3.1.2. The Distributions of Total Decisions based on the Es of Road Safety

A total of 8840 road safety decisions were classified based on the Es of road safety. The distribution showed that, 1941 decisions (21.96%) for education, 2313 decisions (26.17%) for enforcement, 2204 decisions (24.93%) for engineering, 127 decisions (1.44%) for exposure, 131 decisions (1.48%) for examination of competence and fitness, 193 decisions (2.18%) for emergency response, and finally 1931 decisions (21.84%) for evaluation were identified (see Figure 1).

3.2. The Distribution of Different Decisions

The distribution of 652 decisions over the Haddon Matrix and Es of road safety were presented in Table 4.

3.2.1. The Distributions based on the Haddon Matrix

The 652 different decisions were differentiated into the cells of the Haddon Matrix (see Table 5).

Total 652 decisions included 165 human factors (25.31%), 69 vehicle/equipment factors (10.58%), 189 physical environment factors (28.99%) and 229 socio-economic environment factors (35.12%) decisions. Moreover, the decisions were distributed into the phases as followed, 586 for pre-crash (89.88%), 17 for crash (2.61%) and 49 for post-crash (7.51%) phases.

Out of 165 human factors decisions, 143 decisions (86.67%) were related to pre-crash, eight decisions (4.85%) were related to crash, and 14 decisions (8.48%) were related to post-crash phases.

Out of 69 vehicle and equipment factors, 58 pre-crash (84.06%), two crash (2.9%) phase, and nine post-crash (13.04%) phases were found. Out of 189 physical environment decisions, 181 decisions to pre-crash (95.76%), one decision to crash (0.53%), and seven decisions to post-crash (3.70%) phases were determined. Two hundred twenty-nine socio-economic environment decisions were categorised as 204 decisions to pre-crash (89.08%), six decisions to crash (3.17%), and 19 decisions to post-crash (10.05%) phases.

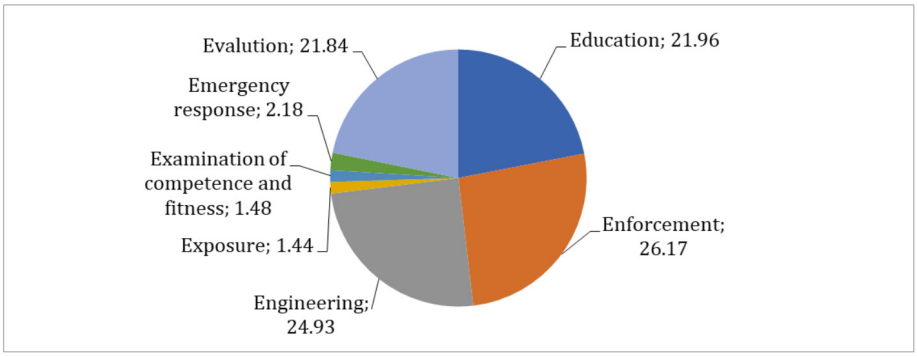

Figure 1. Es Distribution of Road Safety Decisions in Turkey (as percentages)

Table 4. *Distribution of Different Decisions on the Haddon Matrix and Es of the Road Safety*

	Human			Vehicle and Equipment			Physical Environment			Socio-Economic Environment		
	Pre-Crash	Crash	Post-Crash	Pre-Crash	Crash	Post-Crash	Pre-Crash	Crash	Post-Crash	Pre-Crash	Crash	Post-Crash
E1	76	3	10	3	0	0	6	0	0	22	2	0
E2	47	2	0	42	2	1	17	0	0	37	1	1
E3	3	0	0	10	0	0	129	1	3	1	0	0
E4	8	0	0	1	0	0	9	0	0	9	0	0
E5	5	0	0	0	0	0	0	0	0	6	0	1
E6	0	0	3	0	0	8	0	0	3	2	0	12
E7	4	3	1	2	0	0	20	0	1	127	3	5
Total	143	8	14	58	2	9	181	1	7	204	6	19

Note: E1: Education, E2: Enforcement, E3: Engineering, E4: Exposure, E5: Examination of competence and fitness, E6: Emergency response, E7: Evaluation

Table 5. *Distribution of Different Decisions on the Haddon Matrix*

		Factors				
		Human	Vehicle and Equipment	Physical Environment	Socio-Economic Environment	*Total*
Phases	Pre-Crash	143	58	181	204	586
	Crash	8	2	1	6	17
	Post-Crash	14	9	7	19	49
	Total	165	69	189	229	652

3.2.2. The Distributions based on the Es of Road Safety

Each different road safety decision was classified based on the Es of road safety. The distribution showed that, 122 decisions (18.71%) for education, 150 decisions (23.01%) for enforcement, 147 decisions (22.55%) for engineering, 27 decisions (4.14%) for exposure, 12 decisions (1.84%) for examination of competence and fitness, 28 decisions (4.29%) for emergency response, and finally 166 decisions (25.46%) for evaluation were identified (see Figure 2).

3.2.3. The Distributions based on the Haddon Matrix Factors and Es of Road Safety

In the following section, the distribution of decisions over the factors of the Haddon matrix and Es of road safety were investigated (see Table 6). In terms of the classification of 165 human factors related decisions based on 7Es of road safety, 89 decisions for education (53.94%), 49 decisions for enforcement (29.7%), three decisions for engineering (1.82%), eight decisions for exposure (4.85%), five decisions for examination of competence and fitness (3.03%), three decisions for emergency response (1.82%), and eight decisions for evaluation (4.85%) were identified. In terms of the classification of vehicle/equipment factors related decisions based on 7Es of road safety, three decisions for education (4.35%), 45 decisions for enforcement (65.22%), ten decisions for engineering (14.49%), one decision for exposure (1.45%), no decision for examination of competence and fitness, eight decisions for emergency response (11.59%), and two decisions for evaluation (2.9%) were determined.

In terms of the classification of physical environment factors related decisions based on 7Es of road safety, six decisions for education (3.17%), 17 decisions for enforcement (8.99%), 133 decisions for engineering (70.37%), nine decisions for exposure (4.76%), no decision for examination of competence and fitness, three decisions for emergency response

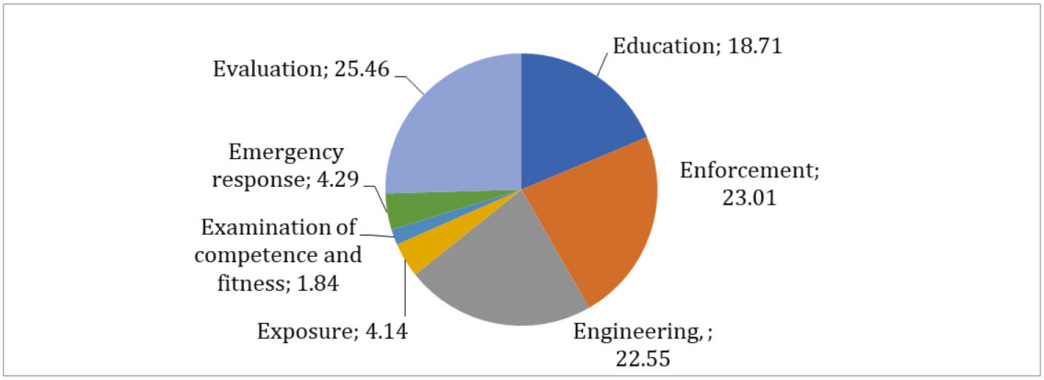

Figure 2. Es Distribution of Road Safety Decisions in Turkey (as percentages)

Table 6. *Distribution of Different Decisions on the Haddon Matrix Factors and Es of Road Safety*

Factors of the Haddon Matrix						
		Human	Vehicle and Equipment	Physical Environment	Socio-Economic Environment	*Total*
Es of Road Safety	Education	89	3	6	24	122
	Enforcement	49	45	17	39	150
	Engineering	3	10	133	1	147
	Exposure	8	1	9	9	27
	Examination of competence and fitness	5	0	0	7	12
	Emergency response	3	8	3	14	28
	Evaluation	8	2	21	135	166
	Total	165	69	189	229	652

(1.59%), and 21 decisions for evaluation (11.11%) were established. In terms of the classification of socio-economic environment factors related decisions based on 7es of road safety, 229 decisions were grouped as followed: 24 decisions to education (10.48%), 39 decisions to enforcement (17.03%), one decision to engineering (0.44%), nine decisions to exposure (3.93%), seven decisions to examination of competence and fitness (3.06%), 14 decisions to emergency response (6.11%), and 135 decisions to evaluation (58.95%).

A total of 122 decisions were determined as being related to education and distributed as followed; 89 decisions for human factors (72.95%), three decisions for vehicle/equipment factors (2.46%), six decisions for physical environment factors (4.92%), and 24 decisions for socio-economic environment factors (19.67%). For enforcement, 150 decisions were determined and distributed as followed; 49 decisions for human factors (32.67%), 45 decisions for vehicle/equipment factors (30%), 17 decisions for physical environment factors (11.33%), and 39 decisions for socio-economic environment factors (26%). For engineering, 147 decisions were determined, and three decisions for human factors (2.04%), ten decisions for vehicle/equipment factors (6.8%), 133 decisions for physical environment factors (90.48%), and one decision for socio-economic environment factors (0.68%) were found.

Out of 27 decisions for exposure, eight decisions for human factors (29.63%), one decision for vehicle/equipment factors (3.7%), nine decisions for physical environment factors (33.33%), and nine

decisions for socio-economic environment factors (33.33%) were determined. For examination of competence and fitness, 12 decisions were determined and distributed: five decisions for human factors (41.67%), and seven decisions for socio-economic environment factors (58.33%). A total of 28 decisions were determined for emergency response and differentiated as three decisions for human factors (10.71%), eight decisions for vehicle/equipment factors (28.57%), three decisions for physical environment factors (10.71%), and 14 decisions for socio-economic environment factors (50%). For evaluation, 166 decisions were determined and distributed as followed; eight decisions for human factors (4.82%), two decisions for vehicle/equipment factors (1.2%), 21 for physical environment factors (12.65%), and 135 for socio-economic environment factors (81.32%).

engineering decisions were classified as 143 pre-crash (97.28%), one crash (0.68%) and three post-crash (2.04%) decisions.

All of the 27 exposure-related decisions were associated with pre-crash phase (100%). Out of 12 examinations of competence and fitness decisions, 11 decisions for pre-crash (91.67%) and one decision for post-crash (8.33%) phases were determined. The 28 emergency response decisions were differentiated as two pre-crash (7.14%) and 26 post-crash (92.86%) phases. Finally, 153 pre-crash (92.17%), six crash (3.61%) and seven post-crash (4.22%) decisions composed 166 evaluation related decisions.

Discussion

Hughes et al. suggested that using a framework based on the policy tools and components of road safety strategies is useful for developing and evaluating road safety strategies.[25] In light of this, the present study investigates the content of national road safety decisions in Turkey based on the Haddon Matrix and 7Es of road safety. For this reason, each road safety decision taken by the Road Traffic Safety Province Coordination Boards was systematically analysed and placed into related dimensions of the Haddon Matrix and Es of road safety.

***Table 7**. Distribution of Different Decisions based on the Haddon Matrix Phases and Es of Road Safety*

Phases of the Haddon Matrix					
		Pre-Crash	Crash	Post-Crash	*Total*
Es of Road Safety	Education	107	5	10	122
	Enforcement	143	5	2	150
	Engineering	143	1	3	147
	Exposure	27	0	0	27
	Examination of competence and fitness	11	0	1	12
	Emergency response	2	0	26	28
	Evaluation	153	6	7	166
	Total	586	17	49	652

3.2.4. The Distributions based on the Haddon Matrix Phases and Es of Road Safety

Finally, the distribution of Es of road safety on the phases of the Haddon Matrix was examined (see Table 7). The 122 education-related decisions were distributed into phases as 107 decision for pre-crash (87.70%), five decisions for crash (4.1%) and ten decisions for post-crash (8.2%) phases. A total of 150 enforcement-related decisions were differentiated as 143 pre-crash (95.33%), five crash (3.33%) and two post-crash (1.33%) decisions. The 147

The distribution of the total number of decisions and different decisions in terms of factors of the Haddon Matrix showed that human, physical environment, and socio-

economic environment factors correspond to 25-35% of decisions in the meetings. Similar to the variety in the characteristics of road traffic crashes[11-12], there was a wide range of decisions across different factors. Even though the majority of the decisions were related to human factors in total decisions (35%), the highest diversity for different decisions was found to be socio-economic environment factors (35%). Considering the variety in the decisions and differences in the number of meetings between provinces proven in the previous report[4], it could be discussed that, even within a country, regions may have different priorities regarding road safety.

According to the energy-damage phenomena, as discussed by Haddon, the essential point of developing effective countermeasures is not only decreasing the number of crashes by focusing on just causes but also reducing the results such as deaths and injuries by identifying all factors through the crash process.[10,13] In the scope of road safety, the focus of effective countermeasures should be both preventing crashes from occurring and decreasing the number of deaths and injuries in the event of a crash. The results of the study showed that approximately 90% of all total or different decisions taken for road safety focuses on the pre-crash phase, where the main focus is to prevent crashes from occurring. The cells of the Haddon Matrix show that majority of the road safety decisions taken in Turkey were related to pre-crash phase, human, physical environment, and socio-economic environment factors. Additionally, education, enforcement, engineering, and evaluation were the most varied Es. That could be interpreted as the main focus in Turkey is preventing crashes from occurring through different Es. With respect to the distribution of decisions, it could also be discussed that there could be a need for interventions in the crash and post-crash phases, such as public first-aid interventions involving different Es of road safety.

Haddon explained road traffic crashes as an energy exchange and also proposed ten main countermeasure strategies that could be used to decrease loss after a crash. It is also suggested that any intervention regarding road safety will reflect these strategies. These strategies are "*1) preventing the initial marshalling of the form of energy, 2) reducing the amount of energy marshalled, 3) preventing the release of the energy, 4) modifying the rate of spatial distribution of release of the energy from its source, 5) separating in time or space the energy being released from the susceptible structure, 6) separating the energy being released from the susceptible structure by interposition of a material barrier, 7) modifying the contact surface, subsurface or basic structure which can be impacted, 8) strengthening the living or non-living structure which might be damaged by the energy transfer, 9) moving rapidly in detection and evaluation of damage and to counter its continuation and extension, and 10) all those measures which fall between the emergency period following the damaging energy exchange and the final stabilization of process.*" Evaluating possible interventions based on individual and combined strategies will show which part of the energy exchange process is interfered.[10, 26]

Rustagi et al. and Short et al. suggested that the Haddon Matrix provides major possible intervention program areas for road safety. Besides, future intervention programs should focus on different factors such as engineering and be supported by community and national level agencies.[9,18] For the Road Traffic Safety Province Coordination Boards in Turkey, various agencies from different levels of the society participated in the decision-making process. However, the results show that the decisions mainly focused on specific areas of road safety, such as education and pre-crash. As discussed earlier, the combined use of the Haddon Matrix and Es of road safety might provide effective intervention programs that address the needs of society. Different strategies planned to achieve the same outcome, such as decreasing crashes,

may require various components[3,26]. For example, suppose that a country aims to reduce crashes, and policymakers develop two countermeasures. Even if two countermeasures focus on the post-crash phase of the Haddon Matrix, one of them may use only one E, such as education, and the other one uses three Es, such as education, enforcement, and emergency response.

As highlighted earlier, the Haddon Matrix can be used to assess national level readiness for public health problems and evaluate and develop strategies effectively using public health resources.[7] Since road traffic crashes are one of the major public health problems worldwide and have a significant impact on the national income of a country[27], and it is essential to conduct road traffic intervention programs that are adequately analysed and planned. Moreover, it is also proposed that if potential or actual hazard, in this case, road traffic crashes, exceeds nations, it is necessary to apply international actions.[27] WHO states that road traffic crashes are not only regional or national problems but also global problem.[27] In recent years, the application of international programs shows the importance and effectiveness of these programs.[29-30] It has been found that the examination of road traffic crashes by using the Haddon Matrix provides detailed information about a specific crash, and future suggestions might be developed based on that crash.[5] However, it should be noted that the multidimensionality of factors affecting a road traffic crash would result in many combinations, so the generalisability of suggestions would be limited. As discussed by Albertsson et al., the Haddon Matrix could be divided and used as different factors since the matrix provides flexibility.[5] The current report shows that the matrix could also be used to investigate national level road safety decisions. Additional dimensions related to regional and country-level might provide detailed inside for road traffic safety problems and result in more effective countermeasure programs.

In addition to the results coming from the Haddon Matrix, the distributions related to 7Es of road safety showed four major areas; education, enforcement, engineering, and evaluation. Additionally, while evaluation was mainly associated with the pre-crash phase and socio-economic environment, engineering was mostly related to the pre-crash phase and physical environment. The majority of the education and enforcement decisions were also associated with the pre-crash phase. The earliest version of three Es of road safety[19], namely education, enforcement, and engineering, also have an essential share in the road safety decisions in Turkey. However, critical factors that as exposure and emergency response did not report as much as other decisions. As discussed by Hughes et al., using a more limited scope of road safety strategies involving a limited number of Es of road safety might affect the effectiveness of these applications.[25]

Based on the current findings, a few theoretical and practical implications could be suggested. First of all, the Haddon Matrix and Es of road safety were found to be valuable tools to evaluate road safety decisions. It has been found that each sub decision had been successfully associated with one of the factors, phases and Es of road safety. Besides, it could also be suggested that the matrix and Es of road safety provide a snapshot of road safety interventions in Turkey. For this reason, it could be recommended that the two methods could provide a more detailed approach to road safety interventions at the country level. Following this exploration, previous interventions could be evaluated, and new intervention programs could be developed. Following this, secondly, the distributions of decisions showed that there are specific points that get more attention than others, such as pre-crash human factors while taking road safety decisions. The fact that there is a wide range of decisions in these areas shows the richness of the intervention programs that could be implemented. However, future studies should also investigate whether the lower number of decisions in specific areas is due to the nature of that category (i.e. lack of different interventions) or indicates a lack of focus on that area.

Additionally, future decisions could be taken by considering these tools as a basic structure and focus on the needs of different parts of the country by examining these needs again based on these tools. Moreover, investigating road traffic crashes that represent the crash profile of different regions or a country and developing countermeasures based on these might provide better road traffic safety policies. As discussed by Rustagi et al., road traffic crashes and crash data involve multiple agencies such as hospitals and police using their own reporting systems and parameters.[9] Using a single crash reporting system that is developed in a way that provides information for cells for the Haddon Matrix and 7Es of road safety might result in a more systematic and efficient system for national-level road safety. Collecting representative and detailed information might result in better outcomes for national road safety programs.[29]

Moreover, Scott-Parker et al. criticised the lack of knowledge about the effects of higher-level contributory factors to young driver crashes, such as government policy and regulatory bodies and interactions between countermeasures from different levels on the road safety.[3] Furthermore, Larsson et al. also suggested that effective road safety should not focus on only one dimension.[1] The general diversity in factors, phases, and Es in Turkey supports the multidimensionality and could be evaluated as good promises for Turkey's future of road safety. The present paper also draws a general picture regarding the variety and distribution of road safety decisions. However, the application and outcomes of these decisions were not the subjects of the current paper. It should also be noted that even though the decisions had been analysed based on the Haddon Matrix and 7Es of road safety, it is not known how the decisions had been applied and what their outcomes are. Because of this, it was not possible to study the applied decisions and their consequences. However, road safety decisions may involve various interventions. Evaluations of these would also have great importance. In future studies, considering the OECD/DAC evaluation criteria for interventions, it would be important also to analyse road safety agenda and interventions based on the relevance, coherence, effectiveness, efficiency, impact and sustainability.[31] Runyan also added the third dimension that will help to choose the best interventions based on certain criteria. The third dimension, named as decision criteria, included several elements from cost to feasibility.[6] By following specific steps, evaluation of different interventions would also be possible.

As discussed by Larsson et al., systems theory has certain aspects associated with safety that enable applying the theory into the road safety context. For instance, systems are viewed as hierarchical structures, and road safety approaches such as Vision Zero emphasise the shared responsibility between elements in a hierarchical structure.[1] Scott-Parker et al. also highlighted the importance of a systems approach in road safety. In the study, the actors associated with young driver road safety were examined, and multiple actors with various responsibilities were determined.[3] Similarly, the current study also supports the notion that a systems approach is necessary for road safety research. The participants of these meetings and the content of the decisions taken in Turkey also support the complex hierarchical structure of road safety. The decisions by the authorities showed immense differences covering many aspects of road safety from drivers to road infrastructure and from education to examination of competence and fitness.

It should also be mentioned that the findings of the current study are the general overview of road safety decisions in Turkey. With respect to that, the present study proposes an example of an investigation of road safety decisions. In the model of Özkan and Lajunen, traffic regulations were the distal factors directly related to road traffic crashes and fatalities at the macro level.[2] From this point of view, the findings of the current study could be regarded as a guideline for road safety researchers and policymakers.

Additionally, using different models (Haddon Matrix and Es of road safety in the current study) proposes a new approach to policy development in public health.

In the near future, the meaning and content of human factors might change with the development of new technologies such as Intelligent Transportation Systems (ITS). Because of these changes, it might be essential to consider the interaction of human factors with other factors such as vehicle and environment while using the Haddon Matrix.[32] In the future, it might be important to consider ITS as a new factor that combines human, vehicle and environment factors. Moreover, it should also be highlighted that the decisions were most likely to be influenced by many factors associated with Turkey, such as demographics or cultural characteristics. As stated by McIlroy et al., the same actors might have different roles across countries, so it might be important to investigate different countries with the same methodology.[33]

A few limitations should be mentioned regarding the present study. One of the most crucial issues while considering the findings of the present study is that the study focuses on the variety of road safety decisions rather than the frequency. The total number of decisions should be interpreted by taking into consideration this. For instance, considering salient points such as education or socio-economic factors, it is unknown whether these decisions and variety represent a wide range of unsolved problems or continuation of successful practices. For this reason, the present study focuses on the presentation of the variety of decisions from the perspective of two frameworks. In future studies, following up on the benefits and efficiency of these decisions would be beneficial for the future of road safety. The other one is related to the decisions and distribution of the decisions. Some decisions were divided into simple forms to be able to classify them. For this reason, although the initial numbers of decisions were large, in the application, some of the decisions were combined to result in one intervention.

In conclusion, for the first time in the literature, the decisions of road safety at a country level were analysed by using the Haddon Matrix and 7Es of road safety. The results show that both methods add valuable theoretical and practical implications for road safety decisions. The use of the Haddon Matrix and 7Es of road safety for policymaking might significantly improve public health interventions. The differentiation of road safety decisions in Turkey showed that the main focus was on the pre-crash phase and education, enforcement, engineering and evaluation activities, highlighting the importance given to different interventions such as educating road users and preventing crashes. It is also believed that the current methodology provides important descriptive of road safety strategies, and results could be used in many areas of road safety from research to policy implementation. Overall, from a systems theory point of view, the present study provides some information that is believed to be valuable for the future of road safety. The study presents a new approach for road safety research by showing that the road safety decisions taken at the top level of the hierarchical structure in a complex socio-technical system can be analysed using different models and theories (the Haddon Matrix and Es of road safety in the present study).

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ORIGINAL ARTICLE / ORİJİNAL MAKALE

The relation of different weight loss methods and of diet compliance with weight loss and weight control

Farklı kilo verme yöntemlerinin ve yöntemlere uyumun kilo verme ve kontrolü ile ilişkisi

Fatih Gültekin[a], Halil İbrahim Büyükbayram[b], Duygu Kumbul Doğuç[c], Hikmet Orhan[d], Osman Gürdal[e], Mücahit Eğri[f], Rıza Çıtıl[g], Mustafa Tözün[h], Nesimi Kişioğlu[i], Fatih Kara[i], İlter İlhan[b], Muazzez Garipağaoğlu Denizhan[j]

[a]Prof. Dr., University of Health Sciences, International Faculty of Medicine, Medical Biochemistry Department, İstanbul, Türkiye.
[b]Asst. Prof., Süleyman Demirel University, Faculty of Medicine, Department of Medical Biochemistry, Isparta, Türkiye.
[c]Prof. Dr., Süleyman Demirel University Faculty of Medicine, Medical Biochemistry Department, Isparta-Türkiye.
[d]Prof.Dr., Süleyman Demirel University Faculty of Medicine, Biostatistics and Medical Informatics Department, Isparta-Türkiye.
[e]Asst. Prof.,Süleyman Demirel University Faculty of Medicine, Department of Biostatistics and Medical Informatics, Isparta, Türkiye.
[f]Prof. Dr., Gaziosmanpaşa University Faculty of Medicine, Public Health Department, Tokat,Türkiye.
[g]Asst. Prof., Gaziosmanpaşa University Faculty of Medicine, Department of Public Health, Tokat-Türkiye.
[h]Prof. Dr., Katip Çelebi University Faculty of Medicine, Public Health Department, İzmir-Türkiye.
[i]Prof. Dr., Süleyman Demirel University Faculty of Medicine, Public Health Department, Isparta-Türkiye.
[i]Assoc. Prof., Ministry of Health, General Director of Public Health, Ankara-Türkiye.
[j]Prof. Dr.,Fenerbahçe Universtiy, Faculty of Health Sciences, Department of Nutrition and Dietetics, İstanbul, Türkiye.

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ABSTRACT

Objective: Obesity is one of the most important health problems of our time. Many people use various methods to lose or maintain their weight. In this study, we aimed to evaluate the effectiveness of the methods used for weight control. **Methods:** In total, 861 participants were interviewed face-to-face and electronically. **Results:** In the questionnaire it was found that the various differences in weight loss methods had no significant effects on weight control; however, variables such as body mass index (BMI) at onset of the diet and duration of it, marital status, age and occupation have different repercussions on weight control. In addition, targeted weight loss over a period of time was found to be adequate on dietary success. **Conclusion:** Our study revealed that different types of diets used for weight loss did not have an effect on reaching the targeted weight or maintaining the weight control.

Keywords: Body weight maintenance, obesity, weight reduction programs

Correspondence: Halil İbrahim BÜYÜKBAYRAM, Süleyman Demirel University Faculty of Medicine, Department of Medical Biochemistry, Isparta-Türkiye.
E-mail: halilibrahimbuyukbayram@hotmail.com. **Tel:**+90 505 308 69 63.

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ÖZ

Amaç: Obezite, çağımızın en önemli sağlık sorunlarından biridir. Birçok insan kilo vermek veya korumak için çeşitli yöntemler kullanır. Bu çalışmada kilo kontrolü için kullanılan yöntemlerin etkinliğini değerlendirmeyi amaçladık. **Yöntem:** Toplam 861 katılımcı ile yüz yüze ve elektronik olarak görüşüldü. **Bulgular:** Çalışmamızda kilo verme yöntemlerindeki çeşitli farklılıkların kilo kontrolü üzerinde önemli bir etkisinin olmadığı; ancak diyetin başlangıcındaki vücut kitle indeksi (VKİ) ve süresi, medeni durum, yaş ve meslek gibi değişkenlerin kilo kontrolü üzerinde farklı etkileri olduğu bulunmuştur. Ek olarak, belirli bir süre boyunca hedeflenen kilo kaybının diyet başarısı üzerinde yeterli olduğu bulunmuştur. **Sonuç:** Çalışmamız kilo vermek için kullanılan farklı diyet türlerinin hedeflenen ağırlığa ulaşmada veya kilo kontrolünü sürdürmede etkisi olmadığını ortaya koymuştur.

Anahtar kelimeler: Kilo kontrolü, obezite, kilo verme programları

Introduction

Obesity is a complex disease involving an excessive amount of body fat which isn't just a cosmetic concern but cause several medical problems such as high blood pressure, Diabetes Mellitus, Acute Coronary Syndrome... Obesity results from a combination of inherited factors, combined with the environmental and personal diet and exercise choices.[1,2] Nowadays traditional eating habits are almost lost; the consumption of ready-to-eat industrial foods with high energy content has increased tremendously. In addition, rapid progress in science and technology makes individuals stationary and increases the risk of obesity by reducing energy consumption.[3, 4] Especially in children and in the young population, the use of computers and tablets increases the sedentary lifestyle and obesity which may become a problem for the younger age population. Diet programs and attempts to bring healthy eating habits became important for younger ages.[5] Compared to the previous generations, sedentary lifestyle and minimal muscle activity, and the consequences of this lifestyle lead some diseases such as obesity, Insulin Intolerance and finally Diabetes Mellitus which become the most important public health problems in developed countries.[1,6] In addition, nowadays, obesity is increasing in low- and middle-income class countries, especially in their urban areas.[7]

The reasons aforementioned above or due to physical fitness concerns, people from all professions start to diet every day and set goals to lose weight by different levels of targets.

There is significant evidence that losing excess body fat is difficult for most individuals and the risk of regaining lost weight is unfortunately high.[2] This study was conducted to evaluate the approaches of diet programs for weight loss in the society, their effectiveness in reaching the target weight and the data regarding the maintenance of the weight reached.

Methods

The questionnaire was prepared from a doctorate thesis which was used at Hacettepe University Institute of Health Sciences Dietetics Program, but later it was modified as a template for the goal of our study. [8]

A cross-sectional analytical questionnaire was applied. The population of the study consisted of individuals who applied a slimming program according to the research purpose, especially in Isparta and Tokat provinces. Convenience non-probability sampling method is used in this study. All individuals who meet the conditions appropriate for the purpose of the study, who can be reached and who agree to participate in the study are included. The sample size of

the research is planned to be more than 10 times the number of variables to be examined based on experience.

The survey was conducted face-to-face in the provinces of Isparta and Tokat and also on the internet. Participants were accessed electronically via e-mail lists randomly. Online application of the questionnaire was done with surveymonkey survey software. The survey was conducted with 1200 people, but 339 questionnaires were excluded due to insufficient answers.

Determining the criteria for achieving the target

When the literature is examined in order to determine which criteria will be used in the evaluation of the success of the weight loss program, it is stated that a 5% decrease in body weight causes a significant decrease in disease risks.[9,10] In the guideline 'The Management of Overweight and Obesity in Adults' which was published in 2013 by American Heart Association (AHA) and American College of Cardiology (ACC), weight loss by 5% -10% of body weight over a period of 6 months was recommended as an initial target.[11] In a different study, to be able to maintain the weight achieved for at least 1 year in terms of long-term weight loss success was suggested as a success criterion.[12] The variables such as the body mass indexes, targeted weights, ideal body weights, diet durations etc. of the people who want to lose weight, make it difficult to give a clear answer to the question 'How is the success of weight loss diets are evaluated?' and there is no standard criterion put forward in this field in the scientific world. Therefore, in our study we implemented the status of achieving the target body weights of the participants, as a criterion instead of 'dietary success' definition. In this way, we aimed to discuss the appropriateness of the objectives set by the participants. By doing this, the participants who could give at least 80% of the weight they wanted to lose via the slimming program implemented in our study was accepted as 'reached the goal'. The other variables were compared each other whether the weight loss target was reached or not.

Statistical Analysis

SPSS v.15 program was used for statistical analysis. First, it was measured whether the participants completed the diet till the end or not. Then, the participants were grouped according to their duration of diet (0-6 months, 6-12 months and> 12 months) and also another group was setup according to the [targeted weight loss/initial body weight x 100] ratio (5-10%, 10-20% and > 20%). For the participants who completed the diet to the end, the achievement of the target in each group was evaluated separately and the data were compared with Pearson Chi-square or Fisher's Exact tests. The relationship between the other questions in the questionnaire and including the achievement of the goal was evaluated either by Chi-Square tests or t-test. Diet duration, weight loss targets and other parameters of dietary discontinuation were also investigated. Moreover, duration of maintaining the body weight reached with slimming program, and the parameters that may have had an effect on this situation have been examined.

Results

Characteristics of the participants

42.6% (n=367) of the participants were males and 57.4% (n=494) of them were females. The mean age of the participants was 34.9 ± 12.3 years and the mean height was 167 ± 8 cm. Among the participants, 37.9% (n = 326) were never married, 57.1% (n = 492) were married and 4.6% (n = 39) whose spouse died or divorced. 79.6% of the participants lived in the city center, 16.8% lived in the districts and 3.6% lived in the town or village. 31% of the participants (n = 266) lived in Isparta and 69% (n = 583) lived in Tokat. When the participants were examined in terms of educational status, the rate of those who did not have any education was 2.7% (n = 23), while the primary school graduates was 12.2% (n = 105), the proportion of high school graduates was 20.2% (n = 174), and the proportion of university-college graduates was 49.8% (n = 429) and the rate of postgraduate graduates was 15.1% (n = 130). When the occupations were examined, we found that 15% of the participants (n = 131) were self-employed, 33.9% (n = 292) of them were public employees and 23.6% (n =

203) of them were students. While the rate of homemakers was 17.9% (n = 154), the rate of self-employed was 4.4% (n = 38). The mean body mass index (BMI) of the participants at the beginning of the diet was 28.3 ± 5.3. This value was 29.1 ± 4.2 for men and 27.7 ± 6.0 for women. While the proportion of normal weight of individuals (BMI 18-24.9) was 28.3% (n = 244), the proportion of overweight of individuals (BMI 25-29.9) was 37.9% (n = 326) and the proportion of obese (BMI≥ 30) was 33%. 6 (n = 289). According to the methods used by the participants to loose weight, 60.7% (n = 523) created their own diet program, 24.2% (n = 208) got assistant through dieticians or physicians, 9.4% (n = 81) used a specific diet program (Karatay, Dukan, Calorie diet, etc.) and 5.7% (n = 49) tried to lose weight by only other methods (sports or interventional procedures such as liposuction, carboxytherapy etc..) except dietary approaches. In addition, the ratio of the patients who received drug support to lose weight was 4.5% (n = 39) in all participants and 1.4% (n = 12) of those who had interventional procedures. The rate of sports was 28.2% (n = 243) in all participants.

Dietary completion rates

Overall, the rate of completion of the diet until the end of the planned period was 49.1% (n = 423).

Achieving the target goal status of those who completed the diet until the end

In order to accurately analyze the effect of diet types, durations and other variables, statistical analysis in this study were performed on 423 people (n=423) who completed the diet program to the end. The variables that may be related to dietary interruption are discussed in the following section. The rate of achieving the target goal was 43.7% (n = 185) in those who completed the planned weight loss to the end of the program. When the effect of other factors on the goal of achievement status was examined, it was found that the 'marital status', 'contacting a specialist (physician or dietitian) for slimming', 'receiving drug support for slimming', 'BMI at the beginning of the diet', 'duration of the diet' and the 'targeted weight loss percentage' were related to the achievement of the target. The relevant results are given in Table 1. Accordingly, the rate of achieving the target was significantly higher in those who did not receive specialist support to lose weight compared to those who received, single ones compared to those who were married, and the ones who didn't receive a drug support compared to those who did receive drug support to slim down ($p < 0.05$). The mean BMI (31.2 ± 5.8) of those who had an expert support was significantly higher ($p<0.01$) than those who did not ask for a specialist's help (27.3 ± 4.8). Again, the rate of reaching the target goal was significantly higher in patients with normal (BMI=18-24.9) and overweights (BMI=25-29.9) than those in the obese group (BMI≥ 30), $p < 0.05$. In terms of the duration of the diet program, the rate of reaching the target goal was significantly higher in the groups who went through the diet program between 6-12 months and over 12 months as compared to the groups who followed the diet programs for 6 months or less ($p < 0.05$). At the end of the each program, the rate of reaching the target goal for 5-10% weight loss was found to be statistically significant as compared to those target goals for 10-20% and more than 20% weight losses ($p < 0.05$).

In order to determine how realistic the target weight loss percentage is determined according to the diet duration, the relationship between the target weight loss percentage and the achievement of the target status was evaluated separately in 3 groups covering different diet periods. In line with this, 32.6% of those who were in the diet schedule for 0-6 months that was targeted for 5-10% weight loss, 51.2% was targeted for 10-20% weight loss, and 16.1% was targeted for more than 20% weight loss. (Table 2). The rate of achieving these schedules were found to be 52.7% in the group, which were in the diet program for six months or less. Their goal was 5-10% weight loss and this ratio

Table 1. Factors associated with achieving the goal in participants who completed the diet to the end of the program.

Category		Rate of Reaching Goal		Chi-Square Test
		%	n	p value
Expert Support	Took	33.7[a]	30	p<0.05
	Did not take	46.4[b]	155	
Marital status	Never Married	54.1[a]	92	p<0.05
	Married	36.1[b]	83	
	Divorced-death	45	9	
Drug Support	Took	14.3[a]	2	p<0.05
	Did not take	44.7[b]	183	
BMI	Normal Weight (BMI 18-24.9)	55[a]	71	p<0.05
	Overweight (BMI 25-29.9)	45.6[a]	77	
	Obese (BMI≥ 30)	29.8[b]	37	
Diet Duration	0-6 months	37.6[a]	115	p<0.05
	7-12 months	57.5[b]	50	
	>12 months	66.7[b]	20	
Targeted Weight Loss	%5-%10	56.4[a]	62	p<0.05
	%10-%20	34.6[b]	73	
	>%20	38[b]	30	

[a,b] : Different letters display statistically significant differences between groups.

was revealed to be significantly higher than the other groups (p <0.001). The success rates of the goals were found to be 25.3% and 21.7% for the 10-20% and more than 20% weight losses, respectively. (Table 3).

In the other two groups that dieted for more than six months, it was found that the targeted weight loss percentage had no effect on the achievement of the target goal (p> 0.05).

Additionally, no statistical relationship was found between compliance with the diet and reaching the target rate (p>0.05). Again, in the absence of expert support, there was no meaningful statistical relationship between weight loss method and reaching the target rate (p>0.05).

Weight maintenance after the weight loss program

Regardless of the interruption of diet and achievement of the goal, the weight maintenance achieved in the participants were as shown in Table 4. Accordingly, 12.5% of the participants were able to maintain the weight without regain for at least 1

Table 2. Distribution of groups with respect to diet duration and percentage of weight loss targets

Dietary Period	Targeted Weight Loss Rate							
	5-10%		10-20%		> 20%		Total	
	%	n	%	n	%	n	%	n
0-6	32.6	93	51.2	146	16.1	46	100.0	285
7-12	17.6	15	54.1	46	28.2	24	100.0	85
>12 months	6.7	2	63.3	19	30.0	9	100.0	30

Table 3. Relationship between target weight loss and achievement in different diet duration groups

Dietary Period	Target weight loss rate (%)	Rate of Reaching Goal		Chi-Square Test p value
		%	n	
0-6 months	5-10	52.7[a]	49	p<0.001
	10-20	25.3[b]	37	
	>20	21.7[b]	10	
7-12 months	5-10	73.3	11	p>0.05
	10-20	54.3	25	
	>20	54.2	13	
>12 months	5-10	100.0	2	p>0.05
	10-20	57.9	11	
	>20	77.8	7	

[a,b] : Different letters display statistically significant differences between groups.

year. The rate of maintaining weight for at least 1 year was found to be 16.3% of those who continued and finished the weight loss program without reaching the target goals, and 26.5% of those who had completed the program and reached its target goals.

The factors associated with maintaining the achieved weight for at least 1 year were examined on 185 participants who completed the program and achieved their goals. Parameters such as gender, age, marital status, place of residence, education, occupation, diet compliance, mental well-being during the diet, smoking, alcohol consumption, application to a specialist to lose weight, type of diet applied, sports, drug support in order to obtain weight loss, interventional procedures, diet duration, sleep duration, targeted weight loss percentage, actual weight loss percentage and BMI category at the beginning of the diet were analyzed statistically.

In the examined categories, the average age of those who can maintain weight for at least 12 months and those who cannot maintain varies (35.3±11.78 vs. 30.4±10.89 (mean±SD), p<0.01). In addition, marital status, occupation and dietary compliance parameters had an effect on the rate of maintaining weight for at least 12 months (Table 5). In single participants, the rate of maintaining the reached weight for at least 12 months was found to be significantly lower than the other groups (married, divorced, widow) (p <0.01). In terms of occupational group, the rate of students' 12 months weight maintenance was found to be significantly lower than that of self-employed, public employees and housewives (p <0.05). On the other hand, the rate of maintaining weight for at least 12 months was found to be significant, which was higher than those who did not interrupt their diet frequently and those who did not fit into the diet program (p <0.01).

Table 4. Distribution of weight maintenance among participants.

Weight protection duration	%	n
Could not maintain	44.3	381
Able to maintain for 1-3 months	20.9	180
Able to maintain for 4-6 months	16.1	139
Able to maintain for 7-11 months	6.2	53
Able to maintain for 12 months or more	12.5	108
Total	**100.0**	**861**

Investigation of factors related to discontinuation of diet

When various demographic characteristics and the discontinuation of the diet were compared, it was found that the rate of completing the diet program was significantly higher in males than females ($p<0.05$). Marital status, place of residence, smoking and alcohol use, occupational and educational status did not have any significant effect on diet completion ($p>0.05$). Among the other parameters examined, it was found that compliance with diet, mental well-being during the diet program, whether to receive expert support and doing sports were related to completing the diet. (Table 6). However, no significant relationship was found between the types of diets administered. This is either to receive drug support, interventional procedures, BMI at the beginning of the diet, duration of the diet, average daily sleep time, and percentage of weight difference targeted and completion rate of the diet ($p> 0.05$).

Dietary success

As it mentioned before, a 5% reduction in body weight leads to a significant reduction in health risks in general. We wanted to see this generic acceptance in our study. Thus, we investigated the success rate of 5% in all participants and compared with the rate of completion of the diet program and reaching target goal. (Table 7). 71.9% (n = 619) of all participants, who participated in the diet program, lost at least 5% of their body weight at the end of the weight loss program. This rate was found to be 65.8% (n = 288) in 438 participants who did not complete their diet schedules. In 238 people who completed their diet program fully but did not reach their target goals, the success rate of 5% was 68.5%. These results indicated that, individuals who wanted and attempted to lose weight can improve their health status significantly by 71.9% at average, regardless of whether they follow the diet program fully or not.

Table 5. The effect of selected factors on maintaining weight for at least 12 months

Category		Weight preservation rate for at least 12 months		Chi-Square Test
		%	n	p value (Fisher's Exact)
Marital status	Never married	17.4[a]	16	p<0.01
	Married	32.5[b]	27	
	Divorced	75.0[b]	3	
	Widow	60.0[b]	3	
Occupation	Self-employment	31.2[b]	10	p<0.05
	Public Personnel	36.4[b]	20	
	Student	13.1[a]	8	
	Not working	16.7	1	
	Housewife	36.0[b]	9	
Diet Compliance Status	Never interrupted	40.0[a]	22	p<0.01
	Occasionally interrupted	25.5	27	
	Often interrupted	0.0[b]	0	
	I can't say I fit into the program	0.0[b]	0	

[a,b]: Different letters indicate statistically significant differences between groups.

Table 6. Parameters associated with diet completion

Category		Diet completion rate		Chi-Square Test
		%	n	p value
Diet Compliance Status	Never interrupted	80.0[a]	108	p<0.0001
	Occasionally interrupted	49.6[b]	243	
	Often interrupted	24.1[c]	27	
	I can't say I fit into the program	30.8[c]	32	
Mental well-being during the diet	Excellent	57.3[a]	94	p<0.01
	Good	49.1	136	
	Average	43.9[b]	126	
	Bad	33.8[b]	24	
	Very bad	54.5	6	
Expert Support	Doesn't take	51.1	334	p<0.05
	Takes	42.8	89	
Sports	Does	51.3	317	p<0.05
	Doesn't	43.6	106	

[a,b,c]: Different letters indicate statistically significant differences between groups.

Discussion

Our questionnaire was conducted with randomly selected participants from different age groups and genders. We aimed to investigate the dietary forms, dietary success, dietary completion and sustainability. We discussed our data in several categories.

Variables related to the achievement of the target goal

In our study, when the variables of the participants who reached the targeted weight were examined; it included marital status, drug and/or expert support, BMI at the beginning of the diet, duration of diet, and targeted weight loss were found to be related to the achievement of the target goal. 24.2% of all participants got an assistance from a specialist to lose weight (n=208). It can be seen that as an unexpected result of the rate of achieving the target goal was higher in those who did not acquire an expert support. However, the mean BMI of those who had an expert support was significantly higher than those who didn't (p<0.01), and this fact may be responsible for the significant difference between who had specialist support and

Table 7. Comparison of 5 % achievement status among participants.

Category		5% Success status					
		% Successful	n Successful	% Unsuccessful	n Unsuccessful	% total	n total
All Participants		71.9	619	28.1	242	100	861
Diet completion status	Completed	78.3	331	21.7	92	100	423
	Quit	65.8	288	34.2	150	100	438
Diet Completed	Reached the goal	90.8	168	9.2	17	100	185
	Couldn't reach the goal	68.5	163	31.5	75	100	238
Quitted the diet	Reached the goal	93.2	55	6.8	4	100	59
	Couldn't reach the goal	61.5	233	38.5	146	100	379

who applied their own diet. There is a statistically significant relationship between the achievement of target and BMI. It is also possible that those who applied to a specialist to lose weight had a history of failed diet attempts. While the rate of obese individuals was 33.6% in all participants, 57.5% of those who applied to a specialist to lose weight were in the obese category. Therefore, the low rate of achieving the target of the specialist applicants can be explained by the fact that people applying to the specialist are mostly obese or overweight individuals and were not able to lose weight on their own previously and are more resistant to lose weight. This data is mostly supported by the literature that weight loss success in weight management is widely studied among obese persons and it is demonstrated that the pattern of weight change for adults with obesity who took part in a diet during different period of time (a 12-week, internet-based behavioral weight loss program- more than 6 months) showed that weight regain occured in 4-6 months after weight loss.[8, 13-15] Those unsuccessfull attempts led the obese individuals to get professional support in their following diet attempts. When the onset of the BMIs of the diet program is examined, it was found that obese individuals had lower target achievement rates as compared to the normal and overweight individuals. This data is again consistent with the literature as Hadziabdic et al reported that adhering to the weight loss programme is a very difficult task for most obese people, with one-third of the study participants being successful (weight reduction by more than 5%) and another two-thirds either dropping out or finishing the programme without accomplishing the target weight loss goal yet.[13] The success rates of the patients receiving medication support for weight loss were lower than those who did not request any medications. It is possible to establish a similar relationship with this variable in the case of acquiring a specialist. Taking medication to lose weight is more advanced procedure than first-line interventions, such as changing diet or doing sports. 92.3% of that receiving drug support are in the overweight and obese category, and it can be interpreted, as these people are more resistant to lose weight and trying every possibility which may help to lose weight easier. In our study, the rate of achieving the target of single participants was found to be statistically higher than those who were married. This is consistent with the study of Hadziabdic, et al. as they reported that being married was a negative predictor for attempting a diet and losing weight.[13]

The rate of achieving the target goals of those who were in the diet schedule for six months or less was statistically lower than the two groups of those who were in their schedule more than 6 months. As the participants were grouped according to the targeted weight loss percentage, the achievement of the target was found to be significantly higher in the group aiming to give 5-10% of body weight compared to the other groups. However, in addition to the targeted weight loss, the duration of the diet to be applied for this target is also important. Therefore, we categorized the participants by means of the both the targeted weight loss percentage and the diet duration. Regarding this classification, 32.6% of the participants who applied for a 0-6 months diet targeted 5-10% weight loss, 51.2% of them targeted 10-20% weight loss and 16.1% of them targeted over 20% weight loss. Again, the rate of achieving their target goals in the group that aimed at 5-10% weight loss among individuals who were on diet schedules between 0-6 months was found statistically more significant than the groups that targeted 10-20% and those who were more than 20% (Table 3). This result shows that it is unrealistic to target a weight loss of more than 10% for a planned diet duration of 6 months or less. Drop-out rate and percentage weight loss were identified after 12 months of the weight loss programme in Hadziabdic's study. This shows us that the diet period may depend on motivational factors and it is important that the targeted weight loss has to be determined at the beginning of the diet programme and has to be aimed and believed by the participiants. In a study by Resnicow et. al, overweight children whose parents received motivational interview counseling showed a

significant reduction in BMI percentages for 2 years compared to other children.16 There was no relationship found between the type of diet applied and the achievement of the goal (Table 5). There was no significant contribution of a specific diet program in reaching the target weight.

Variables associated with the successful weight loss maintenance

The rate of maintaining body weight for at least 12 months was 26.5% among the participants who completed the program and reached their target. Considering that the rate of reaching the target is 43.7% for those who complete the program by the end, it is seen that maintaining it for this period is a bigger problem than reaching the target goal. In the study of Stunkard & Mc Lauren, who followed 100 obese individuals referred to a nutritional weight loss program found that 2 years after treatment, only 2% maintained a weight loss of at least 20 lb (≈9.07 kg). [17]

In this study, the factors that were associated with the successful weight loss maintenance for at least 12 months were determined as marital status, occupation and diet compliance. In single participants, maintaining the weight loss achievement for at least 12 months was statistically lower than the other groups (married, divorced, spouse passed away) ($p<0.05$). However, when the target achievement rates were examined, the rates of the single participants were significantly higher than the rate of the married ones. These contradictory results shows the differences in dieting of the married and the single participants. Nevertheless, some of the previous research results showed that there is a moderately strong relationship between diet and slimming success. In a study conducted by Karfopoulou et al. in 2017, it was found that eating at home was associated with maintaining the weight loss, especially in male gender, and prevented regain the weight after diet.[14] In a study by Ross et al., it was stated that being married or living with a partner reduces the rate of weight regain after losing weight.[15] In our study, in terms of occupational group the rate of maintaining the weight loss in students was found to be significantly lower than the other 3 occupational groups (self-employed, public employees, housewife). When this result is considered with the marital status, it can be inferred that the students are mostly single. Therefore, it can be expressed that 'married and nonstudent' individuals all differ from single and/or student individuals by nutrition and age. Finally, the rate of maintaining the weight loss that reached at least for 12 months in participants who answered the question such as 'how did you applied your diet?' as 'never interrupted' is found to be statistically significantly higher than those who answered as 'often' or 'occasionally interrupted'. Even though compliance with the program was not found to be related to the achievement of the target goal, and it was found to be important in maintaining the weight goal achieved.

Limitations

Firstly, because of the nature of the survey study, all answers of the participants was subjective and could not been checked for righteousness. Especially body weights, diet durations and diet types were the base parameters in this study. So, we have aimed to increase the number of the participants in order to decrease the imperfection and overcome this limitation.

Secondly, we realized that we had missing details such as the timings of the diet programmes (when was it applied…).

Nevertheless, our findings were mostly concordant with the literature. This accordance showed us that our study can help researchers to find out the right slimming approaches and diet programs.

Conclusion

In our study, we found that different types of dieting programs implemented to lose weight did not have an effect on reaching the target goals or maintaining the weight loss. The rate of maintaining the weight loss achieved for at least 12 months was found to be lower than the rate of achieving a specific target; therefore, sustaining the weight in the

program successfully is turned out to be more important than losing weight. In addition, we found that marital status, age and occupation parameters have different levels of effect on achieving and maintaining the weight goals. We also discovered setting a weight loss goal of more than 10% of body weight in diets for 6 months or less diminishes the rate of reaching the target. Moreover, 60.4% of the participants did not receive any expert assistance. This is considered as a factor that cuts down success dramatically. For the future study the effect of age, occupation, marital status and keeping up with regular nutrition may provide benefits to experts who recommend different dietaries in order to categorize individuals for their right diet programs.

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Ethical Declaration: This study is approved by Suleyman Demirel University, Faculty of Medicine, Clinical Researches Ethical Committee (Date: 11.12.2013, Decision no. 231).

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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Prevalence and risk factors associated with burnout syndrome among healthcare workers in Afghanistan

Afganistan'da sağlık çalışanlarında tükenmişlik sendromu sıklığı ve ilişkili risk faktörleri

Khwaja Mir Islam Saeed[a]

[a] M.D.Spec., Technical Advisor for Afghanistan Field Epidemiology Training Program (AFETP), Afghanistan National Public Health Institute, Ministry of Public Health, Afghanistan.

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ABSTRACT

Objective: This study aims to identify the prevalence of burnout syndrome (BS) with its subscales of emotional exhausting (EE), depersonalization (DP), and personal accomplishment (PA) among frontline healthcare workers in Afghanistan. **Methods:** A total of 623 health workers contracted by NGOs participated in a cross-sectional study in ten provinces. A self-administered questionnaire including Maslach Burnout Inventory were used for data collection. Proportions and factors associated with BS were calculated. Epi info v.7 and SPSS v.20 were used for data management. **Results:** Totally, 264 were females (41.8%); 83% were married and two-third had ≥14 years of education. Half (58%) had monthly income of 130-260. The mean age was 32.5 years, by differentiation of 29.4 years in females and 34.9 years in males. Ten (1.6%) declared currently smoking and 5% dissatisfied with their job. Just 13% were doing private business besides current job. Average number of children was 3.4 and average years of experiences was 8.7. Proportion of high EE, DP and PA was 6.3%, 8.3% and 26.6% respectively. At multivariate analysis age, job satisfaction and work pressure were associated with EE; high level of DP was related to age and job satisfaction; and PA was associated with age, work load, work pressure, security and annual vacation. **Conclusion:** Frontline health workers are affected by various level of burnout syndrome. They should be supported by management with better work environment to prevent problem and provide quality health services.

Keywords: Afghanistan, burnout, depersonalization, health worker, prevalence

Correspondence: Khwaja Mir Islam SAEED, Technical Advisor for Afghanistan Field Epidemiology Training Program (AFETP), Afghanistan National Public Health Institute, Ministry of Public Health, Afghanistan.
E-mail: kmislamsaeed@gmail.com. **Tel:** +9 370 029 09 55.

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ÖZ

Amaç: Bu çalışma, Afganistan'da ön saflarda çalışan sağlık çalışanları arasında tükenmişlik sendromu (BS) ve alt boyutları olan duygusal tükenme (EE), duyarsızlaşma (DP) ve kişisel başarı (PA) yaygınlığını belirlemeyi amaçlamaktadır. **Yöntem:** Kesitsel çalışmaya on ilde sivil toplum kuruluşlarında sözleşmeli olarak çalışan toplam 623 sağlık çalışanı katılmıştır. Veri toplamada Maslach Tükenmişlik Envanterini de içeren, kendi kendine uygulanan bir anket kullanıldı. Çalışmada BS sıklığı ve ilişkili faktörler hesaplanmıştır. Veri analizi için Epi info v.7 ve SPSS v.20 kullanıldı. **Bulgular:** TKatılımcıların 264'ü kadındı (% 41.8); % 83'ü evli ve üçte ikisi ≥14 yıl eğitim almıştı. Yarısının (% 58) aylık geliri 130–260 $ idi. Yaş ortalaması kadınlarda 29.4, erkeklerde 34.9' olmak üzere toplamda 32.5 idi. On kişi (% 1.6) halen sigara içtiğini ve % 5 çalışan işinden memnun olmadığını belirtti. Katılımcıların %13'ü mevcut işle birlikte özel iş yapıyordu. Katılımcıların ortalama olarak 3.4 çocuğu vardı ve ortalama deneyim yılı 8.7 yıldı. Yüksek EE, DP ve PA oranı sırasıyla % 6.3, % 8.3 ve % 26.6 idi. Çok değişkenli analizlerde yaş, iş doyumu ve iş baskısı EE ile ilişkilendirildi; yüksek DP seviyesi yaş ve iş doyumu ile ilişkiliydi ve PA yaş, iş yükü, iş baskısı, güvenlik ve yıllık tatillerle ilişkiliydi. **Sonuç:** Sağlık hizmetlerinin sunumunda ön saflarda yer alan sağlık çalışanları, çeşitli düzeylerde tükenmişlik sendromundan etkilenmektedir. Kaliteli sağlık hizmetlerinin sağlanması için çalışanlar yönetim tarafından desteklenmelidirler.

Anahtar kelimeler: Afganistan, tükenmişlik, duyarsızlaşma, sağlık çalışanı, prevalans

Introduction

Burnout syndrome is a state of physical, emotional, and mental exhaustion that results from prolonged exposure to job stressors or work situations that are emotionally demanding.[1-2] Freudenberg described the term "burnout" in 1974, which characterized by loss of energy and feelings of life being broken into pieces that remain after fire wreckage. Stress and burnout are part of the everyday affairs of organizations with adverse outcomes.[3-5] Health care professionals are at a high risk of developing burnout due to the inherent demands and stress of work environment. Their symptoms maybe anxiety, irritability, mood swings, insomnia, depression, and a sense of failure as a consequence of burnout.[6-8]

In Qatar, the level of burnout syndrome among GPs were 12.6% with higher rates among females, while in Brazil the prevalence was 10.8% and associated factors were younger age, excessive hours of work and job dissatisfaction.[9-11] In Turkey, almost 45% of health workers showed emotional exhaustion (EE), 33.2% depersonalization (DP) and 28% personal accomplishment (PA).[12] Similarly, in India, 66% of the participants scored high on EE and DP scales, whereas 87.1% scored low on PA scale and 62.86% and 11.41% had medium and low scores on the satisfaction with the medical practice scale.[13] A hospital study in Mina city reported high levels of EE (61.8%), high levels of DP (52.5%) and low levels of PA (45.7%). The factors associated with DP as years of working followed by age, hours of working shift, followed by sleeping time, and gender.[14] A longitudinal study in USA reported that work stress, work overload, limited participation in decision-making, and client disability care, were positively associated with burnout.[15] In Saudi Arabia, 29.5% reported high EE, 15.7% high DP and 19.7% low PA, with 6.3% scoring high in all 3 dimensions.[16]. In a descriptive cross-sectional study in Malawi showed that burnout appears to be common among participating maternal health staff.[17] A study in Pakistan reflected that 79% were experiencing severe burnout and nurses of surgery and obstetrics/gynecology departments working longer hours on the night shift scored higher on burnout and lower on quality of life.[18] In another study in Turkey among midwives

and nurses the Maslach PA score was 23, the emotional burnout score median was 15 and the DP score median was found to be 3[19] In Hungary, the strongest predictors of burnout were emotional dissonance for emotional exhaustion and negative emotions for depersonalization.[20] A correlational study in Italy reported that working with acute patients, home-care of chronic and anxiety were factors significantly associated with a low job satisfaction.[21] Furthermore, in another study in Hungary the predictors for burnout in mental health workers were reported as pay and rewards satisfaction, work climate, advancement opportunities, physical manifestations of occupational stress were significant predictors of emotional exhaustion.[22]

In Afghanistan, primary health care is the cornerstone of rural healthcare which has been designed and implemented in Basic Package of Health Services (BPHS) since 2003. It is supported by essential package of hospital services (EPHS). The job description of health workers in rural areas have been evolved and expanded now.[23-24] Job related burnout is a widespread problem in healthcare and mostly endemic in the human services where nurses are involved.[25] There is no report of any study in Afghanistan, however, few studies reflected burnout among health workers in neighboring countries. For instance, a couple of studies in Iran indicated that burnout was the main theme; as reported 34.5% had moderate to severe levels of burnout, 31.4% had abnormal scores in emotional exhaustion (EE), 16.8% in depersonalization (DP), and 47% in the personal accomplishment (PA) subscales. Age, education level, number of children, and years of employment were found to have a significant association with the burnout level of the participants. [26-27] A cross sectional study of community health workers in Pakistan showed that 26% of respondents had mental distress and 19% had significant job pressure.[28] Availability of information on burnout in the country among health workers is needed to tailor the terms of reference based on workload. This study aims to provide information on prevalence of burnout and its categories among health care workers in selected health centers in Afghanistan.

Methods

A cross sectional survey was conducted on a representative sample of health facilities and data were collected from health workers using self-administered questionnaires. The Maslach Burnout Inventory (MBI)[29] tool were adopted and used to collect data on level and categories of burnout and associated factors among health workers. The study conducted in those provinces of the country in which the monitoring mission was planned by Grant and Contract Management Unit (GCMU) in MoPH to have oversight on delivering health services (figure 1).

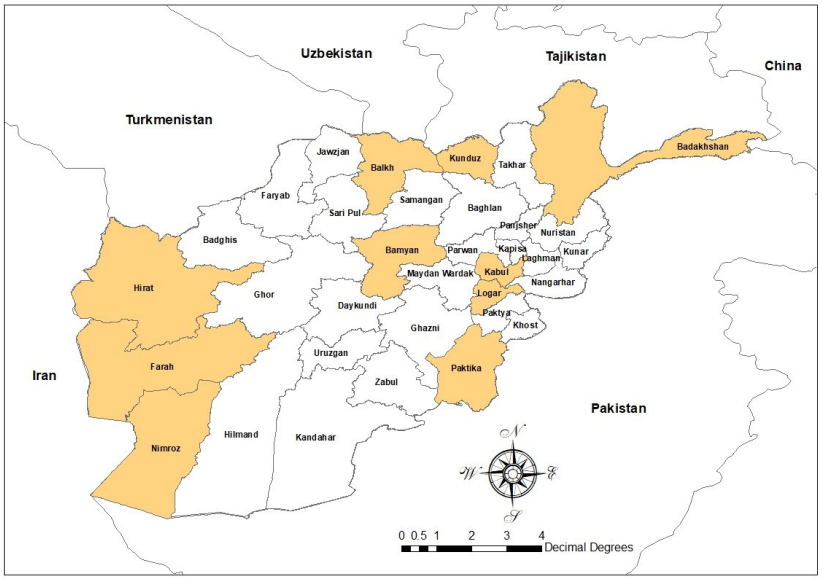

Figure 1: provinces in which the study on burnout syndrome was conducted

Basically, the MoPH began implementing the Basic Package of Health Services (BPHS) in 2004 through contracting arrangement in rural areas. BPHS continues to serve as the foundation of the Afghanistan health system and remains the key instrument in making sure that the most important and effective health interventions are made accessible to all Afghans.[23] In 2005 the MoPH developed Essential Package of Hospital Services (EPHS) to function as a referral center for patients needing more specialized treatment and care, supplement for the BPHS, and place for training of health cadres.[24] The health care workers being involved in provision of health services through BPHS and EPHS by nongovernmental organizations (NGOs) in contracted health facilities were target population. Health workers of less than six months experience, not present during data collection and not willing to participate and working in insecure areas were excluded.

As the national prevalence of burnout and associated risk factors is not available in the country, we assumed the highest prevalence and 95% confidence interval and band of error of 5% which leaded to 385 subjects to be included in the study. However, taking into consideration the proportion of risk factors reflected in literature in similar settings, the number of subjects in this study raised to 600 individuals. Sampling frame were different types of health facilities in BPHS and EPHS. There are four main fixed level of health centers under BPHS including Sub Health Center (SHC), Basic Health Center (BHC), Comprehensive Health Center (CHC) and District Hospitals (DH) each which standard number and type of professional staff. In addition, in EPHS there are provincial hospitals (PH), regional hospitals (RH) and national hospitals (NH). Total numbers of professional standard staff in these four levels of facilities are assumed to be 12500.[30] Totally 632 health workers from various types of health facilities were interviewed. Following operational definitions were used to identify the variables:

Burnout: In this study burnout refers to physical fatigue, emotional exhaustion, depersonalization and personal achievement of health care workers as measured by Maslach Burnout Inventory (MBI). Some cut-offs were used to define low, average or high levels of each dimension of the MBI.[31] In this classification the cut-off of scores for EE was defined as: low, ≤ 14; average,15-24; high, ≥25; for DP was defined as: low, ≤3; average, 4-9; high, ≥ 10; and for PA was defined as: low, ≥ 40; average, 33-39; high, ≤ 32.

Health Care Workers: They refers to all clinical staff working in BPHS and EPHS facilities.

Primary health center: These are BPHS health centers staffed by health workers.

Data collection instrument started with demographic and socioeconomic variables and followed with variables regarding job related symptoms for burnout and stress; at the end the MBI questionnaires which contain 22 questions with seven options were used. A data entry tool was developed, tested and used in Epi Info v.7 while analysis performed utilizing the statistical package for social sciences (SPSS) version 20. In descriptive statistics, mean standard deviation and frequency, percentage distribution were calculated while in inferential statistics chi-square test were computed to find the association between burnout scores with selected socio demographic variables. Multivariate analysis was conducted in order to taken into account the effect of confounding variables. Monitor officers were trained before data collection, data were checked in field as well as in Kabul and during data entry to find and rectify errors. Verbal consent was taken before filling the form and the study protocol were approved by Institutional Review Board (IRB) in Ministry of public health (MoPH).

Results

Out of all study respondents (632), there were 264 females (41.8%) and 363 males (57.4%) while the rest (0.8%) did not identify their sex. The overall mean age was 32.5±10 years by differentiation of 29.4 ±9.2 years in females and 34.9 ±10 years in males.

This difference was statistically significant (p <0.001). The participants related to BPHS and EPHS health facilities as 146 (23.1%) were from provincial hospitals, 112 (17.7%) were from district hospitals, 173 (27.4%) were from comprehensive hospitals, 142 (22.5%) were from basic health centers, 54 (8.5%) were from subhealth centers, 4 (0.6%) were from prison health centers and finally just one (0.2%) were from mobile team in all ten provinces. Almost 83% were married and two third had education level of 14 years or more. More than half of health workers (58%) had income of ten to twenty thousand Afghanis equal to 130 to 260$ (1USD=76.5 Afghanis). Totally 10 (1.6%) declared that they are currently smoking and 5% mentioned they are not satisfied with their job. Half of health workers were involved in managerial job and 80% got managerial support. Just 13% were doing private business along with current job. More than half of respondents expressed that their workload is medium while 40% has written it is high and the rest said it is low. On average they had more than 3 children (3.4±2.5). The mean years of experiences as a general was 8.7±7.4 years while being in current job it was 5.4±5.01 years. The mean number of annual vacations days taken was (13.0±8.0).

Burnout syndrome consisting of emotional exhaustion (EE), depersonalization (DP) and personal achievement is analyzed after combining of its related questionnaire. In this study the cut-off scores of ≥ 26 for high emotional exhaustion, ≥ 9 for high depersonalization and ≤ 33 for diminished personal accomplishment were used.[32] As a whole the proportion of high EE was 6.3%, the proportion of high depersonalization was 8.3% and low personal achievement was 26.6%. After combining all these factors (high EE, high DP and low PA) the proportion of burnout was reported in 15 health workers showing 2.4%.

As shown in figure 2, the low, medium and high proportion of EE were 67.6%, 25.5% and 6.3%; the low, medium and high level of DP were 75.6%, 17.1% and 8.3%; low, medium and high proportion of PA were 59.2%, 14.2% and 26.6%. Mean burnout scores were 12.09 ±7.86 for emotional exhaustion, 9.3 ±4.35 for depersonalization and 37.57 ±12.06 for personal accomplishment.

The dichotomous levels of each dimension are described with respect of socio-demographic variables in table 1. High level of EE and DP is more in lower ages while PA that is higher in higher ages. Burnout proportion in case of EE and DP is similar in males and female, however DP is higher in males versus females. Those who are married have lower proportion of EE (5.9% vs 8.4%), lower level of PA (26.1% vs 29%) and lower level of DP (7.4% vs 12.1%) as compare to singles. In addition, as table 1 shows the lower the level of education the higher level of EE and DP and the lower the level of PA. The higher level of EE and DP is reported from Paktika, Farah and Badakhshan provinces whereas the low level of PA is reported from Paktika, Kunduz and Logar provinces. In addition, according to analysis, the higher the number of children in a family the higher level of EE and DP and lower level of PA. Low salary also affect the level of burnout as shown in Table 1.

Job related factors are cross tabulated with three component of burnout and reflected in Table 2. Specialists, nurses and midwives who

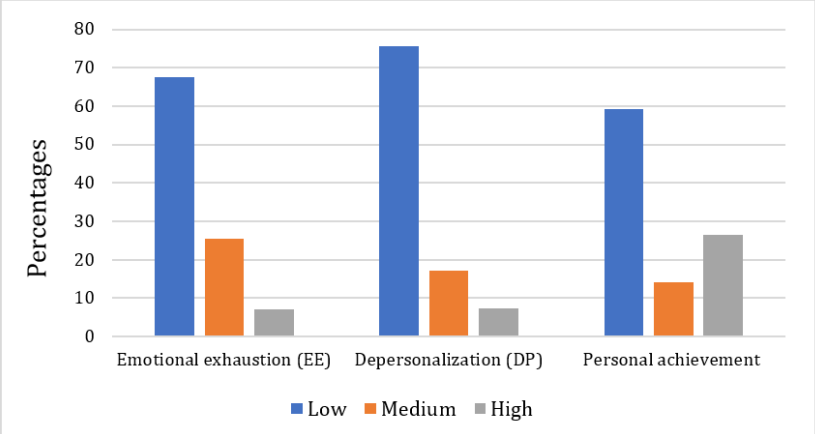

Figure 2: Graphical presentation of burnout dimensions in three categories

Table 1: Frequency distribution of the socio-demographic characteristics and prevalence of Burnout subscales among study participants

Variables	Subgroups	Subjects		EE		DP		PA	
		n	%	n	%	n	%	n	%
Age Groups (missing 53 (8.4%))									
	Less than 25	171	27.1	16	9.4	16	9.4	42	24.6
	25 - 34	188	29.7	14	6.9	19	9.3	47	25
	35 - 44	147	23.3	6	4.3	8	5.4	36	24.5
	45 and more	73	11.6	0	0.0	4	5.5	28	38.4
Gender (missing 5 (0.8%)									
	Female	264	41.8	16	6.1	23	8.7	57	21.6
	Male	363	57.4	24	6.6	29	8.0	109	30.0
Marital Status (missing 1 (0.2%))									
	Single	107	16.9	9	8.4	13	12.1	31	29.0
	Married	524	82.9	31	5.9	39	7.4	137	26.1
Professional Graduation (missing 15 (2.4%))									
	School Graduate Grade 10	22	3.5	3	13.6	5	22.7	9	40.9
	School Graduate Grade 12	117	18.5	5	4.3	10	8.5	33	28.2
	School Graduate Grade 14	300	47.5	21	7.0	25	8.3	74	24.7
	University Graduate	178	28.2	11	6.2	12	6.7	45	25.3
Job Location									
	Badakhshan	35	5.5	3	8.6	2	5.7	9	25.7
	Balkh	72	11.4	3	4.2	4	5.6	13	18.1
	Bamyan	48	7.6	0	0.0	2	4.2	4	8.3
	Farah	77	12.2	7	9.1	8	10.4	24	31.2
	Hirat	118	18.7	7	5.9	11	9.3	34	28.8
	Kabul	50	7.9	1	2.0	2	4.0	7	14.0
	Kunduz	57	9	1	1.8	3	5.3	20	35.1
	Logar	68	10.8	1	1.5	3	4.4	22	32.4
	Nimroz	53	8.4	0	0.0	1	1.9	11	20.8
	Paktika	54	8.5	17	31.5	16	29.6	24	44.4
Number of Children									
	Less than 3	273	43.2	21	7.7	25	9.2	67	24.5
	3 to 6	147	23.3	6	4.1	10	6.8	37	25.2
	More than 6	59	9.3	2	3.4	3	5.1	17	28.8
Income in local currency, Afghani (missing 20 (3.2%))									
	Less than 10000	63	10	7	11.1	10	15.9	22	34.9
	10000 to 20000	369	58.4	20	5.4	26	7.0	97	26.3
	20001 to 50000	148	23.4	10	6.8	12	8.1	36	24.3
	More than 50000	32	5.1	1	3.1	2	6.3	3	9.4
Smoking Status (missing 20 (3.2%))									
	Yes	10	1.6	1	10.0	1	10.0	2	20.0
	No	602	95.3	39	6.5	48	8.0	160	26.6

Table 2: Frequency distribution of job-related factors and prevalence of Burnout subscales among study participants

Variables	Subgroups	Subjects		EE		DP		PA	
		n	%	n	%	n	%	n	%
Positions in Health Centers (missing 10 (1.6%))									
	MD (Physician)	85	13.4	3	3.5	6	7.1	25	29.4
	Specialists	34	5.4	4	11.8	3	8.8	4	11.8
	Nurses	175	27.7	14	8.0	17	9.7	48	27.4
	Midwives	117	18.5	10	8.5	13	11.1	21	17.9
	Vaccinators	67	10.6	1	1.5	4	6.0	13	19.4
	Pharmacists	21	3.3	2	9.5	1	4.8	7	33.3
	Community Health Supervisor	22	3.5	0	0.0	0	0.0	6	27.3
	Technicians	45	7.1	1	2.2	6	13.3	15	33.3
	Others	56	8.9	3	5.4	1	1.8	23	41.1
Involvement in Management (missing 28 (4.4%))									
	Yes	314	49.7	21	6.7	28	8.9	76	24.2
	No	290	45.9	19	6.6	24	8.3	81	27.9
Duration of Experiences (missing 28 (4.4%))									
	< 5 years	261	41.3	17	6.5	25	9.6	68	26.1
	5-10 years	154	24.4	14	9.1	14	9.1	38	24.7
	10-15 years	94	14.9	3	3.2	3	3.2	21	22.3
	15-20 years	49	7.8	1	2.0	5	10.2	9	18.4
	> 20 years	46	7.3	2	4.3	3	6.5	17	37.0
Duration of Experiences Current Job (missing 10 (1.6%))									
	<5 years	387	61.2	24	6.2	35	9.0	99	25.6
	5-10 years	147	23.3	10	6.8	8	5.4	41	27.9
	>10 years	88	13.9	4	4.5	7	8.0	23	26.1
Annual Vacation Taken in Days (missing 64 (10.1%))									
	<5 days	111	17.6	11	9.9	10	9.0	42	37.8
	5-10 days	134	21.2	10	7.5	10	7.5	32	23.9
	11-20 days	235	37.2	11	4.7	23	9.8	59	25.1
	>20 days	88	13.9	6	6.8	5	5.7	19	21.6
Involvement in Private Business (missing 9 (1.4%))									
	Yes	80	12.7	5	6.3	8	10.0	24	30.0
	No	543	85.9	35	6.4	42	7.7	141	26.0
Managerial Support (missing 20 (3.2%))									
	Yes	545	86.2	32	5.9	42	7.7	145	26.6
	No	67	10.6	8	11.9	8	11.9	18	26.9
Job Satisfaction (missing 7 (1.1%))									
	Yes	594	94	31	5.2	45	7.6	157	26.4
	No	31	4.9	9	29.0	6	19.4	9	29.0
Load of Work (missing 31 (4.9%))									
	Low	24	3.8	1	4.2	3	12.5	4	16.7
	Medium	331	52.4	16	4.8	29	8.8	92	27.8
	High	246	38.9	20	8.1	17	6.9	61	24.8
Feeling Work Pressure (missing 17 (2.7%))									
	Low	139	22	1	0.7	11	7.9	34	24.5
	Medium	329	52.1	18	5.5	25	7.6	77	23.4
	High	147	23.3	19	12.9	14	9.5	51	34.7

are apparently taking more responsibilities in health services have higher level of EE (11.8%. 8%, 8.5%), high level of DP (8.8%, 9.7%, 11.1%). Furthermore, low level of PA is reported in technicians (33.3%), pharmacists (33.3%) and MDs (29.4%). Those with less than 5-year experiences and 5-10 years of experiences had higher level of EE (6.5% and 9.1%) as well as highest proportion of DP is recorded in experience group of 15-20 years, whereas the highest experience group (>20years) have lowest level (37%) of PA. The level of satisfaction from job also affected the proportion of burnout. For instance, those who are satisfied had lower level of EE (5.2% vs 29%) and DP (7.6% vs 19.1%) and higher level of PA (26%vs 29%) as compare to dissatisfied group. The effect of workload and work pressure is also reported in Table 1 for more detail.

Table 1 and 2 just reported the level and proportions of EE, DP and PA in different groups of socio-demographic and job-related categories. However, at multivariable analysis those factors which were statistically significant or thought to be biologically important included in the analysis model (Table 3). As shown few factors had significant association with each category of burnout after controlling the effect of other factors. For instance, Age group with adjusted odd ratio (AOR) of (0.89), job satisfaction with AOR of (0.19) and work pressure with AOR of (0.23) had significant association with EE. In addition, Age and job satisfactions with AOR of 0.29 and 0.96 (marginally significant) had association with DP. Furthermore, a group of factors such as age with AOR of (2.35), workload with AOR of (0.51) security with AOR of (0.62), work pressure with AOR of (2.54) and annual vacation with AOR (1.03) had significant association with PA.

Discussion

Among frontline primary healthcare workers in Afghanistan the proportion of high emotional exhaustion (EE) (6.3%), depersonalization (DP) (8.3%) and low personal achievement (PA) (26.6%) is identified for the first time which was demanding. According to multivariate analysis age, job satisfaction and work pressure were associated with EE; high level of DP was related to age and job satisfaction; and PA was associated with age, work load, work pressure, security and annual vacation. Health workers being involved in provision of health services in Afghanistan are affected by various level of burnout syndrome which is characterized by emotional exhaustion, depersonalization, and a diminished sense of personal achievement. Recently, many studies have documented the high prevalence of burnout among healthcare providers.[33] Burnout has been common among physicians, nurses, and other healthcare professionals, ranging, the prevalence, from 40 % to 60% affected by their work environments, exposure to violence and terror, and emotional distress and low social support.[34] The proportions of all dimensions in Afghanistan are lower as compare to health workers in Pakistan, Saudi Arabia and other countries.[16, 32-37] However, these proportions represent the health workers who are recruiting by non-governmental organizations and providing health services on behalf of MoPH using package of BPHS and EPHS. Probably good work environment, incentives, salaries and other benefits affects them positively as compare to their counterpart in public facilities as well as private sector.[35] In addition, the various cut-offs are used by different authors in research papers which is required to be taken into account while comparing the burnout results.[36] Furthermore, the mean level of each dimension in our findings were also lower as compare our neighboring country, Iran[37] and Turkey.[38]

Multivariate analysis reflected that the factors such as age, job satisfaction and work pressure were associated with emotional exhaustion. These findings have been supported by other studies in Saudi Arabia[16], Iran[37], Lebanon[39] and in Pakistan.[40] The high level of depersonalization was related to many socio-demographic and job-related factors, however at logistic regression the age and job satisfaction was significantly associated to depersonalization. Similar associations were found in other studies as well. The low level of personal achievements was associated with some factors such as

Table 3. Multivariate logistic regression analysis for risk factors associated with three subscales of burnout syndrome among study participants

Variables	Subgroups	B	Standard Error	Adjusted OR	95% CI	p-value
For Emotional Exhaustion						
Age						
	Yes	-0.11	0.037	0.896	0.834-0.964	0.003
Job Satisfaction						
	No	-	-	-	-	-
	Yes	0.52	0.521	0.183	0.066-0.508	0.001
Work Pressure						
	Low	-	-	-	-	-
	High	-1.451	0.398	0.234	0.107-0.511	0.000
Work Experiences						
	>5 years	-	-	-	-	-
	<5 years	-0.859	0.47	27.636	0.168-1.064	0.068
For Depersonalization						
Job Satisfaction						
	No	-	-	-	-	-
	Yes	-1.21	0.489	0.298	0.114-0.778	0.013
Age						
	No	-	-	-	-	-
	Yes	-0.035	0.019	0.966	0.931-1.003	0.069
Personal Achievement						
Age Group						
	< 40years	-	-	-	-	-
	> 40years	0.856	0.259	2.353	1.415-3.912	0.001
Workload						
	No	-	-	-	-	-
	Yes	-0.672	0.277	0.511	0.296-0.879	0.002
Provinces Security						
	Secure	-	-	-	-	-
	Less Secure	-0.465	0.215	0.628	0.412-0.598	0.031
Work Pressure						
	More	-	-	-		-
	Less	0.932	0.296	2.541	1.423-4.535	0.002
Vacation taken annually						
	<10 days	-	-	-	-	-
	>10 days	0.027	0.014	1.027	1-1.055	0.053

age, work load and pressure, security in work stations and vacations taken annually at logistic regression. Such findings are supported by other studies in literature.[16, 40] Identification of the problem for the first time among health workers using the organized study is a strength in its nature. Having high gap in research on human resources in Afghanistan, this study is a critical step to bridge the breaks in research. In addition, the concept is burnout is not fairly known in health system, so the report will inspire paying attention to it. We had collected information just from health workers who are contracted by NGOs while the public and private sector is missing. In addition, a larger sample size for each province and each section/department could have more comprehensive and generalizable results. Self-administered questionnaire also has its own limitations due to unavailability of interviewer to describe the technical points. In such self-report individuals with high negative or positive affectivity may perceive their work environment more negatively or positively. Improving work environment is recommended to be improved socially and physically for better work outcome. However, the terms of reference (TOR) of health workers should be reviewed to make it logical based on time available. The reasons for dissatisfaction of job should be clarified and resolved. Probably some changes are required at the health facility levels to address the factors affecting the burnout among health workers. In case of ignoring such challenges, certainly it will adversely affect provision of services, system effectiveness, productivity and performance. Further comprehensive studies are required to focus on specific factors that has high effect on level of burnout among health workers at various departments.

Conclusion

Healthcare workers are involved in high demanding services expected by clients with more pressure and load, so apparently they are at higher risk of burnout. In Afghanistan, primary health services at rural areas are provided by NGOs contracted by government, while other healthcare providers are government and private sector. Until now, the level of burnout is not clear among these three providers in the country. However, as mentioned in literature the level of burnout is more prevalent among frontline health workers particularly nurses. The findings of this study reflected low status of burnout among health workers employed by NGOs as compare to other countries, whereas this prevalence is needed to be evident among public and private healthcare providers to be compared with NGOs. The low level of burnout as compare to other countries are either due to good incentives or work environment fostered by NGOs. Such practices should be promoted in other settings. So, frontline health workers are affected by various level of burnout syndrome. They should be supported by management with better work environment to prevent problem and provide quality health services. Conduction of studies to identify burnout among public and private health sectors is needed to learn more lessons.

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Ethical Declaration: The protocol of this study has been approved by Institutional Review Board (IRB) in ANPHI.

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Conflict of Interest: The authors declare no conflict of interest.

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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Perceptions of e-learning among medical students during COVID-19 pandemic in a medical institution, Kerala

Kerala bir tıp kurumunda COVID-19 pandemisi sırasında tıp öğrencileri arasında e-öğrenime yönelik algıları

Babita Susan Kuruvilla[a], Ann Mary Thomas[b], Jacob Davies Kalliath[a], Alexander John[c], Brilly Rose[d],

[a] Asst.Prof., Sree Narayana Institute of Medical Sciences, Dept of Community Medicine, Kerala, India.
[b] Assoc.Prof., Sree Narayana Institute of Medical Sciences, Dept of Community Medicine, Kerala, India.
[c] Prof., Sree Narayana Institute of Medical Sciences, Dept of Community Medicine, Kerala, India.
[d] Lecturer., Sree Narayana Institute of Medical Sciences, Dept of Community Medicine, Kerala, India.

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ABSTRACT

The ongoing COVID-19 pandemic has made a smorgasbord of changes in the educational sector worldwide. It has compelled us to resort to internet media as an alternative to complete the required syllabus. **Objective:** To assess the perceptions of E-learning among medical students in private medical institution in Kerala. **Methods:** A cross-sectional study was conducted among medical students in a private medical institution for a period of 2 months. Three hundred and two medical undergraduates from all batches who consented to participate were included in the study. Data was collected using a semi structured questionnaire through Google forms. **Results:** E-learning was preferred by 19.9% students over conventional classroom learning and 74.2% perceived it as difficult. Nearly half of the students were anxious about their future education and career. Flexibility of learning (75.5%) was a major advantage whereas technological constraints (85.6%), fatigue of eyes (60.3%), lack of motivation (54%) were some of the constraints of E-learning listed by them. **Conclusion:** Overall, three – fourth of the medical students have had a good E-learning experience. However acceptable alternatives are to be adopted by the medical universities for maintaining the uniformity of teaching and retaining the quality of medical education.

Keywords: COVID-19 pandemic, E-learning, Kerala, Medical students, Perceptions

Correspondence: Alexander John, Sree Narayana Institute of Medical Sciences, Dept of Community Medicine, Kerala, India.
E-mail: bskajhod@gmail.com. **Tel:** 994 617 34 97 .

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ÖZ

Devam eden COVID-19 salgını, dünya çapında eğitim sektöründe büyük bir değişiklik yaptı. Bizi gerekli müfredatı tamamlamak için alternatif olarak internet medyasına başvurmaya zorladı. **Amaç:** Kerala'daki özel tıp kurumundaki tıp öğrencilerinin E-öğrenme algılarını değerlendirmek. **Yöntem:** Özel bir tıp kurumundaki tıp öğrencileri arasında 2 aylık bir süre boyunca kesitsel bir çalışma yapıldı. Çalışmaya tüm gruplardan katılmayı kabul eden üç yüz iki tıp öğrencisi dahil edildi. Veriler, Google formları aracılığıyla yarı yapılandırılmış bir anket kullanılarak toplandı. **Bulgular:** E-öğrenmeyi geleneksel sınıfta öğrenmeye göre öğrencilerin% 19.9'u tercih etmiş ve% 74.2'si zor olarak algılamıştır. Öğrencilerin yaklaşık yarısı gelecekteki eğitimleri ve kariyerleri konusunda endişeliydi. Öğrenme esnekliği (% 75.5) önemli bir avantaj iken, teknolojik kısıtlamalar (% 85.6), göz yorgunluğu (% 60.3), motivasyon eksikliği (% 54), E-öğrenmenin listelediği kısıtlamalardan bazılarıydı. **Sonuç:** Genel olarak, tıp öğrencilerinin dörtte üçü iyi bir E-öğrenme deneyimi yaşamıştır. Bununla birlikte, tıp üniversiteleri tarafından öğretim tekdüzeliğini sürdürmek ve tıp eğitiminin kalitesini korumak için kabul edilebilir alternatifler benimsenmelidir.

Anahtar kelimeler: Kovid-19 pandemisi, uzaktan eğitim, Kerala, tıp öğrencisi, algılar

Introduction

In times of the current nationwide lockdown (COVID -19 pandemic), education especially Medical Education would have been at stake if not for E-learning. E-learning refers to the use of electronic resources to deliver education and training. E-learning which was moving at a snail's pace was pushed 10- 15 years ahead of time by Covid-19 Pandemic.[1] Even few years back, the regulatory body of medical education in India, had realized the importance of the technology in medical education.[2] However, the pandemic has compelled us to use it as a learning platform to impart knowledge and skills to the students to at least complete the required syllabus on time.[3] E-learning also fosters self-directed learning since it replaces conventional didacticism.[4] Synchronous (learning and teaching in real time), Asynchronous (learning and teaching occurring at different time), Blended (use of both methods) are the three types of E-learning.[5,6] Various learning platforms like Zoom, Cisco-WebEx, Microsoft Team, Moodle etc have emerged which the faculty uses to teach the daily lessons. In addition, medical educators are now resorting to Google classroom which enables the use of Google calendars to schedule timings for various classes, share files, post comments etc. It gives ample opportunities for students to turn in assignments using Google Doc and there is also a provision for getting assessed using grade system. E-learning technology can be used in the improvement of all the learning domains viz cognitive, psychomotor and affective. In the cognitive domain, group teaching in classrooms could be enhanced by online material like pre-lecture assignments and audio-video clips during the sessions. Even students could be provided with virtual resources like audio-video clips, animations, and web-links for self-directed learning for their use. In the affective domain, videos of good and bad communication skills, self-recordings can be used to stimulate learning.[7] Psychomotor skills, although best learnt with real practice, can also be augmented by technology, at least up to the 'knows how' level. Flexibility, interactivity (file sharing, use of chat box, annotations), security enhancements, cost- effectiveness, learning from anywhere and at anytime are some of the benefits the new type of

learning offers.[8,9] However, the cons of E-learning cannot be overlooked as it throws fresh challenges to the faculty (tracking invisible online students, netiquette issues) and students also face some barriers like having no android phone or laptops, technical issues like internet connectivity, lack of motivation etc.[10] According to studies done in South India, majority (>70%) of medical students preferred E-learning for interactive learning sessions and considered it as a good supplementary tool in medical education. However, students do not prefer it for practical sessions.[10,11] Considering the above facts, this study was undertaken to assess the perceptions of E-learning among medical students in a private medical institution in Kerala.

Methods

A cross-sectional study was conducted among medical undergraduate students at a private medical college in Kerala for a period of two months (July, 2020 – August, 2020). MBBS students having smart phones or laptops and those willing to answer the questionnaire through Google forms were included in the study. Those medical students who had not attended online classes were excluded.

The sample size was calculated using the prevalence rate from a study done in Chennai in India using the formula.[11]

$$n=\frac{4pq}{d^2}$$

Where,
p = 57
q = 43
d = 10% (allowable error)
Sample size was calculated to be 302.

Simple random sampling technique was the sampling method used. Study tool used for data collection was a semi-structured questionnaire consisting of socio-demographic details, E-learning perceptions, benefits and barriers of E- learning in medical education during COVID-19 Pandemic. The questionnaire was sent to students as Google forms with its link sent in the specific Whatsapp group. The students were asked to answer the questionnaire and respond within a week. Collected data was entered in Microsoft Excel and was analyzed using SPSS version 20 software. Descriptive statistics was expressed in percentage and frequencies.

Ethical committee approval was obtained from institutional ethics committee prior to the study and written informed consent was obtained from students prior to data collection. Anonymity was also maintained in the questionnaire as well.

Results

Socio-demographic Details

Among 302 students, majority of the respondents were in the age group of 20-22 years. Furthermore, the respondent cohort comprised of 72.2% females and 27.8% males which approximately matched the gender balance of students in most of the medical colleges in the state. More than half (58.9%) of the students received E-learning lessons at their homes located in rural areas. The subjects were almost similarly distributed among various batches -first year 26.5%, second year 21.6%, third year 27.7% and fourth year 24.2%.

Table 1: Socio-demographic variables (n = 302)

Variables		n	%
Age	17 – 19	22	7.3
	20 – 22	217	71.9
	23 – 25	62	20.5
	26 and above	1	0.3
Gender	Male	84	27.8
	Female	218	72.2
Place of residence	Rural area	178	58.9
	Urban area	123	40.7
	Campus (in and around)	1	0.4

Perceptions of E-learning

Only 19.9% students preferred E-learning over conventional classroom learning and most of the students (93%) used android phones due to convenience. Eighty five percent students used Cisco-WebEx because of better security features unlike other online platforms.[Table 2] . Sixty seven percent of the students' felt that their doubts were clarified during their E-learning sessions. [Table 4] More than half of the students (58%) agreed that lack of human element in this virtual type of learning had strained them mentally.[Table 3]. Even though exams have been postponed indefinitely on account of the pandemic, 58% students did not even want to take E- test. Majority of them (52%) turned in assignments using Whatsapp. Around three- fourth of the participants found E-learning arduous and 46% mentioned that household chores had affected their learning process. Around half of the students and their parents (48%) were apprehensive about their academics and future prospects. Overall, three-fourth of the medical students have had a good E-learning experience.[Table 4].

Benefits and barriers of E-learning

The most important benefit E-learning offered was the flexibility of learning (75.5%). Students could learn at their own pace, at anytime and anywhere. They (50.3%) could escape from the hassles of commuting on a daily basis [Figure 1]. However students complained of technological constraints (85.6%), strain of eyes (60.3%), lack of motivation (54%) and various other distractions.[Figure 2].

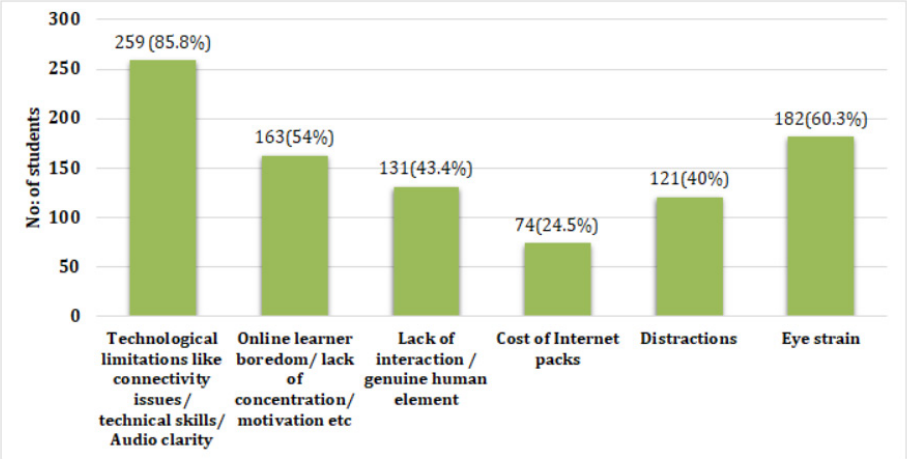

Figure 1: Most common barriers of E-learning

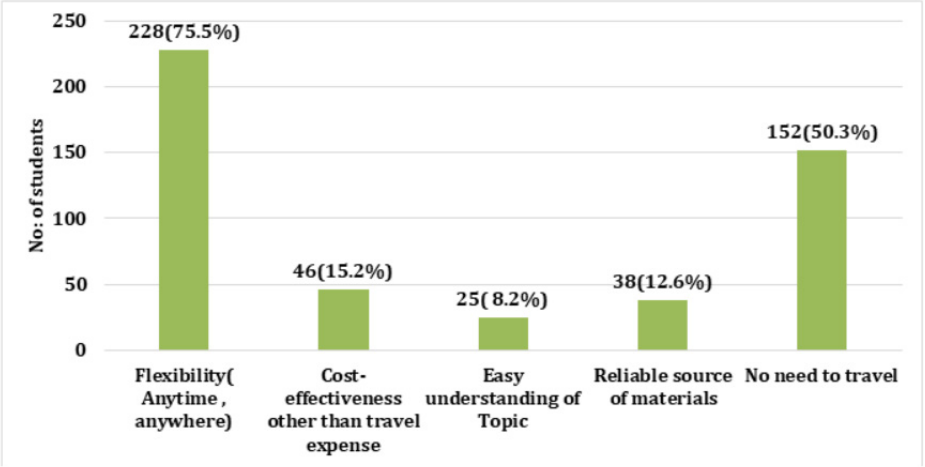

Figure 2: Most important benefits of E-learning

Only a few students recommended the need for training programs for E-learning as 67% of the students had already learnt it by this time. [Table 4]

Discussion

India has the second largest number of internet users in the world (ranked only behind China). However, the internet penetration rate is about 50% in 2020 which means that half of the population does not have accessibility to internet. Results of the survey done in 23 states in 2020, showed that 56% students did not have access to smart phones for online learning.[12] Hence E-learning is considered as a challenge especially in the remote regions of the country. Moreover, majority of the internet users access the internet through their mobile phones.[13] According to a study done in Sree Ramachandran Medical University in Chennai, 77% students preferred E-learning for interactive sessions, 70% opined E-learning should be used as a supplementary tool in medical education.[11] Monali Hiwarkar et al. in her study showed that 84% medical students preferred supplementation of E-learning with conventional classroom learning which was higher than that of our study. However, only 25% students wanted to take E-tests whereas 42% of our students were ready for an E-test.[3] This might be due to the fact that our research was undertaken during COVID 19 Pandemic hence, students wanted to prevent further lag in their course if the condition prevails.

Table 2: Usage of E-learning (n= 302)

Questions	**Response**	**Frequency**	**%**
Are the sessions Interactive or Teacher centred	Interactive	172.1	57
	Teacher centred	129.9	43
Device used for E-learning	Smart Phone	281	93
	Computer	18.1	6
	Tablet	3	1
Commonly used Online Platform	Cisco-WebEx	256	85
	Zoom	22	7
	Microsoft Team	5	2
	WhatsApp	19	6
Danger of using online platforms	Security Issues	123.8	41
	Disturbing Issues	78.5	26
	Privacy Issues	99.7	33
Attendance of online Lectures	Always	137	45.4
	Often	116	38.4
	Sometimes	42	14.0
	Never	7	2.2
Frequency of weekly lectures	1-3	30.2	10
	4-7	105.7	35
	>8	166.1	55
Methods adopted to improvise medical knowledge and skills during this time (multiple response)	Reading Textbooks	236	78.1
	YouTube	127	42
	Wikipedia	32	10.6
	Webinar	17	5.6
	Online medical course	49	16.2

Our results also showed that almost half of the students and parents were worried about the future course of their education.

St John's Hospital, Bangalore and Christian Medical College, Vellore had utilized TUSK platform developed by TUFT's university for online teaching whereas in our study most of them (85%) used Cisco-WebEx as the online platform as it has better security features. In addition, more than two-thirds of the medical students in the above institutions had recommended training for E-learning whereas only one- fourth of our medical students had made this kind of recommendation.[14] The resultant lock down phase had compelled them to resort to self training for E-learning.

Forty eight percent medical students were anxious about their future education and career due to COVID 19 pandemic and the subsequent lockdown. Similarly a study done in Haryana among medical students during this phase showed that 40% of them were worried about their further studies and career.[15]

Our study found that 93% of students used smart phones for E-learning followed by laptops and tablets. Similarly, a study conducted in Pakistan during COVID 19 Pandemic also showed that 76% of the undergraduate students (MBBS and BDS) used mobile phones for E-learning followed by other devices.[16] A study done in Spain in 2019 showed that students chose mobile phones for E-learning compared to other devices.[17] Reasons cited were easier student-teacher interaction and flexibility through mobile phones compared to other devices. Only a few students (19.9%) preferred E-learning over traditional teaching methods in our study. There is a similar preference of E-learning in the study conducted in Pakistan also. [16] This might be due to the fact that the data for the aforesaid studies were collected during the early period of nationwide lockdown during COVID-19 pandemic. In our study, 85% of the students faced technological issues like internet connectivity problems and other audio-video clarity issues whereas a study done by Suraksha Subedi et al showed that only 63% had these kind of connectivity problems.[18]

Table 3: Percentage of students agreeing and disagreeing on E-learning (n = 302)

Questions	Response	Frequency	%
Practical sessions in medical education is better conducted in the department than through internet facility	Strongly Agree	221	73.2
	Agree	49	16.2
	No comments	14	4.6
	Disagree	13	4.3
	Strongly Disagree	5	1.6
E- learning should be mandatory in Medical Education	Strongly Agree	27	8.9
	Agree	99	32.8
	No comments	108	35.8
	Disagree	38	12.6
	Strongly Disagree	30	1.0
E-learning as a consequence of COVID -19 helped you technologically	Strongly Agree	27.2	9
	Agree	145	48
	No comments	90.5	30
	Disagree	24.2	8
	Strongly Disagree	15.1	5
Less face to face interactions with your peers have strained you mentally	Strongly Agree	69.5	23
	Agree	105.6	35
	No comments	84.6	28
	Disagree	30.2	10
	Strongly Disagree	12.1	4

Table 4: Students' Perceptions of E-learning

Questions	Response	Frequency	%
Preference of E-learning over conventional class room teaching method	Yes	60	19.9
	No	242	80.1
Perception about difficulty in E-learning	Easy	78	25.8
	Difficult	194	64.2
	Very difficult	30	10
Best options for Practical sessions to be conducted	Pre-recorded videos	76	2.5
	Youtube videos	45	15
	Audio clips	11	3.6
	To conduct after reopening	252	83.4
Effect of household chores on E-learning	Highly affected	12	4
	Moderately affected	93	30.8
	Least affected	35	11.6
	Not applicable	162	53.6
Recommend Training Programme by the college	Yes	76	25.2
	No	24	7.9
	Already learnt by this time	202	66.9
Perception about future education/ job	Anxious	145	48
	Hopeful	93.6	31
	No comments	63.4	21
Has any exams been postponed due to lockdown	Yes	223	73.8
	No	79	26.2
Would you like to take E-Test	Yes	127	42.1
	No	175	57.9
Best possible way of turning in assignments	Google classrooms	27.2	9
	WhatsApp	157	52
	Notebook method	117.8	39
Parents' worry about your Future	Always	130	43
	Often	54	17.9
	Sometimes	90	29.8
	Never	28	9.3
Doubt clarification by Faculty	Always	203	67.2
	Sometimes	81	26.8
	Never	18	6.0
Has anyone ever helped you with your online sessions	Yes	113	37.4
	No	189	62.6
Rate your E-learning experience	Excellent	13	4.3
	Very good	36	12.0
	Good	101	33.4
	Satisfactory	105	34.8
	Poor	47	15.5

It might be due to the fact most of the students in the aforesaid institution were from metropolitan cities therefore they had better network coverage.[6] Our medical students (84.5%) reported they were happy with the E- learning experience. However, the overwhelming positive response from our students was much less than the response of medical students in Khartoum, Sudan. Majority of the medical students (83.6 %) in Khartoum state had an excellent perception about E-learning since most of their teachers had experience working in developed countries where E-learning is advanced so they encouraged their students and clarified their apprehensions regarding the same.[19]

A study undertaken by IE Obi et al. in a medical school showed that 48% students felt socially isolated with E-learning whereas 58% had mentioned that lack of face to face interaction with their peers had strained them mentally.[20] Our study done during the COVID-19 pandemic accounts for the higher percentage.

Conclusion

Our study concludes only 19.9% medical students preferred E-learning over conventional classroom learning. The study also showed that majority of them perceived technical constraints (85.8%) as the main barrier to E-learning the reason being poor network coverage in their areas, security issues using online platform (41%) mental strain (58%) due to lack of interaction with their peers. Regarding the medical students' perception to E-learning, 89% felt practical sessions were better conducted in department than through internet media and only 41.7% felt E-learning should be mandatory. Another finding of our study is that E-learning is beneficial to students as they can learn from anywhere at any time without relocating thereby saving their money and time.

Taking into account the above facts we felt online method of teaching is effective in certain fields especially in preclinical subjects and that it should go side by side with the traditional method. However, it cannot completely replace our age old conventional teaching method.

Recommendations

Government initiatives for expanding internet facility and increasing the broad band width are needed to provide a uniform E-learning facility. This will not only enable the students to have better access but also provide better audio and video experience in E-learning. While this current pandemic presents new challenges, acceptable alternatives are to be implemented by the medical universities for maintaining the uniformity of teaching and retaining the quality of medical education. They could provide online training program for faculty to improve the quality of teaching. Considering the flexibility in schedules and the non-requirement to travel or to be away from home, E-learning should be considered as a good supplementary teaching option to traditional classroom learning method even after this lockdown period.

Ensuring good internet connectivity, interactive short sessions with students' active participation and prompt feedback after sessions will definitely improve the quality of E-learning in medical education.

Limitations: Our study was done only in one medical institution hence the result cannot not be generalized.

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Ethical Declaration: Ethical committee approval was obtained from institutional ethics committee prior to the study(June 2020) and written informed consent was obtained from students prior to data collection. Anonymity was also maintained in the questionnaire as well.

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Conflict of Interest: The authors declare no conflict of interest.

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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Kayseri ili 2018 yılı HPV tarama sonuçlarının değerlendirilmesi

Evaluation of HPV Dna screening results for 2018 in Kayseri

Serkan Yıldız [a], Mehmet Emin Özdemir [a], Mebrure Beyza Gökçek [b], Nadir Emre Ünsal[c], Berkan Aslan [c], Ali Ramazan Benli [d],

[a] Uzm. Dr., Halk Sağlığı, Kayseri İl Sağlık Müdürlüğü, Kayseri, Türkiye.
[b] Uzm. Dr., Aile Hekimliği, Kayseri Sağlık Müdürlüğü, Kayseri, Türkiye.
[c] İst.Ed., Kayseri Sağlık Müdürlüğü, Kayseri, Türkiye.
[d] Doç. Dr., Aile Hekimliği, Karabük Üniversitesi, Karabük, Türkiye.

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ABSTRACT

Objective: To examine the distribution of HPV types, histopathological typing and advanced center examination results in women who applied to KETEM in Kayseri in 2018 and were positive for HPV. **Methods:** Ethical approval was obtained from Erciyes University Nonclinical Research Ethics Committee for the study. This study was carried out by scanning the data of 28148 people between the ages of 30-65 who received HPV tests in KETEM units throughout 2018. The age, HPV type, cervical cytology result of patients with positive HPV results for 2018 from the HSYS database, and the results of examinations, tests and other procedures performed on patients from public hospitals were examined and transferred to the SPSS 21.0 program. **Results:** The number of people with positive HPV test is 1171 (4.16%). HPV type 16 (26.8%) was the most common. It was observed that 771 (65.8%) of 1171 women with positive HPV test were examined in public hospitals, 478 (620%) had biopsy, 62 (8.0%) had smear examination and 597 (77.4%) had ultrasonography. Pathological findings were not detected in 596 (77.3%) after the examination, LSIL was found in 78 (10.1%) and HSIL in 66 (8.6%). Invasive cancer was detected in three patients (0.4%) **Conclusion:** It is clear that with cervical cancer screening, patients can be diagnosed at an early stage or when they have a precancerous lesion and this situation is of vital importance.

Keywords: Human papilloma virus, cervical cancer screening, prevention, primary healthcare

Correspondence: Serkan YILDIZ, Halk Sağlığı, Kayseri İl Sağlık Müdürlüğü, Kayseri, Türkiye.
E-mail: serkanyildizserkan@gmail.com **Tel:** +90 506 717 07 55
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ÖZ

Amaç: Kayseri İlindeki KETEM'lerine 2018 yılında başvurup HPV pozitif çıkan kadınlardaki HPV tiplerinin, histopatolojik tiplendirme dağılımının ve ileri merkez muayene sonuçlarının incelenmesidir. **Yöntem:** Çalışma için Erciyes Üniversitesi Klinik Olmayan Araştırmalar Etik Kurulu'ndan etik onay alınmıştır (Tarih: 11.12.2019 Sayı:2019/835). Bu çalışma 2018 yılı boyunca KETEM birimlerinde HPV testi alınan 30-65 yaş arası 28148 kişinin verilerinin taranmasıyla yapılmıştır. HSYS veri tabanından 2018 yılına ait HPV sonucu pozitif olan hastaların yaş, HPV tipi, servikal sitoloji sonucu ve kamu hastanelerinden hastalara yapılan muayene, tetkikler ve diğer işlem sonuçları incelenerek SPSS 21.0 programına aktarılmıştır. **Bulgular:** HPV testi pozitif bulunan kişi sayısı 1171 (%4.16)'dir. En sık HPV tip 16 (%26.8) görülmüştür. HPV testi pozitif olan 1171 kadının 771'inin (%65.8) kamu hastanelerinde muayene olduğu, 478'inden (% 62.0) biyopsi alındığı, 62'sine (% 8.0) smear incelemesi 597'sine (%77.4) ultrasonografi yapıldığı görülmüştür. Muayene sonrası 596'sında (%77.3) patolojik bulgu saptanmamış olup, 78'inde (%10.1) LSIL, 66'sında (%8.6) HSIL saptanmıştır. Üç kişide ise (%0.4) invaziv kanser tespit edilmiştir. **Sonuç:** Hedef nüfusun her yıl %20'sinin taranması için tarama programlarının daha geniş kitleye ulaştırılması ve bu kapsamda çalışmalar yapılması gerekmektedir.

Anahtar kelimeler: Human papilloma virüs, serviks kanseri taraması, korunma, birinci basamak

Giriş

Serviks kanseri kadınlarda en sık görülen dördüncü kanser türü olup tüm dünyada kanser ilişkili kadın ölümlerinin başlıca nedenlerindendir.[1] Dünya genelinde yılda yaklaşık yarım milyon serviks kanseri olgusunun tanı aldığı düşünülmektedir.[2] Ülkemizde ise yılda yaklaşık 4250 kadın serviks kanseri tanısı almaktadır ve servikal kanser kadınlarda en sık görülen dokuzuncu kanser konumundadır.[3] Serviks kanseri için risk faktörleri arasında: Human papillomavirus (HPV) enfeksiyonu, çok sayıda veya yüksek riskli cinsel partner, küçük yaşta cinsel ilişki, evlilik ve gebelik, sigara, diyet, immünsupresyon, oral kontraseptif kullanımı, ırk, düşük sosyoekonomik düzey yer almaktadır.[4] Serviks kanserinde tarama testinin amacı diğer kanser türlerinde olduğu gibi prekanseröz lezyonların erkenden teşhis edilmesi ve ölümlerin önlenmesidir. 1940'lı yıllardan itibaren papsmear testinin kullanılmaya başlanması ve ülkelerin ulusal tarama programlarına entegre edilmesiyle hastalığın insidansının ve mortalite oranlarının düştüğü görülmektedir.

Papsmear testi serviks kanseri taramasında kullanılmakla birlikte, aynı zamanda vajinal ve servikal enfeksiyonun değerlendirilmesinde, bakteri (bakteriyel vajinozis), protozoa (trikomonas), mantar (candida) ve virus ayrımında yardımcı olmaktadır.[5] Tarama programlarını etkili uygulayan ülkelerde, servikal kanser sıklığı ve mortalitesinde %70'e yakın azalma olduğu bildirilmektedir.[6] Serviks kanserlerinin en büyük sebebi HPV pozitifliği ve persistan HPV enfeksiyonudur.[7] HPV, yüzlerce alt tipi olan zarfsız bir Deoksiribo Nükleik Asit (DNA) virüsüdür. Genital siğillerden serviks kanserine kadar birçok anogenital bölge hastalığı ile ilişkilendirilmiştir. Servikal kanser açısından yüksek riskli tipler arasında 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, 82 bulunmaktadır.[8] Servikal kanser vakalarında tip 16 ve 18 en sık izole edilen tipler olup, hastaların %50'den fazlasında tip 16 görülmektedir. Ulusal rehberlerde; HPV tip 16 ve 18 pozitif saptandığı veya diğer yüksek riskli subtiplere servikal smear materyalinde atipik değişikliklerin eşlik ettiği

durumlarda hastalara tanı amaçlı kolposkopi eşliğinde biyopsi yapılması önerilmektedir. Kolposkopi ve biyopsi sonuçlarına göre histopatolojik tiplendirme yapılmaktadır.[8]

Servikal sitolojiler Bethesda 3 sistemine göre önemi bilinmeyen atipik hücreler (ASC-US), HSIL düşündüren atipik skuamöz hücreler (ASC-H), atipik glandüler hücreler (AGC), düşük dereceli skuamöz intraepitelyal lezyon (LSIL) ve yüksek dereceli skuamöz intraepitelyal lezyon (HSIL) şeklinde sınıflandırılmaktadır.[9]

Türkiye Cumhuriyeti Sağlık Bakanlığı Serviks Kanseri Tarama Programı Ulusal Standartlarına göre 30-65 yaş arası kadınlara beş yılda bir HPV testi yapılarak taranması hedeflenmektedir. HPV taraması yapılan kadınlar sonuçlardan haberdar edilmekte ve pozitif çıkanlar ileri bir merkezde kadın doğum uzmanlarına yönlendirilmektedir.[10]

Bu çalışmanın amacı, Kayseri İlindeki Kanser Erken Teşhis ve Tarama Eğitim Merkezlerine (KETEM) 2018 yılında başvurup HPV pozitif çıkan kadınlardaki HPV tiplerinin dağılımının, histopatolojik tiplendirmesinin ve ileri merkez muayene sonuçlarının incelenmesidir.

Yöntem

Çalışmanın yürütülebilmesi için Kayseri İl Sağlık Müdürlüğü'nden yazılı izin ve Erciyes Üniversitesi Klinik Olmayan Araştırmalar Etik Kurulu'ndan etik onay alınmıştır. 2018 yılında Kayseri'de nüfusa kayıtlı 30-65 yaş aralığında 302824 kadın bulunmaktadır. Bu çalışma birinci basamak sağlık hizmetleri kapsamında KETEM birimlerinde HPV testi alınan 30-65 yaş arası 28148 kadının verilerinin taranmasıyla yapılmıştır.

Halk Sağlığı Yönetim Sistemleri (HSYS) veri tabanından 2018 yılına ait servikal tarama yapılan hastaların sonuçları incelenmiştir. HPV sonucu pozitif olan hastaların yaş, HPV tipi, servikal sitoloji sonucu incelenerek SPSS 21.0 programına aktarılmıştır. HPV sonucu pozitif hastalar ilgili KETEM birimleri tarafından üçüncü basamak kamu hastanesine yönlendirildiği için kamu hastanelerinden hastalara yapılan muayene tetkikler ve diğer işlem sonuçları resmi yazı ve sağlık müdürlüğü izni ile incelenerek SPSS 21.0 programına aktarılmıştır. Çalışmaya dâhil edilen kadınlarıntarama ve muayene sonrası tespit edilen HPV tipi ve sitoloji sonuçları, aldığı tanılar değerlendirilmiş, frekans ve yüzdeleri belirlenmiştir.

Bulgular

2018 yılı boyunca Kayseri geneli birinci basamak sağlık hizmetleri kapsamında serviks kanseri taraması yapılan kişi sayısı 28148, HPV testi pozitif bulunan kişi sayısı ise 1171 olarak bulunmuştur. Buna göre serviks kanseri taraması yapılan kişilerde HPV prevalansı %4.16 olarak hesaplanmıştır.

Tarama yapılan kadınlarda aynı anda birden fazla HPV tipi saptanabilmektedir.Kadınlarda en sık görülen HPV tipinin 16 olduğu görülmüştür (Tablo 2).

Tablo 1: Servikal kanser taraması yapılan kadınların yaş dağılımı

	Sayı	Yaş Ortalaması ± SS	Min-Max
Tarama Yapılan Kadınlar	28148	44.55 ± 9.92	30-65
HPV Saptanan Kadınlar	1171	42.80 ± 9.28	30-65

HPV saptanan hastaların servikal sitoloji sonuçlarına bakıldığında %43'ünün normal olduğu %28.5'inde enfeksiyon saptandığı, %6'sında ASCUS, %2.6'sında ise LGSIL saptandığı görülmüştür. ASC-H, AGC, ASCUS, HGSIL, LGSIL toplamı %0.4 olarak bulunmuştur (Tablo 3).

HPV testi pozitif olup kamu hastanelerine yönlendirilen 1171 kadından 771'inin (%65.8) kamu hastanelerinde muayene olduğu ve muayene olanların 478'inden (%62) biyopsi alındığı, 62'sine (% 8.0) smear incelemesi , 597'sine (%77.4) ultrason yapıldığı görülmüştür.

Tablo 2: Servikal kanser taraması yapılan kadınlarda saptanan HPV tiplerinin dağılımı **(n:1171)***

HPV Tipi	n	%
16	314	26.8
18	67	5.7
31	118	10.1
33	29	2.5
35	89	7.6
39	72	6.1
45	49	4.2
51	157	13.4
52	99	8.5
56	78	6.7
58	60	5.1
59	73	6.2
68	94	8
Diğer	337	28.8

** Kadınlarda birden fazla Hpv tipi saptanmıştır. Yüzdeler n üzerinden alınmıştır*

*** Diğer: tabloda belirtilen 13 tip dışında kalan tüm hpv tipleri*

Tarama sonrası HPV pozitif olduğu saptanıp hastaneye giden 771 kadının muayene sonrası 596'ında (%77.3) patolojik bulgu saptanmamış olup, 78'inde (%10.1) LSIL, 66'sında (%8.6) HSIL, 3'ünde ise (%0.4) kanser saptanmıştır (Tablo 4).

HPV Tip 16 saptanan hastaların muayene sonrası aldığı tanıların dağılımı ise Tablo 5'te verilmiştir (Tablo 5).

Tartışma

Bu çalışmada 30-65 yaş arası HPV DNA açısından taranan popülasyonun %4.16'sında HPV saptanmıştır. HPV saptananların %26.7'sinde tip 16 ve % 13.4' ünde ise tip 51 bulunmuştur. Tarama sonucu HPV pozitif saptanan ve muayene olan 771 kadının 144'ünde (% 18.7) HSIL veya LSIL belirlenmiş ve 3'ünde (%0.4) kanser tespit edilmiştir. Amasya'da yapılan bir çalışmada KETEM taraması sonuçlarına göre 30-65 yaş kadınlarda HPV pozitiflik oranı %2.7 olarak saptanmıştır.[11] Bu bizim çalışmamızda saptanan % 4.2 değerine göre daha düşük düzeydedir. Van'da Karakuş ve arkadaşlarının 2015 de yaptığı bir çalışmada KETEM taraması sonuçlarına göre serviks HPV taramasında kadınların %2.4'ünde HPV pozitifliği saptanmıştır.[12]

Çalışmamızda en sık görülen HPV tipinin tip 16 (%26.8) olduğu saptanmıştır. Karakuş ve arkadaşlarının KETEM verileri ile yaptığı

Tablo 3: Tarama Sonrası Elde Edilen Servikal Sitoloji Sonuçlarının Dağılımı

Sitoloji Sonucu	n	%	%
Normal	504	43.0	1.78
Enfeksiyon	334	28.5	1.19
AGCW	2	0.2	0.01
ASC-H	11	0.9	0.04
ASC-US	70	6.0	0.25
HGSİL	1	0.1	0.0004
LGSİL	30	2.6	0.11
Yetersiz	219	18.7	0.78
Toplam	1171	100	4.15

**HPV pozitif çıkan kadınlar içinde hesaplanan yüzde*

***Tüm tarama yapılan kadınlar için hesaplanan yüzde*

Tablo 4: Tarama Sonrası HPV Pozitif Olduğu Saptanıp Hastaneye Giden Kadınların Muayene Sonrası Aldığı Tanılar (n:771)

Sonuçlar	n	%
Patolojik Bulgu Yok	596	77.3
Enflamasyon /Enfeksiyon	25	3.2
LSIL	78	10.1
HSIL	66	8.6
ASCUS	2	0.3
ASC-H	1	0.1
Kanser	3	0.4
Toplam	771	100

çalışmada taranan kadınların %15.6'sında tip 16 pozitifliği olduğu görülmüştür.[12] HPV tip 16, 18 dünya çapında servikal kanserlerin %60-70 kadarının nedenidir.[13] Khan ve arkadaşlarının yaptığı bir çalışmada 10 yıl boyunca takipte HPV tip 16 pozitif olan kadınlarda servikal intraepitelyal neoplazi3 (CIN3) gelişme insidansı % 17.2 olarak bulunmuştur.[13] Çalışmamızda HPV tip 16 saptanan 313 hastanın 176'sı muayeneye gitmiş olup hastaların 3'ünde (%1.7) kanser, 81'inde (%46.0) LSIL veya HSIL saptanmıştır.

Çorum'da 23010 kadını kapsayan taramada kadınlarda HPV pozitiflik oranı %3.5 bulunmuştur. HPV saptananların %25.9'una kolposkopi yapılmış ve % 37'sinde HPV tip 16 tespit edilmiştir. Kadınlarda LSIL veya HSIL oranı ise %63 olarak bulunmuştur.[14] Çalışmamızda tip 16 saptanan 176 kadının 81 inde (%46) LSIL veya HSIL ve üçünde ise invaziv kanser saptanmıştır. HPV tip 16'nın prekanseröz lezyon sıklığı açısından oldukça önemli bir etken olduğu görülmektedir.

Kütahya'da yapılan bir çalışmada pap smear yapılan kadınların sonuçları incelenmiş ve %0.02 LGSIL saptanmıştır. Çalışmamızda tarama sonrası LGSIL saptanma oranı %0.11'dir. Çalışmamızda sitoloji sadece HPV saptanan hastalarda çalışılmıştır. Aradaki fark bundan kaynaklanıyor olabilir.[15]

Ankara'da sağlıklı kadınlarda serviks kanseri taramasının yapıldığı bir çalışmada kadınlarda %1.5 oranında anormal sitoloji saptanmıştır. ASCUS %1.1 ASC-H %0.14 LSIL %0.1 bulunmuştur. Çalışmamızda tarama sonrası ASCUS saptanma oranı % 0.25 olarak bulunmuştur. Toplam ASC-H, AGC, LGSIL, HGSIL tanısı ise %0.4'tür. Çalışmamızda düşük çıkma nedeni yetersiz numunelerin varlığı ve sadece HPV pozitif örneklerden sitoloji çalışılmasıyla açıklanabilir.[16]

Hindistan'da yapılan bir çalışmada ASCUS, LSIL, HSIL oranları sırasıyla %2,90,% 5,09, %0,48 bulunmuştur. Bizim çalışmamızda bu oranlar % 6.0, %0.1, %2.6 olarak bulunmuştur. Fark Hindistan kültürünün farklı olmasından ve tarama programlarının olup olmamasından kaynaklanıyor olabilir.[17]

Çanakkale'de yapılan çalışmada hastaneye kadın doğum polikliniğine başvuran kadınlardan alınan smear sonuçlarına göre %1.93 anormal smear ve %1 oranında ASCUS saptanmıştır.[18] Sivas'ta yapılan çalışmada ise kadın

Tablo 5: HPV Tip 16 Saptanan Hastaların Muayene Sonrası Aldığı Tanılar (n:313)

Tanılar	n	%
HGSIL	49	15.7
LGSIL	32	10.2
ASC-US	1	0.3
ASC-H	1	0.3
Kanser	3	0.9
Muayene Olmadı	137	42.9
Toplam	313	100

doğum polikliniğine postkoital kanama ve ağrı şikayetiyle gelenlerin %6.4'ünde HPV pozitif olduğu ve bu kadınlarda en fazla HPV tip 6 (%25)ikinci sırada tip 16'nın (%16.6) enfeksiyona neden olduğu belirlenmiştir.[19] Adana'da yapılan bir çalışmada ise polikliniğe başvuran 20-68 yaş arası hastalar arasında HPV pozitiflik oranı %5.2 olarak bulunmuştur.[20] Sivas'ta yapılan çalışmada 21-67 yaş arası polikliniğe başvuran hastalar arasında HPV DNA pozitiflik oranı %6.4 oranında saptanmıştır.[18]

Poliklinikte yapılan çalışmalarda HPV pozitifliğinin yüksek çıkması polikliniğe gelen hasta popülasyonun, KETEM'de taranan sağlıklı popülasyonundan farklı olması ve daha geniş bir yaş aralığını kapsamasından kaynaklanıyor olabilir.

Danimarka' yapılan bir çalışmada 65 yaş üstü kadınlarda yapılan HPV taramasında katılımcıların %4.3'ünde HPV saptanmış olup, bu kişilerin %24'ünde HPV tip 16 ve 18 olduğu görülmüştür. Bu çalışmada 30-65 yaş arası HPV DNA açısından taranan popülasyonun %4.16'sında HPV saptanmıştır. HPV saptananların %26.7'sinde tip 16 saptanmıştır. Yaş grupları farklı olsa da oranlar benzer bulunmuştur.

Sonuç

Çalışmamızda 30-65 yaş arası HPV DNA taraması yapılan kadınlarda %4.16 oranında HPV pozitifliği saptanmıştır. HPV saptananların 313 (%26.7)'ünde tip 16 ve % 13.4' ünde ise tip 51 bulunmuştur. Tarama sonucu HPV pozitif saptanan ve muayene olan 771 kadının 144'ünde (% 18.7) HSIL veya LSIL tespit edilmiş ve 3'ünde (%0.4) kanser tespit edilmiştir. Tip 16 saptanan 313 hastanın 176'sı muayeneye gitmiş olup hastaların 3'ünde (%1.7) kanser, 81'inde (%46.0) LSIL veya HSIL saptanmıştır. HPV tip 16'nın prekanseröz lezyon sıklığı açısından oldukça önemli bir etken olduğu görülmektedir. Yapılan ulusal kanser taramaları ile birçok kişinin erken evrede veya henüz prekanseröz bir lezyonu varken tanı aldığını ve bunun ne kadar hayati öneme sahip olduğunu anlıyoruz. Servikal kanser taraması 30-65 yaş arası kadınlara her beş yılda bir yapılması önerilmektedir. Bu kapsamda hedef nüfusun her yıl %20'sinin taranması için tarama programlarının daha geniş kitleye ulaştırılması ve bu kapsamda çalışmalar yapılması gerekmektedir.

Bildirimler

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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Socio-demographic determinants of smoking: A data mining analysis of the Global Adult Tobacco Surveys

Sigara kullanımının sosyo-demografik belirleyicileri: Küresel Yetişkin Tütün Araştırmaları üzerine bir veri madenciliği analizi

Zeynep Didem Unutmaz Durmuşoğlu[a], Pınar Kocabey Çiftçi[b],

[a] Associate Prof. Dr., Department of Industrial Engineering, Gaziantep University, Gaziantep, Turkey.
[b] Research Assist Dr., Department of Industrial Engineering, Gaziantep University, Gaziantep, Turkey.

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ABSTRACT

Objective: This paper presented a) how the Global Adult Tobacco Surveys (GATSs) data can be used for extracting valuable information about tobacco use behaviors of people and b) the prediction performance of the implemented classification algorithms on the GATS data. **Methods:** Three well-known classification methods: K-nearest neighbor, C4.5 algorithm, and multilayer perceptron were applied to assess the classifying performance for the smoking status of GATS participants (pre-defined classes: smoker and no smoker) based on the socio-demographic characteristics (age group, gender, residence, education level, and working status). The first analysis was performed on the GATS data from Turkey. Subsequently, the model producing the best performance for Turkey was also implemented for other six European countries: Greece, Kazakhstan, Poland, Romania, Russia, and Ukraine. **Results:** All of the tree algorithms were more confident to classify no smokers. The correct classification rate of C4.5 algorithm was the highest among the algorithms for the GATS Turkey data. In addition, the C4.5 algorithm classified the males more detailed than the females. The comparative analysis indicated that the C4.5 algorithm correctly classified the smoking status of participants of Ukraine over 80% while it was lower than 70% for Greece. Thus, the effects of demographic factors on smoking status can change from one country to another. **Conclusion:** This paper indicated that the data supplied by GATS such as demographic data may help to compute the likelihood of an individual to be a smoker in the future.

Keywords: Smoking, tobacco use, public health

Correspondence: Zeynep Didem UNUTMAZ DURMUŞOĞLU, Department of Industrial Engineering, Gaziantep University, Gaziantep, Turkey. **E-mail:** unutmaz@gantep.edu.tr. **Tel:** +90 342 317 2614.

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ÖZ

Amaç: Bu makale a) Küresel Yetişkin Tütün Araştırması (KYTA) verilerinin tütün kullanım davranışları hakkındaki değerli bilgileri ortaya çıkarmada nasıl kullanılabileceğini ve b)KYTA verileri üzerinde uygulanan sınıflandırma algoritmalarının performanslarını sunmaktadır. **Yöntem:** Üç iyi bilinen sınıflandırma yöntemi olan K -en yakın komşu algoritması, C4.5 algoritması ve çok katmanlı algılayıcısı KYTA katılımcılarının sosyo-demografik özellikleri (yaş grubu, cinsiyet, yerleşim yeri, eğitim düzeyi ve çalışma durumu) temel alınarak, sigara içme durumunu (önceden tanımlanmış sınıflar: sigara içen ve içmeyen) doğru sınıflandırma performansı değerlendirilmiştir. İlk analiz KYTA Türkiye verileri üzerinde gerçekleştirilmiştir. Daha sonra Türkiye için en iyi performansı üreten model altı farklı Avrupa ülkesi: Yunanistan, Kazakistan, Polonya, Romanya, Rusya ve Ukrayna verileri için de uygulanmıştır. **Bulgular:** Bütün ağaç algoritmaları sigara içmeyenleri tespit etmekte daha doğru sonuçlar vermektedir. C4.5 algoritmasının doğru sınıflandırma oranı, Türkiye için en yüksek olandır. Ülkeler için yapılan karşılaştırmalı analiz, C4.5 algoritmasının Ukrayna'daki katılımcıların sigara içme durumunu %80'in üzerinde doğru bir şekilde sınıflandırabildiğini ancak Yunanistan için bu oranını %70'in altında kaldığını göstermektedir. **Sonuç:** Bu makale, demografik veriler gibi KYTA tarafından sağlanan bilgilerin, bir bireyin gelecekte sigara içmesi olasılığının hesaplanmasına yardımcı olabileceğini ortaya koymaktadır.

Anahtar kelimeler: Sigara içmek, tütün kullanımı, kamu sağlığı

Introduction

The collection of data has become an easier process along with the rapid development of technology. A significant amount of data is available in science, industry, business, and many other areas in today's world. Tobacco use and control are also one of the most important research fields where enormous data has been collected recently. After the entrance of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) into force, many countries started to conduct Global Adult Tobacco Surveys (GATSs) and Global Youth Tobacco Surveys (GYTSs) regularly to monitor the prevalence of tobacco use and the effects of key tobacco control measures. The data supplied by these surveys builds considerable datasets for smoking issues. These datasets can be used for transforming the collected data to valuable information using data mining methods in order to help decision makers.

Data mining can be defined as the process of extracting knowledgeable information in an understandable structure from very large amounts of data.[1] It has become one of the most popular disciplines of applied science [2] due to its capability of discovering hidden patterns [3] in data. Classification is one of the important functions of data mining that classifies a data item into one of the different pre-defined classes.

This paper mainly conducted classification analyses on the GATSs data using three different classification algorithms to analyze a) how the GATSs data can be used for extracting valuable information to understand the relations between some important factors and smoking status of people and b) the prediction performance of the implemented classification algorithms on the GATS data.

In the literature, various data mining methods have been applied to various datasets for several different research fields. However, there are also few studies that focus on tobacco research area. For example; Montaño-Moreno et al.[4] used *multilayer perceptron*, *radial basis function*, *probabilistic neural network* and etc. to analyze the predictive power of different

psychosocial and personality variables on the nicotine consumption of teenagers while Moon et al.[5] applied *decision tree models* to characterize smoking behavior among older adults considering the psychological distress, health status, alcohol use, and demographic variables. In the studies of Ding et al.[6] and Yun et al.[7], different algorithms such as *neural network*, *decision tree*, and etc. were used to examine quitting behaviors of people.

Some of the studies that used different datasets were also provided in this study. Sofean and Smith8 and Myslín et al.[9] smoking behaviors of people using data provided by Twitter while Benjakul et al.10 performed a clustering analysis to examine the characteristics of manufactured and roll your own cigarette users using data provided by the GATS 2009 Thailand. Nollen et al.[11] also explored the relations between demographic, psychosocial factors, and tobacco to determine cigarette smokers at higher risk for alternative tobacco product use from a diverse sample of adult smokers. In 2019, Singh and Katyan [12] analyzed the GATS 2010 data to characterize nicotine dependency using decision tree approach.

Apart from these studies, there are several different types of research which used data mining methods on smoking issues at the point of medical care. In 2015, Ding et al.[13] performed a classification analysis based on Support Vector Machine using structural Magnetic Resonance Imaging (MRI) images whereas McCormick et al.[14] classified the patient smoking status using semantic features of patients. In addition, Figueroa et al.[15] used clinical narrative texts to extract smoking status of patients while Wicentowski and Sydes[16] used implicit information from medical discharge summaries of patients. In the study of Sordo and Zeng[17], the dependency among sample size and classification performance of *Naive Bayes*, *Support Vector Machines*, and *Decision Trees* were examined using data supplied by patients. On the other hand, Huang et al.[18] examined the prescribing of smoking cessation medications in the primary care using rule mining methods.

In the light of the brief literature review provided above, it can be seen that there is a limited number of papers that studied the GATSs data using different kinds of data mining algorithms.

In this study, three well-known classification methods: "*K nearest neighbor (KNN)*", "*C4.5 algorithm*", and "*multilayer perceptron*" have been applied to the GATS Turkey 2012 data to classify the smoking status of the participants (two pre-defined classes: no smoker and daily smoker) based on some of their fundamental socio-demographic characteristics (age, gender, residence, education level, and working status). Additionally, the performance of the algorithm that provided the best outputs for Turkey case was tested using the data of six different European countries (Greece, Kazakhstan, Poland, Romania, Russia, and Ukraine) which locate in the same WHO region (Europe) with Turkey and provided open access to their GATSs data via the web page of Center for Disease Control and Prevention (CDC) during the study period.

The GATS is one of the most important surveys that provides vast body of data demographic characteristics, tobacco use behaviors and opinions for tobacco control policies of participants. It is also supported by WHO and implemented by several different countries over years. Many countries has been used this survey to monitor tobacco use and observe the performance of tobacco control policies. Therefore, this survey has become one of the most helpful surveys that researchers of tobacco field need. To our best knowledge, the data of these surveys mostly analyzed with survey methodologies. However, advanced methods can also help to reveal hidden knowledge that can increase our understanding on the relevant field. In this study, the relations between different demographic characteristics of people and their tobacco use behaviors were investigated with different data mining algorithms. This study is an important example how different data mining algorithms can be used on this survey.

The remainder of this paper was organized as follows. First, the methodology was discussed. Then, the results were presented. Finally, conclusions and discussions were provided.

Methods

This study has several steps as described in Figure 1. The initial classification analysis was conducted using the GATS data from Turkey (2012). The GATS is a national household survey[19] that helps nations to collect data on the prevalence of tobacco use and key tobacco measures.[20] It also covers data on some of the fundamental socio-demographic characteristics of the participants. In the content of this study, five *easy to reach* and *well known* demographic factors: *age*, *gender*, *residence*, *education level*, and *working status* were selected to perform analyses.

The GATS Turkey 2012 was performed with a total of 9851 participants. However, some participants did not respond to the selected demographic questions. A total of 24 participants did not declare the work status while 2 participants did not provide education level information. For that reason, these participants were excluded from the performed study and the data of 9825 participants were used for the further analyses. Before considering all of these candidate factors to be considered in our analyses; the dependency between the factors and the current smoking status of people were analyzed using *Chi Square Test*. Subsequently, the significantly depended factors were included for classification purposes.

The corresponding questions and responses used in GATS in 2012 are listed below. The frequency and percentages of the used data were also provided in Table 1.

- *Age: Respondents age in years?* The age data of the participants were collected as numeric variables. In this study, we categorized the ages of the people in 4 classes: 15-24, 25-44, 45-64, 65+. This classification was also used by WHO while analyzing the results of the GATSs.
- *Gender: Gender? (Male and female)*
- *Residence: Residence status? (urban and rural)*
- *Education levels: What is the highest education you have completed? (not graduated, elementary school, primary school, secondary or vocational school, high school, college or faculty, and master or Ph.D.)* Education levels of the countries were collected in 3 classes:no formal schooling (not graduated), primary education (primary to high school), higher education (university, MSc, and PhD in this study.
- *Working status: Which of the following best describes your main work status over the past 12 months? (paid employee, self-employed, non-paid family worker, student, homemaker, retired, no job (not able to work), and no job (able to work)).*Working status is collected in 5 classes: employee or employer, student, homemaker, retired and unemployed in this study.
- *Smoking status: Do you currently smoke tobacco on a daily basis, less than daily, or not at all? (daily, less than daily, and not at all).* In this study, the smoking statuses are defined in two classes: smoker (daily and less than daily smokers) and no smokers.

In this study, three different machine learning algorithms were used to perform a detailed classification analyses. During the selection of the types of algorithms, the main approaches that the algorithms have been used were investigated and algorithms which basically use different approaches from each other were selected for the further analyses. Therefore, *KNN, multilayer perceptron* and *C4.5 algorithms* were implemented using the software WEKA (Waikato Environment for Knowledge Analysis) which provides a collection of machine learning algorithms with single user interface.[21] These classification methods are known to be compatible with the GATS data. *KNN* algorithm performs a case base learning while *C4.5* constructs a decision tree and *multilayer perceptron* maps sets of input data onto a set of appropriate outputs. Brief information about these methods

Table 1. The statistics of the data supplied from GATS 2012 Turkey

Demographic Characteristics	Sub-categories	n	%
Age Group	*15-24*	1275	12.97
	25-44	3945	40.15
	45-64	2987	30.40
	65+	1618	16.46
Gender	*Male*	4453	45.32
	Female	5372	54.67
Residence	*Urban*	4912	49.99
	Rural	4913	50.00
Education Level	*Not Graduated*	1832	18.64
	Primary Education	6915	70.38
	Higher Education	1078	10.97
Work Status	*Employee or Employer*	3584	36.47
	Student	566	5.76
	Homemaker	3832	39.00
	Retired	1338	13.61
	Unemployed	505	5.13

was also provided in the next sub-sections. There are also some other reasons to chose these algorithms. These algorithms have been used on different datasets in several different areas and provided promising results. They are easy to understand, reach and implement.

In order to evaluate the classification performance of the algorithm giving the best classification result for Turkey case, the data sets of six different countries were also analyzed. The selected countries namely Greece, Kazakhstan, Poland, Romania, Russia, and Ukraine locate in the same WHO region (Europe) with Turkey and provide open access to their GATSs data from the web page of CDC. The data for these countries belongs to different years since GATS was performed in different years. Thus, GATS data from Greece belongs to the year 2013 with 4352 participants, from Kazakhstan belongs to the year 2014 with 4404 participants, from Poland belongs to the year 2009-2010 with 7786 participants, from Romania belongs to the year 2011 with 4488 participants, from Russia belongs to the year 2016 with 11440 participants, and from Ukraine belongs to the year 2017 with 8227 participants. This study was performed with the given years for the data. For that reason, the references were taken according to the year at which the analyses of the study was performed.

K-Nearest Neighbor (KNN)

K nearest neighbor (KNN) is one of the effective machine learning methods which is also known as instance-based learning, case-based learning, lazy learning.[1] The nearest algorithms are simply select the training instances with the closest distance to the query instance.[22] It has only one parameter which is called as k, number of neighbors.[23] Thus, as the nearest neighbor algorithm, KNN firstly; trains a set of cases and when a new case is needed to classify, it finds k number of training cases closest to the new point using a similarity function (such as Euclidean distance).[24] KNN can be advantageous when the study will be performed with the small database because the speed of computing distance will increase according to the number of instances.[22]

C4.5 Algorithm

The C4.5 algorithm was developed by Ross Quinlann, is a classification algorithm producing decision tree. It simply constructs a decision tree that is a predictive machine learning model[25] until it reaches the

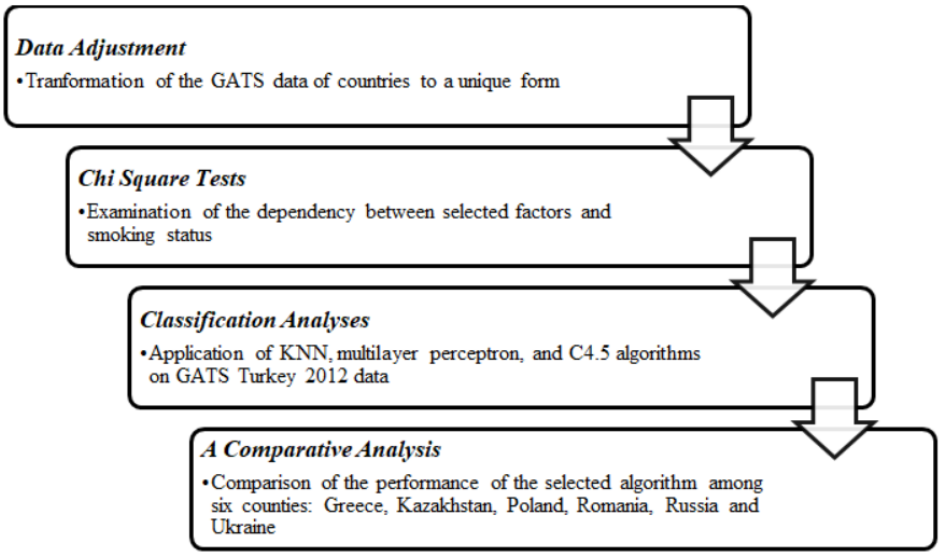

Figure 1. The flow of the analyses performed in the presented paper.

equilibrium of flexibility and accuracy.[26] The internal nodes of the tree represent the different attributes while the branches between the nodes present the possible values.[25] Trees help researchers to determine useful predictors of an outcome efficiently and extract interactions between predictors without specifying these in advance.[27] The tree format of the algorithm allows generated rules to be easily interpreted and reduce the probability of errors.[28] They have provided useful results in medical field for disease diagnosis.[29]

C4.5 is known as a J48 algorithm in the Weka data mining tool. J48 is an open source Java implementation of the C4.5 algorithm in the Weka.30

Multilayer Perceptron

Multilayer Perceptron is one of the well-known neural network models[31] due to its clear architecture and comparably simple algorithm.[32] It is also a back-propagation algorithm[33] that conducts learning on a multilayer feed forward network.[34] Multilayer Perceptron consists of a number of neurons that are connected by weighted links.[35] In this algorithm, when data are denoted in the input layer, the network node conducts computations in the successive layers until an output value is reached at each of the output nodes.[32]

Results

The dependency among selected demographic factors and the smoking status of individuals were primarily tested using Chi Square Tests. For this aim 5 different hypotheses were prepared. An example for the hypothesis is given below.

Ho: residence and smoking status are independent
H1: residence and smoking status are dependent

As it can be seen at Table 2, all analyzed characteristics were found related to each other (<0.01) with the current smoking status of the individuals. Thus, all characteristics were included in the classification analyses.

Table 2. p values of the chi square tests.

	Residence	Age Group	Gender	Education Level	Working Status
Smoking Status	<0.001	<0.001	<0.001	<0.001	<0.001

For the classification analyses, two classes were pre-defined: smoker (class 1) and no smoker (class 2). All analyses were performed using a *10-fold cross validation* (k-fold cross validation) procedure that allow the effective use of the data.[24] In k-fold cross validation;

firstly, the data set is divided into k folds or subsets, secondly, one of the k folds is used as the test sets while k-1 subsets are used for training in turn, and finally, the average error for all k trials is calculated.[36]

The performances of the employed algorithms for Turkey case are compared by using percentages of the correctly classified instances, the values of the precision, the recall, F-measure for each class, and time is taken to build the model. The probability of *correct classification* is a performance measure that corresponds to the area under ROC curve.[37] *Precision* (that is also known as confidence) is the proportion of predicted positive instances that are correctly real positives while *recall* (that is also known as sensitivity) is the proportion of real positive instances that are correctly predicted positive.[38] The formulations of the recall and the precision are given in 1 and 2. On the other hand, *F-measure* can be defined as the harmonic mean of recall and precision.[39]

$$\text{Precision (confidence)}^{40} = \frac{\text{True Positive}}{\text{True positive+False Positive}}$$

$$\text{Recall (sensitivity)}^{40} = \frac{\text{True Positive}}{\text{True positive+False Positive}}$$

The results are as given at Table 3.

The findings of the classification analyses showed that C4.5 algorithm classified the instances correctly with the highest percentage (76.977%) for Turkish participants. Multilayer Perceptron had been the second best while KNN took the last place.

All of the tree algorithms were more confident and sensitive to classify no smoker class (class 2). The results showed that the performance measures for "no smoker" class for all algorithms were higher than 80%.

When the time taken to build model was searched, KNN algorithm took the first place with 0.00 seconds. C4.5 followed it with 0.08 seconds. Multilayer perceptron required more time to build model compared the other two algorithms. Thus, if the rate of correctly classified instances was important for decision makers, C4.5 algorithm dominated the other algorithms with the high correctly classification rate. On the other hand, if the speed of the analysis was primary for them, KNN algorithm was the best among three methods. In this study, the correct classification rate was the vital factor for us. Correspondingly, the C4.5 algorithm had the first place for our analyses. A detailed decision tree was obtained as an output of the C4.5 algorithm. Although the entire decision tree was too big to represent in one figure, only one section of the tree was represented in this paper (as seen in figure 2).

Table 3. Performance measures of three different classification methods on Turkey case.

		KNN	C4.5	Multilayer Perceptron
Correctly classified instances (%)		76.743	76.977	76.875
Precision	Class 1 (smoker)	0.536	0.548	0.534
	Class 2 (no smoker)	0.816	0.811	0.828
	Weighted Average	0.748	0.746	0.756
Recall	Class 1 (smoker)	0.381	0.348	0.439
	Class 2 (no smoker)	0.893	0.907	0.876
	Weighted Average	0.767	0.770	0.769
F value	Class 1 (smoker)	0.446	0.426	0.482
	Class 2 (no smoker)	0.853	0.856	0.851
	Weighted Average	0.753	0.751	0.761
Time is taken to build model (sec)		0.00	0.08	12.53
Total Num. of Instances	9825	9825	9825	9825

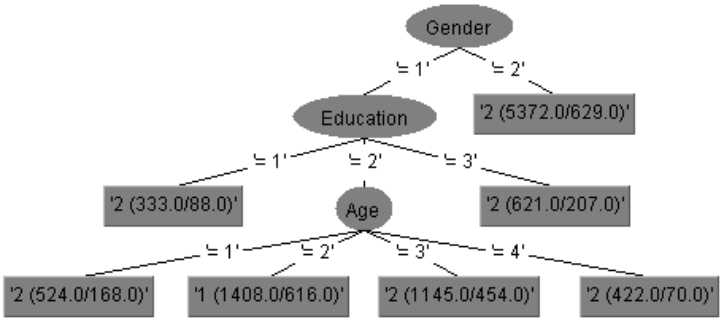

Figure 2. The C4.5 decision tree.

The algorithm started to classify the smoking status of people according to their genders. Males (represented with "1" in the figure) divided by new branches while all females (represented with "2" in the figure) were categorized directly as no smokers. Thus, we may say that this decision tree is more capable of classifying smoking status of males compared to females.

The algorithm continued to classify the smoking status of males according to their education levels. Males who are not graduated from any school (represented by 1) or graduated from higher education (BSc, MSc, PhD) (represented by 3) were classified as no smoker by the algorithm. Males who took primary education (represented by 2) were categorized according to their age group. The algorithm classified the males (who are primarily educated) aged among 15-24 (represented by 1), 45-64 (represented by 3), and 65+ (represented by 4) as no smoker while males aged 25-44 as smoker.

Finally, the findings belonging to Turkey were compared with six other European countries by implementing the best performing algorithm (C4.5). The C4.5 algorithm implemented for the GATS data from Greece 2013, Kazakhstan 2014, Poland 2009-2010, Romania 2011, Russia 2016, and Ukraine 2017. Table 4 exhibits the results of classification analysis of C4.5 algorithm for these countries. The findings indicated that C4.5 produce the highest correctly classification rate for Ukraine (80.369%). Kazakhstan followed Ukraine with 78.133%. Among countries, Greece had the lowest (68.910 %). Turkey took the fourth place after Romania with 76.977%.

Table 4. Performance measures of C4.5 algorithm for different countries.

		Greece	Kazakhstan	Poland	Romania	Russia	Ukraine
Correctly classified instances (%)		68.910	78.133	69.676	77.473	75.542	80.369
Precision	Class 1 (smoker)	0.616	0.531	0.584	0.583	0.598	0.569
	Class 2 (no smoker)	0.722	0.840	0.701	0.785	0.805	0.840
	Weighted Average	0.681	0.768	0.665	0.738	0.744	0.782
Recall	Class 1 (smoker)	0.498	0.435	0.064	0.127	0.489	0.357
	Class 2 (no smoker)	0.808	0.885	0.980	0.972	0.865	0.926
	Weighted Average	0.689	0.781	0.697	0.775	0.755	0.804
F value	Class 1 (smoker)	0.551	0.478	0.115	0.208	0.538	0.439
	Class 2 (no smoker)	0.762	0.862	0.817	0.869	0.834	0.881
	Weighted Average	0.681	0.773	0.600	0.714	0.748	0.786
Total Num. of Instances		4352	4404	7786	4488	11440	8227

Even though %76.977 correctly classification rate was not so high enough to make certain judgments about the smoking status of people, we should remind that the main purpose of this study was to classify the smoking status only with the limited number of socio-demographic characteristics of the individuals. Hence the obtained results can be acceptable considering the limits determined in the presented study.

Discussion

Tobacco use is still a prevalent issue[41] that treats the world population. In order to understand the behavior of smokers, countries collects considerable amount of data with the help of the WHO. This study focused on how the GATSs data can be used for extracting valuable knowledge about smoking related facts. Our main concern has been seeking for a relation between the smoking status and socio-economic factors. Initially, three different classification algorithms: KNN, multilayer perceptron, and C48 algorithms were used on the GATS data from Turkey (2012). Subsequently, the algorithm that provided the best classification results for Turkey was also used for other six European countries: Greece, Kazakhstan, Poland, Romania, Russia, and Ukraine to evaluate the performance of the algorithm on different data sets.

The outputs of the analyses indicated that C4.5 algorithm classified the instances of Turkey more correctly than other two algorithms. That is why; the C4.5 algorithm was used for the classification of the smoking status of individuals for Greece, Kazakhstan, Poland, Romania, Russia, and Ukraine. Ukraine had the highest correctly classification rate among them while Greece had the lowest. The results mainly showed that Ukraine, Kazakhstan, Romania, and Turkey had considerable classification performance for the C4.5 algorithm when compared to others.

The findings of the analyses indicated that the smoking status of approximately 80% of GATS participants was correctly classified by using socio-demographic factors. The best performing algorithm (C4.5) for Turkey was found to be much more capable of classifying the smoking status of males. One of the main reasons of this fact can be the lower number of female smokers in the studied sample. The algorithm could classify the male participants according to education level and age group. Thus, some characteristics such as education level and age group may be accepted as more influential factors compared to others. This may show us that the data about socio-demographic characteristics provided by GATSs can be used as a clue for prediction of smoking status of individuals by decision makers. Thus, this paper showed a convenient application how the GATS data can be used for different purposes besides monitoring the prevalence of tobacco use and the effects of key tobacco control measures. The findings of the study can be helpful to understand the relationships between the smoking status of the individuals and their fundamental characteristics. The findings can also be used to compute the likelihood of an individual to be a smoker in the future. Thereby, some of the smoking cessation policies can be adjusted according to the different age and education groups. Executing the different policies for different groups is expected to be more effective (less cost and time) when compared to implementation of a general set policy.

Hence, conducting detailed analyses with advanced data mining methods using the GATSs data can increase knowledge on smoking issues. Conversion the GATSs data to a more valuable and understandable structure may be beneficial for decision makers and policy makers to use the new form of the data in order to provide scientific evidence for future decision support. However, the performances of the algorithms can change according to the studied database. For example; C4.5 algorithm classified the instances in Turkey case better than Greece case. That is why; it is important to keep in mind that testing the performance of the different algorithms is crucial to extract valuable knowledge from the GATSs data.

This study has also some limitations. In the content of this study, the classification performances of the three data mining methods were tested. Different classification algorithms can also provide better or worse

results than the performed analyses for the studied cases. The algorithm which had the highest correctly classification rate for this study was only capable of classifying the smoking status of males in detail. Studying with different algorithms may also provide a comprehensive classification for females, too and overcome this problem of the performed study. Moreover, the GATS Turkey data was used for the analyses. The comparison analysis was conducted only with countries located in WHO Europe region. The performance of the algorithms can also be tested with the data of other world countries to obtain a vast frame for this topic.

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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Reliability and validity of the Dari version of the World Health Organization quality of life (WHOQOL-BREF) questionnaire in Afghanistan

Dünya Sağlık Örgütü yaşam kalitesi ölçeği Afgan Dari sürümünün (WHOQOL-Bref-Dari) geçerliliği ve güvenilirliği

Nasar Ahmad Shayan[a], Erhan Eser[b], Ahmad Neyazi[c], Sultan Eser[d],

[a] Asst. Prof., Department of Public Health and Infectious Diseases, Faculty of Medicine, Herat University, Herat, Afghanistan.
[b] Prof., Manisa Celal Bayar University School of Medicine Dept. of Public Health, Manisa, Turkey.
[c] Med. Stu., Faculty of Medicine, Ghalib University, Head of Supervision Commission, Afghanistan Medical Students Association, Herat, Afghanistan.
[d] Prof., Balıkesir University Faculty of Medicine Public Health Department, Balıkesir, Turkey.

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ABSTRACT

Objective: The aim of this study was to culturally adapt and validate the WHOQOL-BREF into Dari language of Afghanistan. **Methods:** This study consisted of two stages: translation stage and psychometric analyses. Reliability analyses were done by Internal consistency (alpha value) and item total correlations and validity analyses consisted of convergent validity by SF-36 scale, confirmatory factor analyses and criterion validity (multiple linear regression by overall QoL item-q1) analyses. Acceptable type 1 error was considered as 0.05 in all analyses (n=1473). Analyses were done by using Lisrel v8.05 statistical package. **Results:** Item-domain correlations and -if item deleted-Cronbach alpha values detected no problematic item. The range of alpha values is 0.79-0.80, except for the social relations domain (alpha=0.41). Confirmatory factor analyses revealed goodness of fit results as: GFI: 0.88, CFI: 0.83; and RMSEA: 0.073. Physical and Psychological domains of the WHOQOL-BREF was highly correlated with the related domains of the SF-36 (r=0.60 and 0.64). All of the known groups' categories were significantly sensitive to all domain scores of the WHOQOL ($p<0.001$). Multiple regression analysis revealed a R2 value of 35% and all domains. **Conclusion:**Afghan Dari version of the WHOQOL-BREF can confidently be used in clinical and population settings to assess the QoL of the people. Findings of the social relations domain should be interpreted with caution due to its poor psychometric power. Further studies are needed to address the social aspects of quality of life in Afghan population.

Keywords: Quality of life, World Health Organization, reliability and validity, Afghanistan

Correspondence: Nasar Ahmad SHAYAN, Department of Public Health and Infectious Diseases, Faculty of Medicine, Herat University, Herat, Afghanistan. **E-mail:** n.a.shayan@gmail.com . **Tel:** +93 700429941.

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ÖZ

Amaç: Bu çalışmanın amacı, Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği Kısa sürümünü (WHOQOL-BREF) Afganistan'ın Dari diline kültürel olarak uyarlamak ve psikometrik özelliklerini ortaya koymaktdır. **Yöntem:** Bu çalışma iki aşamadan oluşmaktadır: çeviri aşaması ve psikometrik çözümlemeler. Güvenilirlik, iç tutarlılık (alfa değeri) ve madde toplam korelasyonları ile araştırılmıştır. Ölçeğin geçerlilik çözümlemeleri, SF-36 ölçeği ile birleşim-ayrışım geçerliliği, doğrulayıcı faktör analizleri ve ölçüt geçerliliği (genel YK madde-q1 ile çoklu doğrusal regresyon) analizlerinden oluşmaktadır. İstatistik çözümlemelerde tip 1 hata sınırı 0.05 olarak kabul edilmiş, çözümlemeler Lisrel v8.05 ve SPSS 23 istatistik paketleri kullanılarak yapılmıştır. **Bulgular:** Bütün istatistik çözümlemeler Heart toplumundan gönüllülerden oluşan 1473 yetişkin birey üzerinde yürütülmüştür. Alfa değerleri aralığı, sosyal ilişkiler alanı (alfa = 0.41) dışındaki alanlarda 0.79-0.80'dir. Madde-alan korelasyonları ve-madde silinince-Cronbach alfa değerleri sonuçları, ölçeğin psikometrik açıdan sorunlu maddesinin olmadığını ortaya koymuştur. Doğrulayıcı faktör analizleri uyum iyiliği göstergeleri şöyledir: GFI: 0.88, CFI: 0.83; ve RMSEA: 0.073. WHOQOL-BREF'in fiziksel ve psikolojik alanları, SF-36'nın ilgili alanlarıyla orta-yüksek oranda korelasyon göstermiştir (r = 0.60 ve 0.64). Bilinen tüm grupların kategorileri, WHOQOL'un tüm alan puanlarına önemli ölçüde duyarlıydı (p <0.001). Çoklu regresyon çözümlemesi 0.35'lik bir belirleyicilik katsayısı (R2) değeri ortaya çıkardı. **Sonuç:** WHOQOL-BREF'in Afgan Dari versiyonu, insanların yaşam kalitesini değerlendirmek için klinik ve nüfus ortamlarında güvenle kullanılabilir. Sosyal ilişkiler alanının bulguları, psikometrik gücünün zayıf olması nedeniyle dikkatle yorumlanmalıdır. Afgan nüfusunda yaşam kalitesinin sosyal yönlerini ele almak için daha fazla çalışmaya ihtiyaç vardır.

Anahtar kelimeler: Yaşam kalitesi, Dünya Sağlık Örgütü, güvenilirlik ve geçerlilik, Afganistan

Introduction

There has been an increasing focus on measuring the quality of life (QoL) in clinical settings as well as evaluations of the effects of different interventions due to the increasing life expectancy in recent decades, beyond conventional health indicators. World health organization quality of life group (WHOQOL Group) defines for quality of life as "Individuals perception of their position in life in the context of the culture in which they live and the value systems they have about their goals, expectations, standards, and concerns".[1-3]

Quality of life assessments have been widely used in health services for different purposes, either in health inequalities research or in clinical practice, to decide alternative treatment methods. Both generic and disease specific quality of life instruments have been developed to for different purposes in medical practice mostly used in combination with each other. Well developed, globally accepted and widely used generic quality of life instruments give the chance of international comparisons to the researchers. In earlier decades, a variety of instruments have been developed to measure the quality of life in different countries, though most of them are appropriate only in their relevant populations. However, some are culture-free, and others can translate them into other languages for use in different societies after convenient development and localization. The World Health Organization (WHO) has developed a generic quality of life instrument which takes many subjective aspects of quality of life. The 100 item long (WHOQOL-100) and 26 item short (WHOQOL-BREF) versions of the WHOQOL that have been developed by the WHOQOL Group, serve as the official generic quality of life instruments of the WHO.[4] The

WHOQOL-100 covers six different domains and many of these domains seem to be cross-culturally important. It includes physical wellbeing, mental state, psychological state, social connections, individual's convictions and connections as salient features of the environment. Among the current QoL instruments available, the WHOQOL more likely to provide valid scores for comparison across community groups.[5] The only problem with WHOQOL-100 is that, it is not easy to respond because of its high number of items which makes the volunteer uncomfortable. [6-10]

The 26 item WHOQOL-BREF on the other hand, is one of the best among others and is available in more than 40 languages not only in normal populations but also recently in various diseases and conditions such as substance use disorder patients [11] and type two diabetes.[12-14] It has only 26 items as opposed to 100, though it aims to cover a broad range of quality of life facets divided into four main domains: The Physical, Physiological, Social, and the Environmental domains. The WHOQOL-BREF has been translated and validated into many languages in more than 40 countries so far but has not been validated in Afghanistan yet.[15] A globally used, brief and cross culturally accepted generic quality of life tool is needed in health inequalities research and medical practice in Afghanistan. Afghanistan is a multi-ethnic country with Pashtuns, Tajiks, Uzbeks and Hazaras making up most of the population although Dari is one of the languages mostly used by the people of Herat city in Afghanistan and most of them are comfortable with Dari language. Dari is the first official language of Afghanistan, also known as Farsi or Afghan Persian.

The aim of this study is to culturally adopt the WHOQOL-BREF into Dari language of Afghanistan and test the reliability and validity of the Dari version of the WHOQOL-BREF.

Methods

Instruments

WHOQOL-BREF

The WHOQOL-BREF is a 26-item brief version of the WHOQOL questionnaire. The WHOQOL-BREF covers four individual domains such as: Physical health (activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity); Physiological health(bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality /religion/personal beliefs, thinking, learning, memory and concentration); Social Realtionships (personal relationships, social support, sexual), and Environmental health (financial resources, freedom/physical safety and security, health and social care: accessibility and quality, home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation/ leisure activities physical environment (pollution/ noise/ traffic / climate) issues. Higher WHOQOL-BREF scale scores indicate better quality of life.

Translation of WHOQOL-BREF 26 assessment into Dari language was authorized by World Health Organization according to subject ID 278331 Permission request for WHO copyrighted material.

SF-36

SF-36 is an abbreviated name of Medical Outcomes Study (MOS) 36-Item Short Form. It was developed by Ware JE. et al [16] and validated to Dari by Shayan NA et al. [17] Its objective is to satisfy minimum psychometric standards necessary for group comparisons involving generic health concepts. SF-36 was designed to measure physical and mental health (component summary scores) based on 8 health sub-dimensions: physical and social functioning, role limitations due to physical and emotional problems, mental health, vitality, bodily pain, and general health perception.

Linguistic and Cultural Adaptation

Cultural adaptation of the WHOQOL-BREF into Dari has consisted of two phases: translation phase, and the following cognitive debriefing (pilot) interviews. Forward translations were done by four independent translators and a consensus Dari version was developed by an expert linguist. The back translation of the Dari consensus version of the WHOQOL-BREF into English was done by a bilingual person. The Dari version was revised accordingly by a panel discussion with the translators, when any inconsistency was detected between the original English version and the back translated version.

Cognitive debriefing interviews were carried out on 30 healthy individuals. Following the completion of the questionnaire, everyone was asked to give their feedback about each of the items and response scales of the WHOQOL-BREF and each of the instruction sentences of the instrument. They were asked to tell: (a)" Whether they were able to understand each of the items and each of the instruction sentences or not?" (b) "If there is any word or phrase that they did not understand" if so, (c)"how would they rephrase the question or the sentence?". Eventually, agreed changes were made on the field trial WHOQOL-BREF Dari version.

Finally, the respondents were also asked to do Thurstone sort card exercise to confirm the correct order of response options in Dari version. It took almost 10 minutes for everyone to complete the questionnaire. The volunteers were able to understand all the items and instructions with minimal modifications.

Study sample and Data collection

Field trial sample is a representative sample of Herat City, Afghanistan. The 2018 census of the Herat was around 270 000 [18] The number of households is around 45 000 in the city. The sample size of the study was calculated as 1500, taking the multidimensional poverty rate to be 24.9%; design effect for education 1.82; acceptable sampling error 3%, with a confidence level of 95%. [19]

This study sample was chosen by using a district based multistage (stratified, cluster sampling) sampling method. Volunteers consist of both healthy and unhealthy (who stated that they have at least one or more medical condition receiving some form of medical care) aged 18 or above. Only one adult was selected from each of the households. 1473 persons participated (804 were males and 669 females) to the study. The participation rate was 98.2%. The gender imbalance was due to the higher willingness of men to participate to the study than women. The inclusion criteria were being over age 18 and speaking the Dari language. Questionnaires were administered by medical school students during face-to-face interviews.

Psychometric analyses

Psychometric analyses of the WHOQOL-BREF Dari version is consisted of scale distribution properties and item analyses followed by internal consistency and validity analyses.

Distribution properties

Minimal acceptable limits for Floor and Ceiling value percentages were considered as ≤ 10% [20] and Skewness and Kurtosis limits as 1.0. [21]

Reliability analyses

Both reliability and Validity analysis were based on confirmatory approach. Internal consistency (IC) of the individual domains were tested by Cronbach's alpha.[22] Alpha value refers to the degree to which all the items of the scale really measure the same concept and, 0.70 and above indicates a good internal consistency.[22] Another internal consistency measure used in this study is "item-total" correlations that reveals item success. If this happens for all questions, it can be said 100% item success for the scale.

Identifying potential problematic items

We used two different approaches: (a) "If item removed alpha values" and item scale correlations were used to detect any problematic items. If a question is a potentially problematic item question, the scale alpha value obtained when the question is removed will be greater than the alpha value calculated without removing the question (b) A potentially problematic has a correlation coefficient lower than 0.30 with its own dimension score. For any item, we conclude that this item is a problematic item, if both of these occur.

Validity analyses

Convergent validity, known groups' (discriminant) validity and confirmatory factor analysis was employed for the assessment of construct validity of the WHOQOL-BREF Dari version. Criterion validity was assessed by correlating each of the domain scores with general quality of life item (q1) of the WHOQOL-BREF.

Convergent validity

Convergent validity analysis aims to demonstrate a correlation between the two measures' conceptually related dimensions. SF-36 was used to test convergent validity of the WHOQOL-BREF in this paper.

Discriminant and Known group's' validity
Gender, education, social class and presence of any illness were used for known groups'/ discriminant analyses. The discriminative ability of the instrument between a subgroup were assessed by Student's t test indicating the known groups validity of the measurement. Effect size statistics (i.e. mean differences divided by pooled sd.) were computed to determine the magnitude of the difference in mean scores [23]. A Cohen's D (ES) value closer to 0.20 indicates a small effect, whereas 0.50 a medium and 0.8 and over a big effect in two groups' comparisons.

Factor Analysis
A third approach that was used in this manuscript for testing the construct validity of the WHOQOL-BREF-DARI was the Confirmatory Factor Analyses (CFA). Fit indices generated by CFA were used to test the original WHOQOL scale structure of the Dari version of the WHOQOL-BREF. Root Mean Square Error Approximation (RMSEA) and Comparative Fit Index (CFI) Tucker Lewis Index (TLI) and Root Mean Residuals (RMR) and Chi square tests. Critical acceptable threshold is 0.90 for CFI and TLI and 0.08 for RMSEA and RMR. [21]

Criterion validity
Linear regression analysis showed the correlations of the WHOQOL-BREF domain scores with each general quality of life item (q1) of the WHOQOL-BREF.

Univariate analyses were done by using SPSS v23 and the confirmatory factor analysis was examined by LISREL 8.5. Type 1 error is taken as 0.05 in all statistical analyses.

Results
Socio-demographic characteristics
Of the 1473 respondents, 54.6% men and 45.4% women with a mean age of 37.6±14.2 years (min 14, max 86). The 38.0% of the study sample was 18-29 years old, while 14.8% was 30-39; 24.6% was 40-49 years old and 22.6% was 50 and over. Only 47.25% (n=696) of the respondents were graduated from any school; 41.96% (n=618) were illiterate and 10.79% (n=159) were just how to read and write. Only 25.4% of the respondents perceived themselves as poor; 46.0% as moderate and 28.6% as good or wealthy. About one quarter of the respondents self-reported an existence of an important illness (25.2%). Only 6.5% was current smokers and a great majority of the study sample (89.1%) stated that they had no access to health services.

Psychometric results
Scale distribution
Item frequency analyses showed that the floor and ceiling effects range for each domain are in acceptable limits for all domains. The range of the floor effects was 0.0 to 0.3% and ceiling effects was 0.1 to 3.2% for the domains of WHOQOL-BREF. Skewness and Kurtosis values showed that all the four domain scores were normally distributed (<1.0) **(Table 1).**

Reliability Results
The Cronbach's alpha values of all the domains were satisfactory (0.79 to 0.80) except for the social relationships domain which is quite low (0.41). Item-scale correlations and "if item removed alpha" values indicated no problematic items of the WHOQOL-BREF Dari version. All the 26 items were correlated with their own domains higher than with other domains, indicating 100% "item success". **(Table 1).**

Validity Results
Physical health and Psychological domain scores of the WHOQOL- BREF and SF-36 are highly correlated each other (acceptable

Table 1. Item descriptive statistics and reliability properties (Cronbach's alphas, correlation coefficients)

Dimensions of the WHOQOL-BREF	Mean±sd#	Floor %	Ceiling %	Skewness (SE)	Kurtosis (SE)	α (if item deleted alpha range)	Cor. range (r)	Item Success Rate %
Physical health	62.6±17.2	0.0	0.5	-0.32(0.06)	-0.11 (0.13)	0.79 (0.74-0.78)	0.63-0.75	100
Psychological health	60.5±17.8	0.0	0.6	-0.17(0.06)	-0.42(0.13)	0.79(0.73-0.78)	0.62-0.79	100
Social Relations	62.1±19.4	0.3	3.2	-0.30(0.06)	-0.11(0.13)	0.41(0.22-0.37)	0.65-0.75	100
Environmental health	52.0±16.4	0.2	0.1	-0.06(.06)	0.24(0.13)	0.80(0.77-0.79)	0.60-0.70	100

α: Cronbach's alpha value; Cor. range: Range of Item-scale correlation coefficients (corrected for overlap);
Item success: summary success percent for items discrimination (indicates significant correlation between item and its own dimension scores)

convergence) (r=0.52 and 0.60), whereas environmental domain of the WHOQOL is not correlated with neither physical health nor psychological sub dimensions of the SF-36 (poor convergence) as expected. Social relationships domain of the WHOQOL also fails to be correlated with the social dimension of the SF-36 indicating poor convergence. **(Table 2).**

As for the know groups validity analyses, all the known categories of the gender, level of education and social class were significantly sensitive to all the four domain scores of the WHOQOL ($p<0.001$). The WHOQOL-BREF Dari version was able to discriminate between healthy and chronic ill people

Confirmatory factor analyses showed acceptable goodness of fit results for RMR (0.066) and RMSEA (0.073), but GFI (0.88) and CFI (0.83) values were lower than acceptable limits **(Table 4).**

Multiple linear regression analysis -using overall QoL item (item q1) as the dependent variable- revealed a R^2 value of 35%. All the four domains of the WHOQOL-BREF-Dari version except that of Social relationships domain (β =0.03) could explain the variance of the q1. The best predicting domain is the Environmental domain on overall QoL. Social relationships domain could not predict overall QoL at al. **(Table 5).**

Table 2. Correlation between the dimensions of the WHOQOL-BREF and SF-36 scales for convergent-discriminant validity

Dimensions	SF-36							
	Physical function	Role limit. Physical health	Pain	General health	Energy	Social function	Role limit. Emotion	Emotion. Well-being
SF-36 Dimension scores	72.51±22.72	56.19±33.28	69.11±25.11	61.48±21.81	61.77±20.18	68.15±22.08	57.02±37.13	64.11±19.65
WHOQOL-BREF								
Physical health	0.517**	0.375**	0.580**	0.638**	0.599**	0.506**	0.336**	0.548**
Psychological health	0.332**	0.266**	0.440**	0.580**	0.585**	0.473**	0.305**	0.602**
Social Relations	0.162**	0.133**	0.194**	0.309**	0.320**	0.230**	0.126**	0.320**
Environmental health	0.100**	0.114**	0.185**	0.304**	0.292**	0.202**	0.122**	0.284**

** *p<0.01*

Women were much worse than men in terms of physical health, psychological and environmental dimensions, whereas social class has moderate to high level of discriminable effect on all the four domains. The physical health domain score was more negatively affected by having a chronic illness (ES= 1.23) compared to other domains (ES range= 0.27-0.43). Environmental domain was more sensitive to socioeconomic independent variables such as level of education (ES=0.78) and social class (ES=0.75) and BMI was moderately sensitive to physical health domain (ES=0.31) and Environmental domain (ES=0.36). **(Table 3).**

Linear regression analysis showed the correlations of the WHOQOL-BREF domain scores with each general quality of life item (q1) of the WHOQOL-BREF.

Discussion

Recent political developments in Afghanistan are expected to have positive influences on the health sector of the country that covers broader approach to determinants of health and the assessment of the outcomes of the health interventions both in public health and in the clinical practice. [24] In order to measure well-being of the people living in Afghanistan, standard quality of life assessment need to be used [25]. This study assessed the cultural adaptation of the Afghan Dari language version of the WHOQOL-BREF.

Cultural adaptation of the original WHOQOL-BREF to Dari language followed the international translation procedures including forward and backward translation. In the Herat city, the 4th largest city of the country. The large sample size of the study

Table 3. Known groups validity of the WHOQOL-BREF Dari version

	Gender	Education	Social Class	illness
	Female<Male	Illiterate< (Literate only =Educated)	Lower<middle<upper	ill<well
Physical health	0.56***	0.34***	0.47***	1.23***
Psychological health	1.59***	0.39***	0.63***	0.43***
Social Relations	0.30***	0.32**	0.41***	0.39***
Environmental health	1.09***	0.78***	0.75***	0.27**

Effect size differences in WHOQOL-BREF dimension scored by socio-demographic and physical health conditions.

Effect Size (Cohen's d): two groups: 0.2 low, 0.5 medium, 0.8 large; three or more groups: 0.2 low, 0.5 medium, 0.8 large;
** p<0.05, ** p<0.01, *** p<0.001*

† Body Mass Index categories: <18.5=1; 18.66 to 24.99=2; 25.00 to 29.99=3; 30.00 and over=4

allows generalizability of the results to Dari language, one of the leading official language of Afghanistan.

The distribution properties of the WHOQOL-BERF Dari version were found quite satisfactory with very low floor and ceiling effects and acceptable Skewness and Kurtosis value limits, consistent with the results of several studies in the literature .[9,12,26-27] Internal consistency of the scale was assessed by Cronbach Alpha value and three of four domains of the WHOQOL-BREF Dari version revealed adequate Cronbach Alpha values (0.79 to 0.80) except for Social Relations domain which had Cronbach Alpha value of 0.41. Similar lower Cronbach Alpha values of Social Relations domain were obtained in some other studies conducted in Bangladesh, Denmark, UK, Norway, Iran, Japan, Sierra Leone & Turkey. [1,13,28-30]

A possible explanation of this low internal consistency in social relations domain might be the misconception of the items by the illiterate respondents. A stratified analysis of illiteracy/literacy (not present in the results) showed that the Cronbach Alpha value is 0.38 in illiterate people whereas it is 0.43 for literate people. Additionally, we felt the necessity of exploring existence of any problematic item and we run "if item deleted alpha values" for each of the domains and found no problematic item in any of the domains of WHOQOL-BREF Dari version. What makes us comfortable is the moderate to high item-domain correlations (0.60-0.79) for all domains of the WHOQOL-BREF Dari version. We tested the construct validity of the WHOQOL-BREF Dari version by three different methods: Convergent-divergent validity, known groups validity and the factor analyses. The generic SF-36 scale was used to assess the convergent validity of the WHOQOL-BREF Dari version. The correlation coefficients between the WHOQOL-Bref Physical dimension score and the dimensions of SF-36 related to physical well-being were obtained higher than the correlation coefficients between the WHOQOL-Bref /Psychological dimension score and the dimensions of SF-36 associated with mental/emotional health. Social relations domain and the environmental domain scores of the WHOQOL-BREF Dari had poorer convergence with the related domain of the SF-36. Our results are consistent with some other papers in which, the environmental health domain of the WHOQOL-BREF had no significant correlations with any of the domains of the SF-36. [31] The poor convergence of the WHOQOL-

Table 4. Summary reports of confirmatory factor analyses of the WHOQOL-BREF Afghan Version

Fit indices	Value
RMSEA	0.073
CFI	0.83
GFI	0.88
TLI	0.81
Stand.RMR	0.066
χ^2	2174
Df	246

Table 5. Criterion validity of the WHOQOL-BREF Dari version (with overall quality of life item-q1)

R2=0.35			Collinearity Statistics	
Dependent variable (overall quality of life item-q1)	Std. Beta	p	VIF	Std. Eror
Constant		0.007		
Physical health	0.10	0.001	0.51	1.97
Psychological health	0.28	0.000	0.45	2.30
Social Relations	0.03	0.161	0.74	1.36
Environmental health	0.30	0.000	0.73	1.37

VIF: Variance Inflating Factor

BREF environmental domain with neither physical nor psychological domain scores may be due to its content of socio-economic drive. Hence environmental health domain represents the socioeconomic well-being of the respondent and was not sensitive to any health related concepts which was shown in several studies including original WHOQOL group papers. [7,27,30,32]

Lower environmental domain scores were also obtained from the less developed European study sites such as Romania and Turkey in the WHOQOL global study mentioned above. Our known groups validity results also confirmed the higher sensitivity of the environmental health score to the socioeconomic indicators: quite big effect size figures were obtained for education (0.78) and social class (0.75) variables. On the other hand, several studies indicated that there is not a good convergence between WHOQOL and SF-36.[30,33-34]

The known groups validity analyzes are performed to show previously proven relationships. The women, the ill and low educated people and also those people who belonged to a lower social class are previously known as disadvantaged groups in the community from the perspective of quality of life. Our results indicated that, all four domains of the WHOQOL-BREF Dari version are sensitive to gender, education, social class, objective health status, consistent with literature findings. [6,8,35]

The confirmatory factor analyses results, as the third method of testing the construct validity of the WHOQOL-Dari version showed moderate to high goodness of fit results. RMSEA and RMR values were both in acceptable limits (<0.08) whereas confirmatory fit indices were around 0.83 to 0.88 showing moderate fit to the original WHOQOL-BREF scale structure. In contrary with the satisfactory RMR and RMSEA findings, moderate CFI results were obtained

in several other WHOQOL validation studies, including the original WHOQOL development study. [15,36-37]

Criterion validity of the WHOQOL-Dari version is shown by a linear regression of the Overall QoL item of the WHOQOL over the domain scores. The best Beta values were obtained for Physical health and Social relations domains. The only non-significant domain is the environmental domain. A similar finding was reported in Turkish [30] and Polish [31] validation studies. This is also consistent with our finding that environmental domain is the weakest related domain with illness variable, that was shown in the known groups' validity findings of our study.

There are several limitations of this study. First, the WHOQOL-BREF Dari has been face to face administered to the respondents due to the high portion (about 42%) of illiterate population, which might positively bias the results of this study. Secondly, it was not always possible to fulfill personal privacy during the interviews. And finally, the men/women participation rate was higher in favor of men due to restrictions of social inclusion of the women to the Afghan community.

Conclusion

As we know, this is the first study on Afghanistan's general population demonstrating the relation between socio-demographic variables and QoL domains. Afghan Dari version of the WHOQOL-BREF can confidently be used in clinical setting and in population level to assess the QoL of the people. The results of the social relations domain should be interpreted with caution due to its poor psychometric power. Further studies are needed to address the social aspects of quality of life in Afghan population.

Abbreviations
WHOQOL-Bref: World Health Organization Quality of Life- Bref
QoL: Quality of Life
RMSEA: The Root Mean Square Error of Approximation
CFI: Confirmatory factor analyses
SF-36: Short form survey 36
GFI: comparative fit index
RMR: Root Mean Square Residual
TLI: Tucker-Lewis index
Df: degrees of freedom
χ**2**: chi square

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Ethical Declaration: The study was ethically approved by Ghalib University Ethics Committee. A detailed description of the study, benefits, confidentiality and the informed consent procedures was explained during the initial contact with prospective participants prior to their participation. All the collected information from this study would be treated confidentially and only accessible by the members of the research.
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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Investigation of psychological characteristics of young adults during the COVID-19 pandemic period

COVID-19 pandemisi döneminde genç erişkinlerin psikolojik özelliklerinin araştırılması

Ayşe Sonay Türkmen [a], Ali Ceylan[b], Ayşe Topuz[c]

[a] Assoc. Prof., Karamanoğlu Mehmetbey University Faculty of Health Sciences Nursing Department, Karaman, Turkey
[b] Msc., Karamanoğlu Mehmetbey University Health Services Vocational School Physiotherapy Program, Karaman, Turkey
[c] Msc., Karamanoğlu Mehmetbey University Health Services Vocational School Dialysis Program, Karaman, Turkey

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ABSTRACT

Objective: Aim of this study was to investigate the possible effects of changing living conditions due to COVID-19 in young adult individuals. **Methods:** The study was conducted as a descriptive relation-seeker-type. A total of 551 young people were reached. Questionnaire, Perceived Stress Scale, Health Anxiety Scale-Short Form and Maudsley Obsessive Compulsive Question List were used. For Analysis was used number, percentage, mean, standard deviation, chi-square, t test, ANOVA, Tukey-HSD and Pearson correlation tests. **Results:** The average age of the participants was 22.60 ± 3.49 years. 74% are women, 88.6% are single, 53.4% are students (health). The average stress score of individuals is 30.44±7.86, the average HAS-1 is 14.32±6.22, the average HAS-2 is 3.43±2.34 and the average MOCQ is 17.79±7.19. In terms of obsessive-compulsive disorder, 10% (n=55) of the participants showed low trends, 29.9% (n=165) moderate, and 60.1% (n=331) showed a high level of trend.It was determined that individuals' perceived stress, anxiety and obsessive-compulsive behavior levels changed according to variables such as age, gender, marital status, occupation, presence of chronic disease, smoking and quarantine status ($p<0.05$). **Conclusion:** It was determined that young people experienced psychological problems due to the COVID-19 outbreak, and these problems changed according to demographic characteristic.

Keywords: COVID-19, young adult individual, perceived stress, anxiety, obsessive-compulsive behavior

Correspondence: Ayşe Sonay TÜRKMEN, Karamanoğlu Mehmetbey University Faculty of Health Sciences Nursing Department, Karaman, Turkey. **E-mail:** asonaykurt@gmail.com. **Tel:** +90 0505 378 20 41.

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ÖZ

Amaç: Bu çalışmanın amacı, genç erişkin bireylerde COVID-19 nedeniyle değişen yaşam koşullarının olası etkilerini araştırmaktır. **Yöntem:** Araştırma, tanımlayıcı ilişki arayan tipinde yürütülmüştür. Toplam 551 gence ulaşıldı. Veriler anket formu, Algılanan Stres Ölçeği, Sağlık Anksiyete Ölçeği-Kısa Form ve Maudsley Obsesif Kompulsif Soru Listesi kullanılılarak toplandı. Analiz için sayı, yüzde, ortalama, standart sapma, ki-kare, t testi, ANOVA, Tukey-HSD ve Pearson korelasyon testleri kullanıldı. **Bulgular:** Katılımcıların yaş ortalaması 22.60±3.49 yıl idi. %74'ü kadın, %88.6'sı bekar, %53.4'ü öğrencidir(sağlık). Bireylerin ortalama PSS puanı 30.44±7.86, HAS-1 14.32±6.22, HAS-2 3.43±2.34 ve MOCQ 17.79±7.19'dur. Obsesif kompulsif bozukluk açısından katılımcıların %10'u (n=55) düşük, %29.9'u (n=165) orta ve %60.1'i (n=331) yüksek düzeyde eğilim göstermiştir.Bireylerin algıladıkları stres, kaygı ve obsesif-kompulsif davranış düzeylerinin yaş, cinsiyet, medeni durum, meslek, kronik hastalık varlığı, sigara ve karantina durumu gibi değişkenlere göre değiştiği belirlendi ($p<0.05$). Ayrıca PSS, HAS ve MOCQ ortalama puanları arasında pozitif ve istatistiksel olarak anlamlı bir ilişki vardı. **Sonuç:** Gençlerin COVID-19 salgını nedeniyle psikolojik sorunlar yaşadıkları ve bu sorunların demografik özelliklere göre değiştiği belirlendi.

Anahtar kelimeler: COVID-19, genç yetişkin birey, algılanan stres, kaygı, obsesif-kompulsif davranış

Introduction

The new coronavirus disease, which was first detected in the Wuhan city of Hubei province of China, has spread to the whole world in a short time and an unknown microbial pathogen has been reported to cause viral pneumonia in individuals.[1,2] It has been reported that symptoms such as fever, cough, difficulty in breathing, joint pain and fatigue may occur in individuals 2-14 days after contact with the pathogen.[3] As of June 2020, scientists continue to work for effective treatment and vaccination in the fight against COVID-19, while countries continue to work to reduce the effects of the epidemic in line with their own treatment protocols and decisions.

This global epidemic, which shook the world deeply, not only affected the health of infected individuals, but also brought significant psychological, sociological and economic consequences on society in all areas of modern life.[4] Knowing that an invisible microorganism causes disease, loss or death can lead to unreal fears, stress and panic in individuals.[5] Many people may exhibit cognitive responses and psychological behaviors such as anxiety, stress and obsessively when faced with such health-threatening situations.[6,7] The first of the reactions given in unexpected situations and against changing life conditions is the thoughts that occur uncontrollably, mostly compulsive actions, and the other is anxiety and stress, which causes the ability to understand.[8] In a study conducted during the SARS outbreak in Hong Kong in 2003, it was stated that psychological reactions such as high levels of stress, helplessness and post-traumatic symptoms were common in individuals.[9] In a study involving university students and employees in Spain and investigating the psychological effects of the epidemic and quarantine; individuals have been reported to experience moderate or severe anxiety, depression and stress.[1] In a study examining the effect of COVID-19 on mental health in young individuals, it was stated that individuals are prone to psychological problems and show signs of posttraumatic stress.[2] In a comprehensive study conducted during the epidemic in China, it was stated that all parameters of the psychological stress elements of healthcare workers were significantly higher than university students.[10]

Quarantine is an application that reduces the risk of transmission to other people by isolating them from other people and limiting their movements in order to determine whether individuals who are likely to carry infectious diseases are sick. In studies conducted on the psychological effects of long-term quarantine restrictions, it was reported that individuals who were treated with quarantine had negative behaviors such as post-traumatic stress symptoms, confusion, anxiety, and anger.[11-13]

In these days when the COVID-19 epidemic continues, it is thought that individuals' mental health may be affected due to the restrictions of their freedom, losing their jobs and loved ones, or fear of losing their loved ones, becoming infected, and death. In the literature review, no study investigating the effects of COVID-19 outbreak in young adult individuals was found in Turkey. For this reason, this study was conducted to investigate the psychological state of young adult individuals during the COVID-19 period.

Methods

The study was conducted as a descriptive relation-seeker-type. The population of the study consists of individuals between the ages of 18-30 living in the country. According to the sample calculation guide in the descriptive studies published by the World Health Organization; a minimum sample size of 384 was determined at ±2 error level (d), 50% disease prevalence, and 95% confidence interval.[14] A total of 551 young individuals were included in the study. The Questionnaire developed by the researchers, Perceived Stress Scale (PSS), Health Anxiety Scale-Short Form (HAS-SF) and Maudsley Obsessive Compulsive Questionnaire (MOCQ) were used as data collection tools. Data collection tools were sent to all individuals between the ages of 18-30living in a city center, randomly designated and available online. Individuals who volunteered to participate in the study and provided feedback were included in the study. The time to fill the forms is on average 10 minutes.

The Questionnaire

It consists of questions including demographic information such as age, gender, marital status, educational status, smoking and alcohol use, quarantine status, place of residence and knowledge levels about COVID-19 created by researchers.

Perceived Stress Scale (PSS)

This scale, which was developed by Cohen et al in 1983, was adapted to Turkish society by Eskin et al in 2013. This scale, consisting of 14 items in total, is designed to measure how stressful a number of situations in a person's life are perceived. The participants evaluate each item on a 5-point Likert scale ranging from "Never (0)" to "Very often (4)". 7 items with positive statements are scored in reverse (4,5,6,7,9,10,13). Total score varies between 0 and 56. As the scale score increases, the perceived stress level also increases.[15]

Health Anxiety Scale-Short Form (HAS)

The Turkish validity and reliability study of this scale, which was developed by Salkovskis et al in 2002, was conducted by Aydemir et al in 2013. It is a self-report scale consisting of 18 items. Scoring of the scale is between 0-3 in each item, and a high score indicates a high level of health anxiety. It consists of two factors; the first factor (HAS-1) includes the first 14 items of the scale and is called the body size, which represents the dimension of hypersensitivity and anxiety to physical symptoms. The second factor (HAS-2) includes the last 4 items of the scale and is called the dimension associated with the negative results of the disease. Cronbach's alpha value of the scale is 0.91.[16]

Maudsley Obsessive Compulsive Questionnaire (MOCQ)

Developed in 1977 by Hodgson and Rachman, this scale consists of 4 subscales and 30 items. It is a self-report scale that is measured by answering true / false type. The "true" answer is 1, the "false" answer is 0 points. This scale, which was made in 1988 by Erol and Savaşır in our country, became 37 items by adding 7 items to this scale. The scale's total score (MOCQ-T) ranges from 0 to 37. Scale; consists of control (MOCQ-C) (2, 6,

8, 14, 15, 20, 22, 26 and 28 items), cleaning (MOCQ-Cl) (1, 4, 5, 9, 13, 17, 19, 21, 24, 26 and 27 items), slowness (MOCQ-S) (2, 4, 8, 16, 23, 25 and 29 items), doubt (MOCQ-D) (3, 7, 10, 11, 12, 18 and 30) and rumination (MOCQ-R)(2, 8,31-37. items) subscales. The highest score is 37. It is 9 points for checking, 11 points for cleaning, 7 points for slowness and 7 points for doubt. Those who scored 8 or less in total show low tendency to obsessive compulsive symptoms, those who score between 9 and 15 have a medium level trend, and those who score 16 or above show a high level obsessive compulsive trend. The more points obtained from the scale, the more frequently the obsessive-compulsive symptoms occur.[17]

Analysis of the data was evaluated on computer. Descriptive data are given as a percentage and are reported as mean ± standard deviation. The Chi-squared test was used to analyse the categorical data, whereas the Student's t-test and One-Way Analysis of Variance were used to analyse interval/ ratio data. Tukey's HSD (honestly significant difference) test was conducted for post hoc analysis. Pearson's correlation analysis was implemented to determine the direction and level of the relationship between the continuous variables of measurement. Significance level $p < 0.05$ was accepted.

Results

The average age of the young people who participated in the study was determined as 22.60 ± 3.49 years. The majority of the participants were female (74%), single (88.6%), health student (53.4%), not in quarantine (57.5%) and without any chronic disease (91.8%).

The average stress score of individuals is 30.44±7.86, the average HAS-1 is 14.32±6.22, the average HAS-2 is 3.43±2.34 and the average MOCQ is 17.79±7.19.Also according to MOCQ-T score status; In terms of obsessive-compulsive disorder, 10% (n=55) of the participants showed low trends, 29.9% (n=165) moderate, and 60.1% (n=331) showed a high level of trend.

The stress levels of women, single, those with any chronic disease and those left in quarantine were higher (Table 1). In advanced analysis; it found that the 18-20 years old had a significantly higher PSS score than 26-30 years old (p=0.027). In addition, it was determined that students *studying* in health-related departments received higher scores than healthcare professionals (p=0.027) and public employees (p=0.011).

Female had higher HAS-Hypersensitivity and anxiety to physical symptoms. Accordingly, female are more susceptible to disease-specific physical symptoms (Table 2).Furtherly, public employees received higher scores than non-employed HAS-Negative consequences of the disease ($p<0.001$).

Female also scored higher than the MOCQ-Cl and MOCQ-R. All MOCQ subscales mean scores of smokers and those who did not go out on the streets were higher (Table 3).

For MOCQ-C subscale; it was determined that young people between the ages of 18-20 years received higher scores than those between 21-25 years ($p = 0.029$) and 26-30 years ($p = 0.042$);that students studying outside the field of health received higher scores than public employees ($p =0.036$).

For MOCQ-Cl subscale; it was determined that young people between the ages of 18-20 years received higher scores than those between 21-25 years (p=0.047); that students studying in departments outside the field of health received higher scores than Healthcare workers ($p = 0.001$), public workers ($p =0.008$) and non-workers ($p = 0.047$).

For MOCQ-S subscale; it was determined that students studying in the field of health ($p = 0.020$), students studying outside the field of health ($p =0.014$) and private sector employees ($p = 0.036$) received higher scores than health workers.

For MOCQ-D subscale; it was determined that young people between the ages of 18-

Table 1. Distribution of PSS mean scores and differences between the groups

Demographic characteristics	n	%	PSS Mean ± SD
Age of the participants			
18-20 year	207	37.6	31.37±7.38
21-25 year	216	39.2	30.35±8.35
26-30 year	128	23.2	29.09±7.61
F			*3.378*
p			***0.035***
Gender			
Female	408	74.0	31.07±7.92
Male	143	26.0	28.64±7.40
t			*3.218*
p			***0.001***
Marital status			
Single	488	88.6	30.74 ± 7.88
Married	63	11.4	28.10 ± 7.30
t			*-2.530*
p			***0.012***
Profession Groups			
Student (Health)	294	53.4	31.61 ±7.63
Student (Other)	56	10.2	31.21 ±8.72
Health Profession	89	16.2	28.73 ±7.76
Public employee	30	5.4	26.63 ±6.81
Private Sector Employee	40	7.3	28.35 ±7.29
Non-employed	42	7.6	29.57 ±8.08
F			*4.464*
p			***0.001***
Any chronic disease			
Yes	45	8.2	34.02 ± 7.77
No	506	91.8	30.12 ± 7.80
t			*3.217*
p			***0.001***
Status of Quarantine			
Yes	234	42.5	31.93±7.45
No	311	57.5	29.34±7.98
t			*3.875*
p			***<0.001***

PSS:*Perceived Stress Scale*

20 years received higher scores thanthose between 26-30 years (p=0.004); that students studying in the field of health (p = 0.018) and students studying outside the health field (p = 0.019) received higher scores than the healthcare professionals.

field of health were to have higher scores than healthcare workers (p = 0.000); that students studying outside of the field of health received significantly higher scores from healthcare workers (p < 0.001), public employees (p = 0.005) and non-workers (p = 0.015).

Table 2. Distribution of HAS mean scores and differences between the groups

Demographic characteristics	n	%	HAS-1 Mean ± SD	HAS-2 Mean ± SD
Gender				
Female	408	143	15.01±6.19	3.51±2.37
Male	74.0	26.0	12.38±5.89	3.20±2.24
t			*4.418*	*1.352*
p			***< 0.001***	*0.177*
Profession Groups				
Student (Health)	294	53.4	14.71 ±6.56	3.42 ±2.22
Student (Other)	56	10.2	15.11 ±5.21	4.00 ±2.51
Health Profession	89	16.2	13.40 ±5.41	3.18 ±2.21
Public employee	30	5.4	14.40 ±6.61	4.23 ±2.74
Private Sector Employee	40	7.3	13.63 ±5.86	3.45 ±3.07
Non-employed	42	7.6	13.21 ±5.56	2.69 ±1.83
F			*1.162*	*2.450*
p			*0.326*	***0.033***

HAS-1:*Health anxiety scale-Hypersensitivity and anxiety to physical symptoms,*
HAS-2:*Health anxiety scale-Negative consequences of the disease*

For MOCQ-R subscale; it was determined that young people between the ages of 18-20 years received higher scores than those between 26-30 years (p<0.001); that students studying in the field of health received higher scores than healthcare workers (p < 0.001) and public employees (p = 0.045); that students studying outside the field of health were also found to score higher than healthcare professionals (p < 0.001) and public employees (p=0.015).

For MOCQ-T; it was determined that young people between the ages of 18-20 years received higher scores than those between 21-25 years (p = 0.010) and 26-30 years (p = 0.002);that students studying in the

Of the participants, 8.6% were high school, 41.7% were associate degree, 43.7% were undergraduate and 6% were master graduates. 37.2% were living in metropolitan cities, 20.9% in city centers, 25.4% in districts, 16.5% in towns / villages. The difference between the groups in terms of scale mean scores by both demographic features was found insignificant (p> 0.05).

65 participants (11.8%) who participated in the study stated that there was a relative in the immediate vicinity who was diagnosed with COVID-19, and 14 participants (2.5%) reported that they lost their lives due to COVID-19. It was determined that the diagnosis of COVID-19 in the immediate

Table 3. Distribution of MOCQ mean scores and differences between the groups

Demographic characteristics	n	%	Control Mean±SD	Cleaning Mean ± SD	Slowing Mean ± SD	Doubt Mean ± SD	Rumination Mean ± SD	Total Mean ± SD
Age Group								
18-20 year	207	37.6	4.14±2.27	5.93±2.17	2.57 ± 1.71	3.89±1.56	4.96±2.36	19.22±6.48
21-25 year	216	39.2	3.56±2.29	5.39±2.41	2.38±1.70	3.55±1.47	4.38±2.74	17.19±7.36
26-30 year	128	23.2	3.51±2.55	5.38±2.47	2.32±1.84	3.34±1.64	3.84±2.63	16.52±7.65
F			*4.308*	*3.466*	*1.080*	*5.619*	*7.670*	*6.985*
p			***0.014***	***0.032***	**0.340**	***0.004***	***0.001***	***<0.001***
Gender								
Female	408	143	3.83±2.35	5.72±2.32	2.46±1.73	3.64±1.58	4.62±2.61	18.12±7.17
Male	74.0	26.0	3.59±2.39	5.22±2.39	2.38±1.75	3.60±1.50	4.06±2.57	16.87±7.20
t			1.062	2.176	0.478	0.253	2.196	1.796
p			**0.289**	**0.030**	**0.633**	**0.800**	**0.029**	0.073
Profession Groups								
Student(Health)	294	53.4	3.95 ±2.23	5.72 ±2.22	2.53 ±1.71	3.78 ±1.54	4.85 ±2.14	18.60±6.61
Student(Other)	56	10.2	4.38 ±2.61	6.50 ±2.26	2.84 ±1.86	4.02 ±1.80	5.30 ±2.46	20.64±7.81
Health working	89	16.2	3.19 ±2.23	4.93 ±2.31	1.88 ±1.57	3.18 ± 1.47	3.44 ±2.54	15.00±6.73
Public working	30	5.4	2.93 ±2.49	4.70 ±2.82	2.27 ±1.72	3.27 ±1.60	3.43 ±2.97	14.93±8.20
Private Sector	40	7.3	4.08 ±2.85	5.98 ±2.28	2.85 ±2.05	3.43 ±1.43	4.13 ±2.84	18.20±8.13
Non-employed	42	7.6	3.19 ±2.17	5.14 ±2.56	2.14 ±1.51	3.50 ±1.38	4.02 ±2.90	15.98±7.08
F			3.639	4.801	3.469	3.285	6.832	7.051
p			**0.003**	***< 0.001***	**0.004**	**0.006**	***<0 .001***	***< 0.001***
Smoking								
Yes	112	20.3	4.32±2.61	5.67±2.71	2.96±1.92	3.89±1.54	5.24±2.77	19.35±8.32
No	439	79.7	3.63±2.27	5.57±2.25	2.31±1.66	3.56±1.56	4.28±2.53	17.40±6.83
t			2.800	0.403	3.575	2.008	3.524	2.573
p			**0.005**	**0.687**	***< 0.001***	**0.045**	***<0 .001***	**0.010**
Quarantine								
Yes	234	42.5	4.10±2.29	5.86±2.22	2.66±1.74	3.84±1.48	5.01±2.55	19.08±6.65
No	311	57.5	3.52±2.38	5.39±2.42	2.27±1.71	3.48±1.60	4.08±2.58	16.85±7.44
t			2.881	2.360	2.628	2.706	4.231	3.634
p			**0.004**	**0.019**	**0.009**	**0.007**	***< 0.001***	***< 0.001***

vicinity or the burning from the immediate environment did not affect the mean scores of the scale (p> 0.05).

Discussion

It is possible that pandemics such as COVID-19 can cause many psychological problems such as stress, anxiety, and obsessive behaviors on individuals. It found that the average stress score of individuals is 30.44±7.86, the average HAS-1 is 14.32±6.22, the average HAS-2 is 3.43±2.34 and the average MOCQ is 17.79±7.19. In a study conducted with 442 healthcare workers during the COVID-19 pandemic process, it was reported that individuals showed symptoms of depression, 224 (51.6%) of anxiety, and 182 (41.2%) of stress. In addition, factors such as being female, young and single, lack of professional experience, and working in the front line with the epidemic have been associated with high scores.[18] In the study conducted by Bakioğlu et al. in 970 individuals with an average age of 29.74±9.64 year, they stated that fear of COVID-19 increased the intolerance of depression, anxiety, stress and uncertainty and decreased positive mood.[19] These findings of the study are similar to the literature.

In this study, which was conducted in order to examine the possible effects of changing life conditions due to the outbreak of COVID-19 in young adult individuals, it was determined that the individuals' age, gender, marital status, occupation, presence of chronic disease, smoking and quarantine status of individuals affect their stress, anxiety and obsessive-compulsive behavior levels.

It was determined that young people between the ages of 18-20 years had significantly higher PSS scores than those between the ages of 26-30 years. This indicates that stress decreases as the age progresses during the COVID-19 outbreak. In the study of Bin-Li et al., Where they examined the emotional and behavioral effects of COVID-19 in the Chinese people, it was reported that age had a significant relationship with perception and decrease in positive emotion.[20] This result is similar to this study. In the study conducted with 103 healthcare workers during the COVID-19 epidemic period, anxiety levels were shown to be higher in individuals over the age of 29.[21] Otherwise Ekizet al.COVID-19 outbreak in the process of a study conducted in Turkey has been shown to be a significant correlation in individuals' age and level of anxiety.[6] The fact that there are different results in the literature regarding the situation between age and anxiety suggests that more information is needed on this subject.

The stress level of females was higher than males. According to the report of the American Psychological Association in 2017, it was stated that females experience more stress than males.[22] In studies conducted during the SARS and H1N1 outbreak, it has been reported that women have high post-traumatic stress and anxiety levels and exhibit behaviors such as panic and depression.[9,23] Similarly, studies conducted in the COVID-19 process have been shown to increase the negative emotions, stress, anxiety and sensitivities in women.[20,21,24] Differently, in a study of Zhang et al with healthcare workers; it has been reported that there is no significant relationship in the anxiety levels of men and women against COVID-19 outbreak.[25] It is likely that working in the health sector in the epidemic period removed the significance between the genders.[6] In this case, it can be said that everyone working in the health field has similar stress levels, but women working in other sectors experience more stress. The study also found that the female HAS- Hypersensitivity and anxiety to physical symptoms mean score was higher. High stress causes more physical symptoms related to stress.

The study also revealed that the stress level of single participants was higher. There are studies publishing different results in the literature. Liang et al. In a study conducted with young individuals on COVID-19, it was reported that divorced and widowed individuals had higher post-traumatic stress disorder.[2] In another study, it was stated that married people tend to worsen their mental health status due to the SARS outbreak.[9] Wang et al. reported that marital status was not related to anxiety, stress and depression.[26] It is thought that doing this study in young individuals, the inexperience of single young

people of our country, especially in health issues, their anxiety more than the epidemic, their failure to develop strategies to cope with the negative situations they face, and the need for support units may be an indicator of this result.

When the scale mean scores of the participants were compared by profession groups, the difference between the groups was found to be significant in almost all scales. It was observed that the stress levels of the students studying in the field of health, HAS-negative consequences of the disease of the public employees, and the obsessive behaviors of the students in the other fields were higher. In the study conducted by Cao et al with 7143 university students in the COVID-19 period, they reported that stated 75.1% (5367) of university students did not show symptoms, 21.3% (1518) were weak, 2.7% (196) moderate and 0.9% (62) had severe anxiety levels.[27] In a study involving university students and employees in Spain and investigating the psychological effects of the epidemic and quarantine, individuals were reported to experience moderate or severe anxiety, depression and stress.[1]In a comprehensive study conducted by Wu et al., It has been shown that healthcare professionals score significantly higher in all parameters of psychological stress than university students.[10] It is thought that the availability of different information in the literature may result from cultural differences.

Individuals with chronic disease and quarantine had higher mean PSS scores. This finding is similar to the literature.[26,28] In one study, it was stated that the presence of chronic disease did not affect the stress level of individuals.[6]In a study, it was found that 7% of individuals during quarantine showed symptoms of anxiety, 17% showed anger, and after a quarantine (after 4-6 months), anxiety decreased to 3% and anger status to 6%.[12] In a study conducted on hospital personnel thought to be in contact during the SARS period, it was stated that quarantine administration was the most determinant factor of acute stress disorder after quarantine ended (9 days).[29] There are similar studies on the effects of quarantine.[13,30] Presence of chronic disease is an important criterion for quarantine. Therefore, it is expected that these two variables were give the same result. It is known that the presence of chronic disease increases the negative effects of COVID-19 disease. In this reason, individuals with this cryonic disease are expected to experience more stress.

It was seen that alcohol consumption of the participants did not affect the level of obsessive behavior, but smoking status affected these behaviors. COVID-19 revealed that cough, shortness of breath, and the risk of death are reported to be higher in smokers, which may have caused these individuals to be more obsessive.

It was also determined that those between the ages of 18-20, women, students and quarantine remained more obsessive. Similarly, in the face of any uncertainty, it has been reported that obsessive behaviors and self-harm behaviors are high in children, young adults, women, prisoners or quarantine.[31-33] It is reported that depression, anxiety, anger, irritability, unrest in interpersonal relations and obsessive-compulsive-like behavior disorders are observed intensively in university students due to uncertainty.[34]

It was found that 10% (n = 55) of the participants showed a low tendency, 29.9% (n = 165) were moderate and 60.1% (n = 331) showed a high level of trend in terms of obsessive compulsive disorder. In studies conducted, it is reported that individuals may tend to some obsessive compulsive strategies such as accusing themselves and others, focusing on thoughts, comparing with other events or emphasizing their relativity to reduce the importance of events.[8,9,35,36] This indicates that obsessive behaviors have increased significantly due to the epidemic.

Conslusion

As a result of the study, it is seen that the psychological state of young adults may be adversely affected due to the changing living conditions during the COVID-19 epidemic process. It was determined that those who experienced the most intense stress among

the participants were 18-20 years old, female, single, student, people with chronic diseases and those who were in quarantine. Hypersensitivity and anxiety to physical symptoms were women and experienced negative consequences of the disease were public employees.

The reflections of stress on behavior were evaluated with obsessive-compulsive symptoms in this study. It was determined that the best control status for the disease was individuals between the ages of 18-20, students, smokers, and in quarantine. Regarding cleaning, it was found that women, students and quarantine individuals between the ages of 18-20 were better. Private sector employees, smokers and those in quarantine are slower; 18 and 20 years old, students, smokers and in quarantine were more skeptical. The individuals who showed the most obsessive compulsive behaviors in general were 18-20 years old, students, smokers and in quarantine.

As a result of the study, it was revealed that the COVID-19 epidemic may affect some individuals (for high stress levels: 18-20 years old, female, single, student, people with chronic diseases and those who were in quarantine; for experience the negative consequences of the disease: women and public employees; for obsessive-compulsive symptoms: 18-20 years, students, smokers, and in quarantine) more intensely than others.

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REPORT / RAPOR

Türkiye'de göçmenlere sunulan sağlık hizmetleri için yürütülen iletişim çalışmaları

Communication studies for health service delivery to migrants in Turkey

Sevil Turhan[a], Selen Gürsoy Turan[b], Serdar Karakullukçu[c]

[a] Dr. Öğr. Üyesi, Karadeniz Teknik Üniversitesi Tıp Fakültesi, Halk Sağlığı Anabilim Dalı, Trabzon, Türkiye.
[b] Uzm. Dr., Trabzon İl Sağlık Müdürlüğü, Halk Sağlığı Hizmetleri Başkanlığı, Trabzon, Türkiye.
[c] Uzm. Dr., Bayburt Merkez Toplum Sağlığı Merkezi, Bayburt, Türkiye.

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ABSTRACT

Communication, which constitutes a large part of healthcare delivery, forms the basis of medical care. Good relationships can be established and individual's needs can be understood by providing correct information exchange with effective communication. Being a foreigner in a country and not understanding the language spoken in that country poses a risk in accessing healthcare services. Migration, is an action caused by social change, affects the whole society in both the receiving and originating country. Firstly classic communication barriers are encountered when considering the adaptation process in terms of health communication. Although the concept of "mother tongue" is at the top, when viewed with the sub dimensions, spoken language, typefaces, terminology, visual symbols, the alphabet used and differences in dialect and accent also have an important place. Immigrants may have difficulties in describing their health problems due to differences in their mother tongue and culture, in this way the need for a interpreter may arise. Health professionals' experiences with immigrants are also important. Mostly communication-related difficulties such as lack of communication, not getting informed consent, inability of empathizing, not effectively carrying out the diagnosis and treatment process can be experienced. In our country great steps have been taken to facilitate the provision of health services to immigrants. The interpreter support was provided in existing health centers. Separate health centers and call centers had been established, even foreign healthcare workers had been employed in these centers. However, the biggest barrier for immigrants to access healthcare services is still communication problems. The communication skills of existing interpereters and encouraging community translation services are need to be improved, especially in order to fill the gap of qualified interpereters.

Keywords: Migrants, health services, communication, Turkey

Correspondence: Sevil TURHAN, Karadeniz Teknik Üniversitesi Tıp Fakültesi Halk Sağlığı Anabilim Dalı, Trabzon, Türkiye. **E-mail:** sevilikinci@gmail.com. **Tel:** +90 505 844 39 83.

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ÖZ

Sağlık hizmeti sunumunun büyük bir bölümünü oluşturan iletişim, tıbbi bakımın temelini oluşturur. Etkili iletişim ile doğru bilgi alışverişi sağlanarak iyi ilişkiler kurulabilir ve bireyin gereksinimleri anlaşılabilir. Bir ülkede yabancı olmak, o ülkede konuşulan dili anlamamak, sağlık hizmetlerine ulaşımda risk oluşturmaktadır. Göç, toplumsal değişimin neden olduğu bir eylem olup hem göç alan hem göç veren ülkedeki bütün toplumu etkiler. Uyum sürecine sağlık iletişimi açısından bakıldığında, öncelikle klasik iletişim engelleri ile karşılaşılmaktadır. Bunların başında "ana dil" kavramı olsa da alt boyutları ile bakıldığında konuşma dili, yazı karakterleri, terminoloji, görsel simgeler, kullanılan alfabe, ağız ve şive farklılıkları da önemli bir yer tutmaktadır. Göçmenler, ana dil ve kültür farklılıkları nedeniyle yaşadığı sağlık problemlerini anlatmada güçlük çekebilmekte ve bir çevirmen (tercüman) gerekliliği ortaya çıkabilmektedir. Sağlık çalışanlarının göçmenlerle ilgili yaşadığı deneyimler de önemlidir ve çoğunlukla iletişim eksikliği, bilgilendirilmiş onam alamama, empati kuramama, tanı ve tedavi sürecini etkin yürütememe gibi iletişim kaynaklı sıkıntılar yaşanabilmektedir. Ülkemizde de göçmenlere verilecek sağlık hizmetleri sunumunu kolaylaştırmaya yönelik büyük adımlar atılarak, ayrı sağlık merkezleri kurulmuş, mevcut sağlık merkezleri içinde tercüman desteği sağlanmış, çağrı merkezleri kurulmuş ve hatta yabancı sağlık personeli çalıştırılması yoluna gidilmiştir. Ancak hala yabancıların sağlık hizmetlerine ulaşmasının önündeki en büyük engel iletişim sorunlarıdır. Özellikle nitelikli tercüman açığının kapatılması için toplum çevirmenliği hizmetlerinin özendirilmesi, mevcut tercümanların sağlık ve iletişim becerilerinin geliştirilmesi gerekmektedir.

Anahtar kelimeler: Göçmenler, sağlık hizmetleri, iletişim, Türkiye

İletişim ve Sağlık Hizmetlerindeki Rolü

İletişim kelimesi Latince "communis" sözcüğünden türetilen "communication" sözcüğünün karşılığıdır ve karşılıklı olarak paylaşmayı, birlikteliği ve toplumsallaşmayı içermektedir.[1] İnsanların bulundukları toplumdaki kuralları öğrenmesi, değer ve inançları benimsemesi, kendisine verilen rolü anlaması ve yürütebilmesi iletişim ile gerçekleşir.[2] Bir toplumda yer edinebilmek gibi bir sağlık hizmetinin iyi sunulmasında da aynı şekilde iletişim kilit rolü üstlenmektedir. Bu rol kültürel ve dilsel yönleri kapsamaktadır.[2,3] Eşit ve kapsayıcı sağlık hizmeti sunabilmek için hastanın tüm yaşamı ve sağlık yakınmaları hakkında bilgi alabilmek gerekmektedir[3]. Sözcüklerin ardındaki ince anlam ayrımlarının sağlık hizmeti sunucuları ve hastalar tarafından tam olarak anlaşılması çok önemlidir.[3]

Sağlıkta iletişimin tarihçesi çok eski zamanlara dayanmaktadır. Amerika Birleşik Devletleri'nde ortaya atılmış ve gelmeye başlamıştır. İkinci Dünya Savaşı'na kadar Amerikalılar tarafından bir değer olarak algılanmayan *sağlık* ve *sağlıklı olma* kavramı, diğer unsurlar arasında belli belirsiz dikkate alınmıştır. Savaşı takip eden dönemlerde Amerika halkı için bireysel sağlık önem kazanmış, sağlık hizmetlerinin sağlanması gündemde olan bir konu olmuştur. Gelişmiş ülkelerde insanlar için sağlık, yaşam biçimine dönüştürülmüştür. Bu gelişmelere paralel olarak iletişim becerilerinde sağlanan iyileştirmenin sağlık hizmetlerinde önemli farklılıklar yarattığı ortaya konmuştur.[4]

Yapısı ve niteliği gereği zor olan sağlık hizmetlerinin, çalışma alanları içinde özel bir yeri ve önemi vardır. Sağlık hizmetinde çalışanlar hizmet verirken çok farklı karakterdeki hasta veya yakınları ile karşılaşmakta ve iletişim kurmak durumundadır. Bu kişilerle iletişim kurulması daha fazla beceri ve özen gerektirmektedir. Çalışanların iletişim becerileri, hastaneye başvuran kişilerin kendilerini değerli ya da değersiz hissetmelerinde önemli rol oynamaktadır. Bireyin gereksinimlerini dikkate alıp bu doğrultuda iletişim kurmak ve bilgilendirmek, kaygı seviyesini azaltır ve güven ortamının oluşmasını sağlar.[5] Sağlık personelinin etkili iletişimi, doğru bilgi alışverişine, iyi ilişkiler kurmaya ve bireyin gereksinimlerini, sorunlarını anlamaya fırsat verir. Sağlık çalışanları, hasta ya da yakınları

ile iletişim kurarak hastanın sorunları, gereksinimleri, ilgi alanları hakkında bilgi toplamalı, bilgi aktararak öneriler vermelidir. Hasta ve sağlık personeli arasında iletişimin niteliği ile hasta doyumu, hastanın tedaviye uyumu ve olumlu sağlık sonuçları arasında doğrudan ilişki vardır.[6]

Sağlık Hizmetleri ve Göçmenler

Sağlık hizmeti sunumunda sağlıklı iletişim sağlayabilme açısından da riskli gruplar bulunmaktadır. Bu grupların başında bebekler ve çocuklar, görme – işitme engelliler, farklı eğitim ve sosyokültürel seviyede yer alanlar olsa da bir ülkede *yabancı* olmak, o ülkede konuşulan dili anlamamak, diğer tüm riskleri arkasından getirerek ön sıraya yerleşir.

Uluslararası Göç Örgütü (IOM), göçmeni, bir kişinin veya bir grup insanın uluslararası bir sınırı geçerek veya bir devlet içinde yer değiştirmesi olarak tanımlamıştır. Göç; süresi, yapısı ve nedeni ne olursa olsun insanların yer değiştirdiği nüfus hareketleridir. Buna, mültecilerin, yerinden edilmiş kişilerin, ekonomik göçmenlerin, aile birleşimi gibi farklı amaçlarla hareket eden kişilerin göçü de dâhildir.[7] Savaş, doğal afetler veya çevresel bozulma, siyasi zulüm, yoksulluk, ayrımcılık ve temel hizmetlere erişim eksikliği ve özellikle iş veya eğitim açısından yeni fırsatlar arayışı gibi çeşitli nedenlerle insanlar göç etmektedirler.[8]

Göç, toplumsal değişimin neden olduğu kolektif bir eylem olup hem göç alan hem göç veren ülkedeki bütün toplumu etkiler.[9] Göç etme sebebi ne olursa olsun, göçmenler, sosyal desteklerini geride bırakarak alıştıkları ortamlarından farklı dil ve kültürde yeni bir rol üstlenmektedir.[9] Göçmenin sağlık durumu, hedef ülkeye vardıktan sonra yeni bir etkileşim sürecine girmektedir. Yeni ülkeye dair bilgiye gereksinim duymaktadır. Göçmenin bilgiye olan gereksiniminin farkında olmasının yanı sıra, göç edilen ülkenin hizmet sunucularının da göçmenlerin bilgi alma gereksinimi olduğunu fark etmesi önemlidir. Özellikle ülkenin sosyal, ekonomik, kültürel ve hukuki yapısı hakkında bilgi verilmesi gerekmektedir. Hedef ülkeye varıldıktan sonra gerçekleşen uyum süreci göçmenin sağlığı açısından kilit bir rol oynamaktadır. Göçmen gruplarla yerleşik toplum arasında karşılıklı, göreli olarak durağan yaşanan değişim sonucu kişiler yeni yerleştikleri yere biyolojik, psikolojik, sosyal ve ekonomik uyum sağlarlar. Bir diğer ifade ile uyum süreci sağlık durumu, iletişim yeterlilikleri, farkındalık, kabul duygusu, kültürel davranış becerileri, ekonomik yeterlilikler vb. olarak ifade edilen çok boyutlu bir yapıdır. Bu boyutların herhangi birindeki aksaklık, göçmenin fizyolojik ve psikolojik sağlığını tehdit altına alabilecek durumlara neden olabilmektedir.[10]

Toplumu ve bireyleri siyasal, sosyal, kültürel ve ekonomik açıdan etkileyen göç, sağlık sorunlarını da beraberinde getirmektedir. En sık görülen sağlık sorunları arasında kaza sonucu yaralanmalar, hipotermi, yanıklar, gastrointestinal hastalıklar, kardiyovasküler olaylar, gebelik ve doğumla ilgili komplikasyonlar, diyabet ve hipertansiyon yer almaktadır. Göç ve bulaşıcı hastalıkların bir ülkeden başka bir ülkeye taşınması arasında bir ilişki yaygın bir algı olmasına rağmen sistematik bir ilişki saptanamamıştır.[1]

Sağlık, tüm bireylerin temel haklarından biridir. Göç eden grupların sağlık hizmetlerine erişimi oldukça önemli bir konudur. Sağlık hizmetlerine erişimde yaşanan sorunlar, sağlık eşitsizliklerindeki önemli bir unsur olarak karşımıza çıkmaktadır. Yapılan çalışmalarda göçmenlerin sağlık sistemlerini yetersiz kullandıkları vurgulanmaktadır. Bu durum, göçmenlerin kendi sağlıklarının yanında genel halkın sağlığını riske atabilmektedir.[12,13]

Son yıllarda, sağlık hakkı da dahil olmak üzere göçmenlerin insan haklarının korunması giderek daha fazla kabul görmekte ve uluslararası gündemde de yer almaktadır. Uluslararası ve ulusal düzeylerde yasal yükümlülüklerini yerine getirmek için birçok bölgedeki hükümetler, göçmenlerin sağlık ihtiyaçlarını ve savunmasızlıklarını ulusal planlarına, politikalarına ve stratejilerine entegre etme ihtiyacını kabul etmişlerdir.[8]

Göçmenlere Yönelik Sağlık İletişimi

Uyum sürecine sağlık iletişimi açısından bakıldığında, öncelikle klasik iletişim engelleri ile karşılaşırız. Bunların başında "ana dil" kavramı olsa da alt boyutları ile bakıldığında konuşma dili, yazı karakterleri, terminoloji, görsel simgeler, kullanılan alfabe, ağız ve şive farklılıkları da önemli bir yer tutmaktadır.[2] Göçmenler, ana dil ve kültür farklılıkları nedeniyle yaşadığı sağlık problemlerini anlatmada güçlük çekebilmekte ve bir çevirmen (tercüman) gerekliliği ortaya çıkabilmektedir.[9] Sağlık çalışanlarının göçmenlerle ilgili yaşadığı deneyimler de önemlidir ve çoğunlukla iletişim eksikliği, bilgilendirilmiş onam alamama, empati kuramama, tanı ve tedavi sürecini etkin yürütememe gibi iletişim kaynaklı sıkıntılardan oluşmaktadır.[9] Bazı çalışmalarda sağlık çalışanlarının göçmenlerle ilgili yaşadıkları sorunlar; başvuran Türkçe dil bilmediği için hiç iletişim kuramama, hastanede tercüman olmadığı için hizmet verememe, kültürel farklılık nedeniyle anlaşamama, tedaviye uyumda zorlanma, sağlık eğitiminde etkisizlik ve psikolojik destekte yetersizlik, çözüm üretmek adına da beden dili kullanmaya çalışma, bir kısmının sözlük kullanma, resimler ve çizimler ile konuyu aktarma ve tercüman kullanma yöntemine başvurduğu ancak tercümanın ne derece doğru aktarım yaptığından emin olamadığı gösterilmiştir.[14,15,16,17] Akkoç ve ark. nın yaptığı çalışmaya göre sağlık çalışanlarının %61'i dil güçlüğünden dolayı problem yaşamıştır.[14] Zengin ve ark. nın yaptığı araştırmada, hemşirelerin neredeyse tamamında Suriyeli çocuklara bakım verirken iletişim konusunda güçlükler yaşandığı saptanmıştır.[18] Koçan ve ark., göçmenlerin kendilerini ifade edemedikleri ve sağlık çalışanları tarafından anlaşılamadıkları için güven problemi yaşadıklarını ortaya koymuştur.[9] Bursa'da hane ziyaretleri yapılarak gerçekleştirilen bir çalışmada, göçmenlerin %17.1'inin hastalandıklarında hastaneye başvurmadıkları, başvurmama sebeplerinin %26.3'ünün dil problemleri olduğu bildirilmiştir.[19] Tuzcu'nun Antalya ilinde hemşirelik öğrencileri üzerinde yaptığı çalışmada, dış göç ile gelen hastaya bakım verirken; dil sorunu (%46.8) ve kültürlerarası farklılıktan kaynaklanan sorunlar (%42.1) yaşandığı saptanmıştır.[20] Birçok hastanın kimlik numarası bulunmaması ve ilaç alabilmek için akrabaları aracılığıyla reçeteli ilaç almaya çalışması, kime bakım verdiğini bilemeyen hekimlerin ileride sorumlu tutulmaktan korkmalarına ve göçmen hastalara olan güvenlerinin sarsılması ile hasta hekim ilişkisinin bozulmasına yol açabilmektedir.[17] Bir göçmenin sağlık hizmeti kullanımına yönelik görev alacak tercümanın hemcins olması özellikle bazı sağlık durumlarında önem arz etmektedir. Hemcins tercüman kullanımı, tıbbi öykü alma, fizik muayene yapma, tetkik için numune verme ve sağlık eğitiminde (gebelik ve düşük öyküsünü anlatması, batın muayenesi, kendi kendine meme muayenesi, ejakulat örneği verilmesi,..) verimi artıracaktır. Kurumsal olarak sağlanan tercümanlar istenilen niteliklerde olmadığında, yalnızca biraz daha iyi iletişim kurabildiği için veya ülkeye daha önce geldiği için bir başka göçmeni veya çocuklarını sağlık hizmetlerinde aracı olarak kullanabilmektedir.[21] Bazı göçmenler tercüman masrafından dolayı sağlık hizmetlerine erişememektedir. Hatta bu ücreti verebilseler bile sınırlı sayıdaki tercümana ulaşabilmek için uygun gün ve saati beklemek zorunda kalmaktadırlar veya bu sağlık hizmeti talebinden vazgeçmektedirler.[21]

Türkiye'de Göçmenlere Yönelik Sağlık İletişimi Hizmetleri

Çeviribilim açısından ardıl çeviri, iletişim verilerinin süreç içerisinde toparlanıp özetlenerek aktarılmasıdır. Konuşmacı belirli bir süre konuştuktan sonra ara verir ve bu sırada çevirmen aldığı notlar aracılığıyla kaynak dilden hedef dile konuşmanın özetini aktarır.[22] Toplum çevirmenliği ise çevirmenin çalıştığı, yaşadığı ya da bulunmak durumunda kaldığı sosyokültürel çevre itibari ile iletişim aracılığını üstlendiği çeviri türüdür. Genellikle kamu hizmetlerinin yürütülmesinde (polis merkezi, göçmen daireleri, sosyal hizmet merkezleri, hastaneler ve sağlık kuruluşları, okul) çalışanlar ile toplum arasında iletişimi sağlamak amacıyla ardıl çeviri yöntemi kullanılır. Yüz yüze ya da telefonda çeviri yapılabilir. Bu tür bir çeviri hizmeti

gönüllüler tarafından, yakın akrabalar ve/veya ilgili kurum çalışanları arasından dil bilenler tarafından gerçekleştirilir (doğal çevirmenler). Çevirmen olmaya yönelik herhangi bir eğitim almamışlardır.[22] Sağlık hizmetlerinde yer alan tercümanın önem arz eden nitelikleri, cinsiyeti, dil bilgisi, kültürel anlayışı, etnik geçmişi, kültürel ağları, çeviri becerisi, bireysel pozitif ve negatif özellikleridir.[21]

Dünyada da göçmenler sağlık hizmetlerine erişimde başta dil ve iletişim olmak üzere birçok engel ve sorunla karşı karşıya kalmaktadır. Sağlığa ilişkin engellerin, göçmenlerin ve ev sahibi toplulukların refahını etkilemekte olduğu ve küresel sağlık hedeflerine ve sağlıkla ilgili Sürdürülebilir Kalkınma Hedeflerine (SDGs) erişmede zorluklar meydana getirdiği ifade edilmektedir.[23] İç İşleri Bakanlığı Göç İdaresi Genel Müdürlüğü'nün (GİGM) Uyum Strateji Belgesi ve Ulusal Eylem Planı'nın temel bileşenlerinden biri "sağlık"tır. Bu öncelik kapsamındaki amaçlardan biri sağlık hizmetlerinin göçmenlerin ihtiyaçlarına ve kültürel farklılıklara duyarlı hale getirilmesi, farkındalık ve uyum faaliyetlerinin gerçekleştirilmesidir. Belirlenen hedefler; göçmenlerin sağlık okuryazarlıklarının artırılmasına yönelik çalışmalar yapılması, göçmenlerin sağlığa ilişkin hakları ile bunlara ulaşım yolları hakkında etkin bilgilendirilmelerin yapılması, göçmenlere hizmet sunulan sağlık tesislerinde, tercümanlık hizmetlerini de içerecek şekilde hasta rehberlik hizmetlerinin güçlendirilmesi, sağlık çalışanlarına, göç sağlığı hakkında eğitimler verilmesi ve sağlık çalışanı olan göçmenlerin sağlık hizmetlerinin sunumuna dâhil edilmesine yönelik çalışmalar yapılmasıdır.[24] Göç yönetiminin ayrılmaz bir parçası olan uyum konusu Türkiye'nin sivil göç yönetimini oluşturan 6458 sayılı Yabancılar ve Uluslararası Koruma Kanunu'nda (YUKK) düzenlemiştir.[25] Bu düzenleme ile uyum konusu ilk kez mevzuatımıza girmiş ve bu alanda politika oluşturulması için gerekli normatif çerçeve belirlenmiştir. Kanun'un 96. Maddesinde temel sağlık hizmetleri almaya ilişkin kursların yaygınlaştırılması hususu şerh düşülmüştür. Bu noktada, sosyal kültürel iletişimin gözetildiği ve sivil toplum kuruluşları için de hukuki bir alan açıldığı görülmektedir.[25] Ayrıca, yabancıların toplumla karşılıklı uyumlarını sağlamak adına uyum faaliyetlerini planlama ve yürütme görevi verilen GİGM bünyesinde uyum faaliyetlerini ilgili kurumlarla iş birliği içerisinde planlamak ve uygulamak amacıyla Uyum ve İletişim Dairesi Başkanlığı kurulmuştur.[26]

Ülkemizdeki göçmenlere yönelik sağlık hizmetleri T.C. Sağlık Bakanlığı tarafından kurulan birimler aracılığıyla yürütülmektedir. T.C. Anayasası'nın Sağlık hizmetleri ve çevrenin korunması başlığını taşıyan 56. Maddesine göre, Devlet, herkesin hayatını, beden ve ruh sağlığı içinde sürdürmesini sağlamak; insan ve madde gücünde tasarruf ve verimi artırarak, iş birliğini gerçekleştirmek amacıyla sağlık kuruluşlarını tek elden planlayıp hizmet vermesini düzenler. Devlet, bu görevini kamu ve özel kesimlerdeki sağlık ve sosyal kurumlarından yararlanarak, onları denetleyerek yerine getirir.[27] Geçici Koruma Yönetmeliğinin 27. maddesinde hizmetlerin kapsamı yer almaktadır.[28] Bu yönetmeliğin uygulama esaslarını belirten Geçici Koruma Altına Alınanlara Verilecek Sağlık Hizmetlerine Dair Esaslar Yönergesi[29] ile söz konusu düzenlemeyle verilen sağlık hizmetlerinin kapsamı genişletilmiştir.[30] Kısa adı SIHHAT olan "Geçici Koruma Altındaki Suriyelilerin Sağlık Statüsünün ve Türkiye Cumhuriyeti Tarafından Sunulan İlgili Hizmetlerin Geliştirilmesi" Projesi 2016 yılında faaliyete başlamıştır. Bu kapsamda 29 ilde 175 göçmen sağlığı merkezi içerisinde 785 göçmen sağlığı birimi açılmıştır.[30] 31.03.2020 tarihi itibariyle aralarında Suriyelilerin de yer aldığı 708 doktor, 966 hemşire/ebe, 11 psikolog, 11 sosyal çalışmacı, 13 teknisyen, Türkçe ve Arapça bilen 1.144 hasta yönlendirme rehberi ve 407 destek personeli istihdam edilmiştir. Sağlık Personelinin Eğitimi faaliyetinin amacı geçici koruma altındaki Suriyelilere hizmet veren sağlık personeli, Arapça ve Türkçe bilen hasta yönlendirme rehberlerinin göç sağlığı, kültürlerarası iletişim gibi konularda kapasitelerinin artırılmasıdır.[30]

Ruh Sağlığı çalışmaları kapsamında 50 Toplum Ruh Sağlığı Merkezi personeli için 2 tur oryantasyon eğitimi düzenlenmiştir. 966 Arapça ve Türkçe bilen hasta yönlendirme rehberine 7 tur eğitim verilmiştir. 2520 sağlık personeline 22 tur eğitim verilmiştir.[30] Sağlık okuryazarlığının artırılması çalışmaları kapsamında, göçmenlerin sağlık hizmetlerine olan taleplerini artırmak, kendi sağlık durumlarını takip etmelerini ve taleplerini doğru şekilde yönetmelerini sağlamak amaçlanarak 16 farklı konuda 500.000 poster ve 38 farklı konuda 20.000.000 broşür basılmış sağlık merkezlerine dağıtılmıştır.[30,31]

Ortalama her 4.000 kişiye hizmet verecek bir hekim ile bir yardımcı sağlık personelinden oluşan göçmen sağlığı merkezleri (GSM); ülkemizde, aile hekimliği için tanımlanan fiziki ve teknik standartlara göre yapılandırılmıştır.[32] Geçici korunanların yoğun olarak yaşamadıkları yerlerde ise birinci basamak sağlık hizmetlerinin, bu kişilerin başvuruda bulundukları ildeki toplum sağlığı merkezleri ve aile sağlığı merkezleri tarafından sunulmasına devam edilmektedir. Ayrıca Suriyeliler dışında çoğu Pakistan, Afganistan ve Irak'tan olmak üzere farklı uyruklardan göçmenlere veya GSM'lerin bulunmadığı yerlerde koruyucu sağlık hizmetleri ve bulaşıcı hastalıklarla mücadele öncelikli olmak üzere birinci basamak sağlık hizmetlerini sunmak için "Yabancı Uyruklular Polikliniği (YUP)" açılmıştır. Öncelikle her ilde en az bir YUP açılması planlanmış olup hali hazırda 80 ilde 98 poliklinik, hizmet vermektedir.[31,33] Kadın Sağlığı Danışma Merkezleri Projesi ile Göçmen Sağlığı Merkezleri içerisinde kurulan 30 Kadın Sağlığı Danışma Merkezinde toplamda 4 hekim, 21 ebe/hemşire, 23 psikolog, 18 sosyal çalışmacı 44 sağlık aracısı, 90 tercüman ve destek personeli üreme sağlığı, koruma, psikososyal destek, vaka yönetimi ve yönlendirme konularında eğitim almıştır. Otuz Eylül 2019 tarihi itibariyle Kadın Sağlığı Danışma Merkezleri faaliyetleri Göçmen Sağlığı Merkezleri ile bütünleştirilmiştir.[31] Yabancı Uyruklular Polikliniklerinin, o bölgenin ihtiyacına göre, dil bilen personel ile desteklenmesi düşünülerek yerel olanaklar ile gönüllü tercüman desteği sağlanmaya çalışılmıştır.[33] Birinci basamak sağlık hizmetlerine yönelik tüm duyuru, afiş ve broşürler ve COVID-19 hastalığı (İngilizce ve Arapça), korunma yolları, rehberler ve çalışma hayatını ilgilendiren bilgiler Göçmen sağlığı merkezlerinde kullanılmak üzere Türkçe dili formatı ile aynı görünümde Arapça dilinde hazırlanmıştır.[34,35]

Sivil Toplum Kuruluşları, Geçici Koruma Altına Alınanlara Verilecek Sağlık Hizmetlerine Dair Esaslar Yönergesi çerçevesinde, geçici koruma altına alınanlara, gönüllülük esasına göre ve ücretsiz olarak sağlık hizmetlerini sunmak üzere gönüllü sağlık tesisleri açabilmektedirler.[29] Türkiye'de 48 ulusal (AFAD, Mavi Hilal Vakfı, MAZLUMDER, Yeryüzü Doktorları,..), 17 uluslararası (Sınır Tanımayan Doktorlar, ASAM,..) sivil toplum kuruluşu bulunmaktadır.[37] Türkiye'deki Suriyelilere yönelik olarak sivil toplum kuruluşları, başta sağlık olmak üzere beslenme, barınma, çalışma hakkı ve hukuki destek, Suriyeli çocukların eğitimi, Suriyeli kadınlar ve toplumsal uyum konularında çalışmalar yapmaktadır.[10] Bu kuruluşlardan biri olan Sığınmacılar ve Göçmenlerle Dayanışma Derneği (SGDD-ASAM) tarafından gerçekleştirilen Birleşmiş Milletler Dünya Sağlık Örgütü ve T.C. Sağlık Bakanlığı tarafından desteklenen "Türk Sağlık Sistemi içinde Suriyeli Sağlık Çalışanlarının Kapasitelerinin Geliştirilmesi ile Kendi Nüfuslarına Hizmet Verecek Şekilde Kültüre Duyarlı Sağlık Hizmetlerinin Desteklenmesi: Göçmen Sağlığı Eğitim Merkezlerinin Kurulması ve İdare Edilmesi" projesi 2017 yılında imzalanmıştır. Amaçları, Göçmen Sağlığı Eğitim Merkezlerinde Suriyeli 300 doktor ve 300 hemşireye 6 haftalık bir eğitim verilerek istihdam edilmesi ve 4 ilde (Hatay, Mersin, Ankara, İzmir) Suriyeli sığınmacılara birinci basamak sağlık hizmetlerinin sunulmasıdır.[37]

Sağlık Hizmetleri Genel Müdürlüğü'nün 12 Nisan 2013 tarihli yazısında, Sağlık Bakanlığı bünyesinde yurtdışından gelen hastalar ve turistlere 7 gün 24 saat Almanca, İngilizce, Arapça, Rusça, Farsça ve Fransızca dillerinde tercümanlık desteği

verilmek üzere 444 47 28 numaralı çağrının kurulduğu belirtilmiştir. Bu kapsamda 112 Acil çağrı hattını arayan, 184 SABİM hattını arayan yabancı uyruklu hastalara, Sağlık Bakanlığı'na bağlı hastaneler, taşra teşkilatı ve merkez teşkilatının idari birimlerini telefonla arayan yabancı kişilere, ülkeye gelen yabancı uyruklu hastalara ve turistlere sağlıkla ilgili konularda, Sağlık Bakanlığı'na bağlı hastanelerde tedavi gören uluslararası hastaların medikal raporlarının çevirilerinde tercümanlık ve destek hizmeti verilmeye başlanmıştır.[38] Sağlık Hizmetleri Genel Müdürlüğü'nün bir diğer yazısı ile de ülkemize sağlık turizmi ve turistin sağlığı kapsamında gelen hastaların sağlık hizmetine kolay ulaşmalarını sağlamak amacıyla "Uluslararası Hasta Destek Birimi Tercümanlık ve Çağrı Merkezi (UHDB)" kurulduğu belirtilmiştir.[39] Merkezin çağrı numarası +90 850 288 38 38 olarak belirlenmiş olup 1 Nisan 2017 tarihinden itibaren hizmet vermeye başlamıştır. Merkezin vereceği hizmetler; uluslararası hastalar tarafından 112 ve 184 çağrı merkezlerine gelen yabancı dildeki telefon çağrıları veya UHDB'ye telekonferans ile yönlendirilen yabancı dildeki telefon çağrılarının tercüme edilerek (ardıl tercüme) Türkçe'den yabancı dile ve/veya yabancı dilden Türkçe'ye çevrilmesi ve Türkiye dışından gelen telefon çağrıları cevaplanarak ihtiyaca göre danışmanlık hizmeti verilmesi ya da öneri ve şikâyetlerin kayıt altına alınması olarak belirlenmiştir. Uluslararası Hasta Destek Birimi Tercümanlık ve Çağrı Merkezi Almanca, Arapça, İngilizce, Rusça, Farsça, Fransızca olmak üzere 6 (altı) dilde hizmet vermektedir.[39] 2005 yılında insan ticareti mağdurlarına yardım amacıyla acil iletişim hattı olarak faaliyete başlayan 157, GİGM tarafından devralınmış ve 2015 yılında Yabancılar İletişim Merkezi (YİMER 157) adını almıştır. Yabancılar İletişim Merkezi aracılığı ile yabancılara her türlü acil durumda Türkçe, İngilizce, Arapça, Rusça, Almanca, Farsça ve Peştuca (Afganistan resmi dili) dillerinde 7/24 danışmanlık hizmeti verilmektedir. İki bin yirmi yılının ilk yarısının sonuna kadar YİMER 157 ile yaklaşık 3.600.000 çağrı karşılanmış ve 2.500.000 farklı kişi ile görüşülmüştür.[40]

Sonuç olarak, sağlık hizmetlerinin "sağlıklı" yürütülmesinde iletişim konusu her boyutuyla büyük önem arz etmektedir ve ana dilde bile önemli sorunların kaynağı olabilir. Dezavantajlı grupların başında gelen göçmenlerin sağlık durumu fizyolojik ve psikolojik yönden etkilenmişken sağlık hizmetlerine erişiminde de iletişim engelleriyle karşılaşmaktadırlar. Ülkemizde göçmenlere verilecek sağlık hizmetleri sunumunu kolaylaştırmaya yönelik büyük adımlar atılarak, ayrı sağlık merkezleri kurulmuş, mevcut sağlık merkezleri içinde tercüman desteği sağlanmış, çağrı merkezleri kurulmuş ve hatta yabancı sağlık personeli çalıştırılması yoluna gidilmiştir. Tüm bu çalışmaların yanında göçmenlerin doğru, etkili ve zamanında sağlık hizmetlerine ulaşmasının önündeki en büyük engel hala iletişim sorunlarıdır. Özellikle nitelikli tercüman açığının kapatılması için toplum çevirmenliği hizmetlerinin özendirilmesi, mevcut tercümanların sağlık ve iletişim becerilerinin geliştirilmesi gerekmektedir.

Bildirimler

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REPORT / RAPOR

Halk sağlığı bakış açısıyla teletıp

Telemedicine in public health perspective

Deren Özyürek Ucael[a], Mustafa Enes Özden[a], Ercüment Altıntaş[a], Dilek Aslan[b]

[a] Arş. Gör. Dr., Hacettepe Üniversitesi Tıp Fakültesi, Halk Sağlığı Anabilim Dalı, Ankara, Türkiye.
[b] Prof. Dr., Hacettepe Üniversitesi Tıp Fakültesi, Halk Sağlığı Anabilim Dalı, Ankara, Türkiye.

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ABSTRACT

Telemedicine is among medical practices where "virtual" opportunities can be used. Although it has a historical background, telemedicine has become more popular due to the increasing trend in technology use in Novel Coronavirus Disease (COVID-19) pandemic. In this article, telemedicine use has been discussed with its strengths and limitations in public health perspective. Preventive medicine dimension has also been tackled in the content. Today, there is an increasing trend in telemedicine use due to some reasons including reducing health care cost, increasing access to health care services, promoting telemedicine use in chronic diseases, enabling healthcare professionals to provide healthcare services where telemedicine infrastructure is accessible, encouraging healthcare professionals to use telemedicine, and supporting multidisciplinary work of health professionals. Current telemedicine applications continue to be used both in clinical practice and in preventive medicine in "simultaneous", "asynchronous" and "remote patient monitoring" formats. Limitations of telemedicine including standardization and quality problems, insufficient patient-physician communication, problems in data storage, cheap labor, have become prominent. Public health perspective is thought to be helpful to promote telemedicine use in all fields of medicine and to propose solutions for its current limitations.

Keywords: Telemedicine, health service, preventive medicine

Correspondence: Dilek ASLAN, Hacettepe Üniversitesi Tıp Fakültesi, Halk Sağlığı Anabilim Dalı, Ankara, Türkiye.
E-mail: diaslan.dr@gmail.com. **Tel:** +90 536 833 45 85.

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ÖZ

Teletıp, tıbbın "sanal" olanakların kullanılabildiği uygulama alanları arasındadır. Geçmişte de uygulanmasına rağmen, Yeni Koronavirüs Hastalığı (COVID-19) pandemisinde teknoloji kullanımındaki artma eğilimi nedeniyle günümüzde teletıp uygulamaları daha popüler olmuştur. Bu makalede, teletıbbın güçlü yanları ve sınırlılıkları halk sağlığı bakış açısıyla tartışılmıştır. İçerikte uygulamaların koruyucu hekimlik boyutuna da değinilmiştir. Günümüzde, sağlık hizmetlerinin maliyetini azaltmak, sağlığa olan erişimi artırmak, kronik hastalıklarda teletıbbın uygulanmasını geliştirmek, sağlık çalışanlarının teletıp altyapısının var olduğu her yerden sağlık hizmeti sunmasını sağlamak, sağlık çalışanlarını teletıp uygulamalarını kullanmaya teşvik etmek ve sağlık profesyonelleri arasında multidisipliner çalışmayı desteklemek gibi gerekçelere bağlı olarak teletıp uygulamalarında artma eğilimi vardır. Güncel teletıp uygulamaları eş zamanlı, eş zamanlı olmayan ve uzaktan hasta izlemi şeklinde hem klinik uygulamalarda hem koruyucu hekimlik alanında kullanılmaya devam etmektedir. Teletıp uygulamalarıyla ilgili olarak; standardizasyon ve nitelik sorunları, hasta-hekim iletişiminin yetersizliği, verilerin saklanmasındaki problemler, ucuz iş gücü gibi sınırlılıklar öne çıkmaktadır. Teletıp uygulamalarının tıbbın bütün alanlarında uygulanmasını desteklemek ve uygulamaların mevcut kısıtlılıklarına çözüm üretebilmek için halk sağlığı bakış açısının yararlı olacağı düşünülmektedir.

Anahtar kelimeler: Teletıp, sağlık hizmeti, koruyucu hekimlik

Giriş

Dünya Sağlık Örgütü (DSÖ) tarafından teletıp "mesafenin kritik bir faktör olduğu zamanlarda sağlık hizmetlerinin sunumunun tüm sağlık çalışanları tarafından tanı, tedavi, hastalık ve kazaların önlenmesi, araştırma, değerlendirme, sağlık eğitimi ve sağlığın geliştirilmesi için diğer alanlarda bilgi ve iletişim teknolojilerini kullanılarak sağlanması" olarak tanımlamaktadır.[1] Tanımdan da anlaşılacağı üzere teletıp hizmetlerinin, birey ve toplum sağlığının korunması ve geliştirilmesini de içeren halk sağlığı bakış açısıyla sunulması önem kazanmaktadır. Halk sağlığı bakış açısı, sağlığın korunması ve geliştirilmesini, hastalıkların önlenmesini, erken tanısını, tedavisini, rehabilitasyon hizmetlerini kapsayan tüm hizmetler ile sağlığı ilgilendiren konularda yapılan araştırma ve değerlendirmelerin, teknolojik olanakların verimli bir biçimde kullanılmasını önceleyen bir yaklaşıma önem verir. Bu bakış açısı aynı zamanda sunulan ve sürdürülen bütün hizmetlere toplum katılımının sağlanması için çabayı vurgular. Geniş yelpazede halk sağlığı bakış açısı sağlık ve hastalık örüntülerinin konu olduğu her alana uyarlanabilir. Örneğin, teknolojik gelişimin sağlık alanı için kullanıldığı konularda da bu yaklaşım geçerlidir. Gelişen teknoloji sağlının her alanında kendine farklı şekillerde yer bulmuştur. Halk sağlığının bu bakış açısı, bireyin ve toplumun daha fazla yarar göreceği öngörüsüne de uygun olarak günümüzün teknolojik gelişmeleriyle uyumludur. Teknolojik gelişmelerden yararlanılarak sunulan sağlık hizmetleri (telesağlık, teletıp vb) özellikle toplumda eşitsizliklerden daha yoğun olarak etkilendiği bilinen kadınlar, çocuklar, yaşlılar, düşük sosyoekonomik düzeyine sahip olan bireyler gibi gruplara daha çok erişim olanağı sağlaması, daha uygun maliyetli seçenekler sunabilmesi açılarından da avantaj sağlayabilmektedir. Bu gibi hizmetler farklı disiplinlerle bir arada çalışabilmeye de olanak sağlamaktadır.

Amerika Birleşik Devletleri Hastalık Önleme ve Kontrol Merkezi (CDC) telesağlık ve teletıp uygulamalarının giderek yaygınlaştığını, 2020 yılında yaklaşık 30 milyar Amerikan doları seviyesinde bir piyasa büyüklüğüne ulaştığını, bu hızlı büyümenin sebeplerini ise sağlık hizmetlerinin ulaşılabilirliğini önemli ölçüde arttırması, standart bir bakım hizmeti haline gelmesi ve sağlık hizmetlerinin

masraflarını önemli ölçüde düşürmesi olarak belirtmiştir. Bu avantajlarının yanında COVID-19 pandemisi gibi sağlık sistemlerini zor durumda bırakan özel durumlarda bu büyümeye katkı sağlamıştır.[2] Toplum sağlığını en yüksek seviyeye çıkartmak için bu uygulamaların çerçevesinin iyi anlaşılması gerekmektedir. Bu gerekçe ile bu makalede teletıp uygulamalarının tarihsel gelişimi, temel uygulama alanları ve bu alanlar içerisinde koruyucu hekimlik uygulamaları açısından değerlendirmeleri halk sağlığı bakış açısıyla yapılmıştır. Makalede aynı zamanda uygulamaların birey ve toplum sağlığı açısından olası risklerine ve bu risklerin önlenebilmesi için önerilere yer verilmiştir.

Tarihten kesitler

İletişimin başladığı tarihlerden itibaren sağlık haberleşmesi de bunun bir parçası olmuş ve bu konudaki gelişmelere eşlik etmiştir. Telefonun icadı ile ise teletıp kavramı tanımı tam olarak yapılmasa bile oluşmaya başlamıştır. Lancet dergisinde 1879 yılında yayınlanan bir vakada sadece telefon aracılığı ile bir çocuğa tanı konulduğu ve telefonun aktif kullanımı ile gereksiz ofis ziyaretlerinin azalacağı belirtilmiştir. İlk transtelefonik stetoskop 1910 yılında İngiltere'de tanıtıldıktan itibaren gerek hastalar tarafından öneri ve bilgi almak için, gerek hekimler tarafından konsültasyon ve bilgi paylaşımı amacıyla giderek artan şekilde kullanılmaya başlanmıştır. Tarihteki ilk geniş kapsamlı kullanımı ise Antarktika'da tıbbi hizmetlerin sağlanması için radyo temelli bir sistem kullanılması olarak belirtilmiştir. Sağlık hizmetlerinde etkileşimli video iletişiminin ilk olarak kullanımı ise 1950'lerin sonlarında, Nebraska Psikiyatri Enstitüsü ile 112 mil uzaklıktaki Norfolk Eyalet Hastanesi arasında telepsikiyatri konsültasyonlarında olmuştur. Zamanla uydu ve internet teknolojilerinde yaşanan gelişmeler ile gittikçe önem kazanmaya başlamış, tüm dünyada pek çok proje ve çalışma başlatılmıştır. Özellikle 1988 Ermenistan depremi ve 1989 Rusya doğalgaz felaketinde kurulan bir konsey ile hastalar uzaktan değerlendirilmiş ve personele tavsiyelerde bulunulmuştur.[3,4] Milenyumun ilk on yılı ayakta ve yatan hastalar için telesağlık hizmetlerinde gelişmeye olanak sağlamıştır. Telesağlık hizmetleri 2010'lu yıllara gelindiğinde sağlık hizmetlerinin pek çok alanında kullanılmaya başlanmıştır. Yatan hasta ve acil telesağlık, kısmen telenöroloji ve tele-yoğun bakım (tele-YBÜ) alanlarında bu on yılda önemli gelişmeler yaşanmıştır. Teletıp alanında çalışanlar, çeşitli organizasyonlara katılarak ulusal seslerini artırmaya devam etmişlerdir. 2010 yılına kadar, Amerikan Teletıp Derneği'nin üyeliği, çeşitli kuruluşlardan yaklaşık 3.100 ABD ve uluslararası üyeye ulaşmıştır. İlerleyen yıllar ise; internet ve e-ticaretin yükseldiği, dijital ve elektronik araçların hızla geliştiği ve sonucunda dünya ekonomisinin ve kültürünün gidişatının değiştiği bir dönem olmuştur. Bu değişimler sağlık hizmetlerinin de kolay erişilebilir olmasıyla ilgili bir beklentiye neden olmuştur. Doğal olarak, telesağlık uygulamaları da hızla gelişerek, sağlayıcıların ve hastaların bakım ve hizmet verme şeklini her geçen gün değiştirmektedir.[5,6]

Telesağlık alanında gelişme ve yenilik günümüze kadar artarak sürmüştür. Telesağlık uygulamaları sağlık hizmetinin birçok alanında ana akım haline gelerek tercih edilen bakım sağlama yöntemi olarak kabul edilmektedir. Pubmed veritabanında 2010'dan 2021 yılına kadar "teletıp" ve "telesağlık" anahtar kelimelerini kullanarak yapılan bir taramada, yayınlanan 27.000'den fazla makale bulunmaktadır. Bu örnek; teletıp uygulamalarının yaygınlaştığını ve geliştirilmeye çalışıldığını göstermektedir. Bu büyüyen sağlık uygulama alanının tam potansiyeli keşfedilmeye devam etmektedir.

Uygulama örnekleri

Güncel teletıp uygulamaları eş zamanlı, eş zamanlı olmayan ve uzaktan hasta izlemi şeklinde üç ana başlıkta incelenebilir. Eş zamanlı uygulamalar; telefon, bilgisayar ve tablet kullanan bir hastayla telefon veya canlı ses-video etkileşimini içermektedir. Yetkili sağlık personeli tarafından iletişim araçları kullanılarak uzaktan değerlendirme yapılmaktadır. Buna psikiyatri alanındaki uygulamalar örnek olarak verilebilir. Eş

zamanlı olmayan uygulamalar görüntülerin veya verilerin bir anda bir noktada toplandığı ve daha sonra yorumlandığı veya yanıtlandığı "sakla ve ilet" teknolojisini içermektedir. Meme kanseri tarama testleri, PACS (Picture Archiving and Communication System-Görüntü Saklama ve İletişim Sistemleri) sistemleri gibi sistemler bu alana örnek olarak verilebilir. Uzaktan hasta izlemi ise bir hastanın klinik ölçümlerinin belli bir mesafeden (gerçek zamanlı olabilir veya olmayabilir) sağlık hizmeti sağlayıcısına doğrudan aktarılmasına olanak tanır. Bu alanda da sürekli kan şekeri ölçüm cihazları, holter cihazları gibi ileri teknoloji uygulamaları örnek verilebilir. Tütün kullanımının bırakılması, sağlıklı beslenme gibi alanlar da bu kapsamda verilebilecek örnekler arasındadır.

Klinik uygulamalar

Teletıp uygulamalarının günümüzde özellikle nöroloji, kardiyoloji, psikiyatri, pediatri gibi uzman sayısının yetersiz kaldığı veya uzmanların coğrafyaya eşit dağılmadığı alanlarda aktif bir şekilde kullanılması yaygınlaşmaya başlamıştır.

Nöroloji kliniğinde; Amerikan Gıda ve İlaç Dairesi'nin (FDA) 1996 yılında akut iskemik inmeli hastalarda intravenöz doku plazminojen aktivatörünün (tPA) kullanımını onaylamasına rağmen ilk güvenlik endişeleri düşük kullanıma sebep olmuştur. Doku plazminojen aktivatörü'nün güvenirliliği ve etkililiğinin kanıt temeli arttıkça, yapılan araştırmalar teleinme hizmetleri ile tPA kullanımının %57.6 artırılabileceği kanıtlanmıştır. Bu durum, inme üzerine çalışan nörologların coğrafi dağılımındaki eşitsizliğin önüne geçmek ve tPA'nın uygun kullanımını artırmak amacıyla aktif bir şekilde teletıp uygulamalarını kullanmaya teşvik etmiştir. Bu konuda nöroloji alanında 2013 yılından itibaren Amerika'da "telestroke" isimli uygulama kullanılmaya başlanmış ve yaygınlaşmıştır. Bu uygulama ile hastaların ihtiyaç duydukları özel acil bakımı alırken en yakın hastaneye gitmeleri ve tüm hastaların eşit hayatta kalma şansına ulaştıkları belirtilmiştir.

Radyoloji alanından da örnekler mevcuttur. Amerika'da 2014 yılından itibaren teleradyoloji teknolojisi kullanılması yaygınlaşmıştır. Teleradyoloji; hastaların toplanan görüntülerinin bir radyoloğa iletildiği ve raporlanmasının sağlandığı bir sistem olarak belirtilmiştir. Özellikle radyoloji uzman sayısının yetersiz olduğu bölgelerde hasta ile radyolog arasındaki yüz yüze görüşmeyi ortadan kaldırarak ve hastalara daha hızlı sonuçlar sunarak bu eksikliği tamamladığı belirtilmiştir.[7] Psikiyatri gibi yüz yüze iletişimin ön planda olduğu alanlarda da teletıp kullanılarak benzer kalitede bakım sağlandığı belirtilmiştir. Özellikle canlı video-ses etkileşimini içeren teknolojiler kullanılarak yapılan görüşmeler ile hasta takibi yapılabildiği belirtilmiştir. Ayrıca hemşirelerin servislerde tedavi gören hastaları teletıp uygulamaları sayesinde hekimlere danışıp tedavilerinin geciktirilmeden sağlandığı uygulamalar da belirtilmiştir.[8] Kardiyoloji alanı da teletıp uygulamalarının sıklıkla kullanıldığı alanlardan birisidir. Hastalarının elektrokardiyogramlarının hekimlere iletilmesinde ve temel yaşam desteği sağlanması için sağlık profesyonellerinin alana yönlendirilmesinde sosyal medya araçları (Whatsapp®, Telegram® vb.) kullanılmaktadır. Bu alanda özellikle miyokard enfarktüsü gibi aciliyet teşkil eden durumlarda hastanın tanısında, gerekli sağlık merkezine başvurmasında ve sağlık merkezleri arasında sevk edilmesinde kullanılan uygulamalar ön plana çıkmaktadır.

Tüm bunlara ek olarak 2019 yılı aralık ayında ortaya çıkıp kısa sürede tüm dünyada etki gösteren COVID-19 pandemisi sağlık sistemleri üzerinde büyük bir yük oluşturmuştur. Sağlık personelinin COVID-19 ile ilgili alanlara kaydırılması, hastanelerin yoğunluğunun artması, karantina uygulamaları gibi sebeplerle bulaşıcı olmayan hastalıkların tedavi ve takipleri aksamıştır. Bu sebeple bu hastalıkları tedavi etmek, reçeteleri uzaktan doldurmak ve başvuruları azaltarak personelin amacını değiştirmek için teletıp uygulamaları kullanılarak yeni stratejiler geliştirilmiştir.[9]

Koruyucu hekimlik uygulamaları

Koruyucu hekimlik bireylerde ve toplumlarda sağlığı geliştirme ve hastalıkları önleme uygulamalarını kapsar. Uygulayıcılar, sağlık sistemleri dönüşümünü desteklemek ve hastalık ile yeti yitimi önlenmesine dayanan bir sağlık hizmeti sistemi oluşturmak için klinik bakım ve halk sağlığı alanındaki becerileri ve deneyimleri birleştirir.[10] Koruyucu sağlık hizmetleri hastalanmaktan, yaralanmaktan, yeti yitiminden ve erken ölümden korumak amacıyla verilen sağlık hizmetleridir. Koruyucu sağlık hizmetleri bireyin bulunduğu hastalık dönemlerine göre koruyucu sağlık hizmetleri (primordial, primer, sekonder, tersiyer koruma) ya da kişiye ve topluma yönelik koruyucu sağlık hizmetleri (bağışıklama, ilaçla koruma, erken tanı, sağlık eğitimi, beslenme, aile planlaması, kişisel hijyen) olarak incelenebilir. Teletıp uygulamalarının gebelerin doğum öncesi bakım randevularına katılmaları sırasında, çocukların aşısı için hatırlatma amacıyla ve cinsel ve üreme sağlığını korumak için gelecekte kullanılabileceğini DSÖ tarafından bildirilmiştir.[11,12]

Bağışıklama alanında; aşılama bilgi sistemleri kullanılmaktadır. Bu sistemler gizlidir ve verileri kaydetmek için tasarlanmış nüfus kaynaklı bilgisayar destekli veri tabanlarını kullanır. Aşılama bilgi sistemleri risk altındaki kişi ve grupların belirlenmesini, aşılama verilerinin yönetimi, depolanması ve entegrasyonu için çözümler sunmasını, ailelerin katılımını kolaylaştırmasını, sağlık sağlayıcıları için desteğini ve bölgesel, ulusal ve uluslararası sağlık sağlayıcıları arasında veri paylaşımını sağlamaktadır. Aşı dozu sorumluluğu da dijital çözümlerden faydalanabilir. CDC aşı izleme sistemi (VTrckS), kamu tarafından finanse edilen aşıların internet üzerinden tedariğine ve izlenmesine (aşı ürününü tanımlama; son kullanma tarihi ile aşı bilgilerini saklamak için barkodların kullanılması) sağlamaktadır. Klinik karar destek sistemleri, doğum tarihine ve aşı geçmişine dayalı olarak çocuklar için uygun aşılama programını önererek, düzenlemelerdeki değişiklikleri otomatik olarak entegre ederek, proaktif olarak doktorlara hastaları için aşıların yan etkilerini otomatik olarak tanıtarak ve riskli gruplarda özel aşılamaları önererek sağlık profesyonellerinin aşıları doğru bir şekilde yönetmelerine yardımcı olmaktadır. Hastalar ve aileler tarafından yönetilen kişisel sağlık kayıtları (PHR) da otomatik bildirimler yoluyla aşılama programlarına uyumu iyileştirebilir. Gelişmekte olan ülkelerde altyapı eksikliği ve yüksek maliyetler nedeniyle aşılama bilgi sistemlerini benimsemek daha zor olmaktadır. Telefonlar gelişmekte olan ülkelerde yaygın olarak kullanılmaktadır ve mobil tabanlı yaklaşımlar bu bağlamda umut verici olabilir.[13]

Ülkemizde tütün kullanımını bırakmak isteyen bireyler için ALO 171 danışma hattı kurulmuştur. 175'ten fazla operatörün görev yaptığı hatta günlük ortalama 4000 çağrı girdisi yapılmakta, burada gerekli bilgilendirmeler yapıldıktan sonra isteyen hastalar için sigara bırakma polikliniği randevusu verilmekte, daha sonra kontrol aramaları yapılmaktadır.[14]

Tüberküloz hastalığının tanı, tedavi ve takibinin yapıldığı verem savaş dispanserlerinde doğrudan gözetimli tedavi içerisinde, anlık video görüşme programları kullanılarak video gözetimli tedavi ile hastaların tedavisi her gün takip edilmektedir.

Yeni Koronavirüs Hastalığı nedeniyle pek çok klinik muayenede aksamalar olmuş, teletıp sistemleri denenmeye başlamıştır. Türkiye'de Sağlık Bakanlığı'nın geliştirmiş olduğu "Dr.e-Nabız Sistemi" ve hayat eve sığar (HES) mobil uygulamaları ile hastalık sebebiyle pozitif veya temaslı durumunda olan kişilerin çevrimiçi sağlık hizmetlerine ulaşabilmesini, takiplerini ve ayrıca diğer bireyler tarafından da mevcut durumun anlık takibi sayesinde korunmasını sağlamaktadır.[15,16] Birçok üniversite hastanesi ve özel hastane de bu dönemde "internet polikliniği" uygulamasını başlatmıştır. Hastalar, hekimlerine internet üzerinden randevu alarak ulaşabilmektedirler. İngiltere'de gebe kadınlar için sosyal medya temelli bir antenatal destek grubu oluşturulmuş, gerekli bilgilendirmeler paylaşılmış, ebelerin gözetiminde tartışma ortamları yaratılmıştır.[17]

Evde bakım hizmetleri

Kronik hastalıklara sahip hastalar için teletıp uygulamaları kapsamında ev ortamında glikoz ve kan basıncı monitörlerinin bulunarak, kayıtlı değerlerinden herhangi biri anormal ise bir hekime başvurmaları konusunda hastaları uyaran uygulamalar mevcuttur. Bu tip ev içi sistemler acil servise aşırı yüklenmeden hasta değerlendirilmesine olanak sağlamakta, doktorların hastaları teletıp yoluyla izlemelerine izin vermektedir.[18]

Teletıp uygulamalarının dikkate alınması gereken sınırlılıkları

Günümüzde sağlık hizmetlerinde maliyeti düşürmek, sağlık erişimi daha kısıtlı olan kişilere sağlık hizmeti ulaştırmak, sadece akut durumlarda değil kronik ve dönemsel hastalıklarda da teletıp uygulamalarının kullanımının artırmak, teletıp uygulamalarını sadece hastaneden değil sağlık çalışanlarının mobil olarak her yerden erişebilmesini sağlamak, sağlık çalışanlarını teletıp uygulamalarını kullanmaya teşvik etmek ve uzmanlıklar arasındaki işbirliği ile multidisipliner çalışmayı artırmak gibi gerekçelere bağlı olarak teletıp uygulamalarında artma eğilimi vardır.[19,20] Bununla birlikte, uygulamanın kısıtlılıkları mevcuttur.

Shigekawa ve arkadaşlarının Ocak 2004-Mayıs 2018 döneminde yayınlanan her yaştaki hastalar tarafından telesağlık hizmetlerinin kullanımının sistematik incelemelerini ve meta analizlerini araştırdığı çalışmalarında telesağlık müdahaleleri genellikle yüz yüze bakıma eşdeğer görüldüğü fakat telesağlık uygulamalarının etkililiğinin kanıtlarını analiz ederken, modalite, kanıt kalitesi, nüfus demografisi ve sonuçların belirli bir noktada ölçülmesi dahil olmak üzere birçok faktörün dikkatlice değerlendirilmesi gerektiğini belirtmiştir.[21] Bu konu ile ilgili olarak Dünya Sağlık Örgütü sağlık çalışanlarının farklı lokasyonlarda iken sağlık konularında iletişim kurmasını sağlayacak teletıp uygulamalarının kullanılabileceğini ifade etmesine rağmen, bunların tamamen yüz yüze etkileşim ve konsültasyonların yerini alamayacağını bildirmiş ve ayrıca sağlık bilgilerinin mahremiyetinin korunmasının önemine vurgu yapmıştır.

İster "geleneksel" ya da teletıp uygulamalarının ağırlık kazandığı sağlık hizmeti sunumunda hastalar (ya da başvuranlar); hekimlerinin hasta yararını en önde bulundurduklarını, hasta mahremiyetine saygı duymalarını, hizmet aldıkları hekimin uygun klinik niteliklere ve deneyime sahip olmasını, iyi düşünülmüş kararlar vermelerini ve uzman tavsiyesi sunmak için gerekli olan önemli bilgileri elde etmek için bazı araçlara sahip olmasını beklemektedir. Hizmet sunucularının görevi, bu temel sorumlulukların, yüz yüze hasta-hekim etkileşimlerinden farklı olarak telesağlık ve teletıp bağlamında nasıl farklı şekilde işleyebileceğini anlamaktır.[22]

Teletıp uygulamaları, sağlık hizmetleri sunumunu yeni bir boyutta gerçekleştirse de hekim ve hasta arasındaki mahremiyet güvencesini sağlamakla yükümlüdür. Örneğin, günümüzde kullanımı oldukça yaygın olan sağlık alanındaki web siteleri, kullanıcılar hakkında bilgi toplamaktadır. Mahremiyet hakkı sebebiyle bu web sitelerine içerik sağlayan sağlık hizmeti sunucularının, kullandıkları web sitelerinin gizlilik politikasına sahip olduğundan; gizlilik politikalarının şeffaf olduğundan ve hangi bilgilerin toplanarak nasıl kullandığından emin olma sorumluluğu vardır. Teletıp uygulamaları, üçüncü şahısların elektronik tıbbi kayıt gibi gizli bilgilerle karşılaşması durumunda bu hakkı ortadan kaldırma potansiyeline sahiptir.[23]

Sağlık hizmeti sunucularının yetkinliği, teletıp uygulamalarının kullanımı boyunca sağlanması gereken bir sorumluluktur. Uzman tavsiyesi almak isteyen hastalara yanıt veren hekimlerin, uygun klinik niteliklere ve deneyime sahip olması gerekmektedir. Hekimler uzman kararı verirken, gerekli olan bilgilere erişmek için o günkü şartlarda kullanılan en yetkin tıbbi cihazlara sahip olmalıdır. Ek olarak, hekimlerin verdikleri kararların hem hukuksal açıdan hem de hastalarına karşı hesap verilebilir olmalıdır.

Teletıp uygulamaları,maliyet açısından uygun gibi görünse de, sistemlerin geliştirilmesi ve uygulanması için ekipman, personel, iletişim gibi çok farklı kalemlerin her birisinin maliyetinin dikkate alınması gerektiği unutulmamalıdır.

Teletıp uygulamaları, başlangıçta yatırım ve kullanıldığı süreçte bakım maliyetleri gerektirse de uzun dönemde hastaların bağımsız yaşama kabiliyetini ve yaşam kalitesini artırarak, sağlık hizmetlerine ulaşmak için harcanan seyahat maliyetlerini düşürerek önemli maliyet tasarrufu sağlama potansiyeline sahiptirler.[24] Lee ve arkadaşları 2018 yılında 10 veritabanında yayınlanan diabetes mellitus hastalığında teletıp uygulamalarının ekonomik model ve zaman açısından değerlendiren yayınlarını araştıran sistematik bir derleme çalışması yapmışlar ve çalışmalarında sağlık hizmeti sunucularının ücretlerinin toplam maliyet için önemli bir belirleyici olduğunu ortaya koymuşlardır. Lee ve arkadaşları aynı zamanda diabetes mellitus hastalığının takibinde önemli bir yer tutan retina taraması için kullanılan teletıp uygulamalarının hastalığın yönetimi için faydalı ve uygun maliyetli olduğunu da vurgulamışlardır. Aynı araştırmada, teleizleme ve telefon hatırlatıcılarının kullanımı diabetes mellitus hastalığının yönetiminde maliyet açısından avantajlı bulunmuştur.[25] Jiang ve arkadaşlarının kardiyovasküler hastalıkların yönetiminde dijital sağlık müdahalelerinin (kısa mesaj, telefon görüşmesi, telefon uygulamaları, video konferans görüşmeleri, teleizlem ve giyilebilir tıbbi cihazlar) maliyet etkinliğini değerlendiren karar analitik model tabanlı çalışmaların sistematik incelemesinde, dijital sağlık müdahalelerin uygun maliyetli olduğunu saptamıştır. 14 çalışmanın 6'sında maliyet tasarrufu ile daha yüksek QALY (kalite endeksli yaşam yılı) kazanılmış ve çalışmaların geri kalanında ise daha yüksek bir maliyetle olsa da maliyet/etkililik oranında artışla QALY elde edildiği saptanmıştır.[26]

Öneriler

Teletıp uygulamalarının birey ve toplum sağlığı açısından en üst düzeyde yarar sağlayabilmesi için bazı öneriler aşağıda sunulmuştur:

Teletıp uygulamalarıyla ilgili gelişmelerin yakından takip edilebilmesi için sağlık hizmeti alanlara ve sunanlara yönelik eğitimler verilebilir. Hizmet alanlara yönelik olarak; teletıp uygulamaları kullanımı tanıtılabilir, daha yaygın kullanımı için yaş, cinsiyet, öğrenim durumu gibi kişisel özellikler göz önünde bulundurularak eğitimler planlanabilir. Teletıp uygulamaları her zaman yüz yüze görüşme kadar etkili olamayabilir. Bu nedenle bu alandan yararlanılırken yüz yüze görüşme ve hasta/başvuran-hekim ilişkisinin kesintiye uğratılmamasına özen gösterilmelidir. Tedavi edici sağlık hizmetlerini sunanlar tarafından teletıp uygulamaları kullanılırken hasta/başvuran öyküsünün ayrıntılı olarak alınması ve muayene adımlarının yapılması gibi aşamaları sekteye uğratılmamalıdır.

Koruyucu sağlık hizmetleri her bireyin her yerde ve her zaman ulaşmaya hakkı olduğu hizmetlerdir. Sağlık hizmeti sunucuları olağandışı durumlarda, coğrafi zorluklarda, yetersiz hizmet alan kişi ve toplumlara koruyucu sağlık hizmetlerini ulaştırmak için teletıp uygulamalarını güncel kullanımda artırmalıdır. Uygulamalar sürdürülürken etik, hukuki boyutlar muhakkak dikkate alınmalıdır. Özellikle kamu tarafından geliştirilen uygulamalarda birey ve toplum yararı her zaman en öncelikli amaç olmalıdır. Teletıp uygulamaları alanındaki çalışmalar artırılarak sürdürülmelidir. Maliyeti yüksek olabilecek geliştirilme aşaması için gerekli destekler sağlanmalıdır. Teletıp uygulamalarının etik, yasal, vb. açılardan çerçevesinin çizilmesine ihtiyaç vardır. Teletıp uygulamaları, halk sağlığı sorunlarının belirlenmesine ve izlenmesine yardımcı olacak epidemiyolojik çalışmalarda daha çok kullanılabilir hale getirilmelidir.

Sonuç olarak, teletıp uygulamalarının başarılı olabilmesi için pek çok alanda düzenlemeye ihtiyaç vardır. Bu ihtiyaçların birey ve toplum sağlığının yararını en üst düzeyde tutacak şekilde giderilmesine özen gösterilmelidir.

Bildirimler

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