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EDITORIAL

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Medical Research Reports Dergisinin 2024 yılı ikinci sayısını sizlerle paylaşıyoruz. Bu sayıda dört araştırma makalesi ve bir vaka raporu olmak üzere çok değerli beş bilimsel makale bulunmaktadır. Literatüre kazandırılan bu çalışmaların ilgi ile okunacağını ve başka araştırmalara referans oluşturacağını umuyoruz.

Hedefimiz ve çalışmalarımız; okunurluğu ve erişilebilirliği yüksek, uluslararası standartlara uygun bilimsel bir yayın olmak yönündedir. Yeni yılla birlikte daha fazla indekste yer almaya çalışacağız. Mevcut standartlarımız ve yayın süreçlerimiz buna uygun şekilde yapılandırılmıştır.

Meslektaşlarımızı çalışmalarını Medical Research Reports aracılığı ile bilim dünyasıyla paylaşmaya davet eder, saygılarımızı sunarız.

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Dear Readers of the Journal of Medical Research Reports,

We share with you the first issue of the Medical Research Reports Journal for 2024. There are five scientific articles in this issue, including four original studies and one case report. We hope that these studies brought to the literature will be read with interest and will serve as a reference for other studies.

Our goal and work; It aims to be a scientific publication with high readability and accessibility, in line with international standards. We will try to be included in more indexes with the new year. Our current standards and publication processes are structured accordingly.

We invite our colleagues to share their work with the scientific world through Medical Research Reports, and we present our respects.

Associate Professor Mehmet Enes GOKLER
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ORIGINAL ARTICLE

Social Media Use and Perceived Loneliness Level in Covid-19 Infected Patients and Its Relationship with Depression

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ÖZET

Amaç: Çalışmamızda Covid-19 nedeniyle karantinaya alınan bireylerle, Covid-19 geçirmeyip karantinaya alınmayan kişilerin depresyon, anksiyete, sosyal medya bağımlılığı ve algılanan yalnızlık düzeyleri arasındaki ilişkilerin karşılaştırılması ve değerlendirilmesi amaçlanmıştır. **Yöntem:** Psikiyatri polikliniğine anksiyete ve depresyon belirtileri ile başvuran 92'si Covid-19 tanısı ile karantinaya alınmış, 97'si Covid-19 geçirmemiş ve karantinaya alınmamış 189 hasta çalışmaya katılmıştır. Katılımcılara sosyodemografik bilgi formu, Beck Depresyon Ölçeği, Beck Anksiyete Ölçeği, Sosyal Medya Bağımlılığı Formu, Algılanan Yalnızlık Ölçeği, Nomofobi Ölçeği uygulanmıştır. **Bulgular:** Karantinaya alınan hastaların anksiyete düzeyleri alınmayanlara kıyasla anlamlı derecede yüksek ve algılanan yalnızlık düzeyleri ise anlamlı derecede düşük olarak saptanmıştır. Karantinaya alınan bireyler arasında depresyon ve anksiyete düzeyleri arasında orta düzey ve anlamlı bir ilişki (r=0,593), nomofobi ve sosyal medya bağımlılığı düzeyleri arasında orta düzeyde ve anlamlı bir ilişki (r=0,679) ve anksiyete ve yalnızlık düzeyleri arasında orta düzeyde ve anlamlı bir ilişki (r=0,404) tespit edilmiştir. Covid -19 geçirmemiş hastalar arasında nomofobi ile yalnızlık arasında zayıf ve anlamlı bir ilişki (r=0,295) ve nomofobi ile sosyal medya bağımlılığı arasında orta düzeyde ve anlamlı bir ilişki (r=0,609) gözlenmiştir. **Sonuç:** Çalışmamız, karantinanın olumsuz psikolojik etkilerle ilişkili olduğu ve bunun da kişinin yalnızlık hissi ve sosyal medya kullanımı ile ilişkili olduğu sonucuna varmıştır. Bu sorunlar, güvenilir kaynaklardan doğru bilgi edinilmesi ve sosyal medyaya sınırlı zaman ayrılmasıyla azaltılabilir.

Anahtar kelimeler: Anksiyete, Karantina, Sosyal medya

ABSTRACT

Aim: This study aimed to compare and assess the connections between depression, anxiety, social media dependency, and perceived loneliness levels in individuals who were quarantined due to Covid-19 and those who were not affected by the virus and were not quarantined. **Methods:** The study involved 189 patients seeking treatment for anxiety and depression at a psychiatry outpatient clinic, with 92 of them being quarantined due to Covid-19 and 97 not being affected by the virus. Participants completed a sociodemographic information form, Beck Depression Inventory, Beck Anxiety Inventory, Social Media Addiction Form, Perceived Loneliness Scale, and Nomophobia Scale. **Results:** Quarantined patients exhibited significantly higher anxiety levels and lower perceived loneliness levels compared to those who were not quarantined. Among individuals with Covid-19, there was a moderate and significant correlation between depression and anxiety levels (r = 0.509), a moderate and significant correlation between nomophobia and social media addiction levels (r = 0.580), and a moderate and significant correlation between anxiety and loneliness levels (r = 0.305). Among patients without Covid-19, a weak but significant correlation between nomophobia and loneliness (r = 0.295) and a moderate and significant correlation between nomophobia and social media addiction (r = 0.609) were observed. **Conclusion:** The study concluded that quarantine was linked to adverse psychological effects, which were also associated with feelings of loneliness and social media usage. These issues could potentially be alleviated by providing accurate information from reliable sources and by limiting social media usage.

Keywords: Anxiety, Quarantine, Social media

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INTRODUCTION

Quarantine is defined as keeping people infected with an infectious disease in a separate place to check to see if they are infected and to prevent the spread of the disease to other people (1). Individual quarantine can be effective when transmission of an infectious disease is limited, and cases originate from other countries or have clear epidemiological links with other cases. In the later stages of an outbreak, when the virus continues to spread and connections between cases are unclear, individual quarantines may not be enough. In such cases, community-wide quarantines, such as closing schools, canceling public meetings, and reducing travel, may be necessary (2). The term "quarantine," originating from the word quarantenaria, meaning a period of forty days, was initially used in Venice during the 12th century to isolate individuals with leprosy and was later widely employed during plague outbreaks (3). In recent years, many regions quarantined during severe acute respiratory syndrome (SARS), Ebola, MERS outbreaks. More recently and globally, quarantine has also been recommended by World Health Organization (WHO) to manage the Covid-19 outbreak. Despite the WHO' s endorsement of quarantine as a measure to contain the spread of the epidemic, research has revealed adverse psychological effects. Literature has demonstrated that factors such as restricted freedom, monotony, and social stigmatization resulting from quarantine can have detrimental effects on individuals' mental well-being. (1). In the past, psychiatric evaluations of individuals quarantined in outbreaks have revealed that they are at a higher risk of depression, anxiety, post-traumatic stress and emotional exhaustion than the general population (3-5). During the Covid-19 pandemic, quarantine measures were put in place, and there was a greater reliance on technology for social interaction compared to previous outbreaks (6, 7). The use of social media has become increasingly important in our lives and has begun to impact our socializing habits (8). The impact of social media on human psychology is a significant area of study, and the heightened reliance on social media during the Covid-19 pandemic can be seen as essential for tasks like accessing information, pursuing education and work, leisure activities, communication, shopping, entertainment, and arranging virtual meetings (9). Nevertheless, it has been found that using social media can result in various other issues, including excessive screen time, addiction to social media and gaming, psychological issues like stress, depression, and feelings of isolation, as well as physical health problems (10). In today's world, with over 3 billion people using social media (11), the impact of phones and social media on depression, anxiety, and loneliness has been neglected in favor of previous studies on the effects of quarantine. As a result, the isolation experienced during the Covid-19 pandemic and the social distancing measures have been replaced by digital connections through social media. During this time, there has been a significant increase in both the time spent on

social media and the amount of information obtained online (12). In this research we aimed to investigate the levels of depression and anxiety, social media use and perceived loneliness among people who were quarantined with diagnosed Covid 19 infection and people who had never had the disease and were not quarantined during this period and to make a comparison between the groups.

MATERIAL AND METHODS

Individuals who applied to the psychiatric outpatient clinic with anxiety and depression complaints and volunteered to be included in the study were informed about the purpose of the study and their consent was taken. The study data were obtained between March 01, 2022 and October 01, 2022. The researcher conducted the scales with the participants for 30 minutes. Following a psychiatric interview, individuals diagnosed with anxiety disorder or depression by a specialist psychiatrist according to DSM-5 criteria were included in the study. The participants were then divided into two categories: those who had been in quarantine within the past 3 months and those who had not. For those who were and quarantined, patients who applied within the first 3 months after quarantine, were between the ages of 18-65 and had no previous psychiatric admission were included in the study. The participiants who had Covid-19 but did not quarantine were excluded. For not quarantineted, those who were between the ages of 18-65 and had their first psychiatric admission were included in the study, and those who quarantined because someone in their family had Covid-19 or had a contact were excluded. In total, 92 Covid-19 patients who were infected with Covid in the last 3 months and 97 patients who did not have Covid-19 were included in the study. Before starting the study, the necessary approval was obtained from the Ministry of Health and the University Ethics Committee (decision dated 07.02.2022 and numbered 2022/03-25).

Data Collection Tools

The personal data form, which was created by reviewing the relevant literature and obtaining expert opinions, included 16 questions about the sociodemographic information of the individuals and whether they or their relatives had Covid-19. In addition to the demographic information form, Perceived Loneliness Scale (UCLA), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Social Media Addiction Scale Adult Form (SMAS- AF) and Nomophobia Scale were applied to all participants after reading the consent form and obtaining permission.

Beck Depression Inventory (BDI)

The Beck Depression Inventory was developed by Beck in 1961 and assesses emotional, cognitive, physical and motivational factors (13). It is a self-report scale frequently used in research and clinical practice. Although it mainly aims to measure depression symptoms in detail, it also helps to assess cognitive content (14). The Turkish validity and reliability study of the BDI used to measure the degree of depression was performed by Hisli (15).

Beck Anxiety Inventory (BAI)

BAI is 21 items self-report scale used for determining level and intensity of anxiety symptoms. The items in the scale are scored between 0 and 3 and the result obtained varies between 0-63. The score obtained from the test is evaluated as follows: 0-7 minimal anxiety, 8-15 mild anxiety, 16-25 moderate anxiety and 26-63 severe anxiety (16). The Turkish validity and reliability study was performed by Ulusoy et al (17).

UCLA Loneliness Scale

This scale was developed to assess the loneliness levels of individuals. The form revised by Russell, Peplau and Cutrona includes 10 positive and 10 negative statements (18). UCLA Loneliness Scale was adapted into our language by Demir (1989) (19). In each item of this scale, feelings and thoughts about social relationships are evaluated, and expected to rate how often the participants's experience the situations in the scale with a Likert-type four-point rating scale. the total score of the scale as the 'General Loneliness Score'. The general lonelines score ranges from 20 to 80. The higher score indicates the higher level of loneliness.

Social Media Addiction Scale - Adult Form (SMAS- AF)

The scale developed by Şahin and Yağcı (2017) to measure the level of people's dependence on social media. There are 20 items and two sub-dimensions; "Virtual Tolerance" and "Virtual Communication". Two items of the scale are reverse coded. Score ranges from 20 to 100. A high score means that the individual perceives the self as a "social media addict" (20).

Nomophobia Scale

The nomophobia scale is a 20-item 7-point Likert-type scale used to assess smartphone addiction. (20). The scale developed by Yıldırım and Correira consists of four sub-dimensions to measure the nomophobic status of the individual. These are (i) Not being online, (ii) Loss of communication, (iii) Lack of mobile device, (iv) Inability to access information. The reliability value (Cronbach Alpha) was calculated as 0.95, and the Cronbach Alfa of the four subscales were 0,94, 0,87, 0.83 and 0,81 (21). Turkish adaptation study was conducted (22).

Statistical Analysis

The analysis findings were reported in the form of Mean±Standard Deviation and Median (minimum-maximum) for numerical data, and frequency (percentage) for categorical data. The Kolmogorov-Smirnov test was employed to assess normal distribution. It was found that the scores did not meet the normal distribution. Mann-Whitney U test was used for group comparisons and Spearman Correlation Analysis was used to examine the relationship between scale scores. The significance level was taken as $p<0.05$. SPSSv22.0 (Statistical Package for Social Sciences) package program was used to analyze the data.

RESULTS

In the quarantine group (QG), 46% of individuals were between the ages of 18-25, 43% were aged 35-55, and 11% were aged 55-72. Additionally, 38% of the group were male, 66% were married, and 66% resided with their spouse and children. Among the cohabitants, 35% had contracted Covid-19. In contrast, the non-quarantine group (non-QG) consisted of 50% individuals aged 18-25, 39% aged 35-55, and 11% aged 55-72. Furthermore, 35% were male, 49% were married, and 54% lived with their spouses and children. Notably, 48% of cohabitants in this group had contracted Covid-19. The sociodemographic characteristics of the participants in our study are given in Table 1.

Table 1. Sociodemographic characteristics of the study participants

Quarantined status		**Yes**		**No**		
		Number (n)	**%**	**Number (n)**	**%**	**p**
Age (years)	18-35	42	46	49	50	0.552
	35-55	40	43	38	39	
	55-72	10	11	9	11	
Gender	Male	35	38	54	55	0.016
	Female	57	62	43	45	
Education level	Literate	5	5	8	8	0.233
	Primary school	26	28	22	23	
	Secondary school	14	15	23	24	
	High school	13	14	24	25	
	University	34	37	20	20	
Marital status	Married	61	66	48	49	0.013
	Single	30	33	44	45	
	Divorced-widowed	1	1	5	6	
Living together	Alone	9	10	14	14	0.613
	Partner and children	61	66	52	54	
	Parents and siblings	22	24	31	32	
Place of residence	Village	2	2	7	8	0.258
	City	85	92	74	76	
	County	5	5	16	16	
History of psychiatric disease	Yes	44	52	47	48	0.931
	No	48	48	50	52	
Comorbidity	Hypertension	5	5	7	8	0.477
	Diabetes mellitus	5	5	4	5	
	Heart failure	3	3	0	0	
	Obstructive lung disease	4	4	5	5	
	Cancer	10	11	5	5	
	None	65	71	74	77	
COVID-19 history of cohabitants	Yes	60	35	46	48	0.014
	No	32	65	51	52	
Alcohol and substance use	Yes	1	1	3	3	0.340
	No	91	99	94	97	
Cigarette	Yes	21	77	34	36	0.065
	No	71	23	63	64	
Total		92	100	97	100	

*Mann-Whitney U

It was observed that anxiety levels of QG were significantly higher ($p<0.01$) and perceived loneliness levels were significantly lower ($p<0.01$) compared to non-QG. However, there were no significant differences between the groups in terms of social media addiction, depression, and nomophobia, as indicated in Table 2.

Table 2. Scale scoring averages of people with and without COVID-19

	Quarantined status	Number (n)	Mean rank	p
Depression scores	Yes	92	16.57±9.56	0.666
	No	97	16.88±8.98	
Nomophobia scores	Yes	92	53.02±29.41	0.849
	No	97	50.72±19.53	
Anxiety scores	Yes	92	23.54±13.56	**<0.01**
	No	97	16.23±13.93	
Loneliness scores	Yes	92	41.61±11.10	**<0.01**
	No	97	46.79±6.58	
Social media addiction scores	Yes	92	2.22±0.99	0.88
	No	97	2.02±0.87	

*Mann-Whitney U

In the investigation of the correlation between depression, nomophobia, anxiety, social media addiction, and levels of loneliness in a sample population, it was observed that there existed a statistically moderate and significant association between depression and both social media addiction ($p=0.01$, $r=0.342$) and loneliness levels ($p=0.01$, $r=0.328$). Additionally, a moderately significant relationship was identified between depression and anxiety levels ($p<0.01$, $r=0.593$). Furthermore, a robust and statistically significant correlation was found between nomophobia and social media addiction scores ($p<0.01$, $r=0.679$), while a significant and moderate association was observed between anxiety and loneliness scores ($p<0.01$, $r=0.404$) (Table 3).

In the non-QG cohort, the study revealed a moderate correlation between nomophobia and feelings of loneliness ($r=0.367$), a strong correlation between nomophobia and addiction to social media ($r=0.759$), and a moderate correlation with perceived loneliness ($r=0.367$), as well as a weak correlation with the severity of depression ($r=0.230$). These correlations were found to be statistically significant ($p<0.05$) as shown in Table 3.

Table 3. The correlation of the scale scores of those quarantined and those not quarantined

Quarantined status		n		1	2	3	4	5
Yes	**Social media addiction total score**	92	r	1.000	.122	.679**	.342**	.243*
			p		.246	**<0.01**	**.001**	**.020**
	Perceived loneliness score	92	r		1.000	.030	.328**	.404**
			p			.779	**.001**	**<0.01**
	Nomophobia score	92	r			1.000	.354**	.179
			p				.001	.089
	Beck depression scale	92	r				1.000	.593**
			p					**<0.01**
	Beck anxiety scale	92	r					1.000
			p					
No	**Social media addiction total score**	97	r	1.000	.256*	.759**	-.030	.056
			p		**.011**	**<0.01**	.774	.583
	Perceived loneliness score	97	r		1.000	.367**	.230*	.053
			p			**<0.01**	**.023**	.607
	Nomophobia score	97	r			1.000	-.091	.093
			p				.373	.366
	Beck depression scale	97	r				1.000	.217*
			p					**.033**
	Beck anxiety scale	97	r					1.000
			p					

1: Social media addiction total score, 2: Perceived loneliness score, 3: Nomophobia score, 4: Beck depression scale, 5: Beck anxiety scale
*Spearman correlation analysis

Upon comprehensive assessment of all cohorts, a robust association was observed between levels of social media addiction and nomophobia (r=0.703), while a weaker correlation was identified with depression (r=0.152) and anxiety levels (r=0.153). These findings were statistically significant (p=0.05) as depicted in Table 4.

Table 4. Correlation of scale scores of all participants

	n		1	2	3	4	5
Social media addiction total score	189	r	1.000	.103	.703	.152*	.153*
		p		.158	**<0.01**	**.037**	**.036**
Perceived loneliness score	189	r		1.000	.138	.089	.101
		p			.057	.224	.166
Nomophobia score	189	r			1.000	.160*	.113
		p				**.028**	.121
Beck depression scale	189	r				1.000	.356**
		p					**<0.01**
Beck anxiety scale	189	r					1.000
		p					

DISCUSSION

In this research, it was observed that individuals identifying as QG exhibited elevated levels of anxiety compared to non-QG individuals. Furthermore, a noteworthy association was identified between anxiety levels and perceived loneliness among QG participants. Additionally, the study revealed a connection between nomophobia levels and social media addiction in QG individuals, with these levels demonstrating positive correlations with both depression and anxiety. Numerous studies have demonstrated that participation in social networking can act as a protective element by reducing feelings of isolation during periods of quarantine. This is accomplished by enabling individuals to engage in virtual social interactions, connect with others, and meet their cultural and social needs through digital platforms (23). In contrast, Bano et al. (2021) conducted a cross-sectional study to investigate the association between nomophobia and symptoms of depression, anxiety, and stress. Their results revealed that students who spent more time using the internet experienced higher levels of anxiety and stress, which is consistent with the findings of the current study (24). Farchakh et al. (2021) reported a significant relationship between nomophobia and anxiety, depression, high stress, poor sleep and impulsivity (25). In another study, it was observed that people with high scores in gaming addiction, compulsive internet use and social media use also had high scores in depression, loneliness, poor quality sleep and depression-related anxiety (26). Studies have shown that people who feel lonely tend to use their smartphones for social interactions and exhibit behaviors related to addiction when using social media (27). Bian and Leung (2014) stated that smartphone use allows people to avoid face-to-face or voice dialog with others, avoid uncomfortable environments while in public, and enter a virtual, private mobile computing environment (28). In this context, it can be argued that intensive smartphone use and the resulting nomophobia may be related to loneliness.

A study in 2021 in China showed that anxiety levels were lower in Wuhan province during the Covid-19 pandemic compared to residents of Hubaei province, who showed high levels of anxiety. While people in Wuhan city had the opportunity to directly access information about Covid-19, people in Hubaei city had to rely more on social media and were more likely to be exposed to false and alarming information (29). Recent studies suggest that various health problems and risky behaviors, particularly exposure to misinformation and conspiracy stories during the pandemic, may be closely linked to social media use (30, 31). Although numerous studies indicate that perceived loneliness levels would be elevated in QG, our findings revealed a contrasting result, with lower perceived loneliness levels in QG. However, individuals in QG exhibited higher scores on the anxiety scale. The Southeastern Anatolian region, where the study was conducted, is characterized by a strong emphasis on kinship and family ties, with an extended family structure prevailing over

nuclear families. Family relationships in this region are notably more robust and supportive compared to those in western regions of the country. In instances of illness or death, individuals in this region endeavor to offer support to their relatives, often utilizing social media or telephone communication for this purpose (32). We think that the present results can be explained, at least in part, by the cultural structure of the region in which the study was conducted, which is characterized by strong family relationships and individuals living together in the family.

Examination of the factors associated with anxiety and anger symptoms following the MERS outbreak indicates that individuals tend to experience heightened anxiety during the initial phases of the outbreak, when their knowledge about the disease is limited and they rely more on unofficial sources of information (4, 33). As susceptibility grew and people increasingly turned to informal channels for information, there was a concurrent escalation in levels of anxiety. It was observed that various factors identified in the initial phases of the pandemic may also have ramifications for subsequent periods. These results demonstrate the significance of effectively addressing anxiety levels through the timely and accurate dissemination of information about the disease during the initial phase of the pandemic. (33). These results are in line with recent studies showing that feelings of loneliness during quarantine play an important role for depression, anxiety and other comorbidities (34). Loneliness may also explain a significant proportion of the variation in psychiatric symptoms observed in individuals (35). Many expected outcomes of quarantine and associated social and physical distancing measures are important risk factors for mental health problems (1).

One limitation of our study is that the sample was limited to individuals receiving treatment at a psychiatric outpatient clinic. This narrow study population limits the generalizability of the results to the wider population. Furthermore, due to the absence of pre-quarantine data from the participants, it is not feasible to ascertain any potential alterations in the levels of nomophobia and other variables in comparison to the preceding period. Therefore, it is difficult to say whether the proposed model can explain the relationships between the analyzed variables in the same way in situations other than the pandemic. Another limitation to take into account is that the nomophobia scale only focused on the aggregate nomophobia score. Although the total nomophobia score is frequently employed in global literature, a more thorough evaluation of the sub-dimensions of nomophobia could have provided more nuanced understanding of the connections among the variables being studied. In addition, we think that the inclusion of QG patients who presented within the first 3 months after the quarantine, those who had not previously applied to the psychiatric unit and the exclusion of those who did not comply with the quarantine rules, and the exclusion of cases in which the individual himself was quarantined due to the possibility of Covid-19 in a family member, although he did not have

Covid-19 in non-QG, increased the reliability of our results.

Although quarantine is a necessary preventive measure during major infectious disease outbreaks, our study and other studies suggest that quarantine may often be associated with negative psychological effects. This finding is supported by studies showing that the psychological effects of quarantine can be detected months or years later, emphasizing the need for effective mitigating measures to be taken during the quarantine planning process (4). It is also important for individuals to access information from reliable sources and to allocate limited time, at most once or twice a day, to search for information on social media (36).

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ORIGINAL ARTICLE

Effects of Dietary-Like Amount of Arginine Supplementation on Fractional Exhaled Nitric Oxide (FeNO) Levels in Obese and Normal-Weight Individuals

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ÖZET

Amaç: Daha önce yapılan çalışmalarda arjinin-nitrik oksit yolağı obezite gibi bazı kronik hastalıklara özgü yolaklar ile ilişkilendirilmiştir. Bu çalışmanın amacı, obez ve normal ağırlıktaki bireylerde diyete benzer miktarda arjinin takviyesinin fraksiyonel ekshale nitrik oksit (FeNO) düzeyleri üzerindeki etkilerini incelemektir. **Yöntem:** Bu çalışma 40 katılımcı (20 obez ve 20 kontrol) ile gerçekleştirilmiştir. Katılımcılar bir gecelik açlığın ardından 4500 mg arjinin takviyesi ve düşük proteinli (41 mg arjinin/25 g toz ürün) çorba tüketmiştir. Dinlenme metabolizma hızı (DMH) ve 1., 2. ve 5. saat FeNO düzeyleri ölçülmüş ve 3 günlük besin tüketimleri kaydedilmiştir. **Bulgular:** Obez gruptaki katılımcıların ortalama başlangıç ve 1. saat FeNO düzeyi ile kontrol grubundaki katılımcıların ortalama başlangıç FeNO düzeyi arasında anlamlı bir fark yoktu. Kontrol grubundaki katılımcıların ortalama 2. ve 5. saat FeNO düzeyleri, obez gruptaki katılımcıların ortalama 2. ve 5. saat FeNO düzeylerinden anlamlı olarak daha yüksekti ($p<0.05$). **Sonuç:** Normal ağırlıktaki katılımcıların obez katılımcılardan daha yüksek FeNO düzeylerine sahip olması, muhtemelen hava yolu inflamasyonu ve obezite arasındaki ilişkiye işaret eden önceki çalışmaları desteklemektedir.

Anahtar kelimeler: Arjinin, Obezite, Solunum, Nitrik oksit, Vücut ağırlığı

ABSTRACT

Aim: In previous studies, the arginine-nitric oxide pathway has been associated with pathways specific to some chronic diseases such as obesity. The purpose of this study was to examine the effects of dietary-like amounts of arginine supplementation on fractional exhaled nitric oxide (FeNO) levels in obese and normal-weighted individuals. **Methods:** This study was conducted with 40 participants (20 obese and 20 control). The participants consumed 4500 mg arginine supplement and low protein (41 mg arginine/25 g powder product) soup after one-night hunger. Resting metabolic rate (RMR) and 1st, 2nd, and 5th hour fractional exhaled nitric oxide (FeNO) levels were measured and 3-day food consumptions were recorded. **Results:** There was no significant difference between the mean baseline and 1st -hour FeNO level of the participants in the obese group and the mean baseline FeNO level of the participants in the control group. The mean 2nd and 5th hour FeNO level of the participants in the control group were significantly higher than the mean 2nd and 5th hour FeNO levels of the participants in the obese group ($p<0.05$). **Conclusion:** The fact that normal-weighted participants had higher FeNO levels than obese participants probably support previous studies that pointed to the relationship between airway inflammation and obesity.

Keywords: Arginine, Obesity, Respiration, Nitric oxide, Body weight

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INTRODUCTION

Arginine, a conditionally essential amino acid with four nitrogen atoms in its chemical structure, is the most important nitrogen transporter in the body and works as a precursor in nitric oxide (NO) production which plays an important role in the inflammation process (1). Dietary protein, protein turnover and endogenous (de novo) synthesis are listed as sources of arginine in the body (2). The end metabolism products of arginine such as glutamate, prolamin, and NO which have various regulatory functions in the body (3). The arginine/NO pathway has been associated with pathways specific to some chronic diseases such as obesity (4). Obesity, as a chronic inflammation-related disease, is considered to increase the risk of respiratory diseases (5-7). Numerous studies have revealed that obesity is associated with a decrease in lung function (8, 9). In addition, increasing body mass index (BMI) in obesity could be harmful to lung functions via different mechanisms. Increased mechanical body load with an increase in adipose tissue reduces lung compliance, leading to a decrease in lung volumes (10).

Previous studies reported that there was no difference in FeNO levels in obese individuals compared to normal-weighted individuals (11, 12) or obese individuals had lower FeNO levels compared to normal individuals (13, 14). Some studies have even reported that body weight gain in children and adults increases FeNO production (15, 16). Therefore, investigating the impact of dietary-like amounts of arginine supplementation on FeNO levels in different weight groups could help discern potential associations between arginine intake, body weight, and FeNO regulation. The purpose of this study was to examine the effects of dietary-like amounts of arginine supplementation on FeNO levels in obese and normal-weighted individuals.

MATERIAL AND METHODS

This non-randomized and experimental study was derived from the doctoral dissertation titled "The Effect of Dietary L-Arginine on Nitric Oxide Levels, Resting Metabolic Rate and Anthropometric Measurements. The data was collected between June and September 2015 in Erciyes University Faculty of Health Sciences' anthropometry laboratory. Erciyes University Ethics Committee approved this study in accordance with the Declaration of Helsinki (2014/617). All participants' written consents were obtained. Participants were invited to the study via social media platforms or by calling directly. Anemics, alcohol, cigarette and multivitamin-multimineral, other herbal supplement and medication users, and current dieters with chronic diseases were excluded from the study. Nine of the 54 participants (obese=5, control=4) who were interviewed by giving detailed information about the study did not want to participate. The four participants (obese=3, control=1) were excluded from the study because they had anemia or acute infection. A participant in the control group

could not complete the study due to the development of hypotension and possible nausea caused by hunger on the intervention day. Finally, the study was conducted with 20 obese and 20 control group participants. The participants were assessed using the World Health Organization (WHO) adult BMI classification; those with a BMI ≥ 30.0 kg/m2 were classified as obese, and those with a BMI of 18.5-24.9 kg/m2 were classified as normal weight. All participants were above 18 years old.

Two weeks before the intervention day, the participants were asked to fill in a sociodemographic characteristics' questionnaire and 3-day food consumption records (two weekdays and one weekend) after each snack or meal consumed every day to calculate mean dietary arginine intake. Furthermore, the participants were asked not to consume foods containing high amounts of citrulline three days before the day of the study because of citrulline converted into arginine. The participants were informed about arginine and citrulline-rich foods via a brochure. According to the 3-day food consumption records, the types and amounts of the foods consumed daily were determined, and the energy and nutrients values were calculated using the computer program (BeBiS Version 7.1, Pacific Com., Istanbul, Turkey). The percentages of the participants' energy and nutrients intakes according to dietary reference intakes (DRI) were calculated. DRI percentages (DRI%) were calculated and evaluated as <67% insufficient, 67-133% adequate, and >133% excessive intake according to the level of DRI ±33% (17). The participants were informed on how to keep 3-day food consumption records using household measures. Also, the participants were encouraged to continue their routine nutritional habits, exercise and sleeping habits one week before the intervention day. Participants' diets were encouraged to be standardized to not affect FeNO levels the day before intervention and consume nothing after midnight.

On the intervention day, the body mass index (BMI) and body composition of the participants were determined using the bioelectrical impedance analysis (BIA) method. Anthropometric measurements were measured with the appropriate technique. The Resting metabolic rate (RMR) measurement of participants was measured by indirect calorimetry method using Fitmate Pro (Cosmed Corp., Italy) brand ergospirometer. Before starting the measurement, participants were allowed to rest for 15-20 minutes and placed in a semi-reclining position. The masks were fixed according to the face of the participants and in such a way that it does not leak air. Then, participants consumed 4500 mg arginine supplement (arginine mono hydrochloride, cat no. 1.01543.0250, Merck, Darmstadt, Germany) and low protein (41 mg arginine/25 g powder product) soup (FSM Form Limited Comp., Istanbul, Turkey). Consumption of low protein soup determined by analyzing has low arginine level was preferred. Arginine supplement and low protein soup in powder form consumed by participants were measured with a precision

balance sensitive to 0.0001 g (Pioneer Ohaus Corp., NJ, USA).

Participants first consumed a low protein soup (25 g powder product/portion), followed by 100 ml of water. They then consumed 100 ml of water again after the arginine dietary supplement dissolved in 50 ml of water. The duration of consumption of arginine supplement and low protein soup was standardized at five minutes.

FeNO level was analyzed with the NIOX-MINO (Aerocrine AB, Solna, Sweden) device, which is hand-held, non-invasive, easy to apply, provides fast results, and correlates with chemiluminescence methods. Measurements were made by the measurement techniques recommended by the European Respiratory Society (ERS) and the American Thoracic Society (ATS) (18). FeNO levels of the participants were measured on the intervention day before arginine supplementation (baseline), first, second and fifth hours.

Data was analyzed using SPSS 16.0 (SPSS Inc., Chicago, IL) package program, and were tested with Shapiro-Wilk for normal distribution. Data were expressed as mean ($\bar{x}$), and standard deviation (±SD). Student-t test was used to compare quantitative variables with normal distribution, and Mann Whitney U test was used for the comparison of non-normally distributed quantitative variables. Values were considered significant at $p<0.05$.

RESULTS

There were 11 men and 9 women in the obese group, and 9 men and 11 women in the control group. There was no significant difference between the groups in terms of other sociodemographic characteristics. (Data not shown in a table). There was no significant difference between the ages and heights of the obese and control groups' participants. Some characteristics and anthropometric measurements of the participants were presented in Table 1. Energy and nutrient intakes of the participants were also presented in Table 2.

Table 1. Some characteristics and anthropometric measurements of the participants

Variables	Obese group (n=20) $\bar{x}$±SD	Control group (n=20) $\bar{x}$±SD	p
Age (year)	31.5±8.3	27.5±6.2	0.128
Weight (kg)	95.2±11.1	65.7±8.7	≤0.001
Height (cm)	170.1±6.4	169.1±9.3	0.697
BMI (kg/m^2)	32.8±2.7	22.8±1.1	≤0.001
NC (cm)	40.9±3.5	35.5±3.4	≤0.001
WC (cm)	109.3±9.4	85.9±10.3	≤0.001

HC (cm)	116.6±8.2	102.6±5.6	≤0.001
Waist \ Hip	0.94±0.08	0.83±0.08	≤0.001
Waist \ Height	0.64±0.05	0.50±0.04	≤0.001
BFM (kg)	33.0±8.2	16.2±3.9	≤0.001
BFR (%)	38.1±4.01	23.7±6.1	≤0.001
TBW (kg)	44.8±6.7	37.5±7.6	0.005
TBWR (%)	47.0±4.7	53.3±4.1	0.001
RMR (kcal)	2087.4±345.6	1761.3±337.2	0.005

BMI: Body mass index. NC: Neck circumference. WC: Waist circumference. HC: Hip circumference. BFM: Body fat mass. BFR: Body fat ratio. TBW: Total body water. TBWR: Total body water ratio. RMR: Resting metabolic rate.

Table 2. Energy and nutrient intakes of the participants

Energy and nutrient intakes	**Obese group (n=20) $\bar{x}$±SD**	**Control group (n=20) $\bar{x}$±SD**	**p**
Energy (kcal)	3523.2±161.7	2625.8±121.8	≤0.001
Protein (g)	93.5±3.7	71.0±5.8	≤0.001
Protein (E%)	10.6±0.3	10.8±0.6	0.123
Plant protein (g)	37.2±4.7	25.4±1.8	≤0.001
Animal protein (g)	56.2±1.7	45.5±4.1	≤0.001
Animal protein (P%)	60.2±3.6	64.1±1.3	0.002
Arginine (mg)	4118.4±226.77	4060.8±168.92	0.224
Carbohydrates (g)	440.5±24.4	359.3±10.4	≤0.001
Carbohydrates (E%)	54.8±1.9	50.0±1.1	≤0.001
Fat (g)	154.1±7.8	100.5±9.8	≤0.001
Fat (E%)	39.4±1.0	34.3±1.8	≤0.001
MUFA (g)	53.6±2.6	42.7±1.7	≤0.001
PUFA (g)	44.5±3.1	38.3±2.3	≤0.001
SFA (g)	55.9±6.4	20.4±8.5	≤0.001
Linoleic acid (g)	39.4±2.7	33.0±1.6	≤0.001
Linolenic acid (g)	4.7±0.3	2.2±0.4	≤0.001
Cholesterol (mg)	413.0±23.4	299.3±50.6	≤0.001
Dietary fiber (g)	25.7±1.0	26.8±0.9	0.004
Soluble dietary fiber (g)	6.4±0.8	8.1±0.8	≤0.001
Insoluble dietary fiber (g)	19.3±1.1	18.7±1.0	0.147
Water (ml)	2640.0±356.0	2800.0±278.0	0.114

E%: Percentage of nutrient contribution to energy. MUFA: Monounsaturated fatty acids. PUFA: Polyunsaturated fatty acids. SFA: Unsaturated fatty acids

The comparison of the FeNO levels of the participants in the obese and control groups were shown in Table 3. There was no significant difference between the mean baseline FeNO level of the participants in the obese group (25.52±13.3 ppb) and the mean baseline FeNO level of the participants in the control group (30.74±17.4 ppb). There was no significant difference between the 1st hour FeNO level of the participants in the obese group (33.64±13.9 ppb) and the 1st hour FeNO level (40.02±20.3 ppb) of the participants in the control group. The mean 2nd hour FeNO level of the participants in the control group (40.02±19.1 ppb) was significantly higher than the mean 2nd hour FeNO level of the participants in the obese group (27.84±12.1 ppb) ($p<0.05$). The mean of the 5th hour FeNO level of the participants in the control group (35.96±19.7 ppb) was significantly higher than the mean of the 5th hour FeNO level of the participants in the obese group (23.20±12.1 ppb) ($p<0.05$) (Table 3).

Table 3. The comparison of the FeNO levels of the participants in the obese and control groups

FeNO (ppb)	**Obese group (n=20)** $\bar{x}\pm SD$	**Control group (n=20)** $\bar{x}\pm SD$	**p^{ϕ}**
Baseline	25.52±13.3	30.74±17.4	0.312
1st hour	33.64±13.9*	40.02±20.3	0.267
2nd hour	27.84±12.1	40.02±19.1	**0.025**
5th hour	23.20±12.1	35.96±19.7	**0.023**
p^{Ω}	**0.045**	0.423	

Ω: Indicates statistical significance within the group. ϕ: Expresses statistical significance between groups. *: Indicates statistical difference.

DISCUSSION

Demonstrating a relationship between FeNO level and BMI (15. 16) has led to an increase in studies examining the relationship between obesity and FeNO levels (19. 20). However. it was seen that studies examining the relationship between FeNO level and BMI gave inconsistent results.

It has been reported that the NO level measured in the breath is affected by some conditions such as respiratory tract infection. asthma. obesity. allergic diseases. exercise. smoking. use of some drugs. and consumption of nitrite/nitrate-rich diet (20. 21). Furthermore. it has been reported that the period in which the FeNO level is measured during the day affects the measurement result. and the morning measurements are at a lower level. especially when compared to the afternoon measurements (22). In a study. adults with BMI≥27 kg/m2. it was reported that the reliability of a single measurement was sufficient when the FeNO levels of individuals were measured once or three times (23). Another study conducted on 19 normal-weight and 15 overweight and obese individuals. it was reported that obesity did not affect the levels of breath NO. which is an indicator of airway inflammation (11). Similarly. in the study conducted by Gemicioğlu et al. (19). no significant relationship was found between individuals' BMI and FeNO levels. Contrary to these results. in a study by Holguin et al. (24). it was determined that there was a negative correlation between individuals' FeNO levels and BMI. This relationship was explained by the deterioration of the ratio of arginine and asymmetric dimethylarginine (ADMA). It has been reported that ADMA is a natural inhibitor of nitric oxide synthase (NOS) enzyme. which is involved in NO synthesis. and that an increase in ADMA level in obesity causes a decrease in FeNO levels (24). In this study. the mean FeNO levels of the participants in the obese group at the 2nd and 5th hours were significantly lower. This result suggests that dietary-like amount of arginine supplementation causes different FeNO levels in obese and normal-weighted individuals and this is thought to be related to inflammation.

In a clinical study conducted by Ogata et al. (25) with 11 individuals. it was revealed that when a single dose of 200 mg/kg arginine was added to the diet of individuals. plasma. and FeNO levels were measured at 30-minute intervals for 150 minutes. and breath NO reached its highest value in 60 minutes. In the current study. while the 1st hour FeNO levels of the participants in the obese group were found to be significantly higher than the baseline. 2nd. and 5th hour FeNO levels ($p<0.05$). there was no significant difference between the FeNO levels of the participants in the control group. This result shows that. approximately one hour after arginine supplementation to the diet of the participants in the obese group. the participants' FeNO levels increased significantly. In this study. the finding that the FeNO level increased significantly approximately one hour after arginine supplementation to the diet of the participants in the study group supports the results of the study by Ogata et al (25).

However. the lack of this effect in the control group may be because the conversion rates of arginine to NO in breath may differ depending on obesity.

CONCLUSION

FeNO levels of normal-weighted participants were higher than that of obese participants supporting that NO synthesis from arginine added to the diet occurs at different rates in obese and normal-weight individuals. It may be advised not to use commercially available arginine and NO dietary supplements without consulting a physician or dietitian. and to prefer food consumption instead of dietary supplements. Studies that reflect the intake level of arginine. which is an important precursor for the synthesis of NO. which is not essential in adult human nutrition but has many important metabolic functions and examining the relationship between nutrients and nutrients and NO. should be conducted in the future.

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ORIGINAL ARTICLE

Okul Öncesi Çocuklarda Özel Eğitim Etkinliğinin Değerlendirilmesi

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ÖZET

Amaç: Çalışmanın amacı, özel eğitime yönlendirilen 2-7 yaş arası çocukların aldıkları eğitimlerin verimliliği değerlendirmektir. Bu sebeple çocukların tekrarlanan psikometrik testleri incelenmiş, eğitim öncesi ve sonrası testler arası farklılıklar belirlenmiştir. Ayrıca çocukların ve ailelerinin dosyalarında bulunan sosyo-demografik veri formları sayesinde sosyo-demografik özelliklerinin de aldıkları eğitime etkisi değerlendirilmiştir. **Yöntem:** Şubat 2019-Ocak 2022 tarihleri arasında Çocuklar İçin Özel Gereksinim Raporu (ÇÖZGER) almak için hastanemize başvuran tüm 7 yaş ve altı çocukların sağlık kurulu raporu dosyaları geriye dönük olarak taranmıştır. Çocuklara, özel eğitime başlamadan önce ve tekrar rapor yenilemek için başvurduklarında gelişim basamaklarını değerlendirmek ve karşılaştırmak amacıyla Ankara Gelişim Tarama Envanteri (AGTE) uygulanmıştır. Bu araştırma kapsamında araştırmacılar tarafından oluşturulan sosyo-demografik, klinik ve eğitim özellikleri veri formu kullanılmıştır. **Bulgular:** Araştırmanın ilk bulgusu başvuran çocukların tekrarlanan AGTE alt ölçekleri ve bu alt ölçeklerin yüzdesel değişimleri arasında anlamlı fark bulunmamasıdır. Araştırmanın ikinci bulgusu olarak yüzdesel olarak değişim otizm spektrum bozukluğu (OSB) ve entelektüel yeti yitimi (EYY) tanıları ile tekrar incelendiğinde yüzdesel değişim açısından anlamlı fark görülmemiş olmakla beraber EYY tanısına sahip çocukların gelişimsel alt testlerinin her birinde olumlu gelişme gözlenmişken; OSB tanılı çocukların alt testlerinde ise gelişimsel açıdan gerileme belirlenmiştir.**Sonuç:** Çalışmanın sonucunda ardışık gelişim testleri açısından anlamlı bir fark bulunmaması sebebiyle özel eğitime ihtiyaç duyan bu çocukları sadece bir tanı özelinde değerlendirmek yerine her çocuğun sahip oldukları yetenekler ve desteğe ihtiyaç duyduğu alanlar açısından detaylıca değerlendirilip sonrasında en ideal eğitime yönlendirilmesi gerektiği düşüncesine varılmıştır.

Anahtar kelimeler: AGTE, ÇÖZGER, Entelektüel Yeti Yitimi, Otizm Spektrum Bozukluğu

ABSTRACT

Aim: The purpose of the study is to evaluate the efficiency of the education received by children aged 2-7 who are referred to special education. For this reason, repeated psychometric tests of children were examined and differences between pre- and post-training tests were determined. In addition, the impact of socio-demographic characteristics on the education they received was evaluated, thanks to the socio-demographic data forms in the files of the children and their families. **Methods:** The medical board report files of all children aged 7 and under who applied to our hospital to obtain a Special Needs Report for Children (COZGER) between February 2019 and January 2022 were retrospectively scanned. Ankara Developmental Screening Inventory (AGTE) was applied to the children to evaluate and compare their developmental stages before starting special education and when they applied again to renew their report. Within the scope of this research, the socio-demographic, clinical and educational characteristics data form created by the researchers was used. **Results:** The first finding of the study is that there is no significant difference between the repeated AGTE subscales of the admitted children and the percentage changes of these subscales. As the second finding of the study, when the percentage change was re-examined with autism spectrum disorder (ASD) and intellectual disability (ID) diagnoses, no significant difference was seen in terms of percentage change, while positive development was observed in each of the developmental subtests of children with the diagnosis of EY; developmental regression was determined in the subtests of children diagnosed with ASD. **Conclusion:** As a result of the study, since no significant difference was found in terms of sequential development tests, it was concluded that instead of evaluating these children in need of special education only based on a diagnosis, each child should be evaluated in detail in terms of the abilities they have and the areas in which they need support and then directed to the most ideal education.

Keywords: AGTE, COZGER, Intellectual Disability, Autism Spectrum Disorder

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GİRİŞ

Özel eğitim, özel eğitime ihtiyacı olan çocukların eğitim ve sosyal gereksinimlerini karşılamak için her çocuğun ihtiyacı olan alana yönelik geliştirilmiş eğitim programları ve yöntemleri kullanılarak uygun ortamlarda sürdürülen eğitimdir (1).

Entelektüel yeti yitimi (EYY), 18 yaş öncesinde başlayıp entelektüel ve uyum sağlayıcı işlevlerde eksikliklerle giden bir bozukluktur (2). Bu bozukluğa sahip bireylerde günlük yaşam faaliyetlerine katılım ve uygulamada, yaşına ve sosyokültürel düzeyine uygun iletişimde kısıtlılıklar gözlemlenir. Aynı zamanda soyut düşünme, problem çözme becerileri, yargılama gerektiren zihinsel becerilerde gerilik vardır (3). Gecikmiş dönüm noktası tanısı, bir çocuk yaşına uygun olarak sahip olması beklenen gelişimsel becerilerin gerisinde kaldığında kullanılır. Bir çocukta gecikmiş dönüm noktası tanısının varlığı ilerleyen dönemde entelektüel yeti yitimi tanısı için yordayıcı olabilmektedir.

Otizm Spektrum Bozukluğu ise sosyal iletişim ve etkileşimde bozukluklar, iletişimi başlatma ve sürdürmede yaşanan sorunlar, beden dilini anlama ve kullanmada eksiklikler, sözel olmayan iletişim becerilerinde kısıtlılık, sınırlı ve tekrarlayan davranış kalıpları ve ilgi alanları ile giden nörogelişimsel bir bozukluktur (3).

Dil; alıcı dil ve ifade edici dil olmak üzere iki kısımdan oluşur. Alıcı dil söyleneni anlama becerisini içerirken, ifade edici dil ise iletilmek isteneni kelime ve mimiklerle karşı tarafa aktarmayı içerir. Gelişimsel dil gecikmesi tanısı, bir çocuğun alıcı veya ifade edici dil becerilerinde gelişimsel açıdan yaşından geride olduğu belirlendiğinde konulur. Bir çocukta gelişimsel dil gecikmesi işitme azlığı veya kaybı, entelektüel yeti yitimi veya otizm spektrum sebebiyle oluşmuş olabilmektedir (4). Ayrıca gelişimsel dil gecikmesi, otizm spektrum bozukluğu, dikkat eksikliği ve hiperaktivite bozukluğu gibi nörogelişimsel bozukluklar açısından yordayıcı bir faktör olabilir (5).

Çocuklara uygulanan özel eğitimin içeriği tanıya özgüdür. Entelektüel yeti yitimine sahip çocuklarda, problemin derecesine göre odaklanılması gereken temel nokta değişmekle birlikte hepsinde ortak çalışılan alanlar giyinme, beslenme, tuvalet eğitimi ve benzeri öz bakım becerileridir. Otizm spektrum bozukluğuna (OSB) sahip çocuklarda eğitim özellikle iletişim becerileri ve sosyal beceri eğitimleri üzerine olmaktadır (6,7). Gelişimsel dil gecikmesi tanısına sahip çocuklarda ses çıkarma çalışmaları ve doğru ses çıkarımı için gerekli olan motor gelişimi sağlayacak egzersizler yaptırılır (8). Gecikmiş dönüm noktası tanısında ise çocuğun ince ve kaba motor becerilerine yönelik egzersizler uygulanır, çocuklar sosyal ve bilişsel faaliyetlere yönlendirilir. Yapılan çalışmalarda çocuklarda erken müdahale dönemi olarak belirlenen 0-3 yaş arasında verilen özel eğitimden daha hızlı ve verimli dönüt alınabildiği belirlenmiştir (9,10).

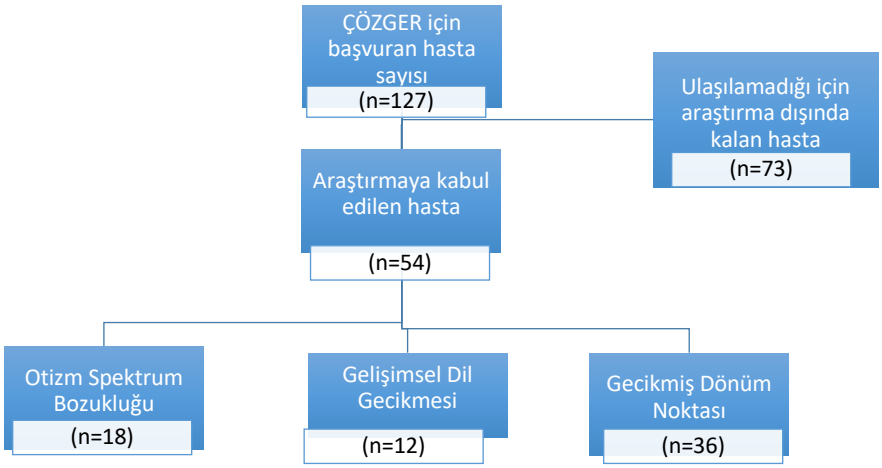
Bu çalışmada özel eğitime yönlendirilen 2-7 yaş arası çocukların aldıkları eğitimlerin verimliliği değerlendirilmiştir. Bu amaçla hastaların dosyaları retrospektif olarak

taranarak, sahip oldukları Çocuklar İçin Özel Gereksinim Raporları incelenmiştir. Sonrasında yapılan araştırmalar sonucu hasta rapor yenilenmesi için başvurmuş ise tekrarlanan psikometrik testler incelenmiş, eğitim öncesi ve sonrası testler arası farklılıklar belirlenmiştir. Ayrıca çocukların ve ailelerinin dosyalarında bulunan sosyodemografik veri formları sayesinde sosyodemografik özelliklerinin de aldıkları eğitime etkisi değerlendirilmiştir.

GEREÇ VE YÖNTEM

Katılımcıların Belirlenmesi

Çalışmamız, T.C. Ankara Yıldırım Beyazıt Üniversitesi Yenimahalle Eğitim ve Araştırma Hastanesi Etik Kurulu tarafından 19/01/2022 tarihinde E-2022-02 dosya numarası ile etik açıdan uygun olduğu belirlenmiş, sonrasında Şubat 2019- Ocak 2022 tarihleri arasında Çocuklar İçin Özel Gereksinim Raporu (ÇÖZGER) almak için hastanemize başvuran tüm 7 yaş ve altı çocukların sağlık kurulu raporu dosyaları geriye dönük olarak taranmıştır. Bu tarihler arasında 127 çocuğun başvurduğu görülmüştür. Ebeveynleri telefon ile aranmış fakat 73 (%57.4) kişiye farklı nedenlerle ulaşılamamıştır. Bu kişiler araştırma kapsamı dışında bırakılmıştır (Şekil 1).



Şekil 1. Katılımcıların Belirlenmesi

Veri Toplama Araçları

Çocuklara, özel eğitime başlamadan önce ve tekrar rapor yenilemek için başvurduklarında gelişim basamaklarını değerlendirmek ve karşılaştırmak amacıyla Ankara Gelişim Tarama Envanteri (AGTE) uygulanmıştır. Bu araştırma kapsamında araştırmacılar tarafından oluşturulan sosyodemografik, klinik ve eğitim özellikleri veri formu kullanılmıştır.

Ankara Gelişim Tarama Envanteri (AGTE)

Işık Savaşır, Nilhan Sezgin ve Neşe Erol tarafından 0-6 yaş arası çocukların gelişim basamaklarını değerlendirmek amacıyla 1993 yılında geliştirilmiştir (11). Genel Gelişim, Dil-Bilişsel Gelişimi, İnce Motor Gelişimi, Kaba Motor Gelişimi ve Sosyal Beceri-Öz bakım Gelişimi olmak üzere dört adet alt ölçeği bulunmaktadır. Her bir gelişim alanı için toplanan doğru cevaplar ham puan olarak adlandırılır. Ham puanlar, çocuğun yaşı göz önüne alınarak standart puanlara dönüştürülür. Bu standart puanlar kullanılarak her bir alan için çocuğun gelişim düzeyi belirlenir. Tüm alt alanların standart puanları toplanarak genel gelişim düzeyleri belirlenir. Çocuğun bakılan gelişim alanında hangi düzeyde olduğu ve hangi beceri alanında kendini geliştirdiği, hangi beceri alanında geliştirilmeye devam edilmesi gerektiği konularında yol göstermektedir. Test 154 maddeden oluşmaktadır ve maddeler ebeveyn veya bakıverenle çocuk hakkında görüşülerek doldurulmaktadır.

Sosyodemografik, klinik ve eğitim özellikleri formu

Bu form ÇÖZGER için başvurmuş olan çocukların sosyodemografik bilgilerini karşılaştırabilmek amacıyla oluşturulmuştur. Form; çocukların anne-baba-kardeş yaşlarına, psikiyatrik rahatsızlıklarına, eğitim durumlarına, mesleklerine, sosyoekonomik düzeylerine dair bilgiler içermektedir.

İstatistiksel Yöntemler

Çalışmada elde edilen bulgular değerlendirilirken, istatistiksel analizler için IBM SPSS Statistics 26 (IBM Corp. 2019) programı kullanıldı. Niteliksel veriler sıklık ve yüzde olarak, niceliksel verilerden normal dağılıma uyanlar ortalama (standart sapma), uymayanlar ise ortanca ve çeyrekler arası genişlik şeklinde özetlenmiştir. Sürekli değişkenlerin karşılaştırmasında normal dağılım gösterenler Student t testi (t), göstermeyenler Mann Whitney U testi (z) ile gösterilmiştir. Uygulanan AGTE sonuçları, her çocuğun takvim yaşına bölünerek oranlanmıştır. İki sağlık kurulu raporu bulunan çocukların her iki zamanda yapılan AGTE değerlendirmeleri alt testlerin oranları Wilcoxon testi ile karşılaştırılmıştır. Anlamlılık düzeyi olarak $p < 0.05$ değeri kabul edilmiştir.

BULGULAR

Bu araştırmada, 25-84 ay arası toplam 54 çocuk değerlendirildi (Şekil 1). Olguların 17'si kız (%31.5); 37'si erkekti (%68.5). Olguların yaş ortalaması 61.81 ± 14.17 (Medyan/Ortanca = 63.50) aydı. Olguların tanılarına göre sosyodemografik ve eğitime ilişkin bilgileri Tablo 1'de verilmiştir.

Tablo 1. ÇÖZGER'e başvurmuş çocukların sosyodemografik verilerinin tanı grupları açısından karşılaştırılması

	OSB (n=18)	Entelektüel yeti yitimi (n=36)	χ2	p
Yaş (ay)[a]	63.33 (10.73)	61.05 (15.70)	-0.441	0.659
Cinsiyet (Erkek), n (%)	15 (83.3)	22 (61.1)	2.747	0.097
Özel eğitime başlama (ay)[a]	36.50 (16.05)	32.75 (17.32)	-0.505	0.613
Kaç aydır özel eğitim alıyor?[a]	24.83 (16.14)	27.16 (20.55)	-0.248	0.804
Anne yaşı (yıl)[a]	35.83 (5.68)	36.66 (6.83)	-0.809	0.418
Baba yaşı (yıl)[a]	39.11 (5.42)	38.97 (6.45)	-0.184	0.854
Anne eğitim, n (%)				
İlkokul	5 (27.8)	16 (44.4)	3.107	0.211
Lise	7 (38.9)	15 (41.7)		
Üniversite	6 (33.3)	5 (13.9)		
Baba eğitim, n (%)				
İlkokul	3 (16.7)	13 (36.1)	4.318	0.115
Lise	7 (38.9)	16 (44.4)		
Üniversite	8 (44.4)	7 (19.4)		
Doğumdaki anne yaşı (yıl)[a]	31.00 (5.90)	32.00 (6.78)	-0.847	0.397
Doğumdaki baba yaşı (yıl)[a]	34.27 (5.47)	34.30 (6.51)	-0.230	0.818
Sosyoekonomik durum (Düşük), n (%)	1 (5.6)	10 (27.8)	3.653	0.056
Kardeşte psikiyatrik ya da nörolojik bozukluk, n (%)	2 (11.1)	6 (16.7)	0.293	0.588

* OSB: Otizm spektrum bozukluğu, a: Ortalama (standart sapma)

Olguların 24'ünün (%44.4) ikinci, 4'ünün (%7.4) üçüncü sağlık kurulu raporları vardı. Olguların ortanca özel eğitim alma süresi 24.0 aydı (Çeyrekler arası genişlik (IQR): 32.5) (Aralık: 2-74 ay). Ortalama eğitime başladıkları yaş 34.0 ± 16.8 aydı. Ebeveynlerin 45'i (%83.3) çocuklarının özel eğitime düzenli devam ettiklerini, hiç devamsızlık yapmadıklarını ifade etmekteydi. Olguların 36'sı (%66.7) gecikmiş dönüm noktası, 18'i (%33.3) otizm spektrum bozukluğu tanıları ile takip edilmekteydi. Olguların 12'sinde (%22.2) ise gelişimsel dil gecikmesi ek tanısı bulunmaktaydı.

Olguların birinde (%1.9) işitme engeli, birinde (%1.9) yürüme engeli eşlik etmekteydi. Olguların 12'sinde (%22.2) Down Sendromu başta olmak üzere farklı genetik bozukluklar mevcuttu. Olguların 3'ü DEHB (%5.6) ek tanısı ile takip edilmekteydi.

Alınan Özel Eğitim Alanları

Yapılan geriye dönük incelemeler sonucunda araştırmaya katılan çocukların okuma-yazma eğitimi, dil ve konuşma terapisi, duyu bütünleme terapisi, fizik tedavi, bireyselleştirilmiş eğitim programı ve grup terapisi alanlarından bir veya birkaç alanda eğitim aldıkları belirlenmiştir. 54 çocuğun 7'si (%13) sadece bir alanda özel eğitim desteği alırken, 31'i (%57.4) iki alanda birden, 15'i (%27.7) üç alanda ve 1'i (%1.9) dört alanda eğitim almaktaydı.

Özel eğitim aldığı bir yıllık süre içerisinde öğretmen değişiminin sıklığı incelenmiştir. Bu araştırmada sık öğretmen değişimi, çocuğun o yıl içerisinde özel eğitimde değiştirdiği öğretmen sayısının aldığı ders alanı sayısına bölünmesi ile elde edilmiştir. Bu çalışmada elde edilen değerin 2 ve üstünde olması sık öğretmen değişimi olarak değerlendirilmiştir. Buna göre çocukların 20'sinin (%37) öğretmeni bir yıllık süre içerisinde sık değişim göstermiştir.

Olgulardan OSB tanısı konulmuş bir çocuk SSRI tedavisi almaktaydı. OSB tanısı konulmuş olguların 7'si (%39) irritabilite nedeniyle antipsikotik tedavi almaktaydı.

Çalışmaya kabul edilen 54 çocuktan toplam 24 'ünün ikinci sağlık kurulu raporları vardı. Her iki sağlık kuruluna başvuran çocukların AGTE alt ölçeklerinin sonuçlarının takvim yaşlarına oranı belirlendi. Birinci ve ikinci sağlık kurulları arası yüzde değişimi karşılaştırıldı ve bu gruplar arasında anlamlı bir fark bulunmadı (Tablo 2)

Tablo 2. Gelişimsel Değerlendirme Sonuçlarının Takvim Yaşına Göre Oranı

	Sağlık Kurulu I (n=54)	Sağlık Kurulu II (n=24)	Yüzde Değişim	Z	p
AGTE Genel Gelişim / TY	0.48 (0.15)	0.44 (0.51)	-1.50 (37.75)	-0.503	0.615
AGTE Dil Bilişsel Gelişimi / TY	0.49 (0.22)	0.43 (0.82)	2.00 (29.25)	-0.877	0.380
AGTE İnce Motor Gelişimi / TY	0.47 (0.22)	0.46 (0.37)	0.50 (34.75)	-0.731	0.465
AGTE Kaba Motor Gelişimi / TY	0.58 (0.47)	0.54 (0.60)	1.00 (40.25)	-0.156	0.876
AGTE Sosyal Beceri - Öz bakım Gelişimi / TY	0.48 (0.27)	0.46 (0.47)	-3.00 (18.25)	-0.174	0.862

*AGTE: Ankara Gelişim Tarama Envanteri TY: Takvim Yaşı

Birinci ve ikinci sağlık kuruluna başvuran çocukların AGTE alt ölçekleri takvim yaşlarına göre oranlandı ve sonrasında iki sağlık kuruluna giren 24 kişinin gelişim alt ölçekleri açısından yüzdesel değişimi belirlendi. Başvuran çocukların gelişim testleri sonuçları ve yüzdesel değişimleri, çocukların sık öğretmen değiştirme ve değiştirmeme durumuna göre karşılaştırıldı.

Karşılaştırma sırasında iki adet aykırı değer bulundu. Bu iki aykırı değer; bazen çocuklar arasında gelişim konusunda bireysel farklılıklar olabileceği, eğitime daha hızlı veya daha yavaş yanıt veren çocuklar olabileceği sebebiyle çıkartılıp aynı inceleme tekrar yapıldığında çocuklarda yanıtın benzer olduğu belirlenmiş, anlamlı fark bulunmamıştır (Tablo 3).

Tablo 3. Sık öğretmen değiştirmeye göre gelişimsel alanlarda meydana gelen değişikliklerin incelenmesi

	Sağlık Kurulu I (n=52)*	Sağlık Kurulu II (n=22)*	Yüzde Değişim	Z	p
Sık Öğretmen Değiştirmeyenler (n= 34)					
AGTE Genel Gelişim / TY	0.50 (0.18)	0.35 (0.56)	-5.00 (0.41)	-0.445	0.656
AGTE Dil Bilişsel Gelişimi / TY	0.50 (0.21)	0.40 (0.48)	-1.00	-0.890	0.374

			(0.36)		
AGTE İnce Motor Gelişimi / TY	0.50 (0.11)	0.38 (0.49)	-2.00 (0.38)	-2.934	0.457
AGTE Kaba Motor Gelişimi / TY	0.57 (0.19)	0.55 (0.65)	-8.00 (0.53)	-2.934	0.513
AGTE Sosyal Beceri - Öz bakım Gelişimi / TY	0.47 (0.25)	0.37 (0.70)	-3.00 (0.31)	-0.102	0.919
Sık öğretmen Değiştirenler (n= 20)					
AGTE Genel Gelişim / TY	0.47 (0.14)	0.48 (0.42)	2.00 (0.32)	-0.489	0.625
AGTE Dil Bilişsel Gelişimi / TY	0.48 (0.23)	0.46 (0.56)	5.00 (0.22)	-0.223	0.823
AGTE İnce Motor Gelişimi / TY	0.47 (0.19)	0.50 (0.33)	3.00 (0.24)	-2.934	0.421
AGTE Kaba Motor Gelişimi / TY	0.60 (0.60)	0.53 (0.52)	9.00 (0.39)	-2.934	0.263
AGTE Sosyal Beceri - Özbakım Gelişimi / TY	0.50 (0.32)	0.48 (0.24)	-3.00 (0.15)	-0.267	0.790

AGTE: Ankara Gelişim Tarama Envanteri, TY: Takvim Yaşı *Karşılaştırmalar biri sık öğretmen değiştirenler grubundan biri de sık öğretmen değiştirmeyenler grubundan olmak üzere toplam 2 aşırı değer çıkarılarak yapılmıştır.

AGTE alt testlerinin yüzdesel değişimi tanı grupları arasında karşılaştırıldı. OSB ve EY arasında gelişimin yüzdesel değişimi açısından anlamlı bir fark bulunmamakla birlikte; EY tanılı çocuklarda yüzdesel gelişimde ilerleme görülmekle birlikte OSB tanılı çocuklarda yüzdesel gelişimde gerileme gözlendi (Tablo 4).

Tablo 4. AGTE alt testlerinde iki değerlendirme arasındaki yüzde değişimin tanı grupları açısından karşılaştırılması

	OSB (n=7)	**Entelektüel yeti yitimi (n=15)**	**U**	**p**
AGTE Genel Gelişim (Yüzde değişim)*	-14 (25)	2 (30)	-1.410	0.158
AGTE Dil Bilişsel Gelişimi (Yüzde değişim)*	-6 (49)	5 (27)	-0.989	0.323
AGTE İnce Motor Gelişimi (Yüzde değişim)*	-14 (48)	3 (24)	-1.164	0.244
AGTE Kaba Motor Gelişimi (Yüzde değişim)*	-9 (61)	8 (33)	-0.917	0.359
AGTE Sosyal Beceri- Öz bakım Gelişimi (Yüzde değişim)*	-5 (16)	5 (22)	-1.588	0.112

OSB: Otizm spektrum bozukluğu *Yüzde değişim: İki yıl arayla uygulanan AGTE sonuçlarında yüzde olarak değişimi gösterir.

Özel eğitim desteği alınan sürenin gelişime etkisini ölçmek amacıyla özel eğitimde geçirilen süre ile AGTE alt ölçeklerinin yüzdesel değişimi incelendi. İki sağlık kurulu arasında yüzdesel değişim açısından anlamlı bir fark bulunmadı (Tablo 5).

Tablo 5. Özel eğitim alınan süre ve AGTE alt ölçeklerinin yüzdesel olarak değişim korelasyonu

	Genel Gelişim Yüzdesel Değişim	Dil Bilişsel Gelişim Yüzdesel Değişim	İnce Motor Gelişim Yüzdesel Değişim	Kaba Motor Gelişim Yüzdesel Değişim	Sosyal Beceri-Öz bakım Gelişim Yüzdesel Değişim
Haftada alınan eğitim saati	r= -0.283 p=0.202	r=-0.313 p=0.156	r=-0.139 p=0.538	r=-0.399 p=0.066	r=-0.114 p=0.614
Özel eğitime başlama yaşı	r=0.250 p=0.263	r=0.159 p=0.479	r=0.165 p=0.462	r=-0.061 p=0.786	r=-0.068 p=0.765
Toplam özel eğitim alınan süre	r=-0.198 p=0.377	r=-0.124 p=0.582	r=-0.072 p=0.751	r=0.184 p=0.413	r=0.112 p=0.619

TARTIŞMA

Bu araştırmada, araştırmaya dahil edilen çocukların ilk ve iki sene sonraki AGTE gelişim testlerinin karşılaştırılması amaçlanmıştır. Bu karşılaştırmanın sebebi, özel eğitim desteğindeki temel amacın sanılanın aksine bu özel eğitim desteğini alan çocuklar ve gelişimsel geriliği olmayan çocuklar arasındaki açığı tamamen kapatmak değil, bu çocukların bir önceki gelişimsel değerlendirmelerine göre daha iyi performans göstermelerine, özellikle zorlandıkları alanlarda baş etme yeteneklerini geliştirmelerine yardımcı olmasıdır (2).

Ülkemizde 2019 yılı öncesinde çocuklar özel eğitim için Engelli Sağlık Kurulu Raporu (ESKR) heyetine yönlendirilmekte iken 20 Şubat 2019 tarihli 30692 sayılı resmî gazete ile Çocuklar İçin Özel Gereksinim Raporu (ÇÖZGER) kullanımı yürürlüğe girmiştir (12). Bu çalışma ÇÖZGER süresine geçiş sonrasındaki iki seneyi kapsamakla birlikte bu dönemde başvuran 2-7 yaş arası çocuk sayısı 127 ile sınırlı kalmıştır. Bu sayının nispeten düşük görünmesinin ÇÖZGER'e uyum sürecinde olunması, bu dönemde ESKR heyetlerinin bir süre boyunca varlığına devam etmesi ve arkasından takip eden Covid-19 pandemisi sürecinde heyet raporlarının uzatılması nedeniyle rapor yeniletme gereksiniminin ortadan kalkmış olması ile bağlantılı olabileceği belirlenmiştir.

Araştırmanın ilk bulgusu başvuran çocukların tekrarlanan AGTE alt ölçekleri ve bu alt ölçeklerin yüzdesel değişimleri arasında anlamlı fark bulunmamasıdır. Rapor yeniletmek için tekrarlanan psikometrik testler sonrasında alt ölçekleri karşılaştırılan testlerin arasında belirgin bir fark olmaması özel eğitim desteğinin okul öncesi çocukların gelişiminde ilerlemeye katkısının sınırlı olabileceği, diğer açıdan ise geriye gidişi engellemiş olabileceği şeklinde yorumlanabilir. Yapılan bir çalışmada okul öncesi dönemde gelişimsel gecikmesi olan çocukların aldığı özel eğitimin ilerleyen yaşamlarında matematik ve okuma becerileri üzerine etkisi incelenmiş ve her iki alanda da olumsuz etki gözlenmiştir (13).

Özel eğitim merkezlerinden alınan eğitimin verimliliğini arttıran bir diğer faktör de ebeveynlerin eğitim sürecine aktif katılımıdır (14). Alınan eğitimin kalıcılığının sağlanması ve pekişmesi için ebeveynler, alınan eğitimi evde devam ettirmelidir. Bu aşamada ebeveynler de birçok konuda bilgi ve desteğe ihtiyaç duymaktadırlar. Bu konulardan bazıları bilgi edinme, kaliteli eğitim olanaklarına erişim, danışmanlık hizmetleri alma, yaşadıkları zorlukları paylaşma, problem davranışlarla başa çıkma stratejileri hakkında bilgi sahibi olma ve okulda verilen eğitimi evde nasıl devam ettireceklerine dair rehberliktir (15). Ebeveynlerin ihtiyaç duyduğu bilgi ve desteğin eğitim kurumlarınca verilememiş olması ve türlü nedenlerle pekiştirmenin sağlanamamış olması da AGTE alt ölçekleri arasında fark saptanmamış olmasının bir sebebi olabilir.

Araştırmanın ikinci bulgusu olarak yüzdesel olarak değişim OSB ve EY tanıları ile tekrar incelendiğinde yüzdesel değişim açısından anlamlı fark görülmemiş olmakla beraber EY tanısına sahip çocukların gelişimsel alt testlerinin her birinde olumlu gelişme gözlenmişken; OSB tanılı çocukların alt testlerinde ise gelişimsel açıdan gerileme belirlenmiştir. Okul öncesi yaş aralığında konulan OSB ve EY tanılarının geniş bir spektrum olduğunu, her çocuğun farklı alanda gelişmiş yetenekleri ve farklı alanlarda farklı şiddette zorlanma yaşadıklarını düşünürsek bunun sebebi özel eğitim seçeneklerinin ülkemizde kısıtlı olması ve eğitimin kişiye ve zorluk yaşadığı durumlara özgü olması beklenirken bu duruma dar bir perspektiften yaklaşılmaya devam ediliyor olması olabilir. Yapılan araştırmalara göre özel eğitimin örgün eğitimden; öğretmenlerin çocuğun hızına göre daha esnek olması, belirli bir öğrenme görevi için daha fazla deneme yapılması, bir kavram ya da beceriyi kazanmak için daha sabırlı şekilde ilerlenmesi, daha yapılandırılmış bir ortam, zamanında ve yeterli düzeyde pekiştireçlere sahip olması, daha az sayıda öğrenci ve daha fazla sayıda öğretmen ile eğitimlerin mümkün olduğunda bireyselleştirilmesi, öğrencilerin işlevsellik düzeyine uygun müfredat ve daha sık izlem şansı şeklinde sekiz alanda farklılık göstermesi beklenmektedir (16-19). Bu sekiz alandaki her birine ait kısıtlılıklar bu çocukların özel eğitimden yeterince verim alamamasına sebep olabilmektedir.

Araştırmanın bir diğer bulgusu sık öğretmen değiştiren ve değiştirmeyen çocukların AGTE alt ölçekleri değişimleri açısından anlamlı fark bulunmamış olmasıdır. Bu çalışma özelinde anlamlı bir farkın gözlenmemesinin sebebi çalışmaya katılmış olan çocukların gelişimsel gecikme ve otizm spektrum bozukluğu belirti şiddeti sebebiyle en başında yeterli iletişimin kurulamamış olabileceği ve bu sebeple öğretmen değişimlerinin çalışmaya dahil edilmiş çocuklarda etkisinin düşük olmuş olabileceği şeklinde yorumlanabilir. OSB tanısına sahip çocukların yaşadıkları sosyal iletişim bozuklukları sebebiyle özel eğitimde eğitim gördükleri öğretmenler ile daha zayıf ilişki kurmak açısından artmış risk altında olmaları beklenen bir durumdur (3). Ayrıca öğretmenleri ile daha güçlü ilişki kurabilen çocukların ise gelişimsel testlerinde ilerleme, sosyal iletişimlerinde artış, davranışsal sorunlarında ise azalma olduğu gösterilmiştir (20). Bir çalışmada ise otizm şiddeti arttıkça öğretmenler ile kurulan ilişkinin zayıfladığı gösterilmiştir (21).

Tekrarlanan AGTE'ler sosyodemografik verilerle birlikte incelendiğinde de alt ölçekler açısından çocukların cinsiyetleri (p=0.097), ailelerin eğitim (anne eğitim düzeyi p=0.211, baba eğitim düzeyi p=0.115) ve sosyoekonomik düzeyleri (p=0.056) ile ilişkili anlamlı bir fark bulunmamıştır. Yapılan bir çalışmada sosyoekonomik durumları yüksek olan ailelerin otizmli çocuklarının aldıkların özel eğitimin; sosyoekonomik olarak düşük ailelerin otizmli çocuklarının aldıkları eğitime göre daha çekirdek semptomlara yönelik daha öznelleşmiş olduğu gösterilmiştir (22). Benzer sonuçlar bir çok araştırmayla desteklenmiştir; sosyoekonomik düzeyi yüksek ailelerin çocukları özel eğitimden daha fazla hizmet alıp daha çeşitlendirilmiş eğitim desteği alırken düşük sosyoekonomik ailelerin çocuklarının aldığı eğitim hizmeti sınırlı kalmıştır (23-26). Bu çalışmada sosyoekonomik durumun çocukların aldıkları eğitim ve gelişme düzeyleri açısından anlamlı bir fark oluşturmamış olmasının sebebi devletin ayda belirli bir saat özel eğitim desteğini bu çocuklara ücretsiz olarak sunması ve bu şekilde oluşabilecek olan fırsat eşitsizliğini gidermeye çalışması olabilir.

Araştırmadan elde edilen bulgulardan biri olan tekrarlanan AGTE'ler özel eğitime başlama yaşı, toplam özel eğitim alınan süre ve haftada alınan özel eğitim süresi ile ilişkili olarak incelendiğinde alt testler açısından anlamlı fark bulunmamış olmasının özel eğitim kurumları arasındaki yaklaşım farklılıkları sebebiyle olmuş olabileceği şekilde yorumlanmıştır. Devlet bu çocuklara haftada belirli bir saat ücretsiz özel eğitim hakkı tanımış olmasına rağmen bu çocukların eğitimi alacakları kurumları seçmesi ailelerin kararı ile olmuştur. Bununla birlikte bir gözden geçirme çalışmasında otizm spektrum bozukluğunda erken ve yoğun müdahalenin etkileri ile ilgili beş farklı çalışma incelenmiş ve sonuç olarak adaptif davranışlara, otizm şiddetine, iletişim becerilerine etkisi açısından zayıf kanıtlar göstermiştir (27).

Araştırmanın sonuçları değerlendirilirken bazı kısıtlılıkların da dikkate alınması gerekmektedir. Öncelikle araştırma retrospektif bir çalışmadır ve son 3 yılı değerlendirmektedir. Bu süre zarfında ÇÖZGER için bir hayli başvuru olmuşsa da ulaşılabilen hasta sayısı 54 ile sınırlı kalmıştır. Her hastanın tekrarlanan gelişim testi bulunmadığı için de sonuçlar kısıtlı bir örneklemi temsil etmektedir. İkinci olarak OSB ve EYY tanılarına sahip çocukların ruhsal bozukluk şiddet dereceleri farklı olduğu için, bu durumun çalışmanın sonuçlarını etkileyebileceği göz önünde bulundurulmalıdır. Üçüncü olarak, AGTE puanları ailelerin verdiği cevaplar üzerinden oluşturulabilmektedir. Özel eğitim kurumları ile ilişkili bilgiler de ailelerin verdiği cevaplar üzerinden edinilmiştir. Bu iki durum subjektif cevapların ortaya çıkmasına sebep olabilir. Son olarak, çalışmamızda sosyoekonomik düzey ile alınan eğitimin içeriği arasındaki ilişki değerlendirilmemiştir. Bu değerlendirilmenin yapılmamış olması çalışmamızın kısıtlılıklarındandır.

SONUÇ

Özel eğitim etkinliğini belirleyen faktörler incelendiğinde devletin sağladığı desteğin fırsat eşitsizliğini engellemek adına atılmış önemli bir adım olduğu gözlenmiştir. Fakat özel eğitim kurumlarının yaklaşımı açısından bir standardizasyona ihtiyaç vardır. Bu çalışmadan çıkarılması gereken asıl sonuç ise özel eğitime ihtiyaç duyan çocukları sadece bir tanı özelinde değerlendirmek yerine her çocuğun sahip oldukları yetenekler ve desteğe ihtiyaç duyduğu alanlar açısından detaylıca değerlendirilip sonrasında en ideal eğitime yönlendirilmesi gerektiğidir. Bu uygulama ile özel eğitimin etkinliğinin daha yüksek seviyelere çıkarılabileceği düşünülmüştür.

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ORIGINAL ARTICLE

Evaluation of Nutritional Status During Diagnosis, Treatment and Follow-up in Patients with Lung Cancer

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ÖZET

Amaç: Akciğer kanseri şu anda dünyada en sık görülen kanserdir. Tanı genellikle ileri evrede konulur. Bu nedenle mevcut sınırlı yaşam süresinde yaşam kalitesini artırmak oldukça önemlidir. Ortalama sağkalımı değiştirebilecek faktörlerden biri de kilo kaybıdır. Bu amaçla hastanede akciğer kanseri tedavisi gören popülasyonun Beslenme Risk Taraması (NRS-2002) ile kan biyokimyasal ve antropometrik ölçümleri ile akciğer kanseri malnütrisyon semptomlarının araştırılması ve akciğer kanseri hastalarının sağlık durumlarının araştırılması hedeflendi. **Yöntem:** Bu çalışma, 2020-2021 yılları arasında Adana Şehir Hastanesi Tıbbi Onkoloji Kliniğine başvuran, akciğer kanseri tanısı alan 18 yaş ve üzeri 216 erkek, 50 kadın olmak üzere toplam 266 gönüllü üzerinde gerçekleştirildi. **Bulgular:** 266 hasta dahil edildi: 216 erkek, 50 kadın, ortalama yaş 61,7±10,5, ortanca yaş 62 idi. BMI değeri 20'nin altında olan (p<0,001) ve son 3 ayda kilo kaybı olan hastalarda malnütrisyon riski (p<0,045) ikisi arasında pozitif bir ilişki vardı (p<0,005). Hastalarda albumin, antropometrik ölçümler, CRP ve NRS 2002 arasındaki ilişki incelendiğinde anlamlı pozitif ilişki olduğu görüldü. (p<0,005). Hastaların CRP değerleri ile BMI ve antropometrik ölçümleri arasında ters korelasyon mevcuttu (p<0,005). NRS 2002 ile hastanın kilosu ve antropometrik ölçümleri arasında ters korelasyon (p<0,005). Kemoterapi alan hastaların albümin, BMI ve antropometrik ölçümleri ile ters yön arasında, CRP değerleri ile son 3 aydaki kilo kaybı ile NRS 2002 arasında pozitif korelasyon bulundu. (p<0,005). Radyoterapi ile CRP arasında pozitif bir korelasyon. (p<0,005) Hastalarda metastaz ile albumin değerleri, antropometrik ölçümler ve BMI arasında ters ilişki varken; CRP ve NRS 2002 ile pozitif korelasyon bulundu (p<0,005). Yaş, albumin, BMI ve antropometrik ölçümlerle ters ilişki bulunurken, CRP ve NRS 2002 ile pozitif ilişki saptandı (p<0,005). Beslenme tedavisi alan hastalarda kemoterapi alma sıklığı (p=0,06) ve metastaz görülme sıklığı (p< 0,01) yüksek bulundu (p<0,005) **Sonuç:** Akciğer kanseri tanısı alan hastaların, tanı anından itibaren başka herhangi bir hastalık, yaşam kalitesi, malnütrisyon riski ve beslenme durumu açısından taranması gerektiğini, erken tıbbi tedavi ile birlikte beslenmeye yönelik önlemlerin alınmasıyla hastaların beklenen yaşam süresinin uzatılabileceğine inanıyoruz.

Anahtar kelimeler: Akciğer kanseri, beslenme, malnütrisyon, NRS 2002

ABSTRACT

Aim: Lung cancer is currently the most common cancer in the world. Diagnosis is usually made at an advanced stage. For this reason, it is very critical to enhance the standard of life during the current limited lifespan. One of the factors that can change the average survival is weight loss. For this purpose, the Nutritional Risk Screening (NRS-2002) of the population receiving lung cancer treatment in the hospital, blood biochemical and anthropometric measurements, and lung cancer malnutrition symptoms were targeted to explore the health status of lung cancer patients. **Methods:** This study was conducted on a total of 266 volunteers, 216 men and 50 women, aged 18 and over, who were diagnosed with lung cancer and admitted to Adana City Hospital Medical Oncology Clinic during the years 2020-2021. **Results:** Of the 266 patients included, 216 were men and 50 were women. The mean age was 61.7±10.5, and the median age was 62. There was a positive relationship between the risk of malnutrition in patients with BMI values below 20 (p<0.001) and weight loss in the last 3 months (p<0.045) (p<0.005). When the relationship between albumin, anthropometric measurements, CRP, and NRS-2002 in patients was examined, there was a significant positive relationship (p<0.005). There was an inverse correlation between the CRP values of the patients and their BMI and anthropometric measurements (p<0.005). An inverse correlation was also found between NRS-2002 and the patient's weight and anthropometric measurements (p<0.005). A positive correlation was found between the patients receiving chemotherapy and albumin, BMI, and anthropometric measurements, and an inverse correlation with CRP values and weight loss in the last 3 months and NRS-2002 (p<0.005).

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There was a positive correlation between radiotherapy and CRP ($p<0.005$). While there was an inverse relationship between metastases and albumin values, anthropometric measurements, and BMI in patients, a positive correlation was found with CRP and NRS-2002 ($p<0.005$). An inverse relationship was found between age, albumin, BMI, and anthropometric measurements, and a positive relationship with CRP and NRS-2002 ($p<0.005$). The frequency of receiving chemotherapy ($p=0.06$) and the incidence of metastasis ($p<0.01$) were found to be high in cases receiving nutritional therapy ($p<0.005$)
Conclusion: Cases diagnosed with lung cancer should be screened for any other diseases, quality of life, risk of malnutrition, and nutritional status from the time of diagnosis. We believe that the expected survival of patients can be extended by taking precautions for nutrition together with early medical treatment.

Keywords: Lung cancer, Nutrition, Malnutrition, NRS 2002

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INTRODUCTION

While the ratio of lung cancer has decreased all over the world in recent years, lung cancer remains the most common cause of cancer-related deaths in men and women. The vast majority of cases are detected at an advanced stage at the time of diagnosis. In lung cancer, whose average life span is limited to months even with the best treatment, new treatments developed in recent years, such as immunotherapy and targeted therapies, have significantly prolonged life expectancy in some patient groups with local, locally advanced, and metastatic disease. However, predicting the average life expectancy in lung cancer remains of great importance. One of the main factors that can change the average survival is weight loss, which is an indicator of malnutrition. Body mass index and nutritional parameters are other factors that can be used to determine the average life expectancy of lung cancer patients.

Among cancers, especially lung and gastrointestinal system cancers, one of the most common complications is malnutrition (1). Due to malnutrition, the response to chemotherapy and radiotherapy becomes difficult in cancer patients. It also increases the complications related to the disease, mortality, length of hospital stay, and cost. Malnutrition causes a significant decrease in the quality of life in patients since the diagnosis of cancer (2). For this reason, it is very important to evaluate cancer cases for the possibility of malnutrition from the time of diagnosis, to take the necessary precautions, and to treat them if necessary (3,4).

Cancer cachexia, which can be seen after malnutrition resulting from cancer, often causes loss of muscle mass and is responsible for a large portion of deaths due to cancer (5-6). In cancer cases, the feeling of quick satiety, changes in the functions of the gastrointestinal tract, pain, side effects of medications used for pain palliation (such as constipation, bowel movement disorders), side effects secondary to

chemotherapy (such as nausea, vomiting, loss of taste and smell in the mouth, dryness in the mouth) are various reasons that reduce oral intake and cause secondary weight loss (7-9).

Cancer cachexia, on the other hand, is characterized by the loss of skeletal muscle mass that cannot be fully recovered with current nutritional supplements, as well as the regression of physical activities, with or without fat loss (10). Cancer cachexia has an important place among the causes of death (11).

To show the decrease in skeletal muscle mass, it is necessary to define reference values according to gender and to make body composition measurements in accordance with certain standards. The commonly accepted rule is that absolute muscle mass should be below the 5th percentile. This is calculated as follows:

- By anthropometric measurement of middle upper arm muscle area: <32 cm^2 in men, <18 cm^2 in women
- Dual energy X-ray absorptiometry calculated extremity skeletal muscle mass index: <7.26 kg/m^2 in men, <5.45 kg/m^2 in women
- Lumbar skeletal muscle mass index determined by CT: <55 cm^2/m^2 in men, <39 cm^2/m^2 in women
- Total body mass index excluding adipose tissue as assessed by bioelectrical impedance: <14.6 kg/m^2 in men, <11.4 kg/m^2 in women

It has been recommended to measure direct muscle mass in cases such as diffuse edema in the body, the presence of a large tumor mass, and obesity (12).

Evaluating the nutritional status of patients diagnosed with lung cancer, identifying cases with malnutrition or those at risk of malnutrition, as well as cases needing nutritional support, evaluating body compositions, and observing the effect of nutritional support can lead to increased survival in patients diagnosed with lung cancer.

MATERIAL AND METHODS

This study was conducted on 266 volunteer patients, 216 men and 50 women, aged 18 and over, who were diagnosed with lung cancer and admitted to Adana City Training Hospital Medical Oncology Clinic between 2020-2021. Demographic information, laboratory results, nutritional risks according to NRS-2002 scoring, BMI values, body compositions, and treatments (chemotherapy, radiotherapy, immunotherapy, surgery) were recorded. A questionnaire consisting of five sections was applied to the patients. In the first part of the questionnaire, descriptive information of individuals, their existing diseases, whether they have habits such as smoking and alcohol, and the drugs they use were questioned. The second part of the questionnaire includes anthropometric measurements and body fat percentage analysis, while the fourth part includes the biochemical findings (CRP, albumin, etc.) of the patients. In the fifth part of the questionnaire, the malnutrition risk of

the patients was determined with the NRS-2002 screening tool.

Anthropometric measurements of individuals were made in accordance with standards. From anthropometric measurements, the weight (kg) and height (cm) of the individuals were measured according to the technique. The patient's body weight, body fat ratio, lean body mass, and body water ratio were measured with the Tanita MC 780 bioelectrical impedance device. Body mass index (BMI kg/m²) and the ratio of body weight to height (m²) were calculated.

The patients included in the research were evaluated according to the definition of Fearon cancer cachexia (10):

1. Involuntary loss of more than 5% of body weight in the last 6 months (without simple fasting); or
2. BMI below 20 kg/m² with any unintentional weight loss of more than 2%
3. FFMI (fat-free mass index) <14.6 kg/m² in men; <11.4 kg/m² in women

Among the blood findings evaluated were albumin and CRP. All measurements were made in Adana City Training and Research Hospital Central Laboratories.

The NRS-2002 screening tool was applied to the patients in order to evaluate their nutritional status and to determine the risks of malnutrition. The reason for choosing this screening tool is that it is recommended by ESPEN and is suitable for oncological patients.

Statistical Analysis

SPSS (Statistical Package for the Social Sciences) 23.0 was used for statistical analysis of the data. Categorical evaluations were summarized as numbers and percentages, and continuous measurements as mean and standard deviation (median and minimum-maximum where appropriate). Chi-square and Fisher's exact tests were used to compare categorical parameters. The Shapiro-Wilk test was used to determine whether the parameters in the study showed a normal distribution. The Mann-Whitney test was used in paired group analysis for parameters that did not show normal distribution, and the Kruskal-Wallis test was used in the analysis of more than two groups. The Bonferroni method, one of the post hoc analyses, was used to determine the source of the difference between the groups. Spearman correlation tests were used to determine the relationship between variables. The level of statistical significance was set at 0.05 in all tests. Our research was approved by the Adana City Hospital ethics committee (12.02.2020-714) and was performed in accordance with the principles of the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Additionally, this research was produced from the internal medicine specialty thesis.

RESULTS

In this study, we evaluated 266 cases diagnosed with lung cancer. The mean age of the patients was 61.7±10.5 years, and the mean height was 167.2±7.9 cm. While there was no metastasis in 114 (42.9%) of the patients, it was determined that 152 (57.1%) of them were

metastatic. Accordingly, it was determined that 86.1% (n=229) of the patients received chemotherapy, 18.0% (n=48) received radiotherapy, 7.5% (n=20) received immunotherapy, and 13.5% (n=36) underwent surgical procedures (Table 1 and Table 2).

Table 1. General characteristics of individuals

	Frequency (n)	Percent (%)
Gender		
Male	216	81.2
Woman	50	18.8
Metastasis		
No	114	42.9
There is	152	57.1
Educational Status		
Primary school	127	47.7%
High school	84	31.5%
Degree	55	20.6%
Presence of Comorbid Disease		
No	105	23.4%
There is	161	60.5%
Comorbid Disease		
Hypertension	26	16.1%
COPD	23	14.28%
	Mean±sd	Median (Min-Max)
Age	61.7±10.5	62 (28-94)
Size	167.2±7.9	168 (142-190)

Table 2. Distribution of individuals according to their treatment status

	Frequency (n)	Percent (%)
Chemotherapy		
Not received	37	13.9
Has taken	229	86.1
Radiotherapy		
Not received	218	82.0
Has taken	48	18.0
Immunotherapy		
No	246	92.5
There is	20	7.5
Surgical procedure		
Not done	230	86.4
Made	36	13.5

The mean BMI of the individuals included in the study was 25.5±5.2. It was determined that 17.3% (n=46) had a BMI value of 20 and below, and 82.7% (n=220) had a BMI above 20. In patients at risk of malnutrition, the frequency of having a BMI of 20 and below ($p<0.001$) and the frequency of experiencing weight loss in the last 3 months ($p=0.045$) were found to be considerably higher ($p<0.05$).

The patients CRP value showed a weak inverse correlation with weight ($r=-0.234$), BMI ($r=-0.258$), fat mass ($r=-0.237$), abdominal muscle thickness ($r=-0.189$), upper middle arm muscle thickness ($r=-0.243$) and thigh thickness ($r=-0.246$) ($p<0.05$).

Weight (r=-0.301), BMI (r=-0.324), fat mass (r=-0.312), abdominal muscle thickness (r=-0.238), upper middle arm muscle thickness (r=-0.339), and thigh thickness (r=-0.340) showed a weak inverse correlation with the NRS-2002 value ($p<0.05$).

The patients' chemotherapy status showed a weak inverse correlation with albumin (r=-0.201), BMI (r=-0.141), and fat mass (r=-0.162), while showing a weak positive correlation with CRP (r=0.308), weight loss (r=0.168), and NRS-2002 (r=0.182) ($p<0.05$).

The presence of metastases showed a weak inverse correlation with albumin (r=-0.378), weight (r=-0.293), BMI (r=-0.280), fat mass (r=-0.275), abdominal muscle thickness (r=-0.218), upper middle arm muscle thickness (r=-0.315), and thigh thickness (r=-0.312), while showing a strong positive correlation with CRP (r=0.718) and NRS-2002 (r=0.811) values ($p<0.05$) (Table 3).

Table 3. Evaluation and distribution of anthropometric measurements of patients

	Mean±sd	Median (Min-Maks)
Weight	71,1±15,8	69,7 (40-118,4)
Size	167,1±7,9	168 (142-190)
BMI	25,45±5,19	25,7 (12,6-43,3)
Fat mass	16,76±9,38	15,8 (1,1-50)
Abdominal muscle thickness	98,7±59,4	94 (25-1001)
Upper middle arm muscle thickness	27,4±4,2	28 (9-40)
Thigh thickness	43,68±6,78	44 (23-68)

BMI: Body mass index

When the relationships between the patients' anthropometric measurements, albumin and CRP values, and NRS-2002 were examined, the patients albumin value showed a weak positive correlation with weight (r=0.307), BMI (r=0.289), fat mass (r=0.282), abdominal muscle thickness (r=0.246), upper middle arm muscle thickness (r=0.289), and thigh thickness (r=0.312) ($p<0.05$) (Table 4).

Table 4. Investigation of the relationship between anthropometric measurements, albumin and CRP values of patients and NRS 2002

	Albumin		CRP		NRS 2002	
	r	p	r	p	r	p
Weight	0.307**	<0.001	-0.234**	<0.001	-0.301	<0.001
Size	0.085	0.188	0.011	0.867	0.025	0.696
BMI	0.289**	<0.001	-0.258**	<0.001	-0.324	<0.001
Fat mass	0.282**	<0.001	-0.237**	<0.001	-0.312	<0.001
Abdominal muscle thickness	0.246**	<0.001	-0.189**	0.003	-0.238	<0.001
Upper middle arm muscle thickness	0.289**	<0.001	-0.243**	<0.001	-0.339	<0.001
Thigh thickness	0.312**	<0.001	-0.246**	<0.001	-0.340	<0.001

BMI: Body mass index * p<0.05, Spearman correlation test

DISCUSSION

Lung cancer is the most common cause of cancer-related deaths in men and women. Malnutrition causes an important decrease in the quality of life in patients starting from the diagnosis of cancer (13). Martin et al. (9) evaluated the percentage of BMI and weight loss in cancer cases (n=8160) . The mean BMI was 24.4±5.1 kg/m², and it was concluded that low weight loss and high BMI (≥25.0 kg/m²) increased the survival time independent of the cancer stage, the patient's performance and age. While the mean BMI of the individuals included in our study was 25.5±5.2 kg/m², it was determined that 17.3% (n=46) had a BMI value of 20 and below, and 82.7% (n=220) had a BMI above 20. Similarly, in our study, there was a significant correlation between those with BMI <20 and those with weight loss in the last 3 months, indicating that these patients are at higher risk of malnutrition (Figure 1)

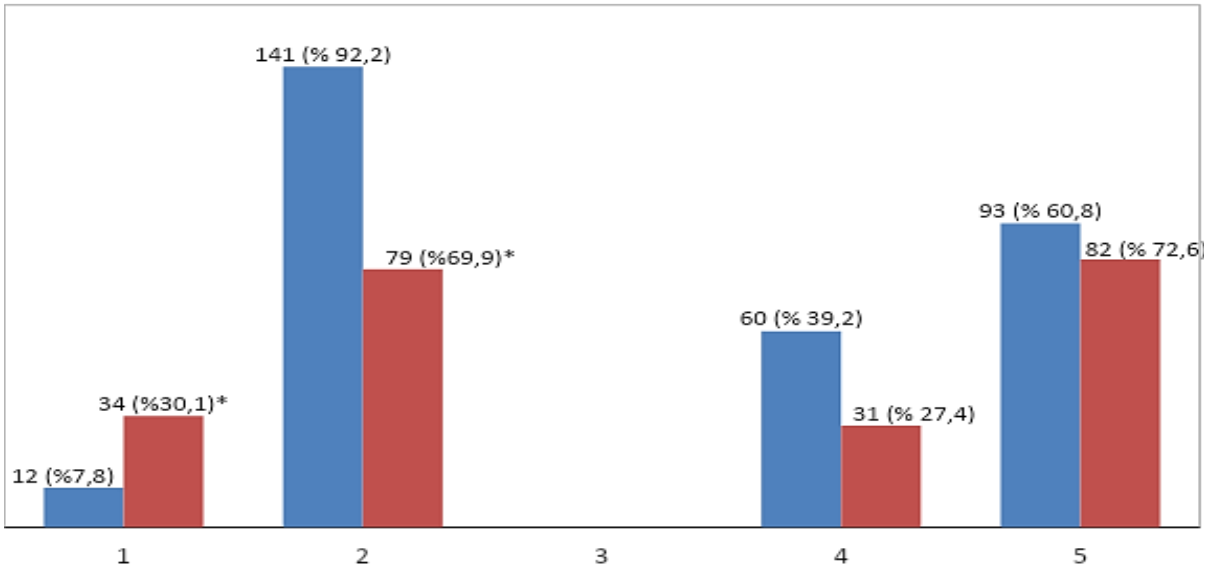

Figure 1. The relationship between malnutrition risk and BMI and weight loss findings in the last 3 months (blue column there is no risk of malnutrition, red there is a risk of malnutrition)

Muscle wasting in cancer is considered an indicator of poor quality of life, impaired functionality, and shortened survival (14). Jeejeebhoy (15) emphasized that muscle dysfunction secondary to malnutrition precedes changes in anthropometric measurements and laboratory parameters. There are many studies showing that it is related (16). In our study, although the UOCC was 27.4±4.2, malnourished cases were found to have statistically significantly lower calf circumference and upper middle arm muscle circumference than non-malnutrition cases. This is consistent with the results of studies by Christensen et al. (17) and Norman et al. (18)

Wu et al. (23) in a study on albumin values, identified individuals with normal nutritional status as having albumin values of 3.5 g/dL and above, mildly malnourished individuals as 3.1-3.4 g/dL, moderately malnourished individuals as 2.6-3.0 g/dL, and severely malnourished individuals as 2.5 g/dL and below. Ryu et al. (19) found the albumin value of well-nourished patients to be 3.86±0.3 g/dL in another study. The albumin value of cases with malnutrition was found to be 3.85±0.3 g/dL. In light of all this data, it is possible to detect the negative changes in the biochemical values of cancer cases whose nutritional status has deteriorated. Fanrong Zhang et al. emphasized that the CRP/albumin ratio was an independent predictor of disease progression and mortality in 617 patients with non-small cell lung cancer who were operated on in a retrospective clinical study (20). Ying Jin et al. conducted a meta-analysis that included 1,649 cases from eight clinical studies, emphasizing that CRP levels in patients with non-small cell lung cancer may be a determining factor in the prognosis of the disease and response to treatment (21). Similarly, in our study, CRP values were found to be higher in patients with metastatic lung disease, and the decrease in albumin values

and the decrease in BMI values were parallel with the increase in CRP values in an inverse proportion to these values.

Gavazzi et al. (4) found that the BMI rates of cases with NRS<3 were 26.1±3.2 kg/m², and the BMI rates of cases with NRS≥3 were 22.6±3.9 kg/m². There was a statistically significant distinction between the NRS 2002 groups in terms of mean body weight ratios ($p<0.001$). There was also a statistically significant distinction among the NRS 2002 groups in terms of mean weight loss values ($p<0.001$), with a statistically significant increase in mean weight loss as one goes towards NRS 4 (19). The weight loss rate of patients with NRS <3 was 0.89±1.4%, while the weight loss rate of patients with NRS ≥3 was 6.42±4.6%, which was statistically significant. Similar to our research, it was found that as the NRS 2002 score increased in cases with lung cancer, BMI decreased and weight loss in the last 3 months increased.

Tsai et al. (22) determined that there is a significant relationship between the MNA screening test, which is a screening method similar to NRS-2002, and MCQ and BMI values.

According to Vergara et al. (24) the malnutrition rate was reported as 40.21% in patients receiving chemotherapy. In another study, the malnutrition rate was found to be 86.3% in 74 adult lung and GIS cancer cases treated with chemotherapy, and it was determined that these cases were more prone to weight loss (25). Similarly, Ramos Chavez et al. (26) found that the risk of malnutrition was higher in lung and colorectal cancer cases. In two separate studies conducted on patients receiving radiotherapy treatment, malnutrition percentages were reported as 37.8% and 60%, respectively (27,28).

In our study, while the NRS 2002 score and CRP values increased in patients receiving chemotherapy, the susceptibility to hypoalbuminemia also increased. Additionally, it was determined that patients who received chemotherapy lost weight in the last 3 months. While there was no relationship between the status of receiving radiotherapy and NRS 2002, albumin values, and weight loss, there was a positive relationship with CRP values. If we evaluate in the light of these data, while the risk of malnutrition increases in patients receiving chemotherapy, the risk is also present in radiotherapy, but it is more pronounced in chemotherapy.

According to a study conducted in France, the presence of lung cancer and metastases had a direct effect on the risk of malnutrition as a result of records obtained from 154 hospitals (29). In our study, 57.1% of cases diagnosed with lung cancer were found to be metastatic. While the NRS 2002 score was higher in cases with metastatic lung cancer, a similar increase in CRP values was observed ($p<0.005$). In the follow-up of patients with metastatic lung cancer, significant weight loss was observed in the last 3 months, and it is noteworthy that the upper arm muscle thickness decreased. The significant determination of these parameters used in the evaluation of nutritional status indicates that metastasis status significantly increases the risk of malnutrition.

CONCLUSION

The incidence of lung cancer has tended to decrease significantly with the reduction of modifiable etiological factors such as smoking. However, lung cancer is still the most widespread cause of death in men and women worldwide. In advanced, locally advanced, or localized lung cancer, with newly developed systemic therapies such as targeted therapies and immunotherapy, the success of treatment seems to increase significantly in cases with locally advanced and localized disease, where the survival of some cancer patients with advanced disease is significantly prolonged.

Malnutrition, on the other hand, is very common in patients with lung cancer and is a factor that directly affects life expectancy and quality of life. For this reason, detecting malnutrition, which is very common in all cancer patients, especially lung cancer patients, using many parameters and screening methods, especially in the early period, is crucial. Early detection and treatment of malnutrition will significantly increase the success of treatment and quality of life in cases with lung cancer.

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CASE REPORT

Can Cognitive Behavioral Therapy be Effective for Social Anxiety Disorder with Dissociative and Self-Harm Behaviors in a 15-Year-Old Adolescent?

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ÖZET

Sosyal anksiyete bozukluğu ergenler için oldukça zorlayıcı olabilir ve bu bozukluk sosyal etkileşimlerden kaçınma, yoğun kaygı ve zaman zaman disosiasyon semptomlarına yol açabilen bir klinik tabloya sahiptir. Bu vaka çalışmasında sosyal anksiyete bozukluğu, disosiasyon belirtileri ve kendine zarar verme davranışları olan 15 yaşındaki bir kız hastanın tedavi sürecini inceledik. Başlangıçta anksiyete, sosyal durumlardan kaçınma ve disosiasyon belirtileri gösteren hastanın Bilişsel Davranışçı Terapi (BDT) ile önemli bir ilerleme kaydettiği görüldü. Bu vakanın dikkate değer bir yönü, hastanın hayali arkadaşlarla etkileşim olarak ortaya çıkan disosiasyon deneyimiydi. Bu deneyim, sosyal anksiyete bozukluğu bağlamında disosiatif semptomların daha sık düşünülmesi ve araştırılması gerekliliğini vurgularken semptomların temel kökenlerinin ele alınmasının önemine de dikkat çekmektedir. Terapide ana odak noktamız başlangıçta sosyal kaygıyı azaltmak olsa da hastanın disosiatif semptomlarının ve kendine zarar verme davranışlarının BDT ile önemli ölçüde düzelmiş olması, BDT'nin sosyal anksiyete bozukluğu, disosiasyon ve kendine zarar vermeyi yönetmek için etkili bir tedavi seçeneği olarak önemini vurgulamaktadır.

Anahtar kelimeler: Bilişsel davranışçı terapi, Disosiasyon, Kendi kendine zarar veren davranış, Sosyal fobi

ABSTRACT

Social anxiety disorder can be quite a challenge for adolescents, often leading to intense fear of social situations and sometimes even dissociation. In this case study, we explored the experiences of a 15-year-old girl who was dealing with social anxiety disorder, dissociation, and self-harm. Despite initially showing symptoms of anxiety, avoiding social situations, and experiencing dissociation, the patient made significant progress through Cognitive Behavioral Therapy (CBT). One notable aspect of this case was the patient's experience of dissociation, which manifested as interactions with imaginary friends. This highlights the need for further research and consideration of dissociative symptoms in the context of social anxiety disorder. It also emphasizes the importance of addressing the root causes of these symptoms. While our main focus in therapy was on reducing social anxiety, it's worth noting that the patient's dissociative symptoms and self-harming behaviors significantly improved with CBT. This underscores the effectiveness of CBT as a powerful treatment option for managing social anxiety disorder, dissociation, and self-harm.

Keywords: Cognitive behavioral therapy, Dissociation, Self-injurious behavior, Social phobia

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INTRODUCTION

Social anxiety disorder (SAD), frequently encountered during adolescence, affects approximately 3% to 11% of teenagers. This condition typically arises during the teenage years or early adulthood and is characterized by an overwhelming and unfounded fear of social interactions, often resulting in efforts to avoid such situations (1).

Coping strategies utilized by individuals with SAD include escapism, avoidance, and engagement in safety behaviors within anxiety-inducing scenarios (2). Dissociation, defined as the disruption of the cohesive integration of consciousness, memory, identity, or environmental perception, might also manifest as an additional coping mechanism in response to episodes of heightened anxiety. While dissociation has traditionally been linked with trauma-related conditions, some literature suggests its occurrence in anxiety disorders (3,4). Despite limited research exploring the correlation between SAD and dissociative symptoms, there is evidence suggesting that cognitive behavioral therapy (CBT) may be beneficial in cases where social anxiety disorder and dissociation coexist (5).

Self-harm, defined as the deliberate act of causing harm to oneself, represents another concerning aspect frequently observed among adolescents. Low levels of family function, deficiencies in parent-adolescent communication, reduced family cohesion, and a lack of support have been associated with the prevalence of self-harm among adolescents (6). In the literature, anxiety disorders have been linked to self-harm behaviors as well. Specifically, a study has revealed that both social anxiety disorder and generalized anxiety disorder are correlated with more concerning manifestations of self-harm (7).

This case report aims to contribute to the existing literature by offering a comprehensive evaluation and treatment plan for a patient presenting with social anxiety disorder, concurrent dissociative symptoms, and self-injurious behavior. While there is some literature discussing the co-occurrence of anxiety and dissociative symptoms, there remains a gap in understanding the specific treatment approaches and outcomes in cases where these conditions overlap, especially in adolescents. By presenting this case, we aim to highlight the importance of assessing and addressing dissociative symptoms in the context of social anxiety disorder and provide insights into the effectiveness of CBT in managing these comorbid conditions.

CASE PRESENTATION

A 15-year-old female patient presented to our outpatient clinic, exhibiting symptoms of social withdrawal, including difficulty making friends and feeling shy in public for the last three years. She expressed concerns such as 'What if I embarrass myself?' or 'What if I look foolish?'. She lacked close friendships and reported experiencing somatic symptoms, including palpitations, trembling, and sweating in anxiety-inducing scenarios. Additionally,

she rarely engaged in self-harming behaviors, such as scratching herself with a razor.

Upon clinical evaluation, she displayed cooperation, clear and coherent speech and reported a predominantly anxious mood, characterized by increased restlessness and tension. Her affect appeared consistent with an anxious mood. Her thought process was coherent and goal-directed, and she expressed concerns about potentially embarrassing situations and displayed a heightened sensitivity to the opinions of others. Her cognition was intact, with regular attention, concentration, and memory, indicating normal intelligence. Sleep and appetite were within normal limits. Based on the evaluation, the patient met DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) criteria for social anxiety disorder.

The patient also described having imaginary companions, particularly a male companion of similar age, over the past three years. These interactions involved solitary dialogues, serving as a surrogate for genuine social connections, given her lack of authentic friendships because of social anxiety disorder. Additionally, the patient experienced feelings of detachment from their surroundings and physical sensations such as faintness and dizziness, consistent with depersonalization symptoms. The engagement with imaginary companions can be interpreted as a manifestation of dissociation. Furthermore, the occurrence of severe parental conflicts, such as the incident involving the father displaying a knife to the mother in the past may have played a traumatic role in precipitating the onset of dissociative experiences in the patient. The patient mentioned that the onset of self-harming activities was influenced by her imaginary male friend, eventually becoming a habitual behavior. Importantly, the patient denied any suicidal ideation or plans.

Due to the persistence of anxiety symptoms despite three months of treatment with fluoxetine 40 mg/day and risperidone 1.5 mg/day, cognitive behavioral therapy was started as the chosen treatment approach upon the patient's presentation to our clinic. The decision to add CBT was prompted by the partial response observed with the prior medication regimen. CBT was conducted by a licensed child and adolescent psychiatrist with CBT certification, who is an expert in treating child and adolescent anxiety disorders and also provides supervision to new therapists.

Table 1. Formulation for the presented case

Predisposing factors:
Father's anxiety, significant family stress
Precipitating factors:
Adolescence and severe parental conflicts
Perpetuating factors:
Cognitive distortions, maladaptive coping mechanisms
Protective factors:
The patient’s high motivation, consistent attendance, family involvement

Throughout treatment, the patient's situation, emotions, thoughts, and behaviors were explored. Predisposing factors and cognitive distortions were addressed. Specific treatment goals were established, including initiating conversations with teachers, using the restroom at school or in public places, raising her hand in class, asking for help when needed, placing orders independently, and openly expressing her thoughts. The patient rated the target list, and exposure homework was assigned to her. She started with the lowest-scoring things on the list and worked on them until they were done. After the exposure task, she raised her hand in class to say what she thought. The family also noted her high level of motivation, which was consistently observed during the sessions.

The patient reported that her imaginary friends were present exclusively when alone, but she came to realize that these experiences were merely visualizations. In addition to the patient's treatment, her parents received psychoeducation on SAD, dissociation, and self-harm. During the therapy sessions, family conflicts were addressed. Their significant marital issues were also investigated, and both parents participated in extended sessions.

After six sssions of CBT, the patient experience a significant reduction in social anxiety symptoms and complete remission of dissociative and self-harm behaviors. Parental conflicts also decreased. Consequently, risperidone was gradually discontinued, and the dosage of fluoxetine was reduced to 20 mg/day.

DISCUSSION

The co-occurrence of anxiety and dissociative symptoms is not uncommon. Dissociative symptoms, traditionally linked with trauma-related disorders, have also been recognized in individuals with anxiety disorders (3,4,8). The patient's dissociative experiences could be viewed as a coping mechanism, possibly serving as a temporary escape from distressing emotions, situations, and the pervasive feeling of loneliness. The remission of dissociative symptoms following

treatment could be attributed to the patient's improved ability to cope with anxiety through adaptive strategies, thereby reducing the need for dissociation as a maladaptive coping mechanism.

There has been limited research on the relationship between social anxiety disorder and dissociative symptoms. However, a study by Michal et al. 2005 found a significant link between increased anxiety levels and depersonalization and derealization in individuals diagnosed with SAD (9). Our case supports these findings, highlighting the importance of assessing dissociative symptoms when dealing with SAD. Additionally, another study by Hoyer et al. in 2013 showed that people with SAD often experience depersonalization and derealization during social performance situations, compared to those without the condition. This study also emphasized the significant association of depersonalization and derealization with processes that sustain SAD, such as safety behaviors and post-event processing (10).

The selected treatment approach of CBT aligns with scientific literature, consistently demonstrating its effectiveness in reducing social anxiety disorder symptoms and improving overall functioning (2). The decision to prioritize social anxiety symptoms over addressing self-harm behavior was based on several factors. Firstly, the frequency of self-harm incidents was relatively low, and the patient was already receiving risperidone treatment, which may have contributed to its management. Additionally, the patient demonstrated greater motivation to address social anxiety symptoms, indicating that it was a primary concern for her. Therefore, the treatment approach was tailored to target the symptoms that were most distressing and impairing for the patient.

By including the family in therapy sessions, we aimed to address potential stressors and conflicts within the family system that may contribute to the patient's symptoms. Additionally, involving the family provided an opportunity to strengthen support networks and make it easier to apply therapeutic strategies in the patient's daily life.

The clinical progress observed after six sessions of CBT, including the reduction of social anxiety symptoms, and remission of dissociative and self-harm behaviors underscores the potential efficacy of the chosen intervention. The shorter duration of CBT sessions may have yielded positive results for several reasons. Firstly, the therapist leading the sessions possessed specialized expertise in treating anxiety disorders in children and adolescents, holding certifications in CBT, and providing guidance to new therapists. Secondly, the positive treatment outcome was further enhanced by the patient's own high motivation. Furthermore, the active participation of her family, along with their efforts in conflict resolution, played a significant role in achieving successful treatment outcomes.

It is important to note that cognitive therapy for social anxiety disorder does not target depersonalization and derealization symptoms. However, it is worth mentioning that Schweden et al. observed a significant

reduction in self-reported experiences of these symptoms after treatment (5), which is consistent with our case and underscores the efficacy of cognitive therapy for SAD and associated dissociative symptoms.

This case report has certain limitations. The use of CBT as an add-on to medication makes it challenging to isolate its unique effects. While suggestive, this case study alone does not allow for conclusions about a direct causal relationship between the improvement in social anxiety and the reduction in dissociative and self-harm symptoms. Longitudinal follow-up would be necessary to determine the long-term stability of the improvements observed.

The findings of this case report emphasize the importance of specifying the primary focus area in treatment plans. Addressing the root cause of symptoms can help prevent additional comorbid problems from arising. The primary goal of therapy in this particular case was to treat social anxiety. However, the successful resolution of dissociative symptoms and self-harming tendencies through CBT demonstrates that this treatment method can effectively manage anxiety disorders with these problematic symptoms. Nevertheless, additional research is necessary to investigate the underlying mechanisms of these improvements.

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