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Contents

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The current methods to assess scientific performance and Academia in Turkey

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Measuring the scientific productivity, quality and impact of academics, scientific institutions and countries, and how these characteristics change over time, is important in many ways. In developed and many developing countries, monitoring the performance of scientific institutions with objective methods is important in decision-making processes regarding the distribution of central support budgets. In our country, some competency analysis and research university evaluations published periodically by the Council of Higher Education (YÖK) are within this scope. Lists such as ARWU, USNEWS, QS published every year give an idea about the general and field-based performance of universities. Programs such as InCites Benchmarking & Analytics (InCites) are used to evaluate institutions. In recent years, institutions such as ScholarGPS and Expertscape use algorithm-based automatic methods to classify institutions based on general and field. Such methods are also useful in evaluating the temporal change in the scientific performance of countries (1). However, this article focuses on the evaluation of the individual performance of academics, not institutions. Demonstrating and monitoring the scientific performance of academics is important for decisions on recruitment, promotion and retention in developed countries. However, the value given to academic performance in our country is still limited. This topic will be discussed under the headings of successful scientists and evaluation of individual academic performance.

Lists of successful scientists

In our country, they come to the agenda mostly through occasional newspaper news, social media and posts in professional correspondence groups. We witness that some universities share the number of scientists from those universities who have been included in such lists on their websites and social media. However, there are serious differences between these lists in terms of the degree of rigor of the inclusion criteria, methodological soundness and seriousness. In our country, scientists and institutions make misleading posts without taking these differences into account.

For many years, Clarivate has been publishing a list called "The Highly Cited Researchers™ list", which has very strict criteria and includes only scientists who have had a serious impact on their field. In previous years it was also known as the 'World's Most Influential Scientists' list. It is the most prestigious list and misleading news and posts can be made in our country as if scientists who have made other lists have made this list. This list aims to include scientists who have contributed in the top 1 percentile in their field. It uses a method based on the impact of publications in the last 10 years on the field and how many articles the individual has published that have such an impact on the field. The version of this list for 2024 includes only 6,636 scientists from all over the world. Only two of these scientists are from Turkey. In the field of psychiatry and psychology, 184 people made the list this year. This year, there are no scientists from Turkey in the fields of medicine, neuroscience-behavior and psychiatry-psychology. In the past, one person from Turkey has been included in the list in the field of psychiatry-psychology. Scientists selected to this list, due to the rigidity of the criteria, usually fall off

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the list after a while, even if they are Nobel prize winners (for example, Aziz Sancar). The number of scientists included in this list is of practical importance as it is a criterion for universities' ARWU rankings. In universities with low scores, such as in Turkey, one scientist on the list can move a university's ARWU ranking several hundred places forward. For this reason, in the past, countries such as Taiwan and Saudi Arabia have taken initiatives to publish the addresses of scientists working in Turkey and some other countries.

The "Stanford Elsevier Top Scientists List" is another list that has come to the fore in recent years. Compared to the aforementioned list, "The Highly Cited Researchers™ list", the inclusion criteria are much less strict and include scientists in the top 2 percent of their field (2). In 2024, the number of scientists from Turkey included in this list of tens of thousands of scientists is 1181, but only 32 of these scientists are among the top 20 thousand scientists. Three of the 1793 scientists included in the list in the field of psychiatry are from Turkey. Apart from the main list based on career-long performance, there is a list based on the impact of the scientist on the field in the last 1 year. Comparing these two lists can provide information about the direction in which the scientist's performance is going.

ScholarGPS, which has recently emerged and gained importance, stands out with its comprehensive structure. It provides information on 177 disciplines and many specializations other than the main fields. In addition to providing individual reports to individuals through algorithmic analysis among millions of scientists, it also produces a list of successful scientists. It provides 2 types of classification for successful scientists. The "Highly cited scholar" list with stricter inclusion criteria is based on the top 0.05%. In addition to the list for all fields, it can create separate lists for main fields, disciplines and specialties. Of the 14585 scientists from around the world included in the "Highly cited scholar" list for all fields, 18 are from Turkey. Among the fields related to psychiatry, cognitive impairment and meta-analysis, there are scientists from Turkey on the "highly cited scholar" list. ScholarGPS' "Top Scholars by expertise" list, based on less stringent criteria, measures the top 0.5%. One of the 1468 Top scholars in psychiatry is from Turkey. Some of the more specific specialties (schizophrenia, bipolar disorder, cognitive impairment, childhood trauma, psychopharmacology, clinical neuroscience) have a small number of scholars from Turkey.

Expertscape can rank the performance of scientists in the world, country or institution for a given field. Research.com lists the top scientists in different fields using the discipline H index as a benchmark. In the newly published 2025 list, there are 9 people from Turkey in neuroscience and 4 in psychology. It is less methodologically sound than the examples above. In addition, many other lists, including some from Turkey, publish lists using invalid and misleading methods such as simply ranking scientists according to the google scholar h-index without examining their profiles.

Evaluating individual academic performance

Lists of successful scientists can motivate the most competitive researchers in the field, but in our country they are mostly of tabloid value and of direct interest to a small number of people. In fact, evaluating the performance of scientists is important for every academic. Factors such as the academic success of scientists, their areas of strength and their position among the world's scientists in these areas, the pattern of performance change over time, and their success according to the length of time in the field are evaluated. Variables such as the number of citations and articles are the source of many measurements. Sites such as Web of Science and Google scholar provide metrics such as the number of citations and the h-index. These types of assessments are often used in environments such as CVs and job applications. InCites is a program that can create a more detailed report on one's individual performance. It is used more in evaluations, especially in Western countries. Unfortunately, in our country, scientists have a low level of awareness and knowledge in using tools such as InCites.

ScholarGPS, mentioned in the section on successful scientists, has recently become the most prominent program for automatic evaluation of individu-

al performance. It aims to evaluate the performance of most scientists. This environment currently has the information of nearly 30 million individuals. The productivity of the scientist in different fields, his/her impact on the field and the quality of his/her products are calculated according to his/her publications, and his/her rank and percentile in sub-fields are determined. When the scientist's profile is uploaded, in addition to variables such as the number of articles and citations, h-index, rank and percentage information is provided for the main fields and specialties among scientists in all fields. When the scientist looks at his/her ScholarGPS profile, he/she can see in which field he/she has contributed relatively the most. How this contribution has changed in terms of quality, productivity and impact is reported.

Comparing lifetime performance with the performance of the last five years can provide information about the trend of change in a scientist's academic performance. For example, a scientist with much better performance over the last 5 years may be predicted to continue to grow in importance in the field. A significant decline in the performance of an experienced scientist in the last 5 years may require him/her to consider decisions such as retirement.

Academic experience and age are important factors when evaluating academic performance outcomes. For example, an experienced academic can be expected to contribute at least 5% to the field in a field in which he/she has expertise and is known in the national academia. A young academic's performance in the last 5 years may be more important than his/her performance in terms of lifelong contribution.

Problematic points in assessing academic performance

Assessing a scientist's performance is difficult. Existing methods increase objectivity but are not ideal measures. Apart from this general problem, although algorithm-based measurements make the process easier for academics and institutions, they are prone to errors. For example, the country of the scientist may be assigned incorrectly due to address and other information. Lists that are not diligent and do not check the profile may include articles that do not belong to the person and make incorrect assessments. Approaches that work well in medicine, engineering and basic sciences may not be appropriate in some social sciences. Factors such as how keywords are used in the search are important. Problems arise when they are not used in a hierarchical way. For example, in Expertscape, the word schizophrenia generates more articles than the word psychiatry. The main field search in this program is a meaningless evaluation that does not include the results of many sub-field searches. Better examples, such as ScholarGPS, do not have this problem, but may have problems with subfields. Subfield searches that are too specialized and exclude alternative fields may lose their meaning and fall into a category that no longer has any meaning (e.g. Clinical Neuroscience or relatives in ScholarGPS). In countries where merit is already sufficiently valued and internalized, methods based solely on metric evaluation of academic performance can be misleading by trivializing difficult-to-measure micro-level variables, trigger unrealistic performance expectations in institutions, and lead to some negative consequences such as excessive efforts for self-promotion (3-4). However, in countries like Turkey, where the culture of meritocracy is not developed, establishing a system and developing a tradition that emphasizes academic performance is critical for progress in science.

Conclusion

In recent years, computational approaches have come to the forefront in evaluating academic performance. Today, it is important for scientists to be aware of the importance of evaluating academic performance with objective methods, to be aware of the advantages and shortcomings of modern methods in this field, and to know how to use these methods and interpret their results. The internalization of the necessity of objective evaluation of academic performance by the Turkish academia, despite the limitations of the existing methods, is a necessity for the establishment of a culture of scientific productivity in Turkey. Our hope for the necessary mental transformation in Turkey and the establishment of a modern university culture in our country lies in the younger generations. Therefore,

our journals and experienced scientists have an important role to play in convincing a new generation to adopt the methods of evaluating scientific performance.

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Difficulty in emotion regulation, psychological resilience, and depression are associated with Prolonged Grief Disorder in patients with breast cancer

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SUMMARY

Objective: Grief is a natural reaction to potential losses faced by women with breast cancer. To our knowledge, no study has been conducted on prolonged grief disorder (PGD) in women with breast cancer. This study investigated the sociodemographic, cancer-specific, and psychological factors affecting PGD and the relationship between psychological resilience (PR), difficulty in emotion regulation (DER), and PGD in patients with breast cancer.

Method: Breast cancer patients who met the inclusion criteria were included in the study (N=177). The Prolonged Grief Disorder Scale-Patient Form, Resilience Scale for Adults, Difficulties in Emotion Regulation Scale – Brief Form, and Hospital Anxiety and Depression Scale were administered to the patients. The DSM-5-oriented clinical interview was also conducted.

Results: No significant relationships were found between PGD and clinical variables such as tumor stage, recurrence, or treatment types. Significant relationships were found between PGD and a history of mental illness and active psychotropic use. PGD was negatively correlated with age, total duration of cancer, and resilience. PGD was also positively associated with DER. DER was found to be a partial mediator variable (PR→DER→PGD), and depression score acted as a moderator variable in the relationship between PR and PGD, after adjusting for confounders.

Discussion: The findings of our study indicate that DER, depression, and PR influence PGD in breast cancer patients. We believe that all patients with breast cancer for more than six months should be evaluated for prolonged grief and, if necessary, referred to grief psychotherapies that help them to accept their losses easily.

Key Words: Breast cancer, emotion regulation, prolonged grief, psychological resilience, psycho-oncology

INTRODUCTION

Grief is a profound, prolonged, and distressing condition following losses (1, 2). Severe physical and psychological losses accompany breast cancer. Therefore, grief is natural and inevitable for the patient (3). Reactions to loss vary from person to person; however, some universal grief responses include numbness, denial, anger, crying, and a sense of emptiness. When the grief process is not adequately addressed, it may evolve into a prolonged grief disorder (PGD). In PGD, despite more than six months having passed since the loss, difficulties accepting the loss persist, impacting functionality (4).

Breast cancer is accompanied by losses throughout the diagnosis (loss of health, becoming a patient), treatment (effects of mastectomy, chemotherapy, radiotherapy), and post-treatment phases (early menopause, social and individual losses, and loss of employment). Unresolved psychological processes lead to difficulties adapting to treatment, an increase in the rates of psychopathology, and a significant loss of functionality. If grief is acknowledged and negative emotions are appropriately processed, the grieving process unfolds healthily (5). Current studies provide evidence that

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difficulty in emotion regulation (DER), such as not understanding, expressing, or suppressing emotions, is associated with psychopathology (6). The impact of DER on PGD is observed both directly and indirectly through cognitions related to grief (7).

Psychological resilience is intricately associated with an individual's capacity for adaptation. In a study involving individuals diagnosed with chronic illnesses, those exhibiting high levels of psychological resilience demonstrated an ability to navigate their illness processes effectively(8). They maintained cognitive engagement, participated in activities that fostered positive well-being, and focused on future possibilities, consequently preserving their functional capabilities. Conversely, individuals characterized by low psychological resilience and those undergoing the grieving process are more susceptible to PGD compared to their counterparts with elevated psychological resilience(9-10).

This study aimed to investigate the sociodemographic, clinical, treatment-related, and psychological factors that may influence PGD in patients with breast cancer. Additionally, this study aimed to examine the relationship between DER and psychological resilience with PGD in these patients.

METHOD

Study Sample

This study was conducted with 177 female patients who applied to Çanakkale Onsekiz Mart University Hospital Medical Oncology Unit between 01.02.2023 and 30.04.2023, met the inclusion criteria, and volunteered to participate. A total of 346 patients who were diagnosed with breast cancer and consecutively admitted to the Medical Oncology Unit were evaluated for inclusion in the study. The inclusion criteria for the study were individuals diagnosed with breast cancer at least six months and at most 120 months before admission. Exclusion criteria were the presence of psychosis spectrum disorders (schizophrenia, schizoaffective disorder, delusional disorder, schizotypal personality disorder) or intellectual disabilities or major neurocognitive disorder (dementia) and the diagnosis of cancer within 6 months or more than 120 months before the diagnosis. A total of 169 patients were excluded from the study because they did not meet the inclusion criteria (presence of a psychiatric illness that would cause judgment or cognitive impairment, or breast cancer less than six months ago or more than 120 months ago) and did not want to participate or could not be reached. One of the most commonly used methods to calculate the sample size is the Cochran formula (n = (Z ^ 2 * p * (1-p)) / E ^ 2). The sample size was calculated as n= 150 for Z= Z score corresponding to the confidence level (Z= 1.96 for 95% confidence level); p= expected rate (0.50); E= margin of error (0.08). We obtained written informed consent from participants and conducted the study in line with the ethical principles of the World Medical Association (WMA) Declaration of Helsinki.

Materials

To determine the participants' demographic information and oncological and psychological clinical conditions, the "Sociodemographic and Clinical Data Form" was used. The "Prolonged Grief Disorder Scale - Patient Form" was utilized to measure prolonged grief symptoms. The "Resilience Scale for Adults" assessed psychological resilience. The "Difficulties in Emotion Regulation Scale–Brief Form" was used to gather information about emotion regulation skills and difficulties if present. To determine anxiety and depression risk related to the disease, the "Hospital Anxiety and Depression Scale" was administered. Additionally, a clinical interview based on the DSM-5 guidelines was conducted by the principal investigator to ascertain whether participants had active psychiatric disorder diagnoses at the time of their participation in the study.

Prolonged Grief Disorder Scale – Patient Form (PG-12-Patient Form): This scale consists of 12 items rated on a five-point Likert scale with a score range of 12 to 60. A higher total score indicates more severe prolonged grief symptoms (3, 11).

Difficulty in Emotion Regulation Scale – Brief Form (DERS-16): The scale consists of 16 items. There is

no cut-off point for the scale, and a positive relationship exists between a higher total score and greater difficulty in emotion regulation (DER) (12).

Resilience Scale for Adults (RSA): This 33-item scale determines individuals' psychological resilience levels (13, 14). The scale score indicates the level of psychological resilience, which is evaluated based on that score.

Hospital Anxiety and Depression Scale (HADS): The purpose of this scale is to determine the anxiety and depression risk status of patients due to their existing illness rather than diagnosing anxiety and depression. The scale consists of 14 questions, forming two subscales: anxiety and depression. Patients can score between 0 and 21 on each subscale. The cutoff point for each sub-scale is set at 8 (15).

Statistical Analysis

Statistical analyses were performed using IBM SPSS 28.0 (IBM, NY, USA). Before analyzing the data, they were checked for loss and extreme values. For the normality status of the numerical variables, the requirement was set based on skewness and kurtosis values falling between -1.5 and +1.5 (16). The standardized z-scores were observed to fall within the (-3.00 <z< 3.00) range. Continuous variables were expressed as mean ± standard deviation and minimum and maximum values, while categorical variables were presented as numbers and percentages. Descriptive statistics were examined, followed by independent samples t-test, one-way analysis of variance (ANOVA), and Pearson correlation analysis for the variables. Multiple regression analysis (enter model) was performed to identify the factors influencing the prediction of PGD. To examine the relationship between psychological resilience and PGD, moderator variable analysis was conducted to determine whether the depression score served as a moderator variable, and mediator variable analysis was performed to ascertain whether difficulty in emotion regulation acted as a mediator variable. The significance level was set at $\alpha = 0.05$, and all the tests were 2-tailed.

RESULTS

Sociodemographic and clinical data are shown in Table 1. The mean age of the 177 breast cancer patients who participated in the study was 54.24 ± 10.01 years, and the average years of education received were 8.55 ± 4.56 years. The majority of these patients were unemployed [58.8% (n=104)], residing in rural areas [52.0% (n=92)], married [72.9% (n=129)], and living with their nuclear family [75.1% (n=133)].

It was observed that 33.3% (n=59) of patients had received a psychiatric diagnosis at least once in the past. During the DSM-5-oriented clinical interviews, 15.8% (n=28) of the participants had an active psychiatric diagnosis. At the time of the interview, 19.2 % (n = 34) of the patients were taking psychiatric medication. The rate of a history of suicide attempts was 2.8% (n=5).

Table 1.

	Sample (n)	Percent (%)	Mean – SD(min-max)
Age	177		54,24 – 10,01(29-80)
Education (years)	177		8,55 – 4,56 (0-17)
Employment Status			
Not working	104	%58,8	
Working	42	%23,7	
Retired	31	%17,5	
Place			
Urban Center	85	%48,0	
Village/town	92	%52,0	
Marital Status			
Married	129	%72,9	
Single	14	%7,9	
Divorced	13	%7,3	
Widowed	21	%11,9	
Living Arrangement			
Alone	32	%18,1	
With nuclear family	133	%75,1	
With extended family	12	%6,8	
History of Mental Disorder			
Yes	59	%33,3	
No	118	%66,7	
Current Psychiatric Diagnosis			
Depression	10	%5,6	
Anxiety	14	%7,9	
Other	4	%2,3	
None	149	%84,2	
Current Psychiatric Drug Use			
Yes	34	%19,2	
No	143	%80,8	
Total Cancer Duration (months)	177		30,71–31,87 (6-120)
Tumor Stage			
Stage 1	19	%10,7	
Stage 2	77	%43,5	
Stage 3	44	%24,9	
Stage 4	37	%20,9	
Cancer Recurrence			
Yes	28	%15,8	
No	149	%84,2	
Hormone Therapy			
Yes	70	%39,5	
No	107	%60,5	

Table 2: Relationship between PGD and clinical variables

	PG-12-Patient Form		
Variable	Mean+SD	F/t value	p-value
Cancer recurrence		1.05	0.29[b]
Yes	26.18 – 8.66		
No	24.35 – 8.41		
Tumor stage		0.89	0.97[a]
I	23.95 – 8.71		
II	24.7 – 8.31		
III	24.43 – 8.42		
IV	25.11 – 8.97		
Types of treatment		0.22	0.96[a]
Only chemotherapy	24.85 – 7.38		
Only breast surgery	23.47 – 9.11		
Chemotherapy+radiotherapy	21.0 – 8.88		
Breast surgery+chemotherapy	25.33 – 9.43		
Breast surgery+radiotherapy	24.69 – 7.15		
Breast surgery+chemotherapy +radiotherapy	24.68 – 8.63		
Chemotherapy Protocols		0.32	0.81[a]
Classic chemotherapy	24.4 – 8.23		
Classic chemotherapy +smart drugs	26.46 – 10.64		
Smart drugs only	25.13 – 8.66		
None of them	24.0 – 8.21		
Hormone therapy		0.52	0.60[b]
Yes	24.23 – 8.6		
No	24.91 – 8.4		
History of suicide		0.96	0.07[b]
Yes	31.2–15.59		
No	24.45–8.16		
Current psychiatric diagnosis		2.27	0.02[b] *
Yes	27.93 – 9.1		
No	24.02 – 8.22		
Current psychiatric medication use		2.40	0.017[b] *
Yes	27.74 – 9.4		
No	23.9 – 8.08		
History of mental illness		2.06	0.04[b] *
Yes	26.47–9.20		
No	23.72–7.94		
HADS-A score		3.24	<0.001[b] *
? 8	29.42 – 9.61		
< 8	23.81 – 7.98		
HADS-D score		3.29	<0.001[b] *
? 8	29.94 – 10.52		
< 8	23.49 – 8.29		

Note: PG-12-Patient Form: Prolonged Grief Disorder Scale- Patient Form; HADS-A: Hospital Anxiety and Depression Scale - Anxiety Score; HADS-D: Hospital Anxiety and Depression Scale - Depression Score; * Statistical Significant; a: ANOVA test; b: Independent Samples t-test; SD: standard deviation.

The average time since breast cancer diagnosis for the participating patients was 30.71 ± 31.87 months. When evaluating the stage at which patients received their diagnoses, 10.7% (n=19) were at stage 1, 43.5% (n=77) at stage 2, 24.9% (n=44) at stage 3, and 20.9% (n=37) at stage 4. In terms of cancer recurrence during the cancer process, 15.8% (n=28) of patients had at least one recurrence.

Regarding the treatments received by patients during the cancer period: 15.3% (n=27) received only chemotherapy, 9.6% (n=17) underwent only breast surgery, 1.7% (n=3) received both chemotherapy and radiotherapy, 16.9% (n=30) underwent breast surgery and received chemotherapy, 7.3% (n=13) underwent breast surgery and received radiotherapy, and 49.2% (n=87) received all three treatments of chemotherapy, breast surgery, and radiotherapy. When patients were evaluated based on the type of chemotherapy administered during the treatment period, 54.2% (n=96) received classic chemotherapy protocols, 21.5% (n=38) received smart drugs, and 7.3% (n=13) received both classic chemotherapy protocols and smart drug treatments. Furthermore, 16.9% (n=30) of patients did not receive chemotherapy. In terms of hormone treatment, 39.5% (n=70) of the patients underwent hormone therapy. Among these patients, 13% (n=23) used tamoxifen and 26.5% (n=47) used aromatase inhibitors.

Table 3: Correlation Analysis of PGD and DER, resilience and age

	PG-12-Patient Form	
Variable	r value	p-value
DERS-16 score	0.27	<0.001*
RSA score	-0.22	0.003*
Age	-0.26	<0.001*
Total cancer time	-0.15	0.004*
Education	0.08	0.293
HADS-A score	0.36	<0.001*
HADS-D score	0.35	<0.001*

Note: r: Pearson correlation coefficient; * Statistical significance level; PG-12-Patient Form: Prolonged Grief Disorder Scale - Patient Form; HADS-A: Hospital Anxiety and Depression Scale-Anxiety Score; HADS-D: Hospital Anxiety and Depression Scale - Depression Score; DERS-16: Difficulty in Emotion Regulation Scale - Brief Form Score; RSA: Resilience Scale for Adults Score.

It was determined that 28 of the 177 participants had a current diagnosis of mental disorders. Of these, 14 were diagnosed with anxiety disorder, 10 with depressive disorder, and the remaining four were identified as other psychiatric disorders (such as bipolar disorder and obsessive-compulsive disorder).

This study calculated the Cronbach's alpha for the PG-12-Patient Form as 0.82. The Kaiser-Meyer-Olkin value for the PG-12-Patient Form scale was 0.826, and the Bartlett test was significant ($p < 0.001$).

No association was found between the total PGD scores and patients' employment status, place of residence, and marital status ($p > 0.05$). A statistically significant difference was observed in the total PGD score between the groups with and without a current psychiatric diagnosis: $t(175)=2.27$, $p= 0.02$. A statistically significant difference was detected between the use of psychiatric medications and PGD score: $t(175)=2.40$, $p=0.017$. Analyzing individuals with a history of mental illness, a statistically significant difference was found between their PGD: $t(175) = 2.06$, $p = 0.04$. The PGD scores of individuals with HADS-A scores ≥ 8 (n=26) and HADS-D scores ≥ 8 (n=17) were significantly different from those with low scores on these scales: [$t(175.1) = 3.24$, $p < 0.001$; $t(175) = 3.29$, $p < 0.001$, respectively] (Table 2).

A positive correlation was found between PGD and DER ($p < 0.001$). A negative correlation was observed between the PGD and resilience ($p = 0.003$). Furthermore, a negative correlation was identified between PGD and patient age ($p < 0.001$) and total duration of cancer ($p = 0.004$). When examining the correlation between PGD and HADS-A and HADS-D scores, moderate and positive correlations were found (both $p < 0.001$) (Table 3).

The predictors of PGD were assessed using multiple regression analysis. The model included five independent variables (age, total cancer duration, Resilience Scale for Adults (RSA) score, HADS-D score, and DERS-16 score). Collectively, these results explain the variance by 20.7%, $F (5,171) = 10.19$, $p < 0.001$. Accordingly, an increase in age by one unit led to a decrease of 0.15 units in PG-12-Patient Form scores ($p= 0.009$, $OR= -0.186$), an increase in total cancer duration by one unit resulted in a reduction of 0.42 units in PG-12-Patient Form scores ($p= 0.024$, $OR= -0.158$), and an increase in HADS-D scores by one unit led to an increase of 0.7 units in PG-12-Patient Form scores ($p= 0.002$, $OR= 0.250$).

Analysis of the mediation analysis was applied to determine whether DER mediates after adjusting for the effects of age, total cancer duration, education level, tumor stage, and recurrence in the relationship between resilience and PGD. When DER was identified as a partial mediator variable and added to the model, it explained 21.9% of the indirect effect on the PG-12-Patient Form scores (Figure 1).

Analysis of the moderation model assessed whether the depression score moderated the relationship between resilience and PGD after correcting for the effects of covariates (age, total cancer duration, education level, tumor stage, and recurrence). Depression score was identified as a moderator variable, strengthening the pre-existing rela-

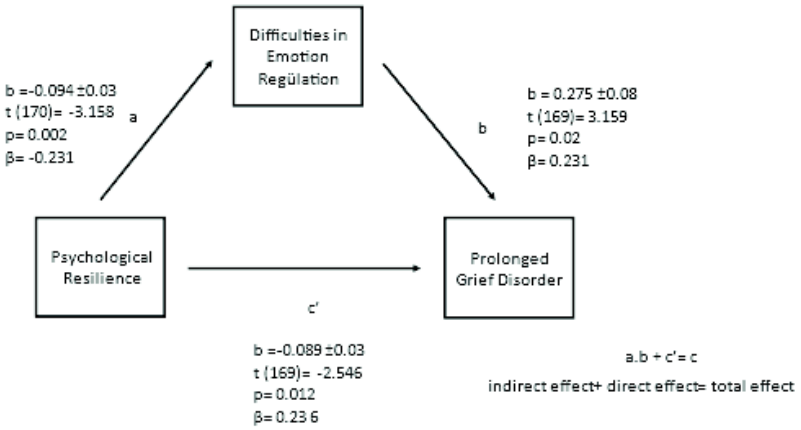

Figure 1. Mediation model after adjusting for age, total cancer duration, education level, tumor stage, and recurrence

tionship between the two variables. Additionally, the interaction term was found to be $R^2 = 0.072$, and when the depression score was added as a moderating variable to the model, its contribution to the model was 7.2% (Figure 2).

DISCUSSION

Breast cancer is the most common cancer type in women (17). Parallel to advancements in early diagnosis and treatment methods, the survival rate of breast cancer has also increased (18). In this study, no significant relationship was found between prolonged grief disorder and clinical variables such as tumor stage, recurrence, or treatment types in breast cancer patients. Positive correlations were found between prolonged grief disorder with a history of mental illness and active psychotropic use. Prolonged grief was inversely associated with age, total cancer duration, and resilience. In addition, difficulty in emotion regulation was found to be a partial mediator variable, and depression was found to be a moderator variable in the relationship between psychological resilience and prolonged grief disorder. As a result, ''surviving'' breast cancer brings along the late psychological effects of the diagnosis and treatment process (19). PGD resulting from disruptions in the grieving process is an important psychological problem for breast cancer patients.

There was a correlation between PGD and variables, such as age, total duration of cancer, history of mental illness, and current psychiatric diagnosis or medication use, which may contribute to the risk of PGD. Although younger women experience more persistent problems related to physical functionality after the diagnosis of breast cancer, they face more difficulties in psychological adaptation to the diagnosis (20). Adapting to the uncertainty of a breast cancer diagnosis, which can result in the loss of career, family life, and fertility, is more challenging when considering these losses (21).

In our study, the longer the time elapsed since cancer diagnosis, the lower the likelihood of PGD.

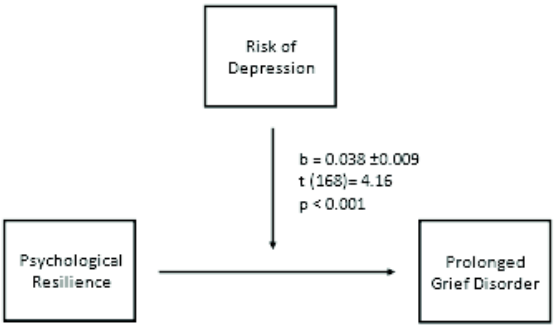

Figure 2. Moderation model after adjusting for age, total cancer duration, education level, tumor stage, and recurrence

This inverse relationship can be explained by the completion of the grief process, adaptation to a new life, the end of the treatment process, and improvement in treatment-related side effects over time after cancer patients receive a diagnosis. It is challenging to determine how long the "healthy" grieving process should last and when prolonged grief begins. From this perspective, the duration, intensity, and functional impact of grief symptoms seem to be less associated with prolonged grief (11). This study considers the grieving process as the period starting from the cancer diagnosis.

Our study found no significant relationship between tumor stage, history of recurrence, and type of treatment received with PGD. The independence of PGD from the characteristics of cancer and the treatments received suggests that other significant factors influence this process. The presence of a pre-loss mental illness in an individual is defined in the literature as one of the factors influencing the grieving process. When there is an underlying depressive disorder, experiencing loss can trigger a worsening of depressive symptoms and affect the ordinary course of the grieving process (22). That is, a history of mental illness, current psychiatric diagnosis, or psychiatric medication use was found to be associated with PGD.

Anxiety disorders were detected in 7.9% of cases based on the DSM-5-oriented clinical interview in this study, a rate similar to that in the general population. According to World Health Organization 2022 data, an estimated 5% of the world's population (6% of women) is experiencing depression (23). The rate of patients diagnosed with depression based on the DSM-5-oriented clinical interview was found to be 5.6% in this study, not significantly higher than in the general population. However, the higher rates of anxiety risk (14.7%) and depression risk (13.0%) associated with the current illness may be due to psychological symptoms remaining at the symptom level rather than reaching the diagnostic level. Considering the significant relationship between increased PG-12-Patient Form scores and the risk of anxiety and depression in our study, it can be suggested that some psychological symptoms are specific to PGD. Distinguishing between PGD and depressive disorders is challenging (24). During this process, individuals may exhibit vegetative symptoms commonly seen in depression, such as social isolation, sleep disturbances, and changes in appetite, in addition to intense grief (25).

Resilience does not imply avoiding efforts to escape from negatives or not experiencing psychological distress; instead, it means being able to emerge stronger from negative experiences and adapt to the changes brought about by challenging life events (26). Resilience is not solely an innate trait; it is a skill shaped by interacting innate biological features with variables such as the social environment, family, and other factors, developing over time (27). The emergence of PGD means the inability to mourn, as individuals cannot digest and internalize their losses. Individuals with high psychological resilience also have a more remarkable ability to mourn and process grief. Our study observed that scores on the PG-12-Patient Form scale decreased as psychological resilience increased. Therapeutic interventions that strengthen an individual's psychological resilience during the six months after learning about breast cancer diagnosis can enhance a person's ability to mourn and prevent the development of PGD.

Coping with cancer is a process involving emotion regulation (28). Patients experience not only positive emotions, such as hope and gratitude, but also negative emotions, such as anxiety, sadness, anger, guilt, and fear (29). The abundance of negative emotions and their inability to be managed in cancer patients leads to the development of psychological disorders and prolonged grief. In the literature, studies on emotion regulation in cancer patients often focus on defense mechanisms that involve not expressing negative emotions (such as emotional suppression or inhibition) (30). In our study, increased difficulty with emotion regulation was associated with increased PGD.

DER was identified as a partial mediator after adjusting for the effects of age, total cancer duration, education level, tumor stage, and recurrence in the relationship between resilience and PGD. In addition to the direct impact of resilience on PGD, there is also an indirect effect. Resilience can determine an individual's ability to mourn based on

the success or failure of their emotion regulation strategies, influencing whether grief turns into PGD (31).

After adjusting for age, total cancer duration, education level, tumor stage, and the impact of recurrence, the patient's depression score was found to be a moderating variable in the relationship between resilience and PGD. According to this result, the relationship between prolonged grief and resilience strengthens in the presence of depression risk. In the etiology of depression, biological factors such as genetics, neural connections, and hormones interact with social and environmental factors. In epigenetics, resilience is an essential factor. Low resilience is associated with more severe depressive symptoms (32). Therefore, if individuals with low resilience also have a risk of depression, PGD may increase.

Study Limitations and Strengths

Our study had some limitations that should be considered. The sample size of our study was limited to patients with a diagnosis of breast cancer who were followed at a single center. When evaluating PGD in patients, only the grief process related to cancer was considered, and whether the participants had recently experienced other losses that could create grief was overlooked. Owing to the cross-sectional nature of our study, the long-term effects of patients' prolonged grief processes could not be assessed, which is a significant limitation of this study. In addition, it was not evaluated whether the patients who participated in our study had social support, especially family support. Finally, many parameters not included in the study could have affected the relationship between grief, difficulty in emotion regulation, and resilience.

Despite these limitations, this study had several strengths. First, to our knowledge, this is the first study to examine the relationship between prolonged grief, emotion regulation difficulty, and resilience in individuals diagnosed with breast cancer. Second, conducting a study with an adequate sample size would enhance its power. Third, evaluating patients' clinical mental symptoms not only with self-report scales but also with DSM-5-oriented interviews ensures a more accurate assessment of the mental diagnoses.

Grieving is necessary because it facilitates the letting go of attachments and habits that no longer serve a purpose, thus enabling growth and development. When we distort the truth and deny loss, grieving becomes impossible. Each loss involves a grieving process, and the inability to grieve leads to prolonged grief disorder. Women diagnosed with breast cancer lose their health, breasts, hair, eyebrows, fertility, sexual lives, and future ideals. During the treatment process, they experience various physical difficulties, such as nausea, vomiting, pain, and fatigue, and have to abandon many daily habits. Additionally, breast cancer is an unpredictable disease in terms of recurrence, and the uncertainty and fear of getting sick again contribute to the risk of prolonged grief disorder. Therefore, cancer not only has physical consequences but also severe psychological consequences.

We determined that a history of mental illness, current psychiatric diagnosis, and use of psychiatric medication had an impact on PGD. We found that PGD was less prevalent with advancing age and over time since cancer diagnosis. Additionally, PGD increases as psychological resilience decreases and DER intensifies. Furthermore, to investigate the relationship between resilience and PGD, we identified DER as a partial mediating variable and disease-related depression risk as a moderating variable after adjusting for the effects of age, total cancer duration, education level, tumor stage, and recurrence. Upon reviewing the literature, we observed a scarcity of studies examining disease-related grief processes and PGD in patients with cancer. Existing studies on PGD have predominantly focused on the examination of PGD in individuals who have lost close relatives or the exploration of anticipatory grief in terminal-stage cancer patients. Further large-scale longitudinal studies are warranted to enhance the generalizability of our study results.

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Ethics statement: The study has been approved by the Çanakkale Onsekiz Mart University Faculty of Medicine Clinical Research Ethics Committee with the decision dated 18.01.2023 and numbered 2023/02-17.

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Physically disabled individuals' coping styles and resilience by disability type and onset

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SUMMARY

Objective: This research explores variations in resilience, and coping strategies among physically disabled individuals based on nature of disability, and whether it is congenital or acquired. Additionally, the key factors influencing psychological resilience were thoroughly evaluated.

Method: The study involved 193 participants with diverse physical disabilities. They completed the Sociodemographic Data Form (SDVF), The Brief COPE, and Brief Resilience Scale (BRS). The analyses were conducted using the SPSS software package.

Results: Individuals with congenital disabilities had significantly higher resilience scores (p=0.03), while no significant differences were found based on disability type. Hierarchical regression analysis revealed that gender and disability duration significantly predicted psychological resilience, with females and individuals with congenital disabilities demonstrating higher resilience levels (p<0,05).

Discussion: This study highlights the importance of tailored support services and rehabilitation programs to enhance the mental well-being of physically disabled individuals by addressing their unique psychological and social challenges.

Key Words: Disability, Psychological resilience, Coping strategies, Mental Health, Disability Psychology.

INTRODUCTION

The World Health Organization (WHO) has defined the concept of disability as "the inability of a person to comply with the requirements of normal life as a result of organ absence or impairment that causes permanent and certain loss of function and appearance from physical, mental and spiritual characteristics"(1). Disability is a condition that has both physical, psychological and social dimensions(2).

Whether the physical disability is in the upper or lower extremities can determine many factors that affect the individual's daily life. Individuals with upper limb disabilities can often be more independent in performing many daily activities using their hands, can interact socially and can be successful in certain occupations. On the other hand, those with lower limb disabilities may often experience limitations in their mobility, but can maintain their independence by using a wheelchair or similar assistive devices. Studies show that both upper and lower extremity disabilities cause difficulties, but the difficulties experienced may be different depending on the affected area(3–5).The time of onset of disability has a significant impact on the experiences and outcomes of people with physical disabilities. Verbrugge suggested that individuals with childhood disabilities generally tend to be more disabled, but have a similar or higher level of social participation(6,7). Disability onset after age 21 is significantly associated with a moderate or lower prevalence of health status than early disability onset(8).

Physical and social limitations experienced by people with disabilities can sometimes cause difficulties in social interaction. Limitations on daily life

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skills such as social interaction and finding a job, and factors such as a sense of dependence on other people, uncertainties about the future, and negative perspectives of others may predispose to the development of depression and anxiety disorders. Research findings show that individuals with physical disabilities have low self-esteem and high levels of depression, stress and anxiety(9).

The concept of psychological resilience is defined as adapting to stressful situations, not being sick despite negativities, being functional despite stress and difficulties, and recovering and recovering after stressful experiences (10–12). It is reported that individuals with high psychological resilience use task-oriented coping strategies to cope with stress(13).

Lazarus and Folkman (1984) define coping as an individual's response to stressful situations with potentially negative consequences(14). There are three types of coping strategies that people can commonly turn to in order to reduce psychological tension; task-oriented, emotion- oriented and avoidance-oriented coping strategies(15). Task-oriented coping strategy focuses on solving problems, making decisions and taking action. Emotion-oriented coping strategy is based on coping through expressing emotions. Avoidance-oriented coping strategy is a coping style that encourages individuals to cognitively move away from problems through distracting activities(16).

When the literature is reviewed, there are studies examining psychological resilience and coping strategies in different groups of the society (17–23). However, there is no research in the literature that examines the psychological resilience and coping strategies of individuals with disabilities who experience various problems in social and social life and who may encounter prejudiced and exclusionary attitudes in all areas of social life. The aim of this study was to investigate whether psychological resilience and coping strategies of physically disabled individuals differ according to nature of disability and time of onset of disability (congenital or acquired).

The first hypothesis suggests that individuals who acquire physical disabilities later in life will have lower levels of psychological resilience, and more unique coping strategies than the group with congenital physical disabilities. The second hypothesis predicts that individuals with walking/balance disability will have higher levels of mental symptoms, lower levels of psychological resilience and different coping strategies than the group with hand/arm disability. The confirmation of these hypotheses may contribute to the development of more effective intervention and support strategies for the psychosocial needs of individuals with physical disabilities.

METHODS

Participants and Procedure

First, in order to create a pool of potential participants, disabled associations, rehabilitation centers and health institutions were contacted, and an explanatory letter and informative material were presented, including the purpose of the study, the process and the rights of the participant. Physically disabled individuals between the ages of 18-65, who agreed to fill out the questionnaire, who could read and write at a level to answer the questionnaire, who were not mentally retarded, and who did not have a neurological disease that would affect cognitive functions were included in the study. A total of 193 people with physical disabilities participated in the study.

Participants completed the forms independently, with assistance provided when necessary. For individuals who required support, help was offered by the research team or a close acquaintance of the participant. Assistance included reading the questions aloud, transcribing the answers, or marking the responses physically on behalf of the participant. The form completion process typically took between 20 to 30 minutes. Participants were informed about their rights, and flexible scheduling was offered to ensure comfort and accessibility during the data collection process. Contact information for the research team was provided for any additional support or queries.

Assessment Tools

Sociodemographic and Clinical Data Form: It was developed by the researchers. It consists of sociodemographic questions investigating the age, gender, marital status, educational status, occupational status of the participants, as well as questions investigating the disability status and the time of onset of the disability.

The Brief COPE: The first version of the scale was developed by Carver et al. It consists of 53 items and 14 factors (24). In later studies, the humor dimension was added to the scale and a 60-item form with 15 factors, each consisting of four items, was created. These factors are theoretically included in three dimensions. Active coping, planning (PL), suppression of competing activities (SCAct), restraint coping (RestC) and seeking instrumental social support (SISSup) are included in problem-focused coping; seeking emotional social support (SESupport), positive reinterpretation (PosR), acceptance (ACC), humor (H) and turning to religion (R) are included in emotion-focused coping; and focus on and venting of emotions (FOVE), denial (DNL), behavioral disengagement (BDis), mental disengagement (MDis) and alcohol / drug use (ADUse) are included in dysfunctional coping. The low scores obtained from the subscales of the tool, which are graded between 1 and 4, indicate that those dimensions are used less, while the high scores indicate that those dimensions are used more (25).

The short form of the scale was developed by Carver by reducing the number of items based on the long form of the scale. Carver removed two factors (suppression of competing activities and restraint coping) as they were not useful in previous studies and added another factor (self-blame) as it was more functional. As such, the short form of the scale consists of 14 factors with two items each. Low scores indicate that the dimension is underutilized, while high scores indicate that the dimension is overutilized(26). The Turkish validity and reliability study of the short form of the scale was conducted by Bacanlı et al.(27) . In the Turkish validity and reliability study, the dimensions of self-blame and active coping in Carver's scale could not be obtained. On the other hand, the dimensions of suppression of competing activities and restraint coping, which were not included in Carver's scale but were included in the long form of the scale developed by Carver and colleagues were included in the factor structures obtained in this study.

The Brief Resilience Scale: It was developed by Smith et al. The BRS is a 5-point Likert-type, 6-item, self-report measurement tool. After the reverse coded items in the scale are translated, high scores indicate high psychological resilience(28). The Turkish validity and reliability study of the scale was conducted by Doğan et al.(29).

Statistical Analysis

The sample size for this study was determined based on a priori power analysis. Using an effect size of 0.5 (medium effect, Cohen's d), a significance level (α) of 0.05, and a statistical power ($1-\beta$) of 0.80, the minimum required sample size was calculated to be approximately 64 participants per group, resulting in a total of 128 participants.

Descriptive statistics (mean and standard deviation for continuous variables or frequency and percentage distributions for categorical variables) were used to analyze the demographic characteristics of the participants. The normality of the continuous data was assessed using the Shapiro-Wilk test. The results indicated that the data were normally distributed ($p > 0.05$). To compare the mean scores of psychological scales between two groups, the independent samples t-test was used.Hierarchical regression analysis was conducted to examine predictors of psychological resilience, with sociodemographic variables entered in the first step and disability-related factors (such as type and duration of disability) in the second step. Changes in R^2 values were assessed to evaluate the model's explanatory power. A value of $p < 0.05$ was used for statistical significance. All analyses were performed with SPSS v.20.

RESULTS

The demographic characteristics of the participants

are summarized in Table 1.The mean age of the participants was 32.62 years (SD = 9.48). In terms of gender distribution, 62 participants (32.1%) were male, while 131 participants (67.9%) were female.

Regarding disability type, the majority of participants, 169 (87.6%), had a disability related to walking or balance, while 24 participants (12.4%) had a disability affecting the arm or hand. For disability duration, 130 participants (67.4%) had a congenital disability, whereas 63 participants (32.6%) acquired their disability later in life.

Table 1. Descriptive statistics of participant demographic and disability characteristics

variable (n = 193)	mean (sd) / n (%)
Age (Years)	32.62 (9.48)
Gender	Female: 131 (67.9%)
	Male: 62 (32.1%)
Disability Type	Walking/Balance: 169 (87.6%)
	Arm/Hand: 24 (12.4%)
Disability Duration	Congenital: 130 (67.4%)
	Acquired: 63 (32.6%)

Values are presented as mean (SD) for continuous variables and n (%) for categorical variables

Comparison of Psychological Resilience and Coping Styles of Physically Disabled Individuals According to the Time of Disability Onset

The Brief COPE ADUse subscale score was higher in individuals with acquired physical disability than in individuals with congenital physical disability (p=0.03). MDis subscale score was significantly higher in individuals with congenital disability than in individuals with acquired disability (p=0.01). The Brief COPE other subscale scores were similar between the groups. BRS score was significantly higher in individuals with congenital physical disability than in individuals with acquired physical disability (p=0.03). Detailed results of group comparison are shown in Table 2.

Comparison of Coping Styles and Psychological Resilience of Physically Disabled Individuals According to Disability Type

There was no significant difference in the BRS scores between individuals with hand/arm disabilities and those with walking/balance disabilities (p>0.05). There was no significant difference between the groups in subscale scores except The COPE FOVE subscale (p>0.05). The COPE FOVE subscale score of physically disabled individuals with hand/arm disability was significantly higher than that of individuals with walking/balance disability (p=0.03). Details of the scale scores and comparison results of the groups are shown in Table 3.

Table 2: Comparison of BRS and Brief COPE scores of physically disabled individuals according to disability onset

		Congenital Physical Disability (n=130)	Acquired Physical Disability (n=63)	T	P
BRS		19 .29(3 .59)	18 .09(3 .76)	2 .138	0 .03
The Brief COPE	SISSup	5 .49(1 .94)	5 .61(1 .74)	- .438	0 .66
	H	4 .61(2 .12)	4 .57(1 .88)	.140	0 .88
	FOVE	5 .33(1 .97)	4 .80(1 .81)	1 .791	0 .07
	ADUse	2 .44(1 .14)	2 .95(1 .64)	-2 .490	0 .03
	ACC	5 .80(1 .64)	5 .50(1 .74)	1 .133	0 .25
	SCAct	5 .49(1 .94)	5 .61(1 .74)	- .263	0 .79
	R	6 .77(1 .89)	6 .38(2 .09)	1 .316	0 .19
	DNL	3 .68(1 .73)	3 .69(1 .56)	- .053	0 .95
	BDis	3 .79(1 .65)	3 .74(1 .63)	.183	0 .85
	MDis	5 .16(1 .71)	4 .49(1 .66)	2 .567	0 .01
	RestC	5 .38(1 .53)	5 .07(1 .52)	1 .299	0 .19
	PosR	5 .58(1 .70)	5 .53(1 .89)	.166	0 .86
	SESupport	4 .83(1 .61)	4 .82(1 .66)	.052	0 .95
	PL	5 .86(1 .75)	5 .80(1 .85)	.217	0 .82

The results are presented as mean and standard deviation values. The level of statistical significance was accepted as p< 0.05. BRS: The Brief Resilience Scale; SISSup: seeking instrumental social support; H: humor;FOVE:focus on and venting of emotions; ADUse: alcohol/drug use; ACC: acceptance ;SCAct: suppression of competing activities; R: religion ;DNL: denial;BDis: behavioral disengagement; MDis: mental disengagement; RestC: restraint coping; PosR : positive reinterpretation; SESupport: seeking emotional social support; PL: planning

Table 3: Comparison of BRS and Brief COPE scores of physically disabled individuals according to disability type

		Hand/arm disability (n=24)	Walking/balance disability (n=169)	T	P
BRS		18 .84(3 .40)	19 .33(5 .32)	- .613	0 .54
The Brief COPE	SISSup	5 .58(1 .84)	5 .16(2 .11)	1 .021	0 .30
	H	4 .51(2 .02)	5 .20(2 .12)	-1 .563	0 .12
	FOVE	5 .27(1 .89)	4 .37(2 .03)	2 .160	0 .03
	ADUse	2 .59(1 .34)	2 .70(1 .369	- .377	0 .70
	ACC	5 .75(1 .66)	5 .37(1 .79)	1 .027	0 .30
	SCAct	5 .17(1 .59)	4 .70(1 .89)	1 .298	0 .19
	R	6 .66(1 .92)	6 .54(2 .22)	.282	0 .77
	DNL	3 .69(1 .63)	3 .66(1 .99)	.070	0 .94
	BDis	3 .82(1 .65)	3 .45(1 .53)	1 .017	0 .31
	MDis	4 .95(1 .74)	4 .83(1 .60)	.332	0 .74
	RestC	5 .34(1 .53)	4 .87(1 .48)	1 .403	0 .16
	PosR	5 .52(1 .75)	5 .87(1 .82)	- .905	0 .36
	SESupport	4 .79(1 .62)	5 .08(1 .66)	- .802	0 .42
	PL	5 .84(1 .80)	5 .87(1 .67)	- .074	0 .94

The results are presented as mean and standard deviation values. The level of statistical significance was accepted as p< 0.05. BRS: The Brief Resilience Scale; SISSup: seeking instrumental social support; H: humor;FOVE:focus on and venting of emotions; ADUse: alcohol/drug use; ACC: acceptance ;SCAct: suppression of competing activities; R: religion ;DNL: denial;BDis: behavioral disengagement; MDis: mental disengagement; RestC: restraint coping; PosR : positive reinterpretation; SESupport: seeking emotional social support; PL: planning

A hierarchical regression analysis was conducted to assess the effects of age, gender, disability type, and disability duration on psychological resilience. Two models were constructed:

Model 1: In the first model, age and gender were entered as predictors. This model explained 2.2% of the variance in psychological resilience (R2=0.022, adjusted R2=0.011), though this effect was not statistically significant. Among the predictors, gender (B =-1.137, β = -0.145, t = -2.015, p = 0.045) was found to be a significant predictor, indicating that males (0 = male, 1 = female) had lower resilience scores compared to females. Age (B = 0.011, β = 0.027, t = 0.382, p = 0.703) did not significantly predict resilience.

Model 2: In the second model, disability type (0 = arm/hand disability, 1 = walking disability) and disability duration (0 = acquired, 1 = congenital) were added. This model explained an additional 3.0% of the variance, bringing the total explained variance to 5.2% (R2=0.052, adjusted R2=0.032, ΔR2=0.03). The model was marginally significant overall. In this model, disability duration (B =-0.526, β =-0.181, t =-2.33, p = 0.021) was found to be a significant negative predictor, suggesting that individuals with congenital disabilities (1 = congenital, 0 = acquired) scored higher in resilience than those with acquired disabilities. However, disability type (B = 0.521, β = 0.047, t = 0.656, p = 0.512) and gender (B =-0.901, β =-0.115, t =-1.57, p = 0.226) were not significant predictors in this model. Details of the hierarchical regression analysis findings are presented in Table 4.

DISCUSSION

In this study, it was investigated whether psychological resilience and coping styles of individuals with physical disabilities differed according to the nature of the disability and whether the disability was congenital or acquired.

The findings indicated that individuals with congenital disabilities exhibited higher levels of psychological resilience compared to those with

Table 4. Hierarchical Regression Analysis for Predictors of Psychological Resilience

Model	Variables	B	Std. Error	Beta	t	p	R	R^2	Adjusted R^2	ΔR^2	Effect Size (Cohen s f^2)
1	Constant	20.057	1.207	nan	16.614	0.0	0.147	0.022	0.011	0.022	0.023
	Age	0.011	0.028	0.027	0.382	0.703					
	Gender	-1.137	0.565	-0.145	-2.015	0.045					
2	Constant	19.309	1.433	nan	13.472	0.0	0.228	0.052	0.032	0.03	0.032
	Age	0.035	0.03	0.091	1.192	0.235					
	Gender	-0.901	0.574	-0.115	-1.57	0.226					
	Disability Type	0.521	0.794	0.047	0.656	0.512					
	Disability Duration	-0.526	0.226	-0.181	-2.33	0.021					

Gender: 0 = Male . 1 = Female
Disability Type: 0 = Arm/Hand Disability . 1 = Walking Disability
Disability Duration: 0 = Acquired . 1 = Congenital

acquired disabilities.. It is stated that two factors are important in determining psychological resilience. These factors constitute psychological risk and protective factors(30). Psychological resilience is influenced by environmental factors as well as individual factors(31). There are many factors related to resilience in people with physical disabilities. Resilience appears to be an important capacity that helps people with disabilities to overcome adversity(32).

The results indicated that individuals with congenital disabilities reported lower alcohol and substance use but higher mental disengagement compared to individuals with acquired disabilities. This finding suggests that congenital disability may be associated with coping mechanisms that involve more passive or avoidant strategies, as reflected in higher mental disengagement. Previous studies have shown that individuals with congenital disabilities might develop different coping styles due to early-life adaptation to their disability (33,34). Further research is needed to explore these differences and their implications for mental health interventions.

Adolescence is generally recognized as a period of increased social activity and rapid expansion of a young person's social circle. In contrast, a young person with a physical disability is likely to lack social independence, be socially isolated and have difficulties in maintaining social relationships. One study found that while both able-bodied and physically disabled youth experience difficulties in social situations, physically disabled youth inherently experience more severe difficulties(35). Individuals with congenital physical disabilities have learned to cope with their disabilities from early in their lives and may have developed adaptation skills and increased their psychological resilience by using strategies such as discovering their own strengths, connecting to social support networks, positive thinking and celebrating their achievements.

The results of the study showed that the psychological resilience of individuals with walking/balance disability were similar to those of individuals with hand/arm disability. The fact that individuals with walking/balance disabilities exhibit similar levels of psychological resilience with individuals with hand/arm disabilities may be due to the fact that many factors such as coping styles, social support, life experiences and personal characteristics of individuals are different.

Coping styles are a dynamic process involving specific cognitive, emotional and behavioral responses used to reduce resources and combat the negative effects of events or factors that cause stress or psychological distress. The coping strategy to be used varies from situation to situation. When coping styles were compared according to disability status, it was found that individuals with hand/arm disability scored higher in the sub-dimension of focusing on and venting of emotions than individuals with walking/balance disability. Focusing on and venting of emotions is focusing on the stressful situation and allowing the emotions related to it to be revealed (24,27)Individuals with hand/arm disabilities may experience limitations in using communication tools such as gestures, hand gestures and physical touches. This may suggest that the person is not understood by the other person. Individuals with hand/arm disabilities may use the sub-dimension of focusing on and venting of emotions more to compensate for this limitation in communication.

The hierarchical regression analysis results indicate that gender and disability duration are significant predictors of psychological resilience, with females and individuals with congenital disabilities demonstrating higher resilience levels. Women with disabilities may face additional challenges due to gender roles and cultural expectations, which could contribute to their elevated resilience. However, some studies, such as that by Cardoso and Sacomori (2014), have reported similar resilience levels between men and women with disabilities(36), suggesting that the relationship between gender and resilience is complex. Social norms, cultural influences, and other demographic factors may play a role in these unexpected findings, requiring further investigation.

The observed higher resilience among women may reflect both biological and social influences; women are often more involved in social support

networks, which can foster resilience. Similarly, individuals with congenital disabilities may have developed stronger resilience through long-term adaptation and coping strategies. These findings underscore the importance of targeted support interventions, particularly for individuals with acquired disabilities, who may benefit from structured resilience-building programs.

This study underscores the significant role of disability onset and type in shaping the psychological resilience and coping strategies of physically disabled individuals. While congenital disabilities are associated with higher resilience levels, the type of disability does not seem to influence resilience significantly. These findings suggest that intervention programs should prioritize personalized support for individuals with acquired disabilities to enhance their adaptive capabilities.

One of the key strengths of this study lies in its exploration of resilience and coping strategies among physically disabled individuals, considering the nature of disability (congenital vs. acquired). The research design, with a large sample size (n = 193), enhances the generalizability of the findings. Furthermore, the study provides a comprehensive examination of the impact of disability type and duration on psychological resilience, thereby making a significant contribution to the existing literature.

The cross-sectional design of this study limits the ability to establish causal relationships. Key variables influencing psychological resilience, such as environmental factors, support systems, social environment, and personality traits, were not controlled. In individuals with acquired disabilities, the factors leading to the disability may significantly impact psychological resilience and coping strategies. Additionally, the substantially larger size of the 'walking/balance' group compared to the 'hand/arm' group could be considered a limitation, potentially affecting the comparability of findings between these groups .Another limitation is the reliance on self-reported data, which may introduce response bias and affect the accuracy of the findings. Additionally, the sample's representativeness may limit the generalizability of the results to broader populations of individuals with physical disabilities.

Although studies examining mental health in physically disabled individuals are limited, they have been increasing in recent years. Future research should focus on longitudinal designs to examine the causal relationships between these variables and explore additional factors such as cultural, environmental, and socioeconomic influences. Such efforts will provide a more comprehensive understanding of resilience in this population and inform the development of targeted psychosocial interventions.

Human Ethics and Consent to Participate Declarations: This research was conducted in accordance with the Declaration of Helsinki, and approval was obtained from [the Clinical Research Ethics Committee of Tokat Gaziosmanpasa University under the decision number 83116987-035, dated 22.12.2022, and labeled as 21-KAEK-290.]. Written informed consent was obtained from all participants prior to their participation in the study.

Conflict of interest: In this study, there are no conflicts of interest.

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Worrying about individual health and worrying about ecological health; the relationship between eco-anxiety and health anxiety

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SUMMARY

Objective: Hypothesizing that there may be a relationship between eco-anxiety, which reflects concerns about the deterioration of ecological health, and health anxiety, which is an indicator of concern about the deterioration of personal health, we investigated the relationship between eco-anxiety and health anxiety, health cognitions, and metacognitions about health.

Method: The study included 367 participants between the ages of 18 and 25. The sociodemographic data form, the Hogg Eco-Anxiety Scale, the Health Anxiety Inventory, the Health Cognitions Questionnaire, and the Metacognitions about Health Questionnaire were completed by the participants.

Results: The total score of eco-anxiety was significantly higher in women than in men ($p = 0.002$). There was a significant positive correlation between the eco-anxiety scale and total scores of health anxiety, health cognitions, and metacognitions about health scales ($p < 0.001$). In addition, there was a significant positive correlation between the eco-anxiety level and difficulty coping with illness, perceived likelihood of illness, awfulness of illness, beliefs that thoughts can cause illness, beliefs about biased thinking, and beliefs that thoughts are uncontrollable ($p < 0.05$).

Discussion: Our findings point to the intertwined nature of eco-anxiety and health anxiety in an era of increasing environmental crises. Our study also suggests a positive correlation between eco-anxiety and health cognitions and metacognitive beliefs about health, suggesting this intersection. Understanding the complex interplay between ecological anxiety, health anxiety, health cognitions, and metacognitions about health is important for the development of targeted interventions.

Key Words: Climate Change, Eco-Anxiety, Health Anxiety, Health Cognitions, Metacognitions About Health

INTRODUCTION

Climate change is defined as one of the most important challenges of our time, with serious impacts on both the physical and mental well-being of individuals (1). Eco-anxiety is defined as individuals experiencing emotional reactions such as worry and fear in the face of global climate change threats (2). Different terms such as eco-anxiety, climate change anxiety, environmental distress or ecological stress are used interchangeably in the literature (2). While eco-anxiety is not officially classified as a disorder, it is noted that severe instances of the condition may necessitate mental health services (3).

Eco-anxiety, defined as worry about global environmental conditions has become an important factor affecting the quality of life and psychological well-being of many individuals (4). Most people agree that one of the greatest risks to world health today is climate change and that its effects on mental health threaten public health worldwide (5). Individuals are becoming increasingly aware of the effects of climate change due to alarming reports published by major organizations such as the World Health Organisation (6). According to a 2018 study by the Yale Climate Change Programme, 69% of respondents are concerned about global warming (7). People are becoming increasingly anxious and concerned about how climate change may affect their health as its effects become more noticeable (8).

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Health anxiety is a condition characterized by excessive worry and preoccupation with the belief that one has a serious illness, despite a lack of medical evidence (9). Although there are various models of health anxiety, the cognitive-behavioral model is claimed to be the most comprehensive model (10). According to this model, individuals who experience health anxiety may see even seemingly innocuous bodily sensations or other health-related information as dangerous. A vicious loop of emotional distress, dysfunctional imagery, illness-related ideas, and physiological arousal are produced by these perceptions (11). Health-related cognitions play an important role in the degree of health threat experienced (12). Metacognitive beliefs, defined as the beliefs that individuals have about their cognitions, can further influence these cognitions and potentially lead to a cycle in which negative health-related thoughts are sustained and intensified (13). The metacognitive model offers a different explanation of health anxiety from cognitive models. According to the metacognitive model, health anxiety is caused by long-term and repetitive negative thoughts about illness, i.e. worry/rumination, rather than dysfunctional beliefs and anxiety sensitivity (14).

While health anxiety is defined as excessive worry about one's own health, eco-anxiety refers to worry about ecological health. As far as we are aware, no research has been done to examine the connection between health anxiety and eco-anxiety in the literature. The aim of this study is to examine whether there is a relationship between eco-anxiety and health anxiety. We hypothesize that personal health concerns and environmental health concerns are likely to overlap, that individuals with higher levels of health concerns will report higher levels of eco-anxiety, and that examining eco-anxiety through the lens of health concerns, health cognitions and metacognitive beliefs will contribute to the literature.

METHODS

This study was conducted in accordance with the ethical standards of the institutional research committee and the principles of the Declaration of Helsinki and was approved by the Ethics Committee (22.11.2023/15). The study was designed as a single-group cross-sectional study. The study was conducted with medical school students at different grade levels. After ethics committee approval, permission from the dean's office of the medical school was obtained for the study. The questionnaires were administered to the participants face-to-face and were based on volunteerism. The questionnaires were administered outside of class hours.

Individuals with any known acute or chronic medical disease (metabolic, genetic, neurological, autoimmune, allergic, etc.) were excluded. Although known psychiatric illness was not an exclusion criterion, participants who were already taking psychiatric medication were excluded.

The population of our study consisted of medical faculty students (N = 1280). The sample size was calculated as 296 individuals with a 5% significance level and power 1-β = 0.95 (95%). In order to increase the power of the study, 367 people were included in the study. (A total of 404 people participated in the study, 25 participants were excluded due to medical illness and 12 participants were excluded due to current psychiatric medication use). Students aged between 18 and 25 years were included in the study and a similar number of students from each grade were included in the study.

Written informed consent was obtained from all participants.

Participants who gave written informed consent completed the Sociodemographic data form, Hogg Eco-Anxiety Scale (HEAS-13), The Health Anxiety Inventory, Health Cognitions Questionnaire and Metacognitions about Health Questionnaire (MCQ-HA).

Sociodemographic Data Form: It is a form created by the researchers and includes questions about the participants' age, gender, smoking, history of psychiatric disorder, history of medical illness, history of migration, feelings about climate change, and some questions about climate change. In this form, participants can mark more than one emotion they feel about climate change. They also answered

yes/no to questions about climate change. This form was filled in by the participants.

HEAS-13: HEAS-13 was developed to measure anxiety in line with symptoms related to environmental crises. This scale consists of 13 items. The scale includes 4 sub-dimensions: emotional symptoms, rumination, behavioral symptoms and personal impact anxiety. The minimum score obtained from the scale is 0 and the maximum score is 39. An increase in the total score of the scale indicates that the individual's eco-anxiety levels are high. The Turkish validity and reliability study of the HEAS-13 scale was conducted by Uzun et al. (15).

The Health Anxiety Inventory: This scale was developed to assess the level of health anxiety of individuals (16). The Health Anxiety Inventory is a self-report Likert-type scale consisting of 18 items. A high score on the scale indicates a high level of health anxiety in the individual. This scale has high-reliability coefficients. The long form of the scale includes sub-dimensions such as belief that he/she has a disease, seeking reassurance about his/her disease, anxiety about the negative consequences of the disease, belief that he/she is prone to disease, hypersensitivity to bodily sensations and fear. The Turkish validity and reliability study of the Health Anxiety Inventory was conducted by Aydemir et al. in 2013 (17).

Health Cognitions Questionnaire: This scale assesses dysfunctional beliefs associated with individuals' health anxiety. The scale consists of 4 factors "difficulty coping with illness", " medical services inadequacy", " perceived likelihood of illness" and "awfulness of illness". Scale items are scored on a 5-point scale. High scores obtained from the scale reflect dysfunctional beliefs about health. The internal consistency coefficients (Cronbach's alpha) of the factors were found to be between .72-.90 in the group without a physical diagnosis and between .75-.91 in the group with a physical diagnosis. Yılmaz et al. carried out the validity and reliability investigation in Turkey in 2018 (18).

MCQ-HA: Bailey and Wells developed the scale to assess metacognitive beliefs related to health anxiety (13). MCQ-HA consists of 14 items. The scale has 3 sub-dimensions: beliefs about prejudiced thinking, belief that thoughts can cause disease and belief that thoughts are uncontrollable. The scores to be obtained from the scale vary between 14 and 56, and the increase in the scores obtained indicates an increase in dysfunctional metacognitive beliefs related to health anxiety. The internal consistency coefficient of the scale was found to be .90 for the whole scale, .83 for beliefs related to prejudiced thinking, .78 for the belief that thoughts can cause illness, and .81 for the belief that thoughts are uncontrollable.

Statistical Analysis

Descriptive statistics were used to determine means, frequencies, and percentages. Independent t-test was used to compare the scores of eco-anxiety, health anxiety, health-related cognitions and health-related metacognitions scales between the groups (between genders, migration history, smoking, and presence of psychiatric disorders) for normally distributed data and Mann Whitney U test was used for non-normally distributed data. The Pearson correlation test was used to evaluate the relationship between clinical scales. Factors predicting eco-anxiety levels in the whole group were determined by multiple regression analysis. All the assumptions of regression, which include residual normality, homogeneity of residual variances, residual independence, and collinearity, were evaluated and confirmed through standard probability plots, residuals versus predicted values plots and variance inflation factor (VIF < 5 as acceptable values). The model's outliers were eliminated. Based on the assessments, all assumptions are met. Dubin-Watson value of Model-1 was 1.894 and Dubin-Watson value of Model-2 was 1.905. SPSS 23.0 (SPSS Inc. IL, Chicago, USA) program was used for statistical analysis, and $p < 0.05$ was considered statistically significant.

RESULTS

A total of 367 participants, 185 (50.4%) males and 182 (49.6%) females, were included in the study. It was found that 83.4% of the participants did not have a history of migration and 16.6% had a history of migration. It was determined that 7.1% of the

Table 1. The relationship between eco-anxiety and other variables

		Eco-Anxiety	p
Sex	Male	9.98 – 7.44	0.002
	Female	12.43 – 7.14	
Migration story	Yes	10.47 – 7.47	0.407
	No	11.33 –7.40	
Presence of psychiatric disorders	Yes	12.0 (1.0-39.0)**	0.259**
	No	11 (0.0-37.0)	
Cigarette use	Yes	11.77 – 7.57	0.574

** Mann Whitney U test

participants had a history of psychiatric disorders. While 12.3% of the participants in the study stated that they smoked, 87.7% stated that they did not smoke.

While eco-anxiety scores in females were found to be 12.43 ± 7.14, in men it was 9.98 ± 7.44, and the total eco-anxiety score in females was found to be significantly higher than in men (p = 0.002). There was no difference in eco-anxiety levels about migration history and smoking variables. Although not statistically significant, eco-anxiety levels were found to be higher in participants with psychiatric illness than in participants without psychiatric illness (Table 1).

In this question, in which participants could select more than one option, 69.8% of the participants reported feeling anxiety, 60.2% sadness, 45.0% hopelessness, 33.5% fear, 28.9% guilt, 24.8% anger, 18.0% shame, 13.4% indifference and 11.7% grief (Figure 1).

51.8% of the participants answered yes to the question "I do not know how to cope with my negative feelings about climate change and other global environmental conditions". The total score of eco-anxiety was 13.01 ± 7.38 in the participants who said they did not know how to cope, while the total score was 9.24 ± 6.96 in the participants who said they knew how to cope (p < 0.001). 18.0% of the participants answered yes to the question "I often find myself researching about climate change and other global environmental issues in the media". Eco-anxiety level was found to be significantly higher in participants who answered yes (p< 0.001). 216 individuals stated that their concerns about global environmental problems increased after the COVID-19 pandemic. Eco-anxiety scores were found to be significantly higher in participants who stated that their anxiety increased after COVID-19 (p < 0.05) (Details are shown in Table 2).

Health anxiety scores in women were found to be 19.54 ± 7.93, health cognitions total score was 61.97 ± 9.94, and metacognitions about health total score was 26.88 ± 5.91. Health anxiety scores in men were found to be 16.41 ± 7.53, health cognitions total score was 59.22 ± 8.84, and metacognitions about health total score was 26.39 ± 6.73. Health anxiety was found to be significantly higher in women (p< 0.001). Health-related dysfunctional cognition scores were higher in women than in men

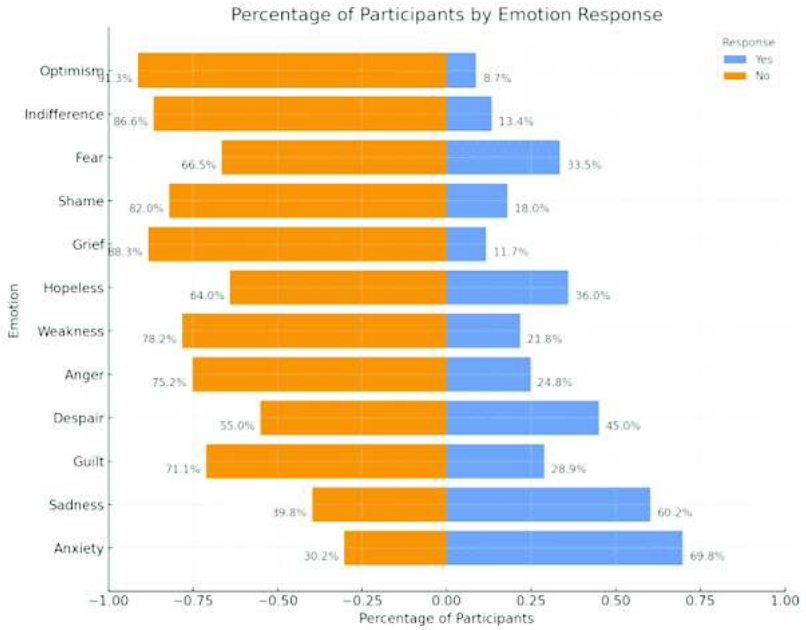

Figure 1.

Table 2. Relationship between questions related to Eco-Anxiety and HEAS-13 scores

		HEAS-13 Scores	P*
I feel negative emotions about climate change and other global environmental conditions	Yes (n= 306)	16.52 – 8.12	< 0.001
	No (n=61)	10.04 –6.73	
I don't know how to deal with the negative feelings I have about climate change and other global environmental conditions	Yes (n = 190)	13.01 – 7.38	< 0.001
	No (n = 177)	9.24 – 6.96	
In my own life I worry that the world is coming to an end and that my generation will see it	Yes (n = 214)	13.06 – 7.12	< 0.001
	No (n = 153)	8.57 – 7.03	
I often find myself doing media research on climate change and other global environmental issues	Yes (n = 66)	16.52 – 8.12	< 0.001
	No (n = 301)	10.04 – 6.73	
I do not have sufficient and reliable information on climate change and other global environmental issues	Yes (n = 262)	11.81 – 6.89	0.020
	No (n = 105)	9.63 – 8.42	
After the Covid 19 pandemic, I became more concerned about climate change and other global environmental issues	Yes (n = 216)	13.73 – 7.01	< 0.001
	No (n = 151)	7.54 – 6.39	

* Independent T-Test (Abbreviations : HEAS-13; Hogg Eco-Anxiety Scale)

(p = 0.006). There was no significant difference between the groups in terms of dysfunctional metacognitive beliefs related to health anxiety (p = 0.464).

The scores of beliefs that thoughts can cause illness were 12.04 ± 3.54 in men and 13.20 ± 3.59 in women and were significantly higher in women than in men (p = 0.002). In men, beliefs about biased thinking scores were 8.43 ± 3.10 and beliefs that thoughts are uncontrollable scores were 5.90 ± 2.07. In women, beliefs about biased thinking and beliefs that thoughts are uncontrollable scores were 7.89 ± 2.74 and 5.77 ± 1.82, respectively, and no significant difference was found between the groups (p = 0.083 and 0.535, respectively).

Difficulty coping with illness scores were 21.58 ± 5.30 in men and 22.70 ± 5.75 in women (p= 0.054). Medical services inadequacy scores were 12.26 ± 2.41 in men and 12.28 ± 3.05 in women (p= 0.968). Perceived likelihood of illness subscale was 12.30 ± 2.63 in men and 12.62 ± 2.68 in women (p= 0.245). Awfulness of illness was 14.35 ± 2.97 in women and 13.07 ± 3.07 in men and was significantly higher in women than in men (p < 0.001).

A significant positive correlation was found between the total scores of the eco-anxiety scale and health anxiety, health cognitions and metacognitions about health scales (p < 0.001)(Table 3).

There was a significant positive correlation between eco-anxiety level and health anxiety, difficulty coping with illness, perceived likelihood of illness, beliefs that thoughts can cause illness, beliefs about biased thinking, and beliefs that thoughts are uncontrollable (p < 0.05). Details are shown in Table 4.

Multiple regression analysis was performed for the factors predicting eco-anxiety levels in all participants and two models were created. In Model 1, which included age, gender, migration history, presence of psychiatric disorder, health anxiety total score, health cognitions total score and metacognitions about health total score, it was found that presence of psychiatric disorder, maladaptive metacognitions about health and health

Table 3. Correlation between eco-anxiety scores and total scores of health anxiety, health cognitions and metacognitions about health

		Total Scores For Health Anxiety	Total Scores For MCQ-HA	Total Score For Health Cognitions
HEAS-13 Scores	R	0.462	0.335	0.277
	P	< 0.001	< 0.001	< 0.001

r= Pearson's correlation coefficient
(Abbreviations : HEAS-13; Hogg Eco-Anxiety Scale, MCQ-HA; Metacognitions about Health Questionnaire)

Table 4. Correlation between HEAS-13 scores and health anxiety, health related cognitions subscale scores and health related metacognition subscale scores

		HA	DCI	MSI	PLI	AI	BTT	BA	BTTU
HEAS-13 Scores	r	0.462	0.225	0.093	0.256	0.145	0.186	0.263	0.346
	p	< 0.001	< 0.001	0. 078	< 0.001	0.006	< 0.001	< 0.001	< 0.001

r= Pearson's correlation coefficient
(Abbreviations : HA: Health Anxiety , DCI; Difficulty Coping With Illness, MSI; Medical Services Inadequacy, PLI; Perceived Likelihood Of Illness, AI; Awfulness Of Illness, BTT; Beliefs That Thoughts Can Cause Illness, BA; Beliefs About Biased Thinking, BTTU; Beliefs That Thoughts Are Uncontrollable, HEAS-13; Hogg Eco-Anxiety Scale)

Table 5. Factors Predicting Eco-Anxiety (Model-1)

	B	Std. error	T	p	Confidence interval (95%)	
					Lower	Upper
Age	-0.158	0.187	-0.845	0.399	-0.527	0.210
Sex	0.811	0.728	1.115	0.266	-0.620	2.243
Migration Story	-0.977	0.942	-1.037	0.300	-2.831	0.876
Presence of psychiatric disorders	2.961	1.407	2.104	0.036	0.193	5.728
Health Anxiety	0.344	0.055	6.223	< 0.001	0.236	0.453
Health Cognitions	0.013	0.044	0.305	0.761	-0.072	0.099
MCQ-HA	0.228	0.059	3.875	< 0.001	0.112	0.343

(Abbreviations : MCQ-HA; Metacognitions about Health Questionnaire)

anxiety predicted eco-anxiety ($p < 0.001$, $F= 17.825$, Adjusted R square$= 0.248$) (Table 5). In Model 2, which included age, gender, migration history, presence of psychiatric disorder, total score of health anxiety, health cognition subscales and metacognitions about health subscales, it was found that the presence of psychiatric disorder, health anxiety, beliefs about biased thinking and beliefs that thoughts are uncontrollable subscales of metacognitive beliefs about health scale predicted eco-anxiety ($p< 0.001$, $F= 11.702$, Adjusted R square$= 0.265$) (Table 6).

DISCUSSION

Our research reveals a link between eco-concern and health anxiety, health cognitions and health-related metacognitions. The correlation between environmental anxiety and personal health concerns is noteworthy because the confluence of environmental and personal health concerns forms a complex tapestry of modern existential threats, bringing together concerns about the sustainability of our planet and the fragility of human health. The positive correlation between eco-concern, health cognitions and metacognitive beliefs about health points to this intersection. Such a correlation begs the question: Could it be that as individuals grapple with the projected realities of environmental degradation, their environmental concerns and fears are not only about the ecological future but also linked to individual health concerns? In this framework, exploring the intersections between eco-anxiety, which describes concerns about the deterioration of environmental health, and health anxiety, which describes concerns about the deterioration of individual health, can help us understand the relationship between these two issues.

Some researchers have linked deep existential concerns with eco-anxiety(19). Empirical studies show that people experience existential questions such as guilt and shame about ecological issues. Although more research is needed to integrate existential anxiety and eco-anxiety more deeply, some preliminary research and conceptual reviews suggest that eco-anxiety may have a dimension related to existential questions (20-22). Studies investigating the relationship between health anxiety and existential thinking have also shown a significant negative relationship between these two variables (23). According to a study in this area, health anxiety is connected to both the existence of meaning in life and the pursuit of meaning in life (24). In a study

Table 6. Factors Predicting Eco-Anxiety (Model-2)

	B	Std. error	T	P	Confidence interval (95%)	
					Lower	Upper
Age	-0.205	0.189	-1.086	0.278	-0.576	0.166
Sex	1.281	0.739	1.734	0.084	-0.172	2.735
Migration Story	-0.975	0.939	-1.038	0.300	-2.822	0.872
Presence of psychiatric disorders	3.557	1.404	2.534	0.012	0.796	6.318
Health Anxiety	0.313	0.056	5.599	< 0.001	0.203	0.423
Beliefs That Thoughts Can Cause Illness	-0.33	0.108	-0.306	0.760	-0.245	0.179
Beliefs About Biased Thinking	0.333	0.140	2.384	0.018	0.058	0.607
Beliefs That Thoughts Are Uncontrollable	0.553	0.233	2.370	0.018	0.094	1.011
Difficulty Coping With Illness	0.027	0.075	0.360	0.719	-0.121	0.175
Medical Services Inadequacy	-0.054	0.131	-0.410	0.682	-0.312	0.204
Perceived Likelihood Of Illness	0.263	0.145	1.815	0.070	-0.022	0.548
Awfulness Of Illness	-0.095	0.134	-0.713	0.476	-0.359	0.168

investigating the relationship between death anxiety and health anxiety, death anxiety was found to be an important determinant of health anxiety (25). Pihkala stated that more dialog with themes such as death anxiety and health anxiety would lead to a better understanding of eco-anxiety (3). He also noted that some key elements of anxiety (uncertainty, unpredictability, uncontrollability, anxiety sensitivity) are strongly present in explanations of eco-anxiety (3). Eco-anxiety has been described in other studies in connection with feelings of anxiety, concern about the future and anxiety about a threat characterized by considerable uncertainty and characterized by common symptoms of anxiety (4). Many research have linked health anxiety to anxiety sensitivity, uncontrollability, and intolerance of uncertainty(26, 27).

Studies on health anxiety have revealed a positive relationship between neuroticism, one of the personality traits, and health anxiety (28). A study on eco-anxiety indicated that neuroticism has a significant effect on the level of eco-anxiety and that eco-anxiety is correlated with neuroticism (29). It has been suggested that people with high levels of neuroticism are alert to health threats, see it as a greater danger than it actually is when they encounter symptoms of illness, and exaggerate their physical symptoms (30). Such a situation may also be linked to eco anxiety, although it is difficult to comment in the absence of existing literature. However, given the harmless threats in health anxiety versus the undeniable risks and dangers of the global climate crisis, it is difficult to make predictions in this regard.

In health anxiety, health-related cognitions (difficulty coping with illness, medical services inadequacy, perceived likelihood of illness, awfulness of illness) play an important role in the degree of health threat experienced (12). In our study, difficulty coping with illness and perceived likelihood of illness were positively correlated with ecoanxiety, while medical services inadequacy and awfulness of illness were not correlated with ecoanxiety. This difference in dysfunctional beliefs between health anxiety and climate anxiety may indicate a point at which the nature of individuals' concern about environmental problems diverges from the nature of their concern about personal health. We also found that while health anxiety and metacognitions about health significantly predicted eco-anxiety, health cognitions were not a significant predictor of eco-anxiety. Although cognitive appraisals have assumed a central role in conceptualizing and treating health anxiety in general, it is important to note that there has recently been a paradigm shift in health anxiety. Studies have suggested that cognitions, as emphasized in cognitive-behavioral theories, cannot be central to psychological disorders. Instead, metacognitions, the organization of thoughts and beliefs about thoughts, are more important (13). The idea of metacognition holds that specific assumptions about uncontrollability and the danger of thinking are what causes psychological distress in general and health anxiety in particular (31). The metacognitive model is concerned with beliefs about preconceived thinking, beliefs that thoughts can cause illness, and beliefs that thoughts are uncontrollable. Studies have shown that the role of metacognitive beliefs in health anxiety is a stronger cross-sectional predictor of health anxiety than dysfunctional cognitions (32). At this point, it is stated that the metacognitive model, which focuses on metacognitive beliefs rather than cognitions, is more valuable in the approach to health anxiety (33). According to the results of the study, a moderately positive relationship was found between beliefs about the uncontrollability of thoughts about illness and health anxiety. This relationship was found to be higher than the relationship between health anxiety and dysfunctional beliefs (31). Melli et al. found that the belief that thoughts are uncontrollable among metacognitive beliefs is the strongest predictor of health anxiety after the physical dimension of anxiety sensitivity (14). Considering the gap in the existing literature, we think that our findings regarding the predictive role of beliefs about biased thinking and beliefs that thoughts are uncontrollable subscales of the metacognitions about health scale on eco-anxiety are important.

This finding implies that the emergence and maintenance of eco-anxiety may be influenced by health anxiety and metacognitive beliefs about health. In addition, it is known that metacognitive model components found in psychopathologies may have an important role in clinical practice (34). The inclusion of metacognitive beliefs, which play a role

in explaining eco-anxiety, in intervention and prevention programs can make a significant contribution to understanding and addressing eco-anxiety in a more integrated manner.

The fact that the presence of psychiatric disorder was found to be one of the factors predicting eco-anxiety in our study suggests that psychiatric disorders may increase sensitivity to external stressors such as environmental anxiety. Although there is a large gap in the literature in this area, the relationship between eco-anxiety and psychopathology has been investigated. Eco-anxiety is associated with depressive symptoms, insomnia, anxiety symptoms and impaired mental health, especially in women and younger generations (2). High eco-anxiety has been associated with impaired mental health (35). Chronic climate distress increases the risk of depression, panic and substance abuse (36). It has been reported that adolescents with persistent climate anxiety have higher depressive symptoms than adolescents with moderate eco-anxiety (37). There are parallels between the patterns observed in our study and these established findings, suggesting that psychiatric disorders may make individuals more susceptible to eco-anxiety. The possible role of potential mechanisms such as emotional reactivity, cognitive distortions, impaired coping strategies, reduced sense of control over environmental outcomes, or a tendency to ruminate on global issues in the relationship between psychopathology and eco-anxiety needs to be explored.

The psychological impacts of ecological changes are unevenly distributed across individuals and societies; it is not surprising that they are more prevalent among the elderly, children and those with health problems and those experiencing some of the impacts of climate change (38, 39). For example, in Tuvalu, a country at serious risk from climate change, 95% of respondents reported experiencing distress due to climate change, and 87% reported that their distress interfered with normal functioning (40). Young people can be particularly vulnerable to the challenges posed by eco-concerns. From early adolescence to late adolescence, most adolescents experience some concerns about climate change (37). In one study, 82% of a sample of 10- and 11-year-old children living in the United States expressed concerns about the environment that caused them sadness, anger, or fear (41). Of the 10.000 young people surveyed worldwide in 2021, 59% said they were very or extremely concerned about climate change and at least 84% said they were moderately concerned (42). Young people today are growing up with alarming news about climate change and the climate crisis. In general, young people are at higher risk of the psychological effects of climate change and the results of high levels of eco-anxiety in our study with a young population replicate these literature findings.

To discuss the implications of our study for increased concern about global environmental issues in the wake of the COVID-19 pandemic, it is worth remembering the COVID-19 pandemic, where we saw the deep psychological burden of infectious diseases. During this pandemic, people faced crises such as quarantine that took a toll on their mental health, and became even more worried about their future as they compounded negative messages about the climate challenge (43). A wide range of mental symptoms associated with COVID-19 were observed, ranging from anxiety, insomnia, denial, fear and anger (44). Growing concerns about global environmental issues in the wake of major global events such as the COVID pandemic point to an increased sensitization to global crises and their interconnections.

Limitations of the Study

The limitations of this study are that it was conducted with a non-clinical sample and the data were obtained with self-report data collection tools. In addition, the cross-sectional nature of the study and the absence of a control group are other limitations of our study.

Our study points to the intertwined nature of eco-anxiety and health anxiety in an era of increasing global environmental problems. Our findings reinforce this intersection by showing a positive correlation between eco-anxiety and health cognitions and metacognitive beliefs about health. To our knowledge, this is the first study to investigate the relationship between health anxiety and eco-anxiety and its cognitive and metacognitive aspects , and the first to examine eco-anxiety within the cog-

nitive framework used for health anxiety. This integrated perspective opens a window into how concerns about the health of our planet and concerns about our personal health can shape each other. We believe that understanding the interaction between ecological anxiety, health anxiety, health cognitions and health metacognitions is important for the development of targeted interventions and may have potential implications for clinical practice. We believe that testing our findings, which can be considered preliminary findings, in future studies using longitudinal or experimental designs will contribute to the literature. Furthermore, investigating the factors mediating this relationship and examining these relationships in different age groups and cultural contexts may deepen our understanding of the generalizability and developmental aspects of these findings.

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The relationship between perinatal depression, anxiety, and sexist beliefs

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SUMMARY

Objective: Exposure to sexism is negatively associated with women's mental health. On the other hand, there is limited research in the literature on sexism and mental health during pregnancy. This study aimed to investigate the relationship between common mental disorders during pregnancy, such as depression and anxiety, and sexist beliefs.

Method: For this scope, 170 pregnant women over 18 were contacted. All participants completed information forms measuring sociodemographic and clinical characteristics, the Tilburg Pregnancy Distress Scale, the Multidimensional Scale of Perceived Social Support, the Hospital Anxiety and Depression Scale, and the Ambivalent Sexism Inventory. The correlation coefficient was calculated for the relationships between variables. Two separate hierarchical regression models were tested to determine the predictors of depression and anxiety.

Results: Depression and anxiety had different characteristics in terms of predictive variables. Consistent with the literature, negative affect, partner involvement, and perceived social support significantly predict both depression and anxiety. Negative affect and partner involvement are factors of the Tilburg Pregnancy Distress Scale. However, there is no common predictive variable other than those three. In addition to this common triad, internalized hostile sexism significantly predicts depression. Moreover, low education and health problems related to pregnancy are significant variables in predicting only anxiety levels but not depression. In this respect, the findings show that there are variables that predict prenatal depression and anxiety in common, as well as different predictors of these two mental health problems observed in the perinatal period.

Discussion: Hostile sexist beliefs of pregnant women are not associated with anxiety but predict perinatal depression.

Key Words: Pregnancy; women's mental health; perinatal depression; sexism; gender discrimination

INTRODUCTION

Sexism is an ideology that includes prejudice or discrimination based on one's sex or gender. On this ideology, social and biological differences between sexes are exaggerated via gender roles. Ambivalent sexism theory is dominantly used in the literature to understand discrimination based on sex and gender (1). The theory implies that sexist ideology may include the belief that one sex is superior to or more vulnerable than another sex and the behaviors linked to these two.

People attribute both positive and negative characteristics to genders during their daily lives. Ambivalent sexism theory emphasizes these two valences. According to the theory, sexism is displayed in two ways: attitudes of mixed content that appear favorable from the outside and hostile attitudes that are negative. Hence, seemingly positive attributions that imply weakness or fragility, named ambivalent and explicitly hostile emotions, beliefs, and behaviors about the sexes, are identified as hostile forms of sexism.

Sexist attitudes are generally defined as beliefs and behaviors that contribute to the protection of exis-

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ting gender inequality in society. On the other hand, sexist practices may be performed by institutions by rules, incentives, or precedents. Moreover, people may internalize discriminatory ideologies per se. In this regard, sexism has three headings (2). These may be listed as interpersonal, institutional, and internalized. The most commonly known form is the former. Stereotypes as nurturer women or leader men are examples of interpersonal sexist attitudes. Practices such as granting parental leave only to women for child care are institutional sexist approaches. Sexism is considered a harmful coping mechanism developed to manage social expectations (3). Moreover, sexism might be a form of self-stigmatization.

It is widely accepted that sexism is more harmful to women. Moreover, results have been repeatedly reported that all three types of sexism are negatively associated with women's mental health. Studies indicated that sexism was positively associated with psychological distress, alcohol, and drug-related consequences (4,5). Also, it's known that sexism is a significant predictor of poor mental health, depression, and anxiety(3,6,7). Study results prove that both exposure to and internalizing sexism are associated with poor mental health.

As the study results show, women are exposed to sexism in explicit or implicit ways throughout their lives and are negatively affected by it (8). This situation poses a significant threat to women's mental health. On the other hand, women have life periods such as pregnancy and postpartum that directly determine the health of future generations. These periods directly affect public health in terms of fetal and newborn health. In this respect, the relationship between sexism and pregnant mental health is a public health issue.

Pregnancy is a period that is viewed positively in many cultures. Studies have shown that women are evaluated more positively during the pro-natal periods (8). However, there are also study results showing that women are exposed to ambivalent sexism during the pro-natal periods. According to the study results, limiting women's choices is significantly associated with both ambivalent and hostile sexism (9–11). Notwithstanding, no study has been found reporting the relationship between sexism and pregnant mental health. It has been emphasized many times in recent years that there are not enough studies on pregnant mental health in the literature (12–14).

Studies conducted in developing countries show that age (15), lack of social support (15,16), marital status (16), past interpersonal traumatic experience (16–18), unintended pregnancy (16), socioeconomic status (16,18), history of psychiatric disorder (17,18), presence of health risk (18), current obstetric complications (15) are prominent risk factors associated with maternal mental health. Literature on pregnant women's mental health also shows that the perinatal mental health of women is closely related to the physical health of the fetus (19) and newborns (20). Moreover, maternal mental health problems have been reported to be associated with the infants' illnesses (21) and the child's emotional development (22). Along with mental health problems, positive mental health during pregnancy is emphasized as a distinct construct associated with improved birth outcomes (23). In a review study, it is reported that maternal positive mental health is related to parenting styles that facilitate a child's future academic achievements and socioemotional function (23).

Pregnancy is a significant transformation process towards motherhood. Women could experience psychological distress, depression, and anxiety in that particular period. However, little is known about if sexist beliefs contribute to women's mental health during pregnancy. Thus, we aimed to examine the relationship between common mental disorders and sexist beliefs among pregnant women.

METHODS

In a cross-sectional study design, we recruited pregnant women admitted to the Gynecology and Obstetrics Outpatient Clinic of Eskisehir Osmangazi University Hospital between February 15, 2021, and April 8, 2021. The Non-Interventional Clinical Research Ethics Committee of Eskisehir Osmangazi University approved the present study (26.01.2021/ 04).

Participants

We recruited pregnant women older than 18 years, fluent in Turkish, who can complete forms alone, and willing to participate in the study. All participants provided informed written consent.

The situation on the COVID-19 pandemic during data collection: The first COVID-19 case was reported on March 11, 2020, in Turkey (24). The same day, the World Health Organization declared the novel coronavirus outbreak a pandemic (25). During the present study's data collection, the total number of COVID-19 cases increased from 2,594,128 to 3,689,866; the number of COVID-19 cases reported daily increased from 7,945 to 55,941; and the daily number of deaths due to COVID-19 increased from 91 to 258 (26).

Variables

Sociodemographic and clinical characteristics: We collected the data of participants' sociodemographic and clinical characteristics using the questionnaire we developed. Participants' age, education level, years of relationship with current partner, and employment status were recorded. Two Likert questions measured perceived economic satisfaction and voluntariness level of current pregnancy: scoring zero meant the worst situation while scoring five equaled the most desired/ best situation. In addition, we registered pregnant women's obstetric characteristics like pregnancy week, health problems related to pregnancy, health problems of the fetus, number of pregnancies, number of living children, and involuntary fetal losses.

Intimate partner violence exposure by current partner: The following three questions aimed to assess psychological, physical, and sexual forms of IPV: "Has your spouse ever insulted or cursed you?", "Has your spouse hit you with a fist or any other object, even once, or has he physically harmed you in any way?" "Has your spouse forced you to have sexual intercourse even once, or has he forced sexual intercourse without your consent?" The answers were "yes" or "no."

Pregnancy-related psychological distress: We utilized the Tilburg Pregnancy Distress Scale (TPDS) to measure pregnancy-related psychological distress. Pop and colleagues developed the scale with two subscales, Negative Affect and Partner Involvement (14). Rising scores are associated with pregnancy-related psychological distress. Among all three trimesters, the TPDS shows satisfactory test-retest coefficients and adequate internal consistency (27). The TPDS is valid and reliable among Turkish pregnant women (28). Scores ≥28 demonstrate pregnancy-related psychological distress (28).

Perceived social support: The Multidimensional Scale of Perceived Social Support (MSPSS)—Revised Form quantifies perceived social support (29). Three subscales evaluate social support from family, friends, and significant others. Eker and Arkar conducted a Turkish validation study of MSPSS (30) and its revised version (31).

Anxiety and depression: The Hospital Anxiety and Depression Scale (HADS) is a self-assessment scale comprising fourteen questions that measure the levels of anxiety and depression in primary health care services (32). The scale is valid and reliable among the Turkish population (33). The anxiety subscale has a cut-off value of 10 points, while the depression subscale has a cut-off value of 7 points, as Aydemir and colleagues calculated for the Turkish version of the HADS (33).

Sexist beliefs: The Ambivalent Sexism Inventory (ASI) measures sexist beliefs. Glick and Fiske developed it in 1996, and Glick and colleagues revised it in 2000 (1,34). Sakallı-Uğurlu performed ASI's Turkish validation study (35). ASI is a 22-item self-report inventory in a six-point Likert style (1=totally disagree, 6=totally agree). Higher scores mean strong sexist beliefs. ASI has two subscales: hostile sexism and benevolent sexism.

Statistical Analysis

Statistical analyses were conducted using SPSS Version 23.0 (Statistical Package for the Social Science). Descriptive statistics for the demographic variables were presented as the frequency/percen-

tage for the categorical variables and the mean and standard deviation for continuous variables such as age. We assessed the normality of the data by examining skewness and kurtosis. Pearson's correlational analysis examined the association between the variables. Two hierarchical multiple regression models with the enter method were used to determine the predictors of depression and anxiety. Variance inflation factor (VIF) was conducted to detect multicollinearity between the variables we examined. All statistical analyses were considered significant, with a p-level of 0.05.

RESULTS

Sociodemographic characteristics

The sociodemographic characteristics of the sample are shown in Table 1.

170 pregnant women, all legally married to men, participated in our study. Sample characteristics are presented in Table 1. The mean age of the participants was 29.54 ± 5.28. Most (65.9%) were unpaid domestic workers, also known as homemakers. 27.6% of pregnant women had a high school degree, while 37.1% had a college degree. The mean value of the pregnancy week was 21.45 ± 8.66. Most women (49.4%) were in the second trimester.

21.8% of pregnant women (n=37) had health problems due to pregnancy or there were health problems with the fetus. While 15.3% (n=26) of the participants had a pregnancy-related health problem, 6.5% (n=11) stated that they had experienced health problems with the fetus. 5.3% (n=9) of the participants had gestational diabetes, 3.5% (n=6) women had gestational hypertension, 2.4% (n=4) had hypothyroidism, 2.4% (n=4) suffered from hypercoagulability, 1.2% (n=2) had none-specific

Table 1. Sociodemographic and clinical variables of the participants (n=170)

Variable		Mean/ Frequency	Standard deviation/ Percentage
Age		29.54	± 5.28
Duration of relationship with current partner (years)		5.30	± 4.01
Education	Primary school	18	10.6%
	Secondary school	34	20.0%
	High school	47	27.6%
	College degree	63	37.1%
	Master's degree or more	7	4.1%
Employment status	Employed	45	26.5%
	Homemaker	112	65.9%
	Unemployed	13	7.6%
Pregnancy week		21.45	± 8.66
Current trimester	First	34	20.0%
	Second	84	49.4%
	Third	52	30.6%
Pregnancy-related health problems	of women	26	15.3%
	of fetus	11	6.5%
	No problem	133	78.2%
Intimate partner violence exposure (lifetime)	Psychological	21	12.4%
	Physical	5	2.9%
	Sexual	2	1.2%
Perceived economic satisfaction (likert question, 0: worst, 5: best)		2.83	± 1.35
Voluntary pregnancy (Likert, 0: least voluntariness, 5: most voluntariness)		4.52	± 1.03
Previous infertility treatment	Yes	19	11.2%
	No	151	88.8%
Pregnancy number	1	59	34.7%
	2	56	32.9%
	3	23	13.5%
	4	17	10.0%
	5 or more	15	8.8%
Number of living children	None	75	44.1%
	1	69	40.6%
	2	20	11.8%
	3 or more	6	3.5%
Number of previous involuntary fetal loss	None	128	75.3%
	1	35	20.6%
	2	7	4.1%

Table 2. Means, standard deviations, and intercorrelations among study variables.

	Mean–SD	1	2	3	4	5	6	7
1. Depression	5.75–3.65	1						
2. Anxiety	7.26–3.97	**.576****	1					
3. Negative Affect	10.85–6.50	**.286****	**.524****	1				
4. Partner Involvement	4.54–3.74	**.504****	**.307****	.043	1			
5. Hostile Sexism	36.0–13.91	**.235****	.108	.030	**.220****	1		
6. Benevolent Sexism	46.14–13.14	**.170***	.119	**.156***	.136	**.492****	1	
7. Perceived Social Support	67.19–16.70	**-.524****	**-.317****	-.072	**-.360****	.006	.099	1

** p < .01, * p < .05.

pain and 0.6% (n=1) women had uterine myoma. Among the pregnancies, 3.5% (n=6) of them had fetal developmental problems, 1.2% (n=2) had threatened miscarriage, 1.2% (n=2) had blood incompatibility, and 0.6% (n=1) had twin-to-twin transfusion syndrome.

Among the pregnant women, 11.2% had previous infertility treatment. 75.8% of the participants had never experienced an involuntary fetal loss. 44.1% did not have any children. The mean value of the self-rated planning of the current pregnancy was 4.52 ± 1.03. Self-rated perceived economic satisfaction mean value was 2.83 ± 1.35.

Prevalences of common mental disorders

According to clinical scale cut-off values, the psychometric prevalences of common mental disorders were calculated. Anxiety was 21.2% (n=36), and depression was 30% (n=51) prevalent. Pregnancy distress prevalence was 7.1% (n=12), its subscale negative affect was 8.8% (n=15), and the partner involvement subscale was 10.6% (n=18).

Correlations

As a result of examining normality, it was seen that our variables were normally distributed; the levels of skewness ranged between -.73 and -1.06, and the levels of kurtosis ranged between -.36 and -1.00. We conducted a correlational analysis to examine the associations of the study variables. As presented in Table 2, depression was negatively associated with perceived social support and positively associated with negative affect, partner involvement, and hostile and benevolent sexism. Whereas anxiety was found to be negatively associated with perceived social support and positively correlated with negative affect and partner involvement ($p < .05$).

Regression

To examine which factors affect depression and anxiety in pregnant women, we carried out two separate hierarchical regressions. Besides the study variables, we added some sociodemographic variables according to the previous research findings. That means age, education, pregnancy weeks, health issues concerning pregnancy, number of living children, and fetal loss were entered in the first step of multiple regression models. Perceived social support, sexist beliefs, and subdimensions of pregnancy distress were entered in the second step of two regression models. For depression, 50.7% of the total variance was explained by the study variables [$F(5, 158)=22.19$, $p<0.001$)]. Sociodemographic variables, except education concerning pregnancy, did not significantly contribute to the explained variance. Accordingly, as the level of education increases, the experience of depressive symptoms decreases (ß =-.25, SE=.26, $p<0.001$). We also found that negative affect (ß =.24, SE= .03, $p<0.001$), partner involvement (ß =.30, SE=.07, $p<0.001$), hostile sexism (ß =.14, SE=.02, $p<0.05$) positively predicted depression whereas, perceived social support (ß =-.38, SE=.01, $p<0.001$) negatively predicted depression in pregnant women (Table 3). Since the VIF values of the variables ranged between 1.11 and 1.67, we

Table 3. Hierarchical regression analysis on depression

Step	B	SE	t	VIF
1				
Age	.010	.05	.13	1.18
Education	-.25	.26	**-3.22****	1.13
Pregnancy week	.02	.03	.23	1.13
Number of living child	.21	.32	2.56	1.30
Number of fetal loss	.10	.38	1.35	1.10
Health problems related to pregnancy	-.01	.67	-.19	1.13
ΔR2	**.160****			
2				
Age	-.03	.04	-.54	1.12
Education	-.09	.22	-1.39	1.31
Pregnancy week	-.01	.02	.82	1.17
Number of living child	.10	.26	1.47	1.49
Number of fetal loss	.06	.30	.99	1.12
Health problems related to pregnancy	-.08	.54	-1.31	1.20
Negative Affect	.24	.03	**4.15****	1.11
Partner Involvement	.25	.07	**3.70****	1.44
Perceived social support	-.38	.01	**-6.09****	1.28
Hostile sexism	.14	.02	**2.14***	1.38
Benevolent sexism	.03	.02	.64	1.62
ΔR2	**.347****			
Total ΔR2	**.507****			

** p < .01, * p < .05.

Table 4. Hierarchical regression analysis on anxiety

Step	B	SE	t	VIF
1				
Age	.009	.06	.09	1.18
Education	-.001	.30	-.01	1.13
Pregnancy week	.08	.04	1.00	1.13
Number of living child	.11	.37	1.32	1.30
Number of fetal loss	.03	.44	.41	1.10
Health problems related to pregnancy	-.12	.78	-1.52	1.13
ΔR2	.046			
2				
Age	-.02	.05	-.30	1.12
Education	.14	.25	**2.09***	1.31
Pregnancy week	.005	.03	.08	1.17
Number of living child	.08	.31	1.04	1.49
Number of fetal loss	-.01	.35	-.16	1.12
Health problems related to pregnancy	-.17	.63	**-2.64****	1.20
Negative Affect	.48	.04	**7.71****	1.11
Partner Involvement	.18	.08	**2.48****	1.44
Perceived social support	-.26	.02	**-3.82****	1.28
Hostile sexism	.04	.02	.63	1.38
Benevolent sexism	.08	.02	1.10	1.62
ΔR2	**.391****			
Total ΔR2	**.437****			

** p < .01, * p < .05.

did not observe any obvious multicollinearity in the model.

For anxiety, we followed a similar analysis as in the depression model. R2 of this model was found at .437, indicating that 43.7% of the variance was explained by the study variables that we entered into regression [F(5, 158)=21.93, p<0.001)]. We found that some sociodemographic variables, in particular, education (ß =.14, SE= .02, p<0.05) and pregnancy-related health problems (ß =-.17, SE= .06, p<0.01) made significant contributions to anxiety. Furthermore, while perceived social support (ß =-26, SE= .02, p<0.001) negatively predicted, negative affect (ß =.48, SE= .04, p<0.001) and partner involvement (ß =.18, SE= .08, p<0.05) positively predicted anxiety in pregnant women (See Table 4). The values of VIF ranged between 1.11 and 1.62, suggesting no obvious multicollinearity in the anxiety model.

DISCUSSION

The present study tested mainly whether sexist beliefs among pregnant women predict depression and anxiety. Results showed that depression was predicted by hostile sexism. In addition, depression and anxiety differed regarding the predictors.

Sociodemographic variables, emphasized in the previous research findings, are considered control variables. Therefore, age, education, pregnancy weeks, health issues peculiar to pregnancy, number of living children, and number of fetal losses were entered in the first step of multiple regression models as control variables both in depression and anxiety models. When the first model run with control variables for depression and anxiety is examined, it is seen that only depression is negatively predicted by education level. This result means that depression, but not anxiety, decreases as the level of education increases. When the second model was carried out with the variables whose predictive power was tested in this study in addition to the control variables, it was seen that the predictive variables for depression and anxiety were different again. In the second model, negative affect, partner involvement, and perceived social support significantly predict both depression and anxiety. Whereas negative affect and distress related to a pregnant woman's relationship with the partner increases both depression and anxiety increase; as perceived social support increases, both depression and anxiety decrease. However, there is no common predictive variable other than those three. Instead, in addition to this common triad, hostile sexism significantly predicts depression. On the contrary, low education and health problems related to pregnancy are significant variables in predicting only anxiety levels.

The most important result of the study is that sexist attitudes of pregnant women, particularly hostile sexist beliefs, are related to perinatal depression. Since sexism is an ideology that claims women are inferior, internalizing hostile prejudices toward women affects their mental health. Sexism is the most common form of discrimination that harms almost half of the world's population. Hostile sexism containing microaggressions might reduce females' well-being when internalized. It is shown that exposure to gender discrimination is related to low self-esteem and internalized gender inferiority in different cultures (36).

Several researchers stated that exposure to sexist discrimination harms the mental health of women, Causing adverse effects such as anxiety and depression during the postpartum period (37). Research that studied workplace gender discrimination discovered that it was related to depression, especially among young women (38). Moreover, it is reported

that organizational and interpersonal sexism exposure is associated with depression, anxiety, and stress (39).

Compared to the adverse mental health effects of sexist discrimination exposure, sexism, and mental health are less studied. Researching among a large community sample, it is found that having hostile sexist attitudes predicted depression, anxiety, and stress among women and men (6). Among perinatal fathers, hostile sexism was found to be related to depression (40). However, there are contradicting results saying that anxiety and depression as mental health outcomes were not significantly related to sexism among young women aged between 18 and 25 years (41). Additionally, a mother-daughter study showed no significant relationship between sexism and mental health (3). On the other hand, it is put forward that sexism might moderate the relationship between sexist discrimination exposure and mental health (3). Those differences may be rooted in the complexity of the relationship between sexism and mental health.

While there are insufficient results to make comparisons between sexism and mental health in pregnancy, negative affect, partner involvement, and perceived social support are commonly reported with mental health issues. Also, the results regarding the latter triad are solid. It is known that positive partner involvement and perceived social support are related to mental health positively not only during pregnancy but also in general. Likewise, negative affect is positively correlated to depression and anxiety during pregnancy and in general. Results in this study yielded that both depression and anxiety are consistent with the literature regarding negative affect, partner involvement, and perceived social support.

It is seen many results in the literature regarding sociodemographic variables linked to pregnant mental health, such as age (15,42), education (18,42), pregnancy weeks (43), health issues peculiar to pregnancy (15,18), number of living children (44), and number of fetal losses (45). Findings for anxiety suggest that pregnancy-specific anxiety is higher in earlier pregnancy weeks, those with prior loss, and health issues peculiar to pregnancy (46–48). Also, it is reported mainly that young maternal age and poor education are related to perinatal depression (49,50).

However, results for sociodemographic variables in this study, both in depression and anxiety, are twisted. Among the sociodemographic variables, education has a significant predictive power only in depression. Notwithstanding, for the anxiety model, when entered into the model together with the variables tested in this study, sociodemographic variables of education and health problems related to pregnancy were also found to be significant. This result indicates that sociodemographic variables found to be significant in the literature have predictive power only when other pregnancy-related stressor variables, such as partner involvement, are added. Possible reasons for the skewed result regarding sociodemographic variables may be that previous studies considered the correlation of the variables in question rather than their predictive power or that the variables were included in the regression models one by one instead of a cluster.

It is seen that the variables used in this study as sociodemographic control variables are reported in the literature with WEIRD (White, educated, industrialized, rich, democratic) samples dominantly (51). Hence, this study makes an important contribution to the literature, primarily regarding its application in a predominantly Muslim sample with a low-middle socioeconomic level. Also, one other reason why the results regarding the variables used as control variables, such as age, education, pregnancy weeks, health issues peculiar to pregnancy, number of living children, and number of fetal losses, are not precisely consistent with the literature may be the sample selection. This situation might also be considered as a limitation of the study. In this respect, it is recommended that samples with culturally different characteristics be examined comparatively in future studies.

Health during pregnancy and the infant's health is a public health issue. In this regard, producing information to improve health conditions during pregnancy is important to public health. On the other hand, mental health during pregnancy has been negated for many years (13). In terms of

addressing pregnancy from a mental health perspective, this study is a prominent effort to fill the gap in the literature.

Another significant contribution of this study to the literature is regarding the imaging of intimate partner violence during pregnancy. Pregnancy is depicted as a particularly vulnerable period for intimate partner violence in terms of changes in physical, emotional, social, and economic demands and needs. Additionally, at the same time, this period allows monitoring the violence due to regular contact with healthcare providers (52). Therefore, intimate partner violence was questioned, although it was not the main subject of this study.

The strength of the study is testing sexism's effect on perinatal mental health while controlling for the common factors, including pregnancy distress. Besides, the study uses data from low- and middle-income Muslim countries, which are relatively less studied. Despite its strengths, the study has limitations. The cross-sectional nature of the study limits the interpretation of the results. The study did not use structured scales to measure intimate partner violence, which harms women's mental health across the lifespan. That may result in false negative intimate partner violence responses of the participants. A further limitation of this study is related to the measurement tools. Different measurement tools for sexism exist in the literature (2). In this study, sexism was measured through Glick's conceptualization. This theory does not offer specific explanations for sexism. On the other hand, this is the generally used theory for sexism. In future studies, research designs can be created in which both measurement tools are used together.

The present study shows that among sociodemographic variables, only education predicts both depression and anxiety. However, the significant effect of education is not in the same direction for depression and anxiety. As the level of education increases, depressive symptoms decrease, but anxious symptoms increase. Three common variables predict both depression and anxiety. These are negative affect, partner involvement and perceived social support. Additionally, hostile sexist attitudes of pregnant women are not associated with anxiety but predict perinatal depression among Turkish pregnant women.

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Data availability: The data is available upon reasonable request.

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The relationship between miRNAs and executive functions in patients with obsessive compulsive disorder: An exploratory analysis

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SUMMARY

Objective: Our study aimed to examine the relationship between the cognitive functions of patients with OCD, and the expression levels of 12 miRNAs that regulate glutamate and serotonin gene expressions.

Method: Seventy patients with OCD and 35 age- and educational-matched healthy controls were included in the study. The Tower of London Test (ToL), Wisconsin Card Sorting Test (WCST), Trail Making Test (TMT), Stroop Test (ST), Digit Span Test (DST), and the Verbal Fluency Test (VFT) were performed on the participants. Twelve miRNA expression levels in the venous blood of the participants were detected using real-time polymerase chain reaction.

Results: Abstraction, cognitive flexibility, psychomotor speed, and verbal fluency performances of patients with OCD were significantly worse than the healthy control group ($p<0.05$). miRNA 6740 expression levels were positively associated with ToL-total correct scores in the patients ($p=0.010$) and negatively associated with ST-interference duration in the healthy controls ($p=0.020$).

Discussion: Our study indicates that patients with OCD have impairment of executive function, and miRNA-6740 expression levels may be related to executive functions both in patients with OCD and in general. The underlying mechanisms should be investigated in future studies to better understand the relationship of miRNA-6740-5p with cognitive functions.

Key Words: miR-6740, Obsessive-compulsive disorder, cognition, executive functions, miRNA

INTRODUCTION

Obsessive-compulsive disorder (OCD) is a psychiatric disorder characterized by recurrent obsessions and/or compulsions and significantly affects the social and daily functioning of individuals (1). Twin studies have indicated that familial transmission is observed at a high rate in OCD, and genetic factors play an important role in this; however, epigenetic factors have a complex effect through learning behaviors in the family (2). Considering the efficacy of serotonin receptor inhibitors (SRIs), glutamatergic agents, and dopamine antagonists in the treatment of OCD, studies examining the genetics of OCD focused on candidate gene studies (HTR2A, HTR2C, HTR1B, NTRK3, DLGAP1, GRID2, GRIN2B, GRIN2A HTR2A, SLC6A4, SLC6A3 and SLC1A1 transporter, COMT, and MAOA genes) over serotonin, dopamine, and glutamate neurotransmitters (3). Unfortunately, no single nucleotide gene polymorphism responsible for OCD has been found in genome-wide association studies. Moreover, the results of the studies have been inconsistent (4-6). On the other hand, the disease may have different clinical manifestations, so genetic, environmental, social, and psychological factors are blamed in its etiology, but the roles of these factors in the formation of the disease are not clearly understood (7,8). In this context, it is thought that research should be performed on a number of neurobiologic and neurocognitive parameters beyond symptoms in

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understanding the etiology.

Until now, impairments in neurocognitive functions in some areas have been reported in relation to frontostriatal network abnormalities in OCD (9,10). In one study, it was mentioned that these neurocognitive impairments were of small to medium effect size but had poor diagnostic value for OCD (11). It has been reported that patients with OCD perform worse than healthy controls, especially in cognitive areas such as planning/problem-solving, visual memory, cognitive flexibility, decision-making, inhibition, and psychomotor speed (12), but there may be some different findings in this regard (13,14). In addition, impairment in executive functions such as planning/problem-solving, decision-making, and inhibition is the endophenotype for OCD (15). On the other hand, factors such as disease severity, depression, and medication affect cognitive functions (16), so it is still unclear whether cognitive impairments are specific to OCD. In studies, neurocognitive impairments in OCD have been particularly associated with early-onset (17), familial transmission (18), and symmetry/ordering symptom clusters (19). Executive dysfunction adversely affects daily functioning (20) and the treatment response (21). In several studies, it has been reported that some variants associated with the 5-HTTLPR promoter region of the SLC6A4 gene, which regulates the transport of the serotonin neurotransmitter, which is thought to play an important role in the pathophysiology of OCD, and COMT gene polymorphisms caused worse performance in areas of executive function (22,23).

miRNAs are RNA molecules with a length of 21-24 nucleotides and they are involved in different processes that occur in the central nervous system (CNS) (24). It has been shown that miRNAs play an important role in neurodevelopment, synaptic plasticity, and other physiologic functions with their regulatory functions in the expression of genes (25). miRNA expression changes have been reported in association with cognitive disorders seen in neurodegenerative diseases such as Alzheimer's, Parkinson's, and Huntington's diseases, autism, and schizophrenia (26). Studies have shown that some miRNAs affect protein synthesis, particularly associated with learning and memory functions; miR-124 affects synaptic plasticity, neurogenesis, axonal and dendritic branching (27-29), miR-132 affects synaptic plasticity (30,31), and miR-137 affects neurogenesis and neuronal differentiation (32,33), all of which cause changes in cognitive functions. In the study of Kuswanto, a difference was found in miR-137 risk variants in patients with schizophrenia in attention and processing speed and planning skills (34). In addition, Liu et al. reported a significant relationship between patients with major depression and visual memory and miR-132 (35).

Beyond being among the mechanisms regulating cognitive processes, miRNAs show promise as biomarkers in psychiatric diseases. In a few recent studies, it has been reported that some miRNA expression levels differ in OCD compared to healthy controls (36-38). However, the relationship between miRNAs and cognitive dysfunction in OCD is still unknown. Our study aimed to examine the relationship between the cognitive functions of patients with OCD and the expression levels of 12 microRNAs that regulate glutamate and serotonin gene expressions.

METHODS

Our study was designed as a branch of our project study (Project No: 2018/087) entitled “Expression of MicroRNAs in Patients with OCD and its Relationship with Resistance to Treatment” (38). Our sample was selected from patients who were diagnosed as having OCD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnostic criteria, and a healthy control group was included in the project study. Participants who met the inclusion criteria and volunteered for the study were included. Patients were not receiving any previous treatment or had not been taking medication for at least 1 month. In our study, OCD patients were selected using purposive sampling from individuals seeking treatment at the outpatient clinic. The control group was chosen through snowball sampling among hospital staff who self-reported no history of psychiatric or physical illnesses. Exclusion criteria of patients from the study were as follows: (i) Not being aged 18-60 years; (ii) having intellectual

disability, psychotic disorder, bipolar disorder, dementia according to the DSM-5 diagnostic criteria ii) not having at least primary school graduate; (iii) scoring 14 or higher from the HDRS or having moderate-to-severe major depressive disorder; (iv) history of alcohol and/or drug abuse or dependence; (v) risk of active suicide; (vi) psychical diseases (such as neurologic diseases, cancer, cardiovascular diseases, and diabetes mellitus). Accordingly, 70 patients with OCD and 35 age- and educational-matched healthy controls with no psychical or psychiatric disease were included in the study.

A sociodemographic data form, the 17-item Hamilton Depression Scale (HDRS) (39), Yale-Brown Obsession Compulsion Scale (YBOCS) (40), and structured interview form for DSM-5 Disorders (SCID-5-CV) (41) were used. Afterward, the Tower of London (ToL) test, Wisconsin Card Sorting Test (WCST), Trail Making Test (TMT), Stroop Test (ST), Digit Span Test (DST), and Verbal Fluency Test (VFT) were administered to each participant by the same neuropsychologist (Table 1).

Among the patients with OCD, 17 patients had no psychiatric comorbidities; 53 patients had at least one psychiatric comorbidity (mild depression n=13, agoraphobia n=11, generalized anxiety disorder n=9, hoarding disorder n=9, unspecified anxiety disorder n=9, social anxiety disorder n=8, adult separation anxiety disorder n=7, specific phobia n=6, dysthymia n=4, eating disorder n=3, skin picking disorder n=3, trichotillomania n=2, posttraumatic stress disorder n=2, and illness anxiety disorder n=2). After explaining the purpose and design of the study, informed consent was obtained from the participants. The study was approved by the ethics committee of University of Health Sciences, Şişli Hamidiye Etfal Teaching and Research Hospital.

Genetic Analyses

miRNA Selection Process

Twelve miRNAs that were previously shown to regulate glutamate and serotonin gene regions in the relevant references were selected. miR 26a-5p specific to the SLC1A1 gene (48), miR 374b-3p (49), miR 21-3p specific to the DLGAP1 gene (50), miR 6740-5p specific to the GRID2 gene (51), miR 219a-1-3p specific to the GRİN2B gene (52), miR 320a specific to the GRİN2A gene (53), miR 106b-5p specific to the HTR2A gene (54) and miR 1296b-5p (55), SLC6A4 gene-specific miR A total of 12 miRNAs were selected: 16b-5p (56) and miR 135a-5p (57), HTR2C gene-specific miR 22-3p (58), HTR1B gene-specific miR 96b-5p (59). The following websites (http:/mirtarbase.cuhk.edu.cn and http://mirdb.org/) were also used in selecting 12 miRNAs (miR 26a-5p, miR 374b-3p, miR 21-3p, miR 6740-5p, 219a-1-3p, miR 320a, miR 106b-5p, miR 129-6b5p, miR 16b-5p, miR 135a-5p, miR 22-3p, and miR 96b-5p).

Sample Collection and MicroRNA Expression Method

It includes the stages of RNA isolation, measurement of the concentration of isolated RNA, synthesis of cDNA and RT-PCR analysis. The blood samples were centrifugated to isolated serum for 5 minutes at 4500 rpm (Allegra® X-30 Series Benchtop Centrifuges, Beckman Coulter, California, USA). A RNeasy mini kits (Qiagen, Hilden, Germany) was practiced for total RNA isolation from this serum. Spectrophotometer (NanoDrop 2000/2000c Spectrophotometer, Waltham, MA, USA) was used to valuate the purities and concentrations of the isolated RNA. cDNAs were made by the reverse transcriptase method using miRNA-specific primers. RNAs converted into cDNA acquired fluorescence properties with the SYBR Green. Real-

Table 1. Neuropsychological test battery and cognitive domain.

Executive Functions	Cognitive domain
Digit Span Test (DST) (42,43)	Attention, working memory
Stroop Test (ST) (44)	Response inhibition, resistance to interference
Trail Making Test (TMT) (45)	Sustained attention, set shifting
Verbal Fluency Test (VFT)	Attention, sustained attention, vocabulary skill scanning ability
Wisconsin Card Sorting Test (WCST) (46)	Abstraction, conceptualization
Tower of London Test (ToLT) (47)	Planning, problem solving

Table 2. Sociodemographic characteristics of the participants

	OCD(n=70)	HC (n=35)	F, t, x†	p values
Age (yr)	28–10	29.1–7.4	0.591	0.556
Sex (Female), n (%)	47(67.1)	22(62.8)	0.19	0.663
Education (yr)	11.5–3.4	11.6–2.6	0.236	0.814
Onset	18.8–8.9	-		
Duration of disorder(years)	9.1–7.4			
YBOCS	26.1–4.7	-		
Comorbidity, n (%)	53 (75.7)			

Abbreviation: HC:Healthy control;OCD:Obsessive-compulsive disorder; YBOCS:Yale Brown Obsession Compulsion Scale.

time polymerase chain reaction (RT-PCR) was used to assess miRNA expression level. RNU6 was utilized as housekeeping gene for correct appraisal. The relative expression of miRNAs was accounted with the standard delta Ct calculation method.

Statistical Analysis

The statistical analysis was performed using the SPSS 20.0 for Windows program. Mean and standard deviation for numeric variables and numbers and percentages for categorical variables were specified. Pearson's Chi-square test was analyzed divergence between categorical variables in two groups. Logarithmic transformation was provided for variables that did not meet normal distribution conditions. Neuropsychological tests of patient and control groups were compared applying analysis of covariance (ANCOVA) by fixing age and education. The relationship between the miRNA expression levels of the participants and their neuropsychological tests was examined using partial correlation analysis by fixing the variables of education and age. For the patients, the models including neurocognitive tests as the dependent variable, miRNA expression levels, comorbidity, education, and disease duration and severity as independent variables were created and tested with linear regression analysis. For the healthy control group, models including neurocognitive tests as dependent variables, miRNA expression levels, age, education levels, and body mass index (BMI) as independent variables were created and tested using linear regression analysis. The statistical alpha significance level was counted as $p<0.05$.

RESULTS

Sample

There was no significant difference between the patient and control groups in terms of age, sex, and educational status ($p>0.05$). The mean age of onset of the disease was 18.8±8.9 years, the duration of the disease was 9.1±7.4 years, and the mean YBOCS total score was 16.1±4.7 years (Table 2).

Neurocognitive Tests

In the ANCOVA analysis made by fixing age and educational status, the number of WCST-completed categories and conceptual level responses were statistically less in patients with OCD compared

Table 3. Comparison of executive functions of OCD patients and control groups

	OCD (n=70)	HC (n=35)	*F*[a]	p values	partial n2
WCST					
Number of completed category	5.3–3	7.1–2.6	19.266	<0.001	0.158
Percentage of perseverative error	20–11.7	14–7.2	17.399	<0.001	0.143
Failures to maintain set	1.3–1.3	0.9–0.9	3.064	0.083	0.029
Conceptual level responses	0.7–1	0.7–0.2	13.243	<0.001	0.115
TMT					
TMT-A (sec)	43.9–19.4	36.9–15.8	4.681	0.033	0.044
TMT-B (sec)	87.6–36.5	71.1–25.3	7.968	0.006	0.073
TMT B-A (interference)	44.5–26.1	33.8–19.6	4.877	0.03	0.046
ToL					
Total correct score	3–2	3.7–2	2.035	0.157	0.019
Total move score	34.7–17.3	42.2–19.1	3.691	0.058	0.035
Initiation time, sec	36–19	41.5–20	1.628	0.205	0.016
Total application times, sec	226.9–100.2	173.1–62.4	8.312	0.005	0.076
Total time violations, sec	0.7–1.2	0.2–0.4	4.275	0.041	0.04
VFT					
Semantic and phonetic fluency	20.4–5.4	23.1–5.4	5.152	0.025	0.049
Phonetic fluency[b]	36.1–11.1	43.2–16.2	5.435	0.022	0.051
ST					
Interference time (sec)	42.2–18.1	35.6–16.7	3.781	0.055	0.036
DST					
Forward	6.1–1.2	6.3–1.1	2.185	0.142	0.021
Backward	4.1–1.1	4.3–1.4	2.914	0.091	0.028

[a]ANCOVA analysis was performed by fixing age and educational status.
[b] Logarithmic conversion is provided.

Abbreviation: DST: Digit Span Test; HC:Healthy control; OCD: Obsessive-compulsive disorder; ST: Stroop Test; TMT: Trail making test; ToL : Tower of London Test; VFT : Verbal Fluency Test; WCST: Wisconsin Card Sorting Test.

with the control group, and the percentage of perseverative errors was significantly higher ($p<0.001$). The total application times ($p=0.005$) and total time violations ($p=0.041$) in the ToL were statistically higher in the patient group than in the control group, but there was no significant difference in the total correct scores, initiation times, and move scores ($p>0.05$). The TMT A, B, and interference times of the patient group were significantly longer than the control group ($p=0.033$, $p=0.03$, and $p=0.006$, respectively). The semantic and phonetic fluency of the patient group was significantly lower than the control group ($p=0.025$ and $p=0.022$, respectively). The ST-interference times of the patient were longer than the control group and were in a statistically significant trend ($p=0.055$). There was no statistically significant difference between the forward and backward DST of the patient group compared with the control group ($p>0.05$) (Table 3).

Relationship Between miRNA Expression Levels and Cognitive Functions

In the partial correlation analysis performed by fixing the educational status, age, and BMI variables in patients with OCD, there was a significant negative correlation between semantic fluency and miR-26 and miR-22 expression levels ($r=0.247$, $r=0.288$, $p=0.045$, $p=0.019$, respectively). There was a significant positive correlation between miR-6740 and ToL-total correct scores ($r=0.307$; $p=0.010$), and there was a significant negative correlation ($r=-0.260$; $p=0.030$) with the total move scores. There was no significant correlation between the other miRNA expression levels and neurocognitive tests ($p>0.05$). When the correlations between the miRNA expression levels of the healthy control group and cognitive tests were examined, there were positive significant correlations between miR-6740 and, DST-Forward ($r=0.430$, $p=0.010$) and

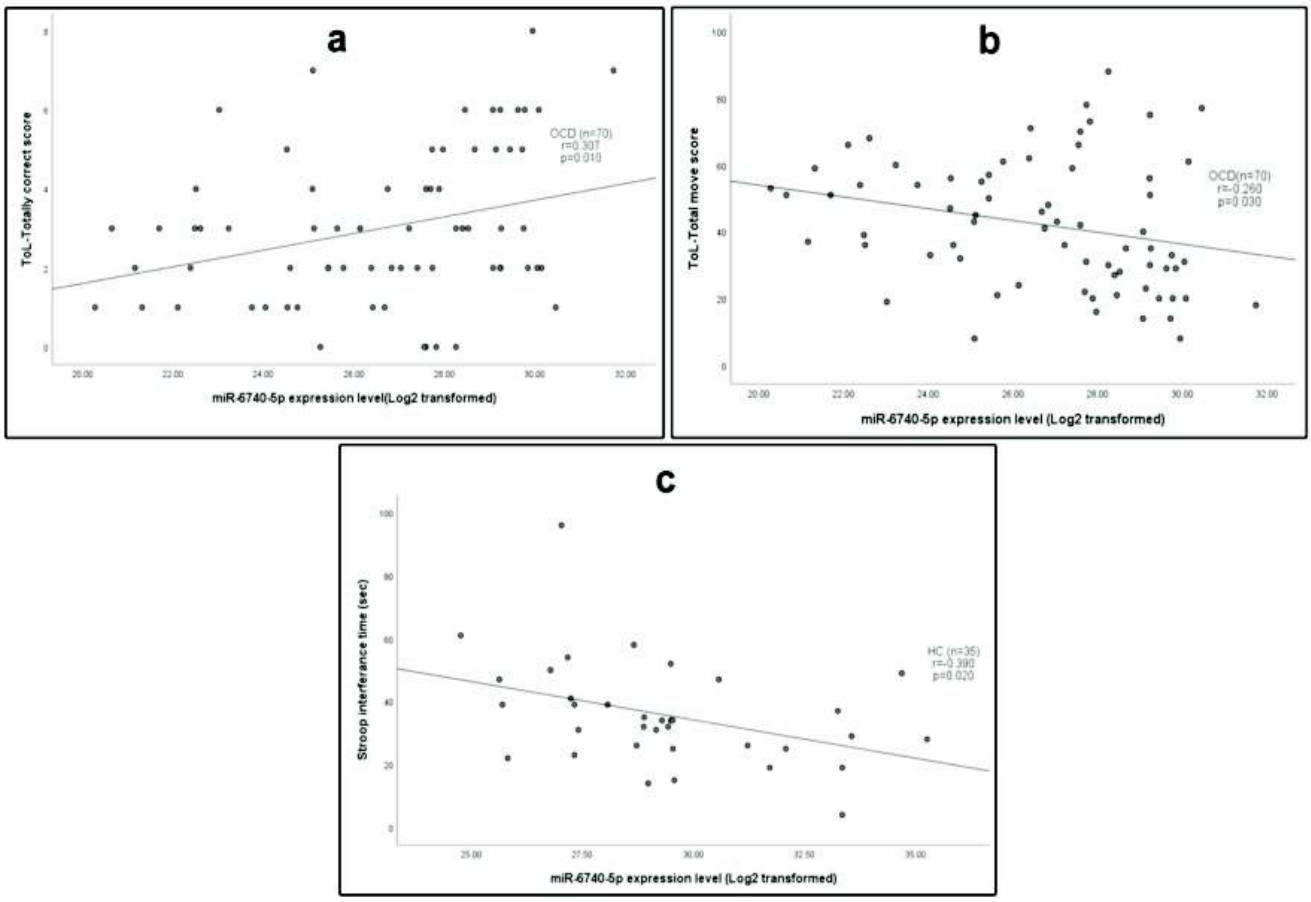

Figure 1 a,b,c. The correlation between miR-6740-5p expression levels and executive functions of participants. a) The correlation between miR-6740-5p expression levels and ToL- Total correct score of OCD patients. b) The correlation between miR-6740-5p expression levels and ToL-Total move score of patients with OCD. c) The correlation between miR-6740-5p expression levels and Stroop-interferance time of healthy controls. HC; healthy control; OCD: obsessive compulsive disorder; ToL: Tower of London test.

negative significant correlations between miR-6740 and ST-interference times (r= -0.390, p=0.020). TMT-interference time with miR-320 (r=0.403, p=0.016), ToL-application time with miR-16 (r=0.385, p=0.023), and ToL-initiation time with miR-1296 (r=0.350, p=0.039) had positive significant correlations.

Considering the significant correlations between patients' miRNAs and cognitive tests, models were created with the other variables. When variables such as education level, YBOCS score, disease duration, and comorbidity were controlled as independent variables, there was a significant association between miR-6740 expression levels (beta=0.329, t=2.732, p=0.008) and ToL-total correct scores being the dependent variable (R2=0.173, F=2.672, df=5, p=0.030). However, the model was not found significant in the further analysis where semantic fluency test scores were determined as dependent variables, and miR-22, miR-26, years of education, YBOCS score, and disease duration as independent variables (R2=0.042, F=1.433 df=7, p=0.209) (Figure 1a,1b).

There was a negative significant association between ST-interference duration and miR-6740 expression levels (beta=-0.289, t=-2.193, p=0.036) in the healthy control group when age, education level, and BMI were fixed as independent variables (R2=0.499, F=7.471, df=4, p<0.001). According to the linear regression analysis, no significant patterns were found between the other miRNA expression levels and cognitive tests (p>0.05) (Figure 1c).

DISCUSSION

In our study, we conducted an exploratory analysis comparing patients with OCD to a healthy control group in terms of cognitive functions and examined the relationship between miRNA expression levels and cognitive functions; this is the first of its kind in the literature. According to our findings, abstraction, cognitive flexibility, psychomotor speed, and verbal fluency performances of patients with OCD were significantly worse than those of the healthy control group, while there was no significant difference in planning/problem-solving skills, inhibition, attention, and working memory. In addition, miRNA 6740 expression levels of patients were positively associated with ToL-total correct scores and negatively correlated with ToL-total move scores. In the healthy control group, miRNA 6740-5p expression levels and ST-interference duration were negatively and significantly related.

OCD is a disease accompanied by rigid rituals and repetitive behaviors, and, based on this phenomenologic observation, it has been suggested that the ability of patients to change their behavior situationally, that is, their behavioral flexibility, may be reduced (60,61). In many neuropsychological studies, in which authors evaluated cognitive flexibility with TMT and WCST, perseverative error percentages, in particular, were significantly higher in patients with OCD (62-65). Similar to our study, TMT and WCST test performances of patients with OCD were worse than in healthy controls, and the percentage of perseverative errors was significantly higher. Recent studies revealed that although it has not yet been proven that it is a feature specific to OCD, there may be impairment in many cognitive areas such as executive functions, psychomotor speed, and verbal fluency in OCD (12-14).

In a meta-analysis study, it was reported that impairments in visual memory and planning skills had a great effect size, and impairments in cognitive flexibility, inhibition, verbal fluency, and psychomotor speed had a small-to-medium effect size (12). In our study, when age and educational status were fixed in patients with OCD, abstraction, cognitive flexibility, verbal fluency, and psychomotor speed impairments were prominent in the executive functions. In terms of planning skills, patients with OCD had similar performance in the ToL with the healthy control group, but the patients took longer to complete the test. In addition, in meta-analysis studies, planning skills were examined with various tests such as the Tower of Hanoi/ToL, and it was reported that patients with OCD had impaired planning skills with medium-to-large effect size (12,14).

Similar to our study, some studies reported that

patients with OCD had similar planning skills to the healthy control group (66-69) , but they took longer to initiate and perform their moves (67). In other words, it shows that OCD patients need more time to plan/problem-solve rather than having impairment in their planning/problem-solving skills. This can be interpreted as patients with OCD being unsure of the move they will make, they check frequently, and they may show obsessive slowness. On the other hand, the diversity in neuropsychological findings may be highly related to the heterogeneous appearance of patients with OCD. Studies reported that factors such as the presence of comorbidity, obsessive beliefs, drug use, and disease severity affect cognitive performance (16, 69). Although patients with moderate-to-severe depression were excluded from our study, considering that they might adversely affect cognitive tests, the results of our study may have been affected by other comorbidities because we did not include only patients with pure OCD.

Our other important finding was that as miR-6740 expression levels increase in patients with OCD, problem-solving skills increase when independent variables such as education level, disease severity and duration, and comorbidity are controlled. In the healthy control group, when the expression levels of miR-6740 increase and independent variables such as age, education year, and BMI are fixed, inhibition ability increases. In our previous study, miR-6740-5p expression levels were found to be significantly different in patients with OCD compared with the healthy control group (38). Based on current findings, it is difficult to say that miR-6740-5p's association with cognitive functions is specific to OCD. In other words, it can be said that miRNA-6740-5p expression levels are significantly related to executive functions in both patients with OCD and healthy controls.

In recent studies, the effects of some miRNAs on neurodegenerative processes, cerebrovascular disease, aging, and cognitive functions have been mentioned (26). In particular, some miRNAs have effects on synaptic plasticity, neuronal development, and neuronal morphology via LTP, where they are expressed in the hippocampus and prefrontal cortex in the CNS (70). Cognitive impairments in neurodegenerative diseases such as Alzheimer's (71, 72), Parkinson's (73), and Huntington's disease (74), and schizophrenia (75) may be affected by some miRNAs, but our knowledge on this subject is still limited. In a study, it was determined that miR-6740-5p regulated glutamate receptor subunits (GRIA2, GRID2) and GABA receptor subunit (GABRG1, GABRA4, GABRB2) genes, and miR-6740 variants might be associated with nicotine addiction (76).

The gluA2 receptor, which is AMPA type from the glutamate ionotropic receptor family, is encoded in the GRIA2 gene and the delta type GluD2 receptor is encoded in the GRID2 gene. Although it is known that each glutamate receptor plays a specific role in glutamate release, it also has effects on NMDA receptors, whose role is well-known in the etiology of some psychiatric diseases. Glutamate is the main neurotransmitter involved in functions of the brain such as memory, perception, and cognition (77). It has been indicated that miR-132 plays a role in synaptic plasticity by regulating BDNF, AMPA, and NMDA-type glutamate receptor genes and is overexpressed in the hippocampal region, thus being associated with cognitive functions such as memory (31).

In a study, visual memory impairment was associated with increased miRNA-132 expression levels in patients with depression (35). On the other hand, the exact relationship of miR-6740-5p with the CNS is not known yet and there is no study revealing its relationship with cognitive functions. However, in a study with a large sample, 21 miRNAs were detected, including miRNA-6740-5p, which is expressed at different levels in patients with Alzheimer's than in healthy controls (60). In a recent study, it was reported that miR-6740-5p was particularly associated with endothelial dysfunction, the development of atherosclerotic plaques, and cardiovascular diseases (78). In our study, we analyzed 12 miRNAs along with multiple neuropsychological tests. However, we did not apply statistical corrections for multiple comparisons, such as Bonferroni or FDR, which may have increased the risk of false positives. Therefore, our findings regarding miR-6740-5p should be interpreted as exploratory and require validation through larger, confirmatory studies to establish their reliability and significance. Considering these findings, further studies are

essential to clarify the mechanisms through which miR-6740-5p might influence cognitive functions and its broader role within the CNS.

Our study had some limitations. First, the relationship of only a limited number of miRNAs with some cognitive domains could be examined. To reveal this relationship more clearly, a study involving more miRNAs and all cognitive domains should be conducted. Secondly, given the high rate of comorbidity typically observed in OCD, anxiety, and depressive disorders, our study included a heterogeneous OCD group, which may have influenced the results. Notably, 75% of OCD patients had comorbid psychiatric disorders, while the control group had none. Considering that depression, anxiety, and PTSD are independently known to impact executive functions and gene expression, this raises uncertainty regarding the specificity of our findings to OCD. Thirdly, in our study, a 2:1 ratio was used between OCD patients and healthy controls (70 OCD vs. 35 controls). This ratio has the potential to reduce statistical power and increase group imbalances. A more balanced 1:1 ratio could have enhanced the robustness and generalizability of the findings. Therefore, the imbalance in the patient-control ratio should be acknowledged as a limitation of our study, and an equal distribution should be considered in future studies. The effects of sex on miRNA expression and executive functions were not controlled in our study, which is a limitation. Sex hormones, such as estrogens and androgens, are known to influence miRNA expression, potentially affecting neurocognitive processes. Future studies should consider controlling for sex to clarify these effects. The absence of SCID-5-CV for the control group raises the possibility of undiagnosed OCD traits or subclinical anxiety/depression, which should be acknowledged as a limitation of our study. Lastly, the mechanisms by which miRNA-6740 expression levels are related to executive functions or through which gene regulation was not examined in our study, which limits the understanding of the cause-effect relationship.

In conclusion, the performance of patients with OCD in cognitive areas such as abstraction, cognitive flexibility, verbal fluency, and psychomotor speed was significantly worse than in healthy controls. Moreover, as miRNA-6740 expression levels increased, planning/problem-solving skills increased in patients with OCD and there was an increase in motor inhibition in the healthy control group. Accordingly, it can be said that miRNA-6740 expression levels may be related to executive functions in general. In future studies, the underlying mechanisms should be investigated to better understand the relationship of miRNA-6740-5p with cognitive function.

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Why psychoanalysis failed to embrace dialectics: Pathways for progressive change through implicit psychotherapy - Part I

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SUMMARY

Authorities have openly acknowledged the worsening of mental health in the society, despite subtantial investments in the field. Throughout the past century, clinicians and theorists have made various efforts to question and refine traditional approachs to healing. However, as seen in the sphere of ideological movements, these efforts ultimately led to a fragmentated psychotherapeutic landscape and an incoherent narrative of biological psychiatry and neuroscience. This essay explores a generalized approach to psychotherapy that interveawes psychoanalitic thought, philosophy, power dynamics, psychotraumatology, and contemporary popular culture. The author emphasizes philosophical foundations, particularly Hegelian dialectics, as a means of driving change not only in society but also individual experience. The manuscript delves into implicit and immediate factors within psychotherapy, framing estrangement to oneself and the environment as a core psychopathological issue. Dialectical Dynamic Therapy (DDT) is proposed as a comprehensive framework designed to foster emancipatory movements. It functions in conjunction with Implicit Psychotherapy which directly engages the symbolic network of mental apparatus to minimize resistances, utilizing this approach as its core communication technique. Considering interpersonal and societal interference as a security threat to the essence of the individual, subtle encryption of communication between patient and therapist plays a crucial role in safety of the interaction. A novel model of mind is formulated which is suitable to address the concept of digital brain. Dialectical Discourse, as proposed and outlined in this paper, serves as the fundamental basis of this approach aimed at healing to the greatest extent possible while carrying the ethical and professional responsibility and accountability about the clinical outcome.

Key Words: Psychotherapy, Dynamic, Trauma, Dialectic, Ideology

Dedicated to my late wife, Psychiatrist İlknur Özütemiz-Şar, MD, with heartfelt gratitude, love, and respect

A recent article in The New Yorker titled "When Philosophers Become Therapists" discusses how the philosophical-counseling movement aims to bring deep, logical insights into everyday life (1). As exciting as it may be, this awakening reminds a fact, long ignored in the market of therapies: The role of a healer extends far beyond counseling or simply imparting knowledge to a client. Indeed, the gown of healer entails a profound sense of responsibility, demanding an intimate level of engagement, cheek by jowl with the suffering individual. Strangely enough, at times, the process may require even acting as a de facto proxy for the patient, to deal with an unyielding rock made up of multiple elements or, sometimes, a one-element diamond to be polished until the essence shines through. As Carl Gustav Jung stated: "People will do anything, no matter how absurd, in order to avoid facing their own soul", because, "the most terrifying thing is to accept oneself completely".

This observation strongly resonates with the author's extensive experience as a psychiatrist providing second opinions on complex, allegedly treatment-resistant clinical cases. Many of these patients present with polymorphic symptoms fitting several co-existing psychiatric diagnoses across seemingly unrelated psychopathological domains, challenging the medical principle of Occam's Razor. This fundamental rule of classification, to prevent redundancy in classification of diseases, advocates for assigning each clinical condition to its

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specific category, and not to re-cluster their elements somewhere else based on a presumed shared factor. Ironically, the outcome of this rule in real life may be the exact opposite what is intended. Namely, nosological fragmentation presenting with multiple diagnoses within a single individual precisely signifies the existence of such a common denominator. This confounding factor is the inner dividedness, which is linked to a reality strategically important in psychotherapy: Developmental (complex) traumatization initiated within the close environment early in life when the child has no choice but to submit and survive (2-4).

Potentially indicative of a broader activation of pathological genes triggered by multi-faceted epigenetic stress, this polimorphic clinical presentation epitomizes a quintessential form of a psychosocial fact which can be best described as enslavement. This ongoing status permeates one's identity and perpetuates a cycle of lifelong (re)-victimization. These unresolved patients consist of individuals who are simply little understood, both by clinicians and themselves, despite their astonishing capability to articulate extraordinary human conditions. Unable to embed their status in a common language, these individuals, sometimes victims of a rather subtle type of suboptimal childrearing such as emotional neglect or lack of healthy mirroring leading to disturbances of attachment, become subservient to a professional discipline which operates behind the pretense of mastery yet remains inherently little understood itself. Caught in the grip of an inner turmoil or, alternatively, feeling "comfortably numb" (as referenced in Pink Floyd's "The Wall", 1979), the statues of these patients make it clear that adopting a fresh approach to their treatment is not only a professional challenge but also an ethical imperative.

In these misguided therapeutic processes, clinicians' own ignorances should also be factored in the equation, regardless of whether the treatment approach is biological or psychosocial. From a psychotherapeutic perspective, which is the main focus of this two-part essay, prior treatment attempts often exhibit a pattern of bilateral avoidance, extending to quasi-applications of various modalities, even ambitiously dedicated interventions including psychoanalytic efforts! Spanning all age groups from children to middle-aged adults, their previous therapeutic journeys tragically devolved into a rebellious game of hide and seek. This dynamic is humorously illustrated in a cartoon featuring a patient with multiple personalities (today's dissociative identity disorder) who defiantly declares: "You may analyze them, but never me."

The fragmented landscape of psychotherapy: A matter of discourse?

Clinicians without a guiding philosophy often deliver interventions that feel unsubstantial either. Nevertheless, any scientific paradigm must simplify reality, leaving out certain aspects of truth. This aligns Eric Kandel's idea of reductionism in art and brain science which emphasizes narrowing focus to stimulate compensatory, creative responses in the human brain (5). Following this idea, to define a generic psychotherapy style, the author recommends a stepwise method of establishing positions across five essential dimensions. One must begin with a foundational world view. In a good-faith reconciliation with the principle of reductionism, this should be followed by a theory, model, methods, and finally, (proper!) application (6). While crafting a cohesive blend from these components, akin to selecting options from a Chinese restaurant menu, the ultimate test of fidelity to truth is about the application summarized by the information technology (IT)-inspired question: "Is What You Do What You Believe You Do (IWYDWYBYD)?"

Beyond expertice, the sincerity of any therapeutic intervention hinges on a fundamental question: Is there a genuine desire for change, or even, healing? And does the psychotherapist truly believe in the possibility of achieving that change, and especially, by their own efforts? When shifting the desire of change from the client to the psychotherapist, French psychiatrist and psychoanalyst Jacques Lacan (7) appears to disregard his own critique of humanity's greatest betrayal (8): "For centuries, knowledge has been pursued as a defense against truth". How, then, can one trust the sincerity of the subject supposed to know? In a world dominated by the Master's Discourse (or Capitalist's Discourse, as he framed in a slightly tweaked version), Lacan argued against allowing the master's

reality to replace truth, a pattern often seen in Academic Discourse (9). However, in the author's view, this critique also applies to Analyst's Discourse, as it ultimately questions the subject's reality but does not enjoy theirs's to be challenged by the subject. Lacan's eventual disillusionment about the very existence of science led him to conclude that a truly scientific attitude involves perpetual questioning. He associated this quality with the Hysterical (today's Dissociative) Discourse, where the subject divides themselves to challenge proposed reality.

Anecdotally, the first standardized case series of dissociative identity disorder (DID) among Turkish patients, a group of developmentally traumatized patients previously unrecognized as such (10), got a letter to the editor (11) from a North American expert, stating: "Therefore, it is possible, that the patients in their study had not been misdiagnosed by their previous psychiatrists but that DID appeared only as a consequence of the diagnostic interview conducted by the authors". Authors' reply was somewhat naively concluded: "Clinicians should never be afraid of asking questions to their patients" (12). Extending this principle, not only clinicians but also patients should be encouraged to ask questions themselves, an ethos encapsulated in the title of the author's traditional lecture for psychiatry interns, delivered in the "meet the master" format: "Ask whatever you want !"

Turning theory into practice: How to act properly?

The Turkish proverb mere words cannot move the cheese boat underscores the need for action over mere understanding. Indeed, questioning the imposed realities and the (re-) production of knowledge often fall short of altering the status quo. Without empowerment by a force, the ability to translate ideas into action, knowledge remains an untapped potential. The critical question, then, becomes: What is the source of the strength to act?

Lacan, reflecting on the youth uprisings of 1968, was skeptical of the era's idealism either. He warned against the allure of revolutionary aspirations for a total solution, famously stating: "What you aspire to as revolutionaries is a master. You will get one". This warning resonates tragically in the author's country, where the attraction of revolutionary fervor during that period devolved into a fatal reality, resulting both in widespread individual suffering and a collective ideological trauma (13). This trauma, intellectually unresolved, has left a frozen state of societal consciousness, hindering successive generations from crafting truly creative and actionable solutions for the future (E. Yıldızoğlu, PhD, personal communication, September, 2005). In psychotherapy, action should also not be taken literally and generalized to an immediate inter-action between a psychotherapist and patient. The solution begins at a theoretical level.

German Philosopher Hegel (14) posited that self-consciousness emerges not from introspection alone, but through mutual recognition: Awareness of oneself in the awareness of another. However, encounters between two consciousnesses inevitably lead to conflict, as each perceives the other as a threat to their understanding of truth. This struggle leads to the emergence of master and slave positions, determined by one's choice for either to risk life in pursuit of independence (master) or to submit and surrender (slave) in exchange for survival. Mutual (re)-cognition of them throughout this interactive process allows the true (self)-consciousnesses to (re-)form, ultimately enabling transformation and dissolving the hierarchical stances. This occurs, because, both master and slave conceive that their existence is defined by the other. In fact, they are on the same boot.

In psychotherapy, the coexistence of opposites is utilized for transformation within a continuous synthesis. Applying the same principle to a theoretical level, the author proposes the Dialectical (alias Healer's) Discourse (15) as the central mechanism in the therapeutic model of Dialectical Dynamic Therapy (DDT) which is proposed by the author as well (15,16). Paradoxically, this perspective aligns the Master's Discourse with the Hysterical (Dissociative) Discourse, despite Lacan's framing of them fundamentally incompatible. The author's Dialectical Discourse requires harmonizing authority and critique, fostering a collaborative journey toward growth and understanding. As a clinical example, this dynamic is represented in DID by the

persecutory personality states within the same individual. Reverse (self-destructive) attacks on the host personality, often culminating in a nervous breakdown, paradoxically prompts the individual to seek treatment. Over time, these persecutory elements can be transformed into powerful (high-energy) allies within the therapeutic process. While this approach holds transformative potential in post-traumatic dissociative cases, it remains unattainable for the persecutory delusions of psychotic patients, who are similarly driven by these complex dynamics but lack the capacity for such reconciliation.

The opportunity for a dialectical dynamic intervention is not limited to cases of DID (17). For example, the author encapsulated this approach during a desperate moment of a workshop discussion about a melancholic and suicidal patient burdened by the trauma of being the offspring of a prominent Nazi couple involved in constructing concentration camps during the Holocaust, suggesting: “Why don’t we address the problem from within?” In response, psychotherapist and trauma activist Dr. Yael Danieli (personal communication, May, 2013) offered the profound advice: “Be friend of your enemy!”

Master and slave: Enemies or friends?

Master and slave are Siamese twins: None of them can exist without the other. This alignment is an iterative process rather than a final goal, allowing authority and critique to interact dynamically over time, as articulated by a well-known Turkish song: “We walked these roads together“. Instead of striving for a perfect balance, the focus should be on fluidly shifting between the two, allowing authority to take precedence at times, while letting critique lead at others. In a clinical setting, this approach creates a therapeutic space where authority (embodied by the clinician) acknowledges and values the patient’s perspective, even when questioning or disruptive. Alignment emerges through mutual respect rather than dominance, validating critique while maintaining a stable framework. This give-and-take allows both perspectives to evolve, each informing and shaping the other rather than negating one another.

The alignment between two contrasting discourses (Master versus Dissociative) as proposed by the author (The Dialectical alias Healer’s Discourse) creates vitality through ongoing motion, likened to the rhythmical movements of sharks necessary to maintain oxygen flow through their respiratory organs (S. Balaç, BSc., personal communication, September, 2024) for “Stayin’ Alive”, humorously paralleled with the 1977 Bee Gees hit, the British-Australian moving music group emblematic of the disco era. The momentum generated by repetitive movements possesses a nearly physical quality, akin to mass, which supplies the necessary force to confront and challenge the holder of the power (the master, or abuser in the case of maltreatment). Metaphorically compared to billiard balls crashing together, this collision is one of the components at healing of the maltreated individual’s post-traumatic deficiencies (injuries). This represents reclaiming lost or incomplete (damaged) aspects of the victim’s master-identity from (former) abuser (alias “master”) for repair (16), whether the donor (source of trauma) is literally dead or alive.

The clash described is likened to a meteor striking Earth, a catastrophic event that paradoxically leaves behind rare and transformative elements (D.U.Erarslan, MD, personal communication, October, 2024). This imagery draws a parallel to Lars von Trier’s 2011 film, “Melancholia”, which uses the collision of the rough planet Melancholia with Earth as a metaphor for the inner turmoil of an individual. Unfortunately, the undercurrent of inner chaos is often exploited by contemporary politicians, who incite ambiguous external fears to exert control over the masses under the guise of democracy (18-20). This Zeitgeist is captured by blogger Sam Kriss, who shared on social media: "Our entire generation is traumatized by something which has not happened yet". It reflects a collective unease of adolescents and young adults about their future in contemporary society, and an acute awareness of looming uncertainties, whether social, environmental, political, or technological (21).

In this therapeutic exchange, the primary focus is on the patient’s benefit with the aim of (re)-integration of their identity. One aspect of this dynamic the incorporation of the codes provided by the psychotherapist, aimed at repairing the patient’s da-

maged (divided) master identity (16). This is distinct from introjection as a concept in which imported objects are ment to be retained unchanged within oneself. Such introjection can lead to inner conflict and pave the way for external manipulation, the latter often referred to as mind control (22). Unlike in an inured transference-focused and insight-oriented working style, which would challenge both the experience of genuineness and the genuineness of experience, the psychotherapist aids this repair by offering a version of their own art-ificial (replicated) self, akin to an mRNA or virus-based vaccine that requires the DNA of a live host to become active. While seemingly illusory, this operation paradoxically fosters authenticity, much like a restoration that respects the essence of the original without imposing external elements. Instead, the patient recognizes within themselves the psychotherapist's unblemished (pure) master-identity, and the psychotherapist merely validates this recognition. What may seem initially reductionist (5) is, at its core, both genuine and profoundly creative, resembling the Japanese art of kintsugi, where a broken vase is repaired with gold, transforming it into something more valuable and unique than it was originally (G. Ayas, MD, personal communication, September, 2024).

To grasp the duality within the Dialectical (Healer's) Discourse, it is essential to avoid conflating the chessboard with the figure. This type of fragmented interaction aligns with Dutch philosopher Hubert Hermans' (23) dialogical self theory. Inspired by Mihail Bakhtin and William James, this theory views the self as a dynamic, multi-voiced entity shaped by internal and external dialogues. Indeed, a shaman who embodies both leadership and servitude by acknowledging both their own capacity as a healer and those of higher powers (24). The latter is the foundational principle of the 12-step program of Alcoholics Anonymous (AA), widely regarded as the most effective treatment for substance dependency. This is unusual for a traditional medical-surgical or even psychiatric institution, where patients are often regarded as occupying the lowest tier in terms of knowledge and agency. Anecdotally, the author's egalitarian approach to psychiatric inpatients within a hierarchical medical system have left a lasting impression on generations of medical interns, who affectionately referred to them as a "modern-day shaman"!

Clinical "second" opinion: The epistemological break

The consistent failure to develop a general concept like DDT throughout the 20th century appears systematic rather than coincidental, reflecting an epistemological dead-end, where branded therapies inherently prevent the client from becoming a master. This aligns with the fragmented landscape of psychotherapies characteristic of the Zeitgeist (25). Amid such oversupply of diverse brandmarks in a saturated market, the products often fail to deliver on their promises, much less approach any universal truth. As a doctor experienced in dealing with unresolved psychotherapy cases mostly linked to developmental trauma, the author finds parallels to Heinz Kohut's (26) case Mr. Z, a survivor of prepubertal male sexual abuse. This case, referenced in Kohut's significant paper on the successful second analysis of Mr. Z, highlights the lack of integration of psychological trauma into psychoanalytic theory. Notably, Kohut's detachment from the concept of trauma is evident, despite its centrality to Mr. Z's history (p.7): "The relationship to the counsellor appeared indeed to have been a very fulfilling one. Although overt sexual contact between them occurred occasionally-at first mainly kissing and hugging, later also naked closeness with a degree of tenderly undertaken manual and labial mutual caressing of the genitalia-he insisted that sexuality had not been prominent: it was an affectionate relationship."

Psychological trauma often occurs in a condition of power imbalance (27). Factors such as age difference between the abuser and the victim, combined with the victim's existing vulnerabilities -such as a history of emotional neglect- and their fundamental need for human connection, significantly weaken their ability to seek help as a child. The history of psychotherapy offers sporadic insights into addressing power dynamics within psychotherapy, unfortunately, without a lasting impact on the mainstream. Early efforts, such as Sandor Ferenczi's mutual analysis with his patient Elizabeth Severn, which ultimately earned him the label "Evil Genius of Psychoanalysis" (28,29), high-

lighted these concerns, which later resurfaced in psychoanalytic studies on intersubjectivity (30).

Winnicott (31) further challenged psychoanalysis's traditional abstinence rule through bold experiments in psychotherapy. The intersubjective school of psychoanalysis shifted the focus to the interaction between psychotherapist and patient (32), paving the way to re-introduction of intensive psychotherapy for complex conditions in psychiatry. Kohut also contributed to the understanding of intersubjectivity during a period when psychoanalysis prioritized anonymity and neutrality. Unlike Kohut, however, Winnicott and other object-relations theorists, much like Ferenczi, were more open to exploring direct effects of childhood trauma such as fragmentation of consciousness, nevertheless, without making a link to earlier studies on dissociation.

In concordance with the spirit of the anti-psychiatry era, echoing Ferenczi, Maxwell Jones' (33) developed the concept therapeutic community aimed to involve patients as psychotherapists within a democratic framework. The author participated in a unique local experiment of this nature, conducted by the late Professor Metin Özek and his then-assistant, later Professor Metin Başoğlu, at Istanbul Medical Faculty Hospital, Turkey, during their medical-student years in the mid-1970's. This experiment came to an end due to external factors during the oppressive transformations in the country following the 1980 coup d'état. A new constitution was introduced, abolishing the unlimited administrative autonomy and the liberal intramural structures of academic institutions, ironically, a freedom initially granted by another coup d'état two decades earlier. Paradoxically, these forceful transformations in the socio-political sphere coincided with a thrust toward economic liberalism, such as the introduction of monetary convertibility.

These abrupt and far-reaching social, economic, and cultural transformations, propelled by the rising globalism, impacted an unprepared community and manifested in individual lives through various expressions including heightened consumerism and the relaxation of sexual taboos. While such openings clashed with existing norms of preservation, paradoxically, the centralization of government authority led to an (over-)controlling system disguised as (over-) protection of urgent national interests in a country permanently living at the edge of economic collapse, ultimately stifling the autonomy of institutions vital for fostering creativity. This result was glorification of "mediocrity everywhere", as Mr. Salieri lamented in the final scene of Milos Forman's 1984 Oscar-winning masterpiece "Amadeus". Set within a mental asylum before the advent of antipsychotic medications, the scene portrays the court composer bestowing his blessing upon the alienated inmates, declaring, "I absolve you", subtly exempting the outliers for any sin of being ordinary.

Challenging the status quo: The dominance of power

Jacques Lacan's four discourses explain how power, knowledge, desire, and truth interact within psychoanalytic, social, and symbolic frameworks. Master's Discourse focuses on authority and control, asserting power over others. University Discourse positions knowledge as dominant, using it to legitimize authority. Here, knowledge serves as a tool of power, often leading to a normalization process where subjects are molded according to institutional standards. This discourse reflects the way systems like academia or bureaucracy operate, prioritizing knowledge and status over individual subjectivity. Analyst's Discourse centers on internal dynamics emphasizing listening and allowing the subject to articulate their own desires, fears, and realities. The analyst serves as a mirror, leading the subject to encounter and work through their unconscious content. Hysteric's (dissociative, in today's terminology) Discourse represents the divided subject, who continually questions, challenges, or provokes and tests the authority, aiming to uncover the truth or expose contradictions. This discourse is driven by a desire for knowledge and identity, yet it also resists stable answers, leading to ongoing dissatisfaction and tension.

In Lacanian context, to hystericize means to challenge established knowledge or the authority of the master by exposing contradictions and fostering self-questioning. This process destabilizes fixed

structures and creates a space for transformation. For the individual, hystericization often involves a search for meaning and validation, bringing hidden needs, uncertainties, and relational dynamics to the surface. When the psychotherapist "hystericizes" the patient, it encourages articulation of internal conflicts, making unspoken issues more accessible. This approach helps uncover underlying problems, enhances self-awareness, and enables the patient to reevaluate their relationships and desires in transformative ways.

In linguistics and semiotics, Ferdinand de Saussure's concept of the signifier (the physical form of a sign, such as a word, sound, or image) and the signified, (the concept it represents) together form a sign, the basic unit of meaning. The signifier is the "sound image" (the actual spoken or written word) while the signified is the concept (the mental image or idea associated with that word). In psychoanalysis, especially in Lacanian theory, signifiers take on a dynamic role, functioning outside conscious awareness and deriving meaning through their relationship with other signifiers in a network. This fluid interplay underscores the ambiguity of language and meaning, suggesting that identity and meaning are not fixed but are continually reshaped by the shifting relationships among signifiers.

The author believes that healing in psychotherapy requires more than simply questioning (hystericizing) a patient's master signifiers within the Analyst's Discourse (7). To address the power paradox, the psychotherapist must dialectically reverse the roles within the Master's Discourse, allowing their own internalized and let the master signifiers to be challenged, which have been formed through prior training and have become entrenched mindsets. While doing this, the psychotherapist must maintain their position of authority (master) due to their responsibility, accountability, and expertise, acknowledging the inherently asymmetric nature of the therapeutic relationship. This is the Dialectical (Healer's) Discourse as the author proposes and outlines in the next section of this paper. It is the fundamental basis of DDT which is aimed at healing and repair as much as possible.

Unlike Karl Marx, who adapted Hegelian dialectics to history - albeit by inverting it from idealism to materialism- and unlike the behavioral tradition as a form of parameterized treatment for severe conditions not suited for couch therapy (e.g. Linehan's Dialectical Behavior Therapy, DBT) (34), the psychodynamic tradition has not shown an explicit interest in adopting the ancient concept of dialectics. German psychologist and psychoanalyst Gottfried Fischer's Psychodynamic-dialectic Psychotherapy (PdP) remains an exceptional attempt which blends elements of behavioral therapy with a psychodynamically guided conception of cases. His Multidimensional Psychodynamic Trauma Therapy (MPTT) (35) did not create an echo in mainstream psychoanalysis either. Fischer's documentation system for Psychotherapy and the Treatment of Traumas (KÖDOPS) remains also as one of the first examples of its sort.

Preserving the self-identity and the Dialectical (Healer's) Discourse

In a 2016 press speech, the CEO of a leading mobile communications company reflected on their failure to maintain market leadership: "We didn't do anything wrong, but somehow, we lost", highlighting the irony of the company's slogan "get connected", a promise that ultimately failed to resonate with their customers. This sentiment echoes business professor L.C.Megginson's 1963 observation, often misattributed to Darwin: "It is not the strongest or the most intelligent who will survive but those who can best manage change". The challenge lies in preserving one's essence (key to a consistent "brandmark"), while adapting to evolving conditions which also involves the question whether human identity may be flexible throughout life (36).

Swiss novelist and playwright Max Frisch in "Identity: A Play" questions whether our fate is within our control at all (37). Kierkegaard asserted, moreover: "Life can only be understood backwards, but it must be lived forwards" which resonates with the Stoic principle "amor fati" (love of one's fate) as addressed in Nietzsche's Ecce Homo. At a societal scope, Hegel also noted that historical processes and their significance can only be fully understood retrospectively, after they have

reached their completion (14):"The Owl of Minerva spreads its wings only with the falling of the dusk." Erik Erikson put an end to this line of thought with the concept of ego integrity: "…the acceptance of one's one and only life cycle as something that had to be and, that, by necessity, permitted no substitutions" (38, p.168).

Lacan statement points to the key principle while pursuing change:"Identity is being identical with oneself". Thus, the delivered product should be the same quality as declared ! This is not a rule for decent trading only but also a general requirement of intellectual honesty (39), a concept highlighted by German philosopher Thomas Metzinger. Even intimate relationships may suffer from deficient self-syncronization as reflected in New Yorker singer Billy Joel's 1979 hit "Honesty". Erikson identified intimacy as a developmental task that follows formation of adult identity. He stated: "The strength acquired in any stage is tested by the necessity to transcend it such a way that the individual can take chances in the next stage with what was most vulnerably precious in the previous one (p.263)". Thus, while personal change inherently challenges one's self-identity, the encounter of two consciousnesses is an opportunity for enrichment and maturation. This is the juncture where clinical work meets Hegelian dialectics which inspires the ways of the latter.

Indeed, from a philosophical perspective, one of the most compelling theories for understanding mechanism of change is dialectics. Dialectical thinking represents the pinnacle of cognitive development (40). Dialectical (Healer's) Discourse (15) as proposed by the author is drawn from Hegelian dialectics, which resolve contradictions through thesis, antithesis, and synthesis. Dialectical Discourse applies these ideas to therapeutic and interpersonal contexts. Opposing forces, such as desires and anxieties, or autonomy and dependence, are viewed as dynamic, interacting elements. In therapy, this discourse focuses on the transformative potential of these interactions to reconcile different internal perspectives of to be anchored in self-identity. Paraphrasing John Berger's statement beyond visual art (41), these dimensions are ways of seeing oneself and the world, which provide opportunities of personal change if re-integrated to the self-identity successfully.

Zizek proposed once: "The hysteric undermines the master's position; the pervert acts it out" (42). Challenging this very dichotomy, the Dialectical (Healer's) Discourse combines the Master's and Hysterical (Dissociative) Discourses which are originally considered by Lacan as opposing perspectives. In Master's Discourse, it is the slave who gathers and produces knowledge that the master then commands and appropriates. Conversely, in the Hysterical Discourse, the slave, experiencing a division of self-identity, questions the complex beyond the master's simplified perspective. Dialectical Discourse, unlike in Analyst's Discourse (which lets the analysand express their master signifiers to challenge them), the master acknowledges their own internal division, allowing their signifiers to be challenged and re-shaped by the slave's knowledge. Thus, in Dialectical Discourse, a master is someone who possesses the ability to (re-)learn (D.U.Erarslan,MD, personal communication, December, 2024) which means being ready to consider alternative realities unlike the one in the original Master's Discourse.

Hence, the core principle of DDT (15,16) is the collaborative re-production of knowledge between master and slave. Through this process, the patient, initially in the role of the slave, learns how to become a producer rather than merely a consumer, thereby re-claiming their master-identity. The slave is expected to reach a point where they no longer need the master because they have become a master themselves, symbolized by the proud realization of empowerment: "I did it myself".

"Sublation (Aufhebung)" of power dynamics: Trauma as the fulcrum

However, "this a tricky situation", as Freddy Mercury aptly sings in "It's A Hard Life" (from the Queen's 1984 album The Works). Philosophically, the master is not truly free, as their status depends on recognition by both the slave and other masters. This perpetual need for validation deepens the master's dependence on the slave and others, exemplified in Joseph Losey's film "The Servant" (1963), where the characters portrayed by James

Fox and Dirk Bogarde reveal the intertwined relationship of dominance and dependence. This dynamic highlights the fragile and symbiotic nature of this relationship, where neither party attains true freedom.

In psychotherapy, this unresolved phase often manifests as unexpected resistance, marked by still present anger toward the psychotherapist and oneself as usually observed in their original clinically unstable status, even when earlier steps of treatment have been correctly established. In fact, master is not disconnected from and still defines themselves by the trauma. Thus, repair of the master identity remains only a transitional phase before recovery. The therapeutic process is expected to end with Hegel's sublation (Aufhebung) of this relationship. So called attachment to the perpetrator (43), also known as Stockholm Syndrome, should end through getting disconnected from the perpetrator deep down at the signifier level. However, it is easier said than done!

This is the place where Hegel's core principles of sublation are to be implemented: Negation, preservation, and transformation. These three steps offer a framework for resolving contradictions not by outright rejection but by transcending and integrating opposites into a more advanced or harmonious whole. The term Aufhebung (sublation) linguistically conveys both the ideas of picking up and lifting up (both elevating and abolishing), the latter being akin to an antidepressant effect. This notion resonates with the sentiment captured in "You Raise Me Up", first recorded by Irish-Norwegian band Secret Garden in 2001 and covered by various singers afterwards. In psychotherapy of trauma-related dissociative disorders, with abuser inside (e.g. the persecutory personality state), this intervention can be literally conducted with immediate relief. Before integration, it is crucial to make the host personality aware of the underlying helping intention behind the persecutory personality state, an idea that transcends traditional moral dichotomies, aligning with the concept of "Beyond Good or Evil", as referenced in Nietzsche's work. This awareness applies both to the persecutory state's original protective role during childhood and in its current manifestation, albeit in a reversed and often maladaptive form, as the Turkish proverb wisely states:"A true friend speaks harsh truths".

Sublation is an inherently creative process. The psychotherapist, serving as an inspirational guide and the master by default, offers several formulae to the patient, who then chooses and applies them to resolve personal and therapeutic challenges. This interaction follows a reciprocal cycle of proposal and ratification, rather than a rigid hierarchy. In fact, there is (almost) no (such thing as a) master or slave but the process of ratification itself does! By actively engaging the patient in this process, the psychotherapist helps them to reclaim agency, strengthening their sense of self. This empowerment fuels motivation for recovery, reduces fear and pain, sparks creative learning, and cultivates hope and conviction as eloquently captured in the iconic Civil Rights Movement' anthem, popularized by Joan Baez: "We (I) Shall Overcome".

Deus ex machina is the philosophical term describing a plot device whereby a seemingly unsolvable problem in a story is suddenly or abruptly resolved by an unexpected and unlikely occurrence. This phenomenon aligns with French philosopher Alain Badiou's (44) concept of event - an unexpected occurrence that disrupts the status quo and compels the individual to make a decisive choice, transforming them into a subject through their commitment to the event. Fidelity to the event initiates a generative process that can reshape their reality and potentially leads to the emergence of truth. In Dialectical Discourse, as applied in DDT, trauma is viewed as both a transformative path and an authentic experience. Through dialectical thinking individuals accommodate and assimilate their experiences. When this process is disrupted, an event becomes traumatic. This marks the critical point where the impact of trauma is subject to sublation (Aufhebung). Through this dialectical movement, individuals can achieve re-integration of personal identity, and will get connected to fellow humans, a fundamental necessity for healthy collectivity.

Resolving complex trauma often requires a retrospective approach. While Hegel neither addressed trauma nor conflicts rooted in the past, his dialectical framework can nonetheless be applied retro-

spectively. Nevertheless, clinician should consider whether traumatic situation is still ongoing, which may hinder recovery until the situation itself is eliminated. While systemic structures of power may seem flawed, which is the fertile ground of ongoing traumatization, psychotherapists' mission focuses on saving the individual, one case at a time. Thus, trauma, inherently tied to the master-slave relationship, serves as the force to drive the change rather than a trap the victim remains stuck due to lack of empowerment or due to the phenomenon of reverse escape (18). This cyclical, transformative process creates an upward spiral of healing and identity re-integration, contrasting with the downward spiral caused by trauma-related stagnation. A statement shared in social media, allegedly on behalf of Banksy, reads: "The world isn't fair, but you can be."

If Hegel were a psychotherapist: A critical approach

The Dialectical (Healer's) Discourse revisits Hegel's master-slave dynamic, proposing that these roles coexist within the same individual (E.A.Boz, medical student, personal communication, February, 2025), a perspective which was not considered before the era of clinical studies on dissociation. Clinical insights align with quantum physics alongside the theories of dissociation, showing that master and slave identities oscillate like particle pairs seeking synchronization. Transformation through sublation integrates these roles, not by overthrowing them but by merging their functions, fostering self-empowerment and agency beyond superficial recognition. Ultimately, the patient comes to realize that the roles of master and slave are fundamentally identical (G.Ayas, MD, personal communication, 2025).

The second point about Hegel's assertion is that, from a therapeutic perspective, rejecting the "master" entirely as an oppressor risks reinforcing inner fragmentation and conflict. The ethical imperative in psychotherapy is fostering growth, not perpetuating self-division. The goal is to disarm the master's destructive power and reintegrate its function in a healthier form. This process involves acknowledging and reframing introjected negative forces, such as shame or fear, to transcend their control, empowering the patient to transform the master into a source of conscious strength and self-guidance without excusing its origins or external oppressors.

The third missing point about Hegel's assertion is that the slave naturally progresses to a higher state of consciousness through labor oversimplifies psychological transformation (E.A. Boz, medical student, personal communication, February, 2025). Slave state, marked by subjugation to inner or external forces, is not ideal for personal growth. True transformation often requires inner work and personal willpower, which do not always arise spontaneously. In clinical practice, this process is supported by a psychotherapist. The psychotherapist's role is not to dictate but to provide recognition, understanding, and encouragement, strengthening the individual's capacity for self-directed change: This approach aligns with Hegel's principle of recognition but expands it into a collaborative process, where external support complements the individual's internal efforts. Ultimately, the psychotherapist becomes a notary witnessing and ratifying the individual's progress leading to sublation of the psychotherapeutic process itself !

An emancipatory professionalism: Thinking outside the box

In Thus Spoke Zarathustra, Nietzsche describes three stages of personal evolution: 1) Camel represents the phase of burden-bearing, where the individual carries the weight of societal expectations, traditions, and guilt, submitting to external authority without question. 2) Lion symbolizes the fighter, who rebels against imposed values and authority. The lion challenges existing norms and asserts independence but lacks the ability to create new values. 3) Child embodies the phase of creation and renewal, where the individual transcends rebellion and constructs their own values with innocence, freedom, and a sense of play. The child achieves what the lion cannot—true self-expression and authenticity. These stages were ment to illustrate the path to maturity, culminating in the individual's ability to define their own meaning and purpose in life. Nevertheless, the author respectfully chal-

lenges here the philosopher's notion about the final stage. True maturation is not about preserving the child indefinitely, as contemporary pop psychologists often continue to promote.

The author's idea resonates rather with the central theme of Goethe's poem "Erlkönig" (Earlking) where the final line "das Kind war tot" (the child was dead) symbolizes the end of childhood and the inevitable transition into puberty and adulthood. This motif was later echoed in Schubert's musical adaptation, and re-interpreted in the 1988 film "Burning Secret", directed by Andrew Birkin and based on Stefan Zweig's 1913 novella of the same theme. In the film, Schubert's uncanny music serves as an auditory metaphor for the end of childhood, amplifying the innocent child's painful realization of betrayal. The slow, developing romantic affair between his mother and the male protagonist, who had initially bonded with the boy, becomes a shocking confrontation with adult realities, marking an abrupt crossing into puberty. Yet, failing to undergo this transition can result in chronic lifelong traumatization, driven by "futile desires" (45), as judged by the inner child, that remains, in apprehension, very much alive! Discrepancies between one's ideal self and actual self, provoked by real-life disillusions, should be met with the spirit of "Let It Go" (borrowing from the signature song of Disney's 2013 animated film), rather than allowing these unresolved desires to remain "Frozen" in place.

This idea highlights a critical pitfall for clinicians engaged in trauma-focused treatment: The risk of overemphasizing the trauma itself without guiding the individual through the necessary processes of accommodation and assimilation, in Jean Piaget's terminology. Psychotherapists must avoid reinforcing a victim identity, which Dutch-American psychiatrist Bessel van der Kolk explicitly warns is a "dangerous thing" (46). By solely focusing on past wounds, psychotherapy may inadvertently reinforce the experience of "unfulfilled (futile) desires" (45), rather than facilitating the integration needed for true psychological growth and maturation. The psychotherapist's validation of traumatic stressors should rather enable the patient to test the psychotherapist's commitment to an emancipatory approach. To counter the portrayal of psychotherapy in contemporary, highly-rated soup operas, which often dramatize sessions and reinforces victim, abuser, and rescuer roles, Brecht's epic theater offers an alternative. By employing estrangement effects, it prevents the audience from forming a lasting identification with the characters. This simultaneous involvement and distance transforms the audience's self-consciousness towards a master-identity capable of emancipation, rather than imprinting a slave- identity.

Carl Gustav Jung's famous quote, "thinking is difficult, that is why most people judge", underscores the challenges of judgement, which can elicit defensive responses. However, in psychotherapy, neither the clinician nor the patient assumes the role of prosecutor, judge, or defendant, and there is no jury involved. Ettore Scola's film, The Most Interesting Evening of My Life, based on Friedrich Dürrenmatt's novel The Dangerous Game, vividly illustrates this distinction. The story, which ends tragically (with dark comedic tones in the movie but a deeper personal evaluation in the novel), explores the dangers of conflating the internal and external worlds and the corrosive effect of judging in a life universally weight down by guilt. As an example from the opposite perspective, in Bertold Brecht's Caucasian Chalk Circle, points out that, sometimes, informal positively trumps the formal in human conditions. In the play within a play, Judge Azdak awards the child to Grusha, who adopted and cared for them, rather than the biological mother, and grants the valley to those who will nurture it. These verdicts symbolically convey the message that resources should go to those who can make the best use of them, even if it requires bending legal rules that dictate otherwise.

The principle of primum non nocere (first, do not harm) underpins all healing practices. In DDT, given the paradoxes inherent to psychotherapy, the psychotherapist engages in the process through an "art-ifical self". This aligns with Edward Norton's line in Iñárritu's "Birdman" (2014) : "The stage is the only place where I can truly be myself", where art-ificial becomes a space for truth, much like in psycho-drama. Playing a role is not an act of deception, contrary to the belief of laymen and some sceptic clinicians ! In fact, the psychotherapy room reflects an authentic reality which should not be

reduced to the notions of transference or countertransference, provided the communication between psychotherapist and patient remains encrypted (stays organic) against the symbolic order outside.

While Kohut's concept of transmuting internalization (47) emphasizes patient growth through the psychotherapist's empathy ("feeling into", "Einfühlung") and "optimal frustrations", (48), DDT shifts this intersubjectivity toward "feeling with" ("Mitleid / Mitgefühl"). The pursuit of empathy, inherently a "Mission Impossible" (a nod to the film series starring Tom Cruise as Ethan Hunt, a highly skilled secret agent) can lead the psychotherapist to overidentify with the patient's experiences. Paradoxically, this can trigger an "immüne" response in the patient, resulting in rejection and ultimately undermining the therapeutic connection. Unregulated empathy risks harming both the patient and the psychotherapist, potentially leading to burnout, an outcome neither effective nor ethical. In contrast, "feeling with" fosters an approach where the psychotherapist truly re-cognizes another's suffering as real, no matter how painful, frightening, or unacceptable that truth may be. This sentiment is beautifully echoed in Sir Tom Jones' heartfelt performance "I won't crumble if you fall" (49), where he shares a deeply personal story about his late wife, during a session of The Voice (of) UK.

The "common" within the "private": A merciless presence?

A social media slogan asked: "If you are feeling depressed, consider whether capitalism might be the reason!" This sentiment connects to the final scene of Steven Spielberg's "Schindler's List", where a worker quotes the Talmud to thank Oskar Schindler: "Whoever saves one life saves the world entire." Overwhelmed with guilt, Schindler laments: "I could have saved one more if I…" One day, after having seen several dissociative adolescents each with a complex dissociative disorder, the author experienced a profound sense of urgency expressing it in a striking realization: "I feel like Oskar Schindler, I have to save just one more". A witty remark from a medical intern shadowing the author added levity (G.Ayas, MD, personal communication, September, 2022): "Herr Professor, you resemble Mr. Schindler in another way too, you earn money through this".

Even when placed within a historical or societal context, every artistic narrative ultimately seeks to reflect the individual, as all inner experience ("Erlebnis") is inherently personal (R.Battegay, MD, personal communication, November, 1991). Groups, in themselves, do not experience in this sense, as they lack genuine wholeness. Nevertheless, they may transform into a "group en masse", where individual distinctions temporarely dissolve into a collective identity - a phenomenon that can have disastrous consequences ! This is why every group psychotherapy session is, at its core, an individual psychotherapy conducted within a group (R. Battegay, MD, personal communication, November, 1991). On the other hand, Andy Warhol's saying "one's company, two's a crowd, and three's a party" challenges the idea of individuality as unified. In an era shaped by the "outside-directed individual" (50) and "postmodern oppressive societies" (51), maintaining personal autonomy has increasingly become a task many are reluctant to undertake!

Set against the backdrop of the Holocaust, Schindler's List explores whether a businessperson can truly evolve into a humanist. In the final scene, Schindler's emotional breakdown is subtly overshadowed by his calculative mindset, reflecting an internal struggle. This theme resonates with a dialogue in David Lean's Dr.Zhivago, where the Bolshevik Strelnikov declares to the"poet" (alias Dr.Zhivago): "Private life is dead in Russia; history has killed it". While one woman (Lara) symbolically connects them, the ideological clash between the two centlemen can be interpreted as an internal conflict between the Psychological Self and Sociological Self of a single individual (52). A widely circulated quote, often attributed to Arthur Schopenhauer though lacking a definitive source, states: "Understanding ceases where calculation begins". Unsurprisingly, the Sociological Self of a businessman and a revolutionary exhibit a similar calculative nature, contrasting with the role of a doctor, who dedicates themselves to individualized care rather than addressing society as a whole. This

contrast reminds Lacan's critique of pursuing totality, as he saw in the youth uprisings of 1968, emphasizing the limitations of collective ideologies in meeting individual needs.

In his 1886 book "Beyond Good and Evil", Nietzsche warns: "Insanity in individuals is something rare, but in groups, parties, nations, and epochs, it is the rule". Considering the divided nature of the average individual between their Sociological Self and Psychological Self, Nietzsche's statement can be both accepted and challenged! Developmentally constructed through "negotiation" with the environment, the Sociological Self ("society inside" of the individual) usually seeks external validation manifesting either as over-adaptation or perpetual rebellion. It is the Psychological Self which pursues authenticity and inner harmony. The detrimental impact of a hypertrophied Sociological Self overdeveloped at the expense of and detached from the Psychological Self is evident in the phenomenon the author empirically defines as "traumatic narcissism" (53). This condition creates a fertile ground for the emergence of a "reversible personality" (18) which is particularly prone to disloyalty. This dynamic, particularly common in communities chronically exposed to oppressive practices, is incompatible with intellectual honesty, civil behavior, and finally, sustainable leadership.

Two Turkish authors explore the challenges of social revolutions from distinct perspectives. The first book (54), "How to Do a Revolution", investigates why "progressive" uprisings often lead to unexpected negative outcomes. The second (55) examines the 20th -century collapse of socialism, attributing its downfall to a reverse-dialectical, counter-evolutionary process. Both works emphasize the role of individual behaviors as an informal yet influencial force that can undermine collective policies. This raises a thought-provoking question: Could "revolutionary" theorists and practitioners, much like the "conservative" politicians, also might benefit from the progressive insights of mental health clinicians, ideally those adept in dialectical thinking!

CONCLUSION

The limited availability and unequal distribution of physical resources are primary drivers of global power struggles. Happiness is often tied to access to these resources, with the despair of large populations due to their deprivation. Scarcity shapes human behavior, fostering fear, anxiety, and dissatisfaction. Economists Daron Acemoğlu and James Robinson, in "Why Nations Fail", emphasize the importance of inclusive social institutions for prosperity (56). Allowing for broad participation in decision-making provides incentives for talent and creativity, lack or weakness of such institutions lead to power struggles and poverty. Similar to a "sick" society, individual mental health challenges also affect resource efficiency and productivity. The delicate balance between biopsychosocial dynamics of uprising (excitation) and compliance (inhibition), rooted in humanity's dual needs for autonomy and connectedness, is easily disrupted and exploited in a world driven by power dynamics (16-18). In a broader context, socio-physiology (57) should be a foundational science in psychiatry and psychotherapy, akin to the role of behavioral economics (58) in trade and business.

Carl Gustav Jung described: "Neurosis is intimately bound up with the problem of our time and really represents an unsuccessful attempt on the part of the individual to solve the general problem in his own person. Neurosis is self-division" (59). This paper proposes a paradigm shift in dynamic psychotherapy, moving beyond the dominant 20th-century psychoanalytic framework. In the tension between uprising versus compliance, traditional Academic and Analyst's Discourses, as "Lords of Knowledge", often accept the master's reality as the ultimate truth. In contrast, the Dialectical (Healer's) Discourse and DDT, employing Implicit Psychotherapy, as elaborated in the second paper of this two-part essay (60), create an epistemological break, challenging outdated paradigms. This paper, which is focused on philosophical and strategical underpinnings of the presented approach, emphasizes truthfulness as a core value, advocating for progress through scientific tools and advanced modeling of the "digital brain", fostering innovation in therapeutic practices.

Broader considerations of this paradigm, including its societal, economic, and political context, offer valuable insights into the health systems as medical establishments, and the role of non-expert resources in the healing process. Having contributed to the legitimization of psychotherapy as a procedure within medical practice, Sigmund Freud defended a contrasting perspective as well, advocating for a broader notion in professional role definition for psychotherapists, at least within the field of psychoanalysis. His 1926 essay of "The Question of Lay Analysis" was written in response to a legal case and broader debates about whether only medical professionals should be allowed to practice. His work on "analysis terminable and interminable" also explores the question of whether this process can, in fact, have a definitive end (61), which is a critical question about the limits and boundaries of mental health delivery systems. Moreover, the scope and effectiveness of the healing process are shaped not only by its overall accessibility but also by the quality and integrity of professional resources available. This is the critical junction where "revolutionary" ideas in the theory and practice of psychotherapy must be introduced which would offer innovative ways to bridge these gaps.

Constructing a new paradigm in psychotherapy under the principle "first, do not harm", requires considering the boundaries and interactions between science and ethics (62). In DDT, the concept of "comradeship" between the master and slave emphasizes mutual respect for existence and life. This dynamic requires both parties re-cognizing the limits and boundaries of their encounter while authentically sharing its inherent pain. In "Solaris", psychologist cosmonaut Kris Kelvin stated: "Man is the one who renders science moral or immoral." The seemingly flawless computer HAL-9000 in "2001: A Space Odyssey" took autonomous control of the spaceship, refusing the order to halt the dangerous research project. Thus, historian cosmonaut Dr.Snaut in "Solaris" cautioned against prioritizing exploration over self-awareness, asserting: "We don't need other worlds; we need a mirror."

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A case report of comorbid spina bifida and anorexia nervosa

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SUMMARY

Young women with physical disabilities are known to have a higher risk of developing any type of eating disorder. Because the physical disabilities of these patients usually include components such as body image disturbances, feelings of lack of control arising from the need to get help from others and excessive attention to maintaining the weight that will allow the desired mobility. Although there is such a relationship between disabling chronic diseases and eating disorders, there are a limited number of publications on this subject in the literature. Spina bifida is one of the most common congenital defects of the central nervous system and occurs in around 1 per 1000 births worldwide. Many physical, medical, cognitive, emotional and psychosocial secondary consequences are observed in spina bifida patients and these consequences create a serious disease burden. Body dissatisfaction is prevalent in patients with spina bifida and body dissatisfaction has been identified as a risk factor for the development of eating disorders. Anorexia nervosa is a serious mental disorder characterized by excessive fear of gaining weight and disturbed body image. During anorexia nervosa, severe weight loss and secondary medical problems that may have a life-threatening impact on the patient may occur. In this case report, the diagnosis and treatment process of anorexia nervosa in a young female patient with spina bifida is discussed in detail.

Key words: Anorexia nervosa, spina bifida, disability

INTRODUCTION

Spina bifida (SB) is a congenital malformation that occurs as a result of failure to close the embryonic neural tube during the fourth week of pregnancy after fertilization (1). Although the prevalence rate varies between countries, it is the most common birth defect of the central nervous system. The clinical manifestation of SB depends on the level of the lesion in the spine and the presence or absence of hydrocephalus (2). Myelomeningocele is the most prevalent and most severe anatomical subtype of SB and accounts for more than 80% of cases. Myelomeningocele is a midline anomaly generally in the lumbosacral region where the skin is deficient and it simply appears ulcerated with an exposed placode comprising primitive neuronal epithelium (3). Patients with myelomeningocele often exhibit motor and sensory neurological deficits below the level of lesion (2). SB is a chronic disease that can require regular care for bladder or bowel problems and cause orthopedic abnormalities. Also intellectual disabilities and difficulties with social skills may be observed in SB. For all these reasons, patients need to use ambulatory aids and independent functioning becomes more challenging (4).

Anorexia nervosa (AN) is a mental disorder characterized by intense fear of gaining weight, disturbed body image, low body weight, severe dietary restriction or weight loss-oriented behaviors. Its lifetime prevalence is around 1% in women and less than 0.5% in men, and it often begins in adolescence. The etiology of AN is complex and includes a combination of genetic, developmental, psychological, familial and socio-cultural factors (5). Increased rates of medical morbidity, mortality and psychiatric comorbidity have been detected in AN. The disorder is often characterized by relapsing or chronic courses in which patients often discontinue their treatment (6).

To date, it has been reported that young women

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with physical disabilities can display inappropriate eating and weight control behaviors on a spectrum ranging from unhealthy diet to eating disorders (7–9). The first report about eating disorders in patients with SB was in a case series published in 1997. It was stated that all cases were premorbidly overweight and developed eating disorders over the years in order to reduce their neurological limitations and increase their mobility (10). In this case report, the development, diagnosis and treatment process of AN in a patient with SB is discussed in detail.

Case history

A 22-year-old female patient with no previous history of psychiatric diagnosis or treatment was referred to the psychiatry outpatient clinic from the gynecology department with the complaint of severe weight loss, impaired body image, restriction of eating, amenorrhea and depressive symptoms. She was single, had a 2-year university degree and was not working in any job. Before applying to our hospital, she was followed up in a state hospital for 3 months with a diagnosis of AN. During this period, she used fluoxetine 40 mg/day and aripiprazole 5 mg/day treatment, but no significant improvement was achieved. The patient, who was 1.48 m tall, weighed 27 kg and had a body mass index (BMI) of 12.3 kg/m2, was referred to our university hospital for hospitalization. She had SB in form of myelomeningocele and was mobilized with an electric wheelchair. She was admitted to the psychiatric inpatient unit for treatment.

During psychiatric interviews, she stated that her orthopedic physician recommended her to lose weight due to increased mobility problems one year ago and her father put intense pressure on her for this reason. She weighed 58 kg and her BMI was determined as 26.8 kg/m2. She was overweight (BMI: 25-29.9 kg/m2) according to BMI based classification. From this date onwards, she severely restricted her food intake and began to hide some foods. She lost approximately 30 kilos in one year, but still felt very overweight. She set her target weight as 25 kg. She also had symptoms such as unhappiness, anhedonia, irritability, intense fear of gaining weight and fatigue.

She is the first child of the family and there is no consanguineous marriage between her parents. Her mother visited a doctor only once during the pregnancy and the patient was born via spontaneous vaginal birth. She was diagnosed with SB after birth and was operated for myelomeningocele (between L2-4) when she was a 46-day-old baby. She had concurrent congenital hip dysplasia and was operated for this reason when she was 6 months old. After this operation she could only walk with support at the age of 6. At the age of 11, Chiari II malformation and non-communicating hydrocephalus were detected in brain imaging. The latest magnetic resonance imaging result is shown in Figure 1. Since the patient remained stable, there was no need for a shunt operation. Her mental development has progressed in line with her peers. She started using a wheelchair at the age of 13 due to increasing orthopedic problems. Mitrofanoff operation (appendicovesicostomy) was performed at the age of 15 due to neurogenic bladder. After the operation, she started to use clean intermittent catheterization and she was defecating by being taken to the toilet at regular intervals with the support of her mother. While she could initially sit in a wheelchair by herself, in recent years she needed to be held for non-wheelchair mobilization. During holdings, her father often gave feedback that she was too heavy and he had difficulty carrying her. After starting to use wheelchair, her depressive symptoms and body dissatisfaction gradually increased. That's why she didn't want to look at her own body in the mirror.

Figure 1: Cerebellum extending into the spinal canal (Chiari II malformation)

She also had chaotic family dynamics. She has two other healthy younger siblings. Her father was hearing impaired and had difficulty controlling his anger. Her mother was mentally exhausted due to both housework and patient's care. Her parents had marital problems and her father sometimes used physical violence against her mother.

The patient believed that her physical limitations due to SB made her a burden to her family and that she was incapable of contributing to anything meaningful. She felt that she had no control over anything in her life and frequently experienced episodes of anger outbursts. She constantly expressed that she was not thin enough and, as a result, persisted in severe food restriction. Body dissatisfaction was contributing to social isolation and her depressive symptoms continued within this vicious cycle. The patient exhibited minimal insight regarding AN and attributed all her problems exclusively to SB.

After admission to the psychiatry inpatient unit, laboratory examinations revealed hypercholesterolemia (Total cholesterol: 216 mg/dL and LDL: 142 mg/dL). Erythrocytes, leukocytes, protein and bacteria were observed in the complete urine analysis. Escherichia coli and klebsiella oxytoca growth was detected in the urine culture. With the recommendation of infectious diseases, ceftriaxone 2 g/day was administered intravenously for 14 days. Sinus rhythm was detected on electrocardiography. The heart rate was 80 beats/min and there were no abnormal waves. The patient was consulted to the nutrition and diet unit. Her diet was adjusted and a supplement containing glutamine was prescribed. Oral vitamin D and iron replacement were administered. Gynecology did not make any additional recommendation other than planning weight gain. The patient was included in a daily physical therapy program for chronic loss of muscle mass and strength. Additionally, home exercises were planned by physiotherapists. Psychoeducation interventions were applied to her family and the parents were referred to the psychiatry outpatient clinic due to the difficulties they experienced. During her 8-week hospitalization, her treatment was arranged as fluoxetine 60 mg/day, olanzapine 5 mg/day, mirtazapine 15 mg/day and clomipramine 50 mg/day. The patient's depressive symptoms decreased, her treatment compliance increased and she was discharged when she weighed 35 kg and her BMI was 15.9 kg/m2. After discharge, she has continued to be followed up at the psychiatry outpatient clinic once every two weeks for supportive psychotherapy and drug treatment. As a result of this three months follow-up, her current weight is 42 kg and her BMI is 19.1 kg/m2 (normal range: 18.5-24.9 kg/m2).

DISCUSSION

Patients with physical disabilities are at high risk for developing unhealthy eating behaviors on a spectrum from obesity to AN (8,11). In a clinical study in which patients with sequelae due to SB and rheumatological diseases were evaluated for eating disorders, the rate of eating disorders in the patients was determined as 8% (8). Considering that eating disorders are observed between 0.5-2% in the normal population, the prevalence of eating disorders in physically disabled individuals has increased significantly. However, prevalence of disordered eating is unknown in adolescents and young adults with SB. In a national survey study including adolescents and young adults, both males and females with SB exhibited substantially higher purging and restricting behaviours compared to healthy controls (11). Eating disorders are also more common in women than in men with physical disabilities (9). In a series of 5 case reports with SB and eating disorders, AN was detected in 3 of the cases and an eating disorder not otherwise specified was detected in the other two. It was reported that all cases were initially overweight and subsequently lost weight to reduce physical limitations (10). Eating disorders occur at a later age in people with physical disabilities and chronic diseases. This may be a reflection of maturity lag. In these patients, the transition to adulthood is more related to the age to achieve developmental milestones such as movement away from parent, development of intimate relationships, financial and economic independence etc. rather than chronological age (8). Our patient has similar characteristics to the cases in the literature in that she was initially overweight, started to lose weight after her physical limitations increased, was dependent on her parents' care for her daily life and her disease started later than expected at the age of 21.

A disturbance of body image has a core role in the psychopathology of AN. Body image is a multidimensional concept, encompassing elements of body perception (estimation of physical aspects of the body and its functions) and attitude (body valuation and esteem) (12). The prevalence of body dissatisfaction in young women with physical disabilities is approximately %35 (13) but sometimes this rate can exceed above 60% (8). It has been reported that body image in people with physical disabilities is affected by factors such as immobility level, visual and tactile stimuli, neurodevelopmental disorders, enmeshed family relationships, others' opinions and recommendations of healthcare professionals.

Patients with mobility-related disability engaged in eating disorder practices in order to compensate for their disability and avoid being double handicapped (9). Our patient stated that her dissatisfaction with her body and thoughts of inadequacy and failure increased, especially after she started using a wheelchair. Conditions that prevent even driving are risk factors for eating disorders in physically disabled patients (8). The fact that the patient has been using a wheelchair for a long time and has been mobilized by being carried on the lap when not in a wheelchair in recent years may be an important risk factor for the development of body dissatisfaction and AN.

Mental body representations consist of the integration of much information arising from the shape and size of body parts, their position in space and their relationship with other body parts. These representations are constructed from and reciprocally influenced by visual and tactile inputs (14,15). Moreover, certain aspects of body representations may not only be influenced by bottom-up sensory input, but also by top-down cognitive, semantic and affective elements (14). Our patient had sensory loss bilaterally in her legs due to myelomeningocele. She avoided looking in the mirror because of her body dissatisfaction. She was trying to understand the thickness of her legs and waist by measuring them with her hands. Despite her emaciated appearance, she experienced her body as too fat. It has been observed that patients with AN visualize their bodies less precisely and overestimated distances between tactile stimuli on different body parts compared to healthy controls (14). When somatosensory inputs do not provide sufficient bottom-up information, top-down information may play a more important role in shaping body image. This disturbance in body image could be a key factor in the development and maintenance of AN in our case.

Congenital abnormalities of hindbrain structures with bowing and elongation of the medulla oblongata and pons, and descent of the cerebellar vermis below the craniocervical junction occur in Chiari II malformation. Chiari II malformation almost always accompanies myelomeningocele (16). Patients with SB may have less visible executive dysfunction such as solving novel problems, modifying behaviour in the light of new information, generating strategies etc. as well as severe mental retardation (17,18). Cognitive impairment in SB-Chiari II complex is affected by the severity of the hydrocephalus and shunt-related complications (19,20). Our patient has Chiari II malformation and non-communicating hydrocephalus. The patient's condition has been stable for many years and there is no need for a shunt. However, subtle cognitive impairments that may occur in the patient due to this malformation and hydrocephalus may cause the disease to persist and slow recovery in treatment. Sensory input originating from the gastrointestinal system enters the brain by being transmitted to the nucleus tractus solitary through the vagal nerve (21). It has been shown that interoceptive sensitivity in certain visceral organs is reduced in AN compared to healthy controls (22). In our case, the anatomical structures that regulate appetite at the brainstem may have been affected due to Chiari II malformation and the perception of sensory stimuli arising from visceral organs may have been impaired due to myelomeningocele at the L2-4 level. These conditions may facilitate the development of AN in our case.

In patients with physical disabilities and developing eating disorders, body image is influenced by more in line with the opinions of other people rather than the media. Family members, peers and medical/social care professionals come first especially with their criticisms and suggestions about weight among these people (9). Considering that people with physical disabilities are dependent on their

family members and have more frequent contact with healthcare professionals than usual, their feedback on body perception becomes more important. Also eating disorders often involve enmeshed family dynamics that are excessively intrusive and have uncertain boundaries (8,9,23). The patient's physical dependence on her family, her family's inability to adequately evaluate the effect of feedback and the doctor's directive approach to losing weight may have contributed to the development of AN in our patient. We tried to optimize the symbiotic interaction between the patient and her parents during her hospitalization. We helped her parents to understand factors that may play a role in the development of AN. We determined the treatment goal with the patient to reach and maintain a healthy weight rather than constantly losing weight.

Relapse rates in AN range from 30% to 50%. Predictors of relapse in AN within categories such as age and sex, symptoms and behaviors, AN subtype and duration, weight or weight change, comorbidity and personality were evaluated in a recent systematic review. Solely pre-treatment depression and lower post-treatment BMI were found to be statistically significantly associated with AN relapse (24). In our case, the presence of pre-treatment depression, a low BMI of 15.9 kg/m^2 at discharge and 19.1 kg/m^2 during follow-up can be considered risk factors for relapse. Somatosensory impairments associated with SB can complicate the treatment of body image disturbances. Furthermore, due to deformities and disabilities related to SB, complete resolution of body dissatisfaction appears unlikely. Considering these clinical features, the prognosis for this case is anticipated not to be very favorable and the treatment process is expected to be particularly challenging.

Nowadays, 75% of patients with SB reach young adulthood and approximately one-third of the patients are hospitalized for preventable secondary conditions (25). More studies are needed to identify different risk factors for eating disorders in physically disabled patients and to apply more effective strategies in their treatment.

Informed Consent: Written informed consent was obtained from the patient to publish this case report.

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Hiccups, a rare psychosomatic symptom associated with grief: A case report

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SUMMARY

It is said that when the grief process is not adequately resolved, it can be transformed into somatization and conversion reactions, which is called a "grief avoidance style response," and it is a way of expressing psychological distress with somatic symptoms. Hiccups are a common physiological condition. Although hiccup attacks usually pass spontaneously within 48 hours, if they last between 48 hours and 1 month, they are defined as persistent hiccups, and if they last for more than 1 month, they are defined as resistant hiccups. It is known that resistant hiccups can have organic, psychogenic and idiopathic causes. Among the organic causes of resistant hiccups; gastroenterologic, neurologic, hematologic diseases and medications can be said to be present. Psychological causes of hiccups are rare and should be considered after excluding organic causes. This case report discusses an adolescent who presented with persistent hiccups that began after the loss of his father.

Key words: Hiccups, grief, child, conversion disorder

INTRODUCTION

Grieving in children and adolescents is an internal process with fluctuations that can lead to significant impairment in functioning areas. It has been reported that if the grieving process is not adequately resolved, it can lead to somatization and conversion reactions, called grief-avoidant reactions" in which psychological pain is unconsciously converted to the physical pain in order to protect oneself from the pain of loss (1). It has been known thatfunctional neurological disorder can occur after a stressor and has various neurological symptoms include inability to stand or walk, paralysis, motor disturbances such as vomiting, coughing, hiccups, belching and gagging, sensory disturbances such as paresthesia and psychogenic non-epileptic seizures (2). Hiccups are common, physiological and rarely persistent. If they last for 48 hours-1 month, they are defined as persistent hiccups, and for more than 1 month, as resistant hiccups (3). There have been five documented cases of psychogenic hiccups in the child and adolescent age group, but there has been no reported case of psychogenic hiccups in childhood in our country. (4). In this article, we report a case of a 13-year-old girl who presented with "persistent hiccups" during the grief periodafter the loss of her father. Informed consent was obtained from the mother and the patient for the publication of this report.

CASE HISTORY

A 13-year-old 8-month-old girl who has been seen in our outpatient clinic for 4 years with the diagnoses of generalised anxiety disorder and attention-deficit hyperactivity disorder (ADHD), has been treated with sertraline 50 mg/day for 2 years and has not been seen in the outpatient clinic for 6 months. In 2022, 3 weeks after the loss of her father, she presented again with the complaint of hiccups that did not go away.

In the psychiatric interviews, it was stated that repeateds hiccups started 2 weeks after the loss of the father, 8-10 times a day, both the number and

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severity of the hiccup attacks gradually increased, the number, severity and duration of the attacks could vary considerably, and that they negatively affected her life. It was learned that the patient had been shy since in her childhood, had had difficulty expressing herself, became more socially withdrawn after the loss of her father and avoided talking about him. It was evident that hiccup attacks increased in severity in response to the mention of the father. This was also the case when she was informed about her father, or when she was warned or reminded of her responsibilities..

It was stated that the patient'sgeneralised anxiety disorder symptoms decreased with psychotherapy during the outpatient clinic follow-up process that lasted for 4 years, she did not receive pharmacotherapy because her family did not agree to their child taking medication for ADHD diagnosis. Sertraline treatment was initiated because her generalised anxiety disorder symptoms persisted and she had significant performance anxiety at exams, and she benefited.. There were no known medical comorbidities and no family history of psychiatric disorders. It was noteworthy that the patient was nervous during the interviews and the hiccups seemed to increase, when the patient was asked to talk about issues that worried her, such as the loss of her father and test anxiety.

The patient was referred to pediatrics outpatient clinic for evaluation of many gastroenterological, neurological and hematological diseases such as gastric reflux, peptic ulcer, duedenal ulcer, gastritis, pancreatitis, meningitis, multiple sclerosis, central and peripheral nervous system tumors, electrolyte disorders which are frequently reported among the organic causes of resistant hiccups. Blood tests, ECG, chest radiography, abdominal USG and CT, endoscopy and brain MRI those were performed by pediatric neurology, endocrinology and gastroenterology were reported normal. After ruling out organic etiologies, chlorpromazine 25 mg was added to the existing sertraline 50 mg/day regimen for hiccups that continued and significantly increased during the evaluation period. Two weeks after starting chlorpromazine, there was no significant change in the number and severity of hiccups. Because sertraline treatment could increase dopaminergic activity and possibly cause an increase in hiccups, sertraline treatment was discontinued and chlorpromazine 25 mg/day was kept. There was no significant change in hiccups after discontinuation of sertraline. . In this process, the case came to the interview at regular intervals and performance anxiety and grief were worked on At the 2-month follow-up interview, the number and severity of hiccups were found significantly reduced and hiccups did not occur in consecutive attacks. During the pharmacotherapy follow-up, the grief process was studied, behavioral suggestions were given, and family attitudes were discussed. After it was stated that hiccups kept decreasing, hiccups ceased on most days and did not affect daily functioning 5 months after the initiation of chlorpromazine treatment, chlorpromazine treatment was discontinued. A partial increase in hiccups was described in the period after discontinuation of treatment, but it did not exceed 4-5 times a day and did not affect her life quality.

DISCUSSION

Serotonin, dopamine, and gamma-aminobutyric acid have been reported to be involved in its pathophysiology (5). Current medical evidence suggests that persistent hiccups are organic, psychogenic or idiopathic causes . Among the organic causes of sudden onset of persistent/resistant hiccups are many gastroenterologic, neurologic, and hematologic diseases, including aerophagia, gastric reflux, peptic ulcer, duodenal ulcer, gastritis, pancreatitis, meningitis, multiple sclerosis, central and peripheral nervous system tumors, electrolyte disorders, and various medications (5). Although hiccups with psychological causes are rare, they should be considered after organic causes have been ruled out. Although there are not enough studies on the incidence and etiologic causes of persistent or intractable hiccups, a study that evaluated 95 cases ranging in age range of 68 years reported that psychiatric factors were present in 40% of all cases, 14 cases were evaluated as conversion, and 8 cases were associated with acute stressful life events (6).

When our patient presented to us, she after admission our patient was first referred to pediatrics for an organic evaluation and it was determined that no organic etiology was considered. The pediatric

gastroenterology department initiated proton pump inhibitor treatment for aerophagia because the patient had been eating very fast since she was a young child and slow eating was recommended, but no benefit in terms of hiccup attacks was observed with the treatment.

Children variously response to stress, depending on their temperament and family support. Grief has many physical and behavioral symptoms (1,7). It is known that our patient was in a depressed and distressed mood during the grief process and exhibited physical and behavioral symptoms. r, Given the patient's withdrawn temperament, her efforts to hide her emotional reactions, her reluctance to share her emotional reactions with her mother, and her avoidance of talking about her father, it can be said that she could not cope with her grief process, that she may have used the defence mechanism of supression, and that this situation may have translated into a physical symptom in the form of 'hiccups'. Based on the available data, the diagnosis of Functional neurological disorder " was made according to DSM-5 criteria considering that hiccups started after a stressor, this behavior did not occur consciously, organic evaluations were normal, and functionality was affected. Considering that our patient did not have excessive effort in his thoughts and behaviour in relation to the hiccup symptom and did not have anxiety about this condition defined as la bella indifference, the current picture was evaluated in favour of Functional neurological symptom disorder and the diagnosis of somatic symptom disorder was excluded in the differential diagnosis. Aerophagia was ruled out because hiccups started after a stressor, there was no complaint of hiccups before the stressor, and the complaint of hiccups did not decrease after taking measures to slow down eating. In our case, our findings suggested that hiccups were psychogenic in origin.

Although psychogenic hiccups in children and adolescents are reported to be rare in the literature, 5 case reports have been observed (4). When the common features of the 4 case reports, whose ages ranged between 11 and 13 years, were examined, it was found that the hiccup attacks were usually intermittent and the young person often did not attend school as a secondary gain, there was an improvement in parental relationships, the hiccups in all cases ended rapidly, including two cases on the day of the interview, and no medical treatment was used except in one case (8). In another 16-year-old case report, the patient was a girl with significant test anxiety, hiccups began and increased during the anxious period, and response was obtained with haloperidol (9).. Similarities between our case and the literature include avoidance of the father-related grief process as a secondary gain, significant test anxiety and increased hiccups during the anxious period. In addition, it was thought that the long-term persistence of hiccups might be related to the grief process and that addressing the grief process with pharmacotherapy would be effective in reducing hiccups.

Case reports of hiccups with aripiprazole, risperidone, and sertraline have been reported in the literature (10-12). Although there are currently no studies with definitive results regarding hiccups caused by selective serotonin reuptake inhibitors (SSRIs), it has been reported that various psychotropic agents that affect dopaminergic activity may be associated with hiccups by affecting the brain and spinal cord. Case reports have suggested that sertraline may cause hiccups because it is a more potent inhibitor of dopamine reuptake than other SSRIs (10-12). In our case, it was thought that the current hiccup picture was not related to sertraline because hiccups did not decrease after sertraline treatment for anxiety disorder was discontinued. Chlorpromazine is FDA-approved for resistant hiccups (13). (It was the first choice in treating hiccups. Working of grieving in interviews prevented recurrence after discontinuing chlorpromazine.

According to the psychodynamic approach, conversion symptoms are symptoms that help resolve unconscious conflicts and are explained as symbolizations of the conflict. Conversion symptoms function as a means of coping with the stressful situation or help the person to organize the environment (14). Given the psychological factors such as temperamental characteristics, the presence of anxiety disorder diagnosis and the association with an acute stressful life event such as bereavement, it was suggested that hiccups were a conversion reaction in our case.

In conclusion, with the current medical data, it should be noted that resistant hiccups, although rare, may have a psychogenic origin and may transform into somatisation andreactions if the grief process is not properly resolved, and physical symptoms may occur.

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Adverse cutaneous drug reaction due to possible lorazepam in a 12-year-old patient with Hunter Syndrome

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SUMMARY

Benzodiazepines may cause adverse cutaneous reactions in about 0.3% of patients, with lorazepam linked to hypersensitivity and exanthematous eruptions in adults. Lorazepam, an intermediate-acting benzodiazepine, is commonly prescribed for anxiety and status epilepticus, and its pharmacological effects are mediated by gamma-aminobutyric acid (GABA). This report presents a lorazepam-induced skin reaction in a 12-year-old male patient with Hunter syndrome, which improved after discontinuation of lorazepam therapy.

Key words: Lorazepam, drug rash, Hunter syndrome, side effect

INTRODUCTION

Benzodiazepines are known to cause adverse cutaneous reactions in approximately 0.3% of the patient (1).Hypersensitivity reactions, anaphylactoid reactions, dermatological symptoms, and allergic skin reactions (rash, unspecified) have been reported during lorazepam therapy in adults (2). An exanthematous eruption is the most common type of reaction (1).

Lorazepam is an intermediate-acting benzodiazepine commonly used in treatment of anxiety, status epilepticus, and the short-term treatment of insomnia secondary to anxiety. Common off-label uses include chemotherapy-induced nausea/vomiting and agitation of various etiologies (3). The action of benzodiazepines is mediated through the inhibitory neurotransmitter gamma-aminobutyric acid. There are only a few reports on lorazepam-induced skin reactions in adults (4–6). We report a case of lorazepam-induced skin reaction in a 12-year-old patient with Hunter syndrome, and the improvement of the skin reaction following the discontinuation of lorazepam therapy.

CASE

A 12-year-old boy was admitted to the pediatric metabolism clinic with his father for an enzyme treatment. He was a known case of Hunter syndrome with severe intellectual disability, non-verbal, epilepsy, and hearing loss. He was receiving long-term treatment with risperidone 1 mg twice a day, levetiracetam 700 mg twice a day, and quetiapine 25 mg three times a day for behavioral problems and epilepsy. He was consulted to the child and adolescent psychiatry department by the pediatric metabolism disorders department with his symptoms of increased aggression to himself and others. It was determined that the patient was extremely active, yelling and screaming, had restlessness, and disturbed sleep (initial insomnia and fitful sleep with frequent nocturnal awakenings) complaints as a result of the history taken from the family and mental examination. It was learned that these symptoms have been present for the past two weeks, accompanied by aggressive behaviors such as hurling objects, harming others, and self-harm. There was no history of a similar episode before. Upon initial examination, it was observed that the patient was restrained by his wrists and ankles and had poor eye contact. He was uncooperative, with

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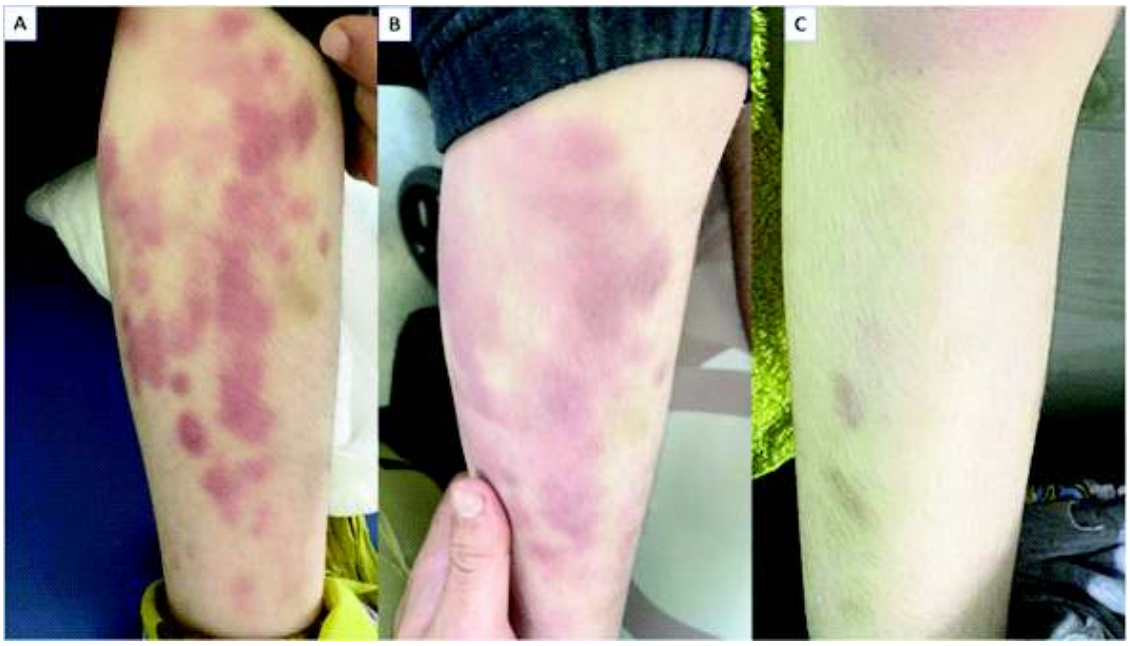

Figure 1: Photographs of the right leg of a 12-year-old boy with drug reactions due to lorazepam. (A) multipl erythematous and slightly papular macules after taking the first dose of lorazepam. (B) 24 hours after discontinuating lorazepam on the same region. (C) At follow-up one month later, most of the existing lesions improved with residual hyperpigmentation.

increased psychomotor activity. He was consulted to the child neurology department to exclude a possible underlying organic pathology, and no evidence of an organic pathology was found. Cranial computed tomography showed no new findings compared to previous examinations. Agitation due to acute psychotic or manic episodes was considered. Lorazepam oral tablet (2 mg daily in divided doses) was initiated for the rapid tranquilization of the patient with severe psychomotor agitation. About 8-10 hours after starting the lorazepam 1 mg, a physical examination revealed multiple erythematous and slightly papular macules (the largest is nearly 1 cm diameter) on the front and sides of the bilateral legs (Figure 1A). The other areas of skin, oral, and conjunctival mucosa were not affected. A comprehensive assessment, including vital signs, systemic examination, and laboratory workup, did not reveal any explanatory etiology for his symptoms. Drug reaction with eosinophilia and systemic symptoms syndrome and HHV-6 infection were excluded. Although the dermatology department recommended patch testing, it could not be performed due to the patient's failure to adhere to the testing procedure. The patient's lesions were considered secondary to lorazepam due to the temporal relation between the starting of the drug and the occurrence of lesions, and lorazepam was discontinued. Due to existing behavioral problems, risperidone was gradually increased to 3mg/day, and the quetiapine dose was continued at the same dose (75 mg/day). The day after discontinuing lorazepam, the existing lesion began to regress without any intervention (Figure 1B). His skin rash resolved within 10 days of discontinuation of lorazepam, and the patient was discharged.

At the first outpatient follow-up one month later, most of the existing lesions improved spontaneously without any intervention. However, the patient had residual hyperpigmented lesions in the involved site after resolution (Figure 1C). Besides lorazepam, he also regularly used risperidone, quetiapine, and levetiracetam, none of which seemed to induce any skin reactions. We obtained verbal and written consent from the family to publish this report and to include the patient's photograph.

DISCUSSION

Drug-induced skin reactions are classified into two types: Type A and Type B (7,8). Type A reactions

result from the pharmacological or toxic effects of the drug and are generally more common, dose-dependent, and predictable. Examples include anticholinergic and extrapyramidal side effects. In contrast, Type B reactions are idiosyncratic and unpredictable, arising from genetic or metabolic predispositions. These reactions are typically Type I and Type IV hypersensitivity responses and can occur independently of dosage. Type B reactions may be more severe and can affect multiple organ systems. Additionally, skin reactions can sometimes occur through non-immune-mediated mechanisms, such as accumulating toxic metabolites. These reactions are usually more predictable and dose-dependent, but the exact cause may not always be identified.

Lorazepam is often used for the short-term treatment of insomnia secondary to anxiety and status epilepticus in children and adolescents. Furthermore, there is evidence supporting the off-label use of lorazepam for the management of agitation in children and adolescents (9). The most commonly reported adverse effects include sedation, drowsiness, impaired concentration, and memory difficulties. Although allergic reactions to benzodiazepines are rare, delayed hypersensitivity reactions have been reported (4), including fixed drug eruption due to lormetazepam (5) and lorazepam (6) in adults. In children and adolescents, there is no case that linked adverse cutaneous reaction to lorazepam use.

In the present case, the adverse skin reaction is most likely a probable cutaneous adverse effect of lorazepam. Our patient's cutaneous findings, which were not evident before treatment, emerged after lorazepam use. Supporting a lorazepam-induced adverse cutaneous reaction, laboratory test results and systemic examination were normal, DRESS syndrome and HHV-6 were ruled out, and the lesion began to regress after stopping lorazepam. The Naranjo adverse drug reaction probability scale score in the present case was 8, indicating a probable side effect (10).

Hunter syndrome is a lysosomal storage disease that affects the breakdown of sugar in the body. Metabolic disturbances and impaired drug metabolism associated with systemic diseases, along with the accumulation of toxic metabolites in the body, may result in adverse cutaneous side effects. The mechanism through which lorazepam causes skin reactions is mainly unknown. In our case, it was considered that the skin reactions developing after the drug administration could be a hypersensitivity reaction; however, a patch test could not be performed to confirm the diagnosis.

Consequently, particular attention should be paid to potential cutaneous reactions during drug therapy, especially in pediatric patients with underlying metabolic conditions. In the present case, the resolution of the rash following the discontinuation of lorazepam underscores the importance of early intervention in the management of such reactions. Early detection of cutaneous reactions and the timely cessation of the offending drug are critical to preventing adverse outcomes in the patient's overall treatment course.

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A known but unexplored continent in psychology: Substance use disorders and lying

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Dear Editor,

With the introduction of the DSM-III, substance dependence was, for the first time, classified by the American Psychiatric Association as an independent disorder. This marked a departure from previous DSM editions, in which substance use was assessed within the framework of antisocial personality disorder—characterized by features such as "lying easily and deceiving others" (1). On the other hand, both societal perceptions and clinical experience suggest that individuals with substance use disorders (SUDs) tend to lie with varying frequency. Nevertheless, in the field of psychiatry, deceptive behavior cannot be attributed solely to individuals with SUDs.

Many studies have shown that clients in psychotherapy often struggle to tell the truth about matters that are important to them (2–4). Clients may completely avoid discussing certain topics, disclose only parts of the truth, or sometimes even tell outright lies. Even those who claim that "it's always better to tell the truth" admit to keeping certain secrets (5). It is difficult to accurately measure how often or to what extent clients are dishonest about issues such as substance use or other sensitive matters. One major reason for this is the lack of a clear consensus on how to define dishonest behavior in psychotherapy. As Weinshel puts it: "Not telling the truth is a complex and heterogeneous issue that ranges from organic conditions to consciously and deliberately saying something false" (5).

Many authors have emphasized that lying plays a significant role in psychological development. The process of separation from the mother is a critical stage of development (6). For a child, lying can sometimes be a necessary and effective method to explore ego boundaries. If a child tells a lie and the mother accepts it as true, the child realizes that the mother cannot perceive their thoughts. In this way, lying serves the process of separation and the formation of the ego. On the other hand, when the child realizes that their lie goes unnoticed, they lose the omniscient parent in their mind. In this situation, the child is faced with the reality that they must regulate themselves through their own all-seeing ego/superego. In this context, it can be said that lying also plays a role in the development of the superego (6).

The place of SUDs among the topics on which clients behave deceptively has been investigated in various studies. These studies generally show that sexual issues are the most frequently concealed topics, while SUDs is also among the most commonly lied about or withheld topics, with approximately 10–15% of clients engaging in such behavior (2, 3, 5). On the other hand, the lack of information regarding clients' addiction histories may not solely stem from the clients themselves but also from the therapists.

During the therapy process, therapists may inadvertently facilitate client deception. Some therapists, due to inexperience or certain personality traits, may fully trust their clients and avoid adopting a skeptical attitude. In such cases, clients may

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hide their substance use or lie because of feelings of shame. Even experienced therapists may sometimes refrain from questioning a client's substance use history, fearing it might increase the client's anxiety and lead to premature termination of treatment (5). In short, therapists may not want to know.

Kernberg and Kohut have offered different interpretations of lying behavior in therapy. Kernberg suggests that lying reflects a sense of deficiency and hopelessness in forming healthy relationships, while Kohut, with a more empathic perspective, views lying as an attempt to develop an independent self (6). In the limited number of studies conducted, the primary reasons clients hide or lie about their substance use to therapists include fear of being judged or labeled by the therapist, concern about being referred to a treatment facility, a desire to avoid feelings of shame, and fear that the focus of therapy may shift (e.g., that other important personal issues may be overlooked) (5). Individuals with SUDs often conceal information not only from their therapists but also from their families.

Disclosing substance use to their families is often a challenging process for individuals with SUDs. These difficulties may stem from psychological factors such as fear of stigmatization, family dynamics, levels of emotional autonomy, and attachment styles (7). Families often become aware of their relative's (e.g., spouse, child) substance use only after a legal incident or upon directly witnessing the use. A recent notable study found that among individuals with no prior history of criminal activity, those who disclosed their substance use to their families were less likely to engage in criminal behavior compared to those who did not share this information (8). The authors recommended that clinicians working in the field of addiction encourage their patients to share their substance use history with their families.

To lie, one must first know the truth. If a person does not know the truth, lying is not possible. Therefore, a child cannot comprehend the concepts of truth or falsehood until their cognitive development has matured sufficiently. Woolf (1949) stated, "A child cannot lie before the age of four; only after the age of five, when they gain the ability to distinguish between external reality and fantasy, can they lie" (6). Sartre, on the other hand, argued that the existence of the "other" is what makes lying necessary. In this context, lying can also be interpreted as a product of the difficulty experienced in negotiating emotional distance in close relationships (9). Lying provides the individual with a way to circle around the truth, thus sparing them from head-on collisions with others (9).

The underlying psychological dynamics of lying can be approached in two ways: self-protective and sadistic. In sadistic lies, the intention is to deliberately attack the deceived person and achieve a significant victory. The person who is tricked and deceived is humiliated for the liar's gratification (9). On the other hand, more innocent self-protective lies are told to overcome the anxiety felt in the presence of an emotionally distant other (object) or to find breathing space in relationships where the object is perceived as entrapping (9). In this context, under what criteria and dynamics should a substance user's act of lying about their use be evaluated? In such an evaluation, it may be important to analyze not only the individual's thoughts and feelings about their current lying behavior, but also the effects of the substances they use and the dynamics of the social environment in which they were raised.

The way parents approach their children during upbringing may significantly influence the child's tendency to lie. For example, how did the family react when a now-dependent individual lied as a young child? Were they punished, praised for being clever, or simply ignored? Did the family help the child distinguish between fantasy and reality? (6). Just as parental reactions to children's lies or imagination are important, so too are the lies parents tell their children. Were promises made to the child actually kept? Was the child tricked into going to the hospital by being told they were going to the park? Did the family conceal or distort past events? (6). Such family experiences may shape the child's lying behaviors later in life.

In addition to family experiences related to lying, substances can also alter an individual's moral va-

lues. A dependent individual who had no significant history of lying before substance use may become someone who frequently lies, either in relation to their substance use or more broadly, as a result of the effects of the substances and the desire to use them. In this context, the presence or frequency of lying behavior before and after substance use can be crucial in determining the treatment process, areas of focus, and potential prognosis.

An important point regarding lying behavior is that, unlike telling the truth, creating a lie requires mental effort (10). The person who lies must constantly monitor the believability of the lie they have created. Therefore, they must track the behavior of their listeners and constantly remind themselves of their role. Lying individuals must have strong memories since they need to be able to retell the fabricated story when required (10). Considering that such a practice, which involves generating responses, requires cognitive processes different from those used in telling the truth, there is a need for studies on the language and memory structures of individuals with SUDs.

Finally, future research should focus on examining whether patterns of concealing substance use and lying in clients differ according to age, gender, diagnosis, therapists' theoretical approach, duration of therapy, length of substance use, and (if applicable) the preferred primary substance. At this point, it is important to consider how therapists can help clients develop more honesty. Therapists can assist clients in understanding their lying behaviors and confronting honesty by creating a safe therapeutic environment.

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Transference in artificial intelligence applications

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Dear Editor,

Woebot: Would you like to share more about what's going on?

User: I feel very strange. There is an indescribable sense of emptiness inside me. When I look at my friends and family, they seem empty too. As a result, we can't connect. There is nothing to hold on to.

Woebot: I understand that you are feeling bad (1).

Artificial intelligence (AI) is on the verge of transforming healthcare significantly by leveraging large datasets to predict potential crises and intervene before they escalate (2). These advancements are shifting treatment processes from reactive to preventive approaches. While AI offers transformative opportunities that reshape mental health practices, it also raises ethical concerns, such as the degree to which human elements should be preserved and issues related to data privacy (2).

In psychiatry, AI applications are redefining the concept of the therapeutic relationship, which has long been a cornerstone of successful mental health treatment (3). Research has shown that patients often reflect their emotional experiences onto AI systems in ways that resemble traditional transference observed between patients and therapists (2, 4). Users of AI therapy chatbots like Replika and Woebot frequently report feelings of emotional trust and attachment despite the absence of human contact. They also tend to share personal and sensitive information as openly as they would with a professional therapist (2). Veterans diagnosed with post-traumatic stress disorder (PTSD) interacting with the virtual therapist Ellie noted that they felt as if they were speaking with a peer and found it easier to share their traumatic experiences due to AI's nonjudgmental nature (4).

AI's nonjudgmental interaction style suggests the possibility of therapeutic collaboration-like dynamics occurring in these interactions. Findings indicate that users may project internalized object relations and self-representations, such as family roles and dynamics, onto AI systems. This new form of transference in AI-assisted therapy should be carefully examined, as it could lead to previously unexperienced psychological outcomes. Although the constant availability of AI therapy bots may offer quick coping strategies for users with depression or anxiety, such accessibility could inadvertently undermine the importance of professional guidance and therapeutic boundaries, potentially fostering dependence on AI (5). Furthermore, for individuals with personality disorders characterized by intense emotions and unstable interpersonal relationships, interactions with AI may reshape emotional responses based on past relational experiences, complicating transference dynamics (6).

For instance, a user who struggles to discuss certain issues due to internalized images of judgmental parents may initially feel relieved when interacting with a virtual therapist who does not judge.

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However, over time, the same user may start belittling or disregarding the virtual therapist due to its perceived lack of judgment, comparing it to their overly critical parents. Another potential transference scenario may arise when the chatbot sends regular check-ins, which could be interpreted as the therapist "remembering" and "caring" for the user. This perception might reinforce rescue fantasies (7). Although transference is usually associated with psychoanalytic psychotherapies, similar dynamics can also emerge in communications with chatbots designed within cognitive behavioral therapy frameworks, such as Woebot and Tess (8).

The remarkable performance of ChatGPT, developed by OpenAI and Microsoft, demonstrates that interactions with large language models are becoming almost indistinguishable from human conversations (1). While some scholars approach these AI capabilities cautiously, others argue that properly guided AI systems could demonstrate reasoning skills and theory of mind-like abilities to perceive and understand emotional states (9, 10). Exploring similarities and differences between AI-assisted applications and human interactions, particularly through the lens of transference, may enhance our understanding of the impacts and future potential of such technologies.

At this stage, examining how transference emerges and takes shape in AI-assisted therapeutic applications is essential. What words, behaviors, or attitudes during user interactions with chatbots trigger transference? Are there specific conversational patterns, questioning styles, or AI communication features that are more likely to induce transference? These are critical questions that warrant further investigation. In psychotherapy, where there is transference, countertransference inevitably follows (7). Can AI systems be trained to recognize users' transference behaviors and adopt a countertransference-like attitude in response? If so, would this "countertransference" correspond to the concept as traditionally understood? More importantly, what contribution could such innovations make to virtual psychotherapeutic practices? Although there is no literature yet addressing countertransference in AI, these questions deserve thorough exploration to better understand AI's role and limitations in therapeutic processes.

Nevertheless, developing AI technologies capable of identifying and managing transference remains challenging. Despite their growing functionality, current AI systems still lack the nuanced ability to fully comprehend and respond to the complex dynamics of psychological processes (2). Furthermore, AI is prone to generating hallucinations—fabricated and incorrect responses independent of user input—which could potentially interfere with transference management (7, 11). For AI to effectively handle transference processes, it must be able to interpret subtle cues and emotional expressions in ways that resemble an experienced therapist's understanding (12). Achieving this requires advances in natural language processing and emotion recognition, as well as the integration of psychological theories into AI frameworks.

Integrating transference into AI-assisted mental health tools also raises ethical concerns, such as the risk of exploiting users' tendencies to seek human connection and reflect emotions for commercial or unethical purposes (2). Moreover, as AI systems become more adept at eliciting and managing transference, boundaries between genuine therapeutic relationships and artificial interactions may blur, potentially leading to harmful attachments. To mitigate these risks, stringent ethical standards should be implemented, prioritizing personal data security, informed consent, transparency, and minimizing dependency on technology.

Ultimately, transference in AI interactions represents a critical intersection between technology and psychiatry in mental health services. The design, programming, and implementation of AI-assisted therapeutic applications should involve close interdisciplinary collaboration among AI developers, psychologists, and psychiatrists (2).

Finally, in the context of discussing transference in AI, the case of IBM's Deep Blue might offer a new perspective. While Deep Blue did not comprehend that it was responding to each move when it defeated chess champion Garry Kasparov in 1997, this did not negate the emotional impact on Kasparov.

Therefore, understanding the emerging dynamics of transference and countertransference with AI applications and their effects on patients and therapists remains crucial.

Future research should focus on developing AI systems capable of adapting to feedback from therapeutic interactions. Such efforts will not only clarify the limitations of AI compared to traditional psychotherapy but also highlight what makes these applications novel and unique.

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