The Impact of Disasters on Stress Levels of Caregivers of Children with Special Needs: A Comparative Study

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Abstract

Aim: Caring needs of children with special needs increase the stress levels of caregivers for many reasons. The aim of this study was to examine, compare, and provide recommendations regarding the stress levels, factors influencing stress levels, and coping strategies among caregivers of both healthy and special needs children during disaster periods.

Method: This research was planned as a cross-sectional study. The survey, which was created in an electronic environment, disseminated to as many people as possible across the country via e-mail, various communication networks, and social media. After the demographic information of 261 caregivers were recorded, the Depression Anxiety Stress Scale 21, the Caregiver Strain Index, and the Ways of Coping Inventory Questionnaire were administered.

Results: While the stress level was high (Mean±SD:7.67±3.98) in the caregivers of children with special needs, this level was within the normal limits (Mean±SD:6.44±3.61) in the caregivers of healthy children. There was a significant difference between the groups (p:0.009). In terms of coping with stress, caregivers of children with special needs were found to prefer emotion-focused/passive approaches, and there was a difference between the groups (p:0.000).

Conclusion: The restrictive conditions during disaster period can impact the mental health of caregivers of special needs children, and there are several factors involved in this process. In line with this, we believe that specific policies and strategies need to be developed to support the mental health of caregivers of special needs children during extraordinary situations such as disaster scenarios.

Keywords: Caregivers, natural disasters, mental health, child, children with special needs.

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Özel Gereksinimli Çocuklara Bakım Verenlerin Stres Düzeylerine Afetlerin Etkisi: Karşılaştırmalı Bir Çalışma

Öz

Amaç: Özel gereksinimli çocukların bakım ihtiyaçları, birçok nedenle bakıcıların stres düzeylerini artırmaktadır. Bu çalışmanın amacı, felaket dönemlerinde hem sağlıklı hem de özel gereksinimli çocukların bakıcıları arasındaki stres düzeylerini, stres düzeylerini etkileyen faktörleri ve başa çıkma stratejilerini incelemek, karşılaştırmak ve öneriler sunmaktır.

Yöntem: Bu araştırma kesitsel bir çalışma olarak planlandı. Elektronik ortamda oluşturulan anket, e-posta, çeşitli iletişim ağları ve sosyal medya aracılığıyla ülke genelinde mümkün olduğunca çok kişiye ulaştırıldı. 261 bakıcının demografik bilgileri kaydedildikten sonra, Depresyon Anksiyete Stres Ölçeği 21, Bakıcı Yükü İndeksi ve Başa Çıkma Envanteri Anketi uygulandı.

Bulgular: Özel gereksinimli çocukların bakıcılarında stres düzeyi yüksekken (Ortalama±SD: 7,67±3,98), sağlıklı çocukların bakıcılarında bu düzey normal sınırlar içindeydi (Ortalama±SD: 6,44±3,61). Gruplar arasında önemli bir fark vardı (p: 0,009). Stresle başa çıkma konusunda, özel gereksinimli çocukların bakıcılarının duygu odaklı/pasif yaklaşımları tercih ettiği ve gruplar arasında farklılık olduğu bulundu (p: 0,000).

Sonuç: Felaket dönemindeki kısıtlayıcı koşullar, özel gereksinimli çocukların bakıcılarının ruh sağlığını etkileyebilir ve bu süreçte birçok faktör rol oynar. Buna uygun olarak, felaket senaryoları gibi olağanüstü durumlarda özel gereksinimli çocukların bakıcılarının ruh sağlığını desteklemek için belirli politikalar ve stratejiler geliştirilmesi gerektiğine inanıyoruz.

Anahtar Sözcükler: Bakımverenler, doğal afetler, ruh sağlığı, çocuk, özel gereksinimli çocuk.

Introduction

Disasters are typically sudden and widespread events that cause significant damage. They fall into two main categories: natural disasters (e.g., earthquakes, tsunamis, hurricanes, floods, famines) and man-made disasters (e.g., terrorist attacks, wars, industrial accidents, nuclear leaks). Disasters have global impacts, affecting both people's well-being and physical surroundings. For instance, the COVID-19 pandemic, which began in 2019, had a profound global impact. Quarantines were imposed worldwide as of March 31, 2020, leading to school closures, curfews, limited social interactions, and disruptions to medical care and rehabilitation[1].

While the world is still recovering from the COVID-19 pandemic, on February 6, 2023, Turkey was hit by a powerful earthquake measuring around 7.8 on the Richter scale. These earthquakes caused the death or injury of tens of thousands of people. Buildings collapsed, leading to significant material losses, and the psychological well-being of

survivors, particularly children with special needs (SNC), was deeply impacted. This psychological strain arises not only from death, disability, and material losses but also from challenges that hinder the rehabilitation of these children[2]. As a result, caregivers, especially those looking after SNC, face heightened stress and anxiety[3,4]. Studies indicate an increase in the number, intensity, and frequency of natural disasters over the years[5,6]. In light of this, it's crucial to recognize the need for psychological support for all caregivers during pandemic periods like COVID-19 and in the aftermath of disasters.

Children with mental or physical disabilities, such as autism spectrum disorder, attention deficit hyperactivity disorder, cerebral palsy, Down syndrome, brachial plexus injuries, developmental delay, learning difficulties, and inherited metabolic diseases, are collectively referred to as SNC. These children regularly attend hospitals or specialized education and rehabilitation centers for training, including physiotherapy, occupational therapy, and language and speech therapy[7]. In developing countries, estimates from 2013 indicated that there were between 93 million and 150 million SNC aged 0-18 years, highlighting the significant impact of quarantine measures on a large population[7]. The pandemic and associated curfews, implemented for protection, have had substantial effects on the physical, mental, and social well-being of SNC, as per the World Health Organization's International Classification of Functioning[8]. Based on reports from their families, it is believed that during disaster periods, these children face health risks related to mental health, behavioral issues, social isolation, sedentary lifestyles, disrupted nutrition and sleep patterns, and interruptions in medical care[9].

Research indicates that disaster preparedness and the subsequent recovery process are insufficient for SNC and their families due to the lack of necessary adjustments. It has been reported that this situation creates negative and disproportionate psychological effects on SNC and their caregivers after a disaster[10]. In addition, studies have found that the age, education level, child's level of independence, and socioeconomic status of caregivers of children with special needs (CGSC) affect the caregiver's stress levels[11-13]. It has also been observed that during and after disasters, SNC experience regression in motor skills, as well as sleep and eating disorders due to various reasons[9,12,13]. After a disaster, children may develop future anxiety, experience changes in their lifestyle, monotony, frustration, a lack of face-to-face contact, a lack of adequate personal space at home, and material and emotional losses. These factors can make children more demanding and result in behavioral changes[11,14,15]. The higher rates of physical and mental illnesses among SNC increase the stress on caregivers who strive to improve the

quality of care, compared to those caring for healthy children[16,17]. Moreover, studies report that disruptions in the treatment follow-up of SNC and the self-efficacy in managing their treatment also negatively impact the psychology of caregivers[11,18]. Although telerehabilitation is thought to reduce or completely eliminate stress levels, CGSC have expressed that while telerehabilitation reduces stress levels, it does not provide as much relief as face-to-face sessions[13].

Research has emphasized that the mental well-being of SNC and CGSC is significantly affected during and after a disaster, with various potential causes identified. However, the overall impact of all these factors on the caregiver's stress levels has not been examined as a whole. The primary aim of this study was to compare the stress levels and coping strategies of caregivers of children with special needs (CGSC) and caregivers of typically developing healthy children (CGHC) during the post-pandemic and post-disaster periods. The secondary aim was to investigate the stressors of the disaster, epidemic and their impact on the psychological health of CGSC, and to explore the continuity of rehabilitation and medical care and their importance to SNC's well-being, such as nutrition, sleep, activities of daily living, psychological state, physical activity, gross-fine motor skills, and communication.

Material and Methods

This study is a quantitative and cross-sectional study. This study adhered to the principles of the Declaration of Helsinki and received approval from the Ethics Committee of University Gazi (05.03.2021-E.43852).

We included 261 caregivers responsible for children aged 0-18 years, including both healthy children (130 participants) and children with special needs (131 participants) in the study. The study was terminated when the power analysis reached 81.5%.

We distributed the survey nationwide through email, various communication platforms, and social media. Participants completed the questionnaires on their desktop computers or mobile devices and provided informed consent at the beginning of the online survey. They were assured of data confidentiality.

The inclusion criteria for the CGSC group are caregivers of children with special needs aged 0-18 years, who are responsible for daily care and live with the child. For the CGHC group, the inclusion criteria are caregivers of mentally and physically healthy children aged 0-18 years with typical development, who are responsible for daily care and live

with the child. The exclusion criteria for both groups include having another disabled child in the family and/or additional care responsibilities beyond normal parental care.

Instruments

Demographic Variables: The questionnaire's initial section gathers information regarding the child's age, the respondent's relationship to the child, the child's level of independence, etc.

Depression Anxiety Stress Scale 21 (DASS-21): DASS-21 is a reliable and valid tool for assessing depression, anxiety, and stress in both clinical and non-clinical populations. This scale employs a 4-point Likert-type rating system and consists of 21 questions, with 7 questions dedicated to each of the depression, anxiety, and stress dimensions. Higher scores in each dimension suggest a greater presence of the related issue[19].

Caregiver Strain Index (CSI): CSI comprises 13 items, with caregivers responding with a 'Yes' (1 point) or 'No' (0 points) to each question. A total score of 7 points or more on the scale indicates a high level of caregiver stress. The scale is applicable to caregivers of all ages and assesses various stressors related to workload, interpersonal relationships, goals, social life restrictions, privacy, family and professional role conflicts, social support, and overall caregiver well-being[20].

Ways of Coping Inventory (WCI): The WCI is a 30-item Likert-type scale. Responses to the items range from "0- Not at all appropriate" to "3- Completely appropriate." The WCI assesses two primary stress coping methods: "problem-focused/active" and "emotion-focused/passive." The seeking for social support approach, optimistic approach, and self-confident approach subscales reflect active coping strategies, while the helpless approach and submissive approach subscales indicate passive coping methods[21].

Statistical Methods

SPSS version 22.0 was used for statistical analysis. The conformity of the data included in the study to the normal distribution was examined by visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Participants' data were compared via descriptive analysis using the Mann-Whitney U test for the difference between groups of continuous data that did not show normal distribution. Categorical data were compared using the Fisher-Exact test and the Chi-

square test. The correlation was analyzed by the Spearman correlation method. The correlations of the data that differed significantly between the two groups were analyzed with the Caregiver Strain Index mean. Linear regression analysis was applied to the data that were found to have a significant difference between them. The data that were found to be significant in this analysis were analyzed again by the multiple regression method. $p<0.05$ was considered statistically significant in the study.

Results

The demographic characteristics of the caregivers in both groups are presented in Table 1. The study included 261 participants and was conducted between confounders.

Medical follow-up, their ability to continue rehabilitation, their knowledge and attitudes about telerehabilitation, and their domestic arrangements of the caregivers in both groups are presented in Table 1.

Information on behavioral changes, type of behavior change, sleep disorders, nutritional disorders, physical activity, social communication skills, mental functions, gross and fine motor skills of the children in both groups are presented in Table 1.

There was a significant difference between groups in favor of the healthy children in terms of the type of behavior change, sleep, nutrition, social communication, mental function, and gross and fine motor skills ($p<0.05$) (Table 1).

Table 1. Demographic characteristics of caregivers and their observations on their children during the quarantine period

VARIABLES	**All Caregivers**		**CGSC**		**CGHC**		
	n	**%**	**n**	**%**	**n**	**%**	**p**
	61	100	134	100	127	100	
Closeness status							
-Mother	193	73.9	101	75.4	92	72.4	
-Father	33	7.1	24	17.9	9	7.1	0.262
-Other caregivers	35	13.4	9	6.7	26	20.5	
Caregiver age range							
-18-30	70	26.8	36	26.9	34	26.8	
-31-40	118	45.1	68	50.7	49	38.6	0.153
-41-50	63	24.1	25	18.7	38	29.9	
- 50 and above	10	3.8	4	3.0	6	4.7	
Child's age range							
-<6	135	51.7	85	63.4	50	39.4	**0.000***
->6	126	48.3	49	36.6	77	60.6	

Diagnosis of SNC							
-Cerebral Palsy	79	59.0	79	59.0			
-Developmental Delay	11	8.2	11	8.2	-	-	-
-Down Syndrome	8	6	8	6			
-Other	36	26.8	36	26.8			
SNC's independence level							
-Totally dependent	5	3.7	5	3.7			
-Walks with support	64	48.5	64	48.5			
-Dependent on fine motor and hygiene skills	38	28.4	38	28.4	-	-	-
-Independent	26	19.4	26	9.4			
Caregiver education level							
-Primary education	44	16.9	37	27.6	7	5.5	
-High school	91	34.9	37	27.6	54	42.5	**0.003***
-University	77	29.5	41	30.6	36	28.3	
-Graduate education	49	18.8	19	14.2	30	23.6	
Working status during disaster							
-Continue the current state	236	90.4	115	85.8	121	95.3	**0.010***
-Laid off	25	9.6	19	14.2	6	4.7	
Knowledgeable about telerehabilitation?							
-Yes	82	31.4	43	32.1	39	30.7	0.747
-No	179	68.6	91	67.9	88	69.3	
Benefit from telerehabilitation?							
-Doesn’t know	154	59.0	73	54.5	81	63.8	
-It has been helpful	17	6.5	12	8.9	5	3.9	
-It didn't help	6	2.3	5	3.7	1	0.8	0.601
-Didn't take advantage	74	28.4	44	32.8	30	23.6	
-Doesn't think it will be effective	10	3.8	0	0.0	10	7.9	
A steady income at home?							
-Yes	224	85.8	113	84.3	111	87.4	0.570
-No	37	14.2	21	15.7	16	12.6	
Hospital visit?							
-Yes	119	45.6	58	43.3	61	48.0	0.442
-No	142	54.4	76	56.7	66	52.0	
Treatment of the SNC at home?							
-Yes	115	85.8	115	85.8	-	-	-
-No	19	14.2	19	14.2			
Any domestic arrangements for the child?							
-Yes	208	79.7	117	87.3	91	71.7	**0.002***
-No	53	20.3	17	12.7	36	28.3	
Do you think physical activity is decreasing?							
-Yes	202	77.4	98	73.1	104	81.9	0.092
-No	59	22.6	36	26.9	23	18.1	
Do you think there is a behavior change?							
-Yes	142	54.4	73	54.5	69		0.981

-No	119	45.6	61	45.5	58	54.3 45.7	
How was the type of behavior change?							
-More moderate	15	5.7	5	3.7	10	7.9	
-More angry	140	53.7	61	45.6	79	62.2	**0.000***
-No change	106	40.6	68	50.7	38	29.9	
Do you think your child's sleep pattern is disrupted?							
-Yes							**0.004***
-No	153	58.6	67	50.0	86	67.7	
	108	41.4	67	50.0	41	32.3	
Do you think your child's nutrition habits have changed?							
-Yes							**0.001***
-No	136	52.1	57	42.5	79	62.2	
	125	47.9	77	57.5	48	37.8	
Do you think your child's social communication is affected?							
-Yes							**0.001***
-No	156	59.4	67	50.0	88	69.3	
	106	40.6	67	50.0	39	30.7	
Do you think your child has mental influence?							
-Yes	107	41.0	46	34.3	61	48.0	**0.025***
-No	154	59.0	88	65.7	66	52.0	
Do you think your child's gross motor skills are getting worse?							
-Yes							
-No	121	46.4	79	59.0	42	33.1	**0.000***
	140	53.6	55	41.0	85	66.9	
Do you think your child's fine motor skills are getting worse?							
-Yes							
-No	79	30.3	58	43.3	21	16.5	**0.000***
	182	69.7	76	56.7	106	83.5	

CGSC: Caregivers for special need children; CGHC: Caregivers for healthy children; SNC: Special need children; p<0.05.

According to the DASS scores of the CGSC, depression, anxiety, and stress levels differed significantly between the groups, and CGSC were found to have higher levels of depression, anxiety, and stress (p<0.05) (Table 2).

The sub-dimensions of the Ways of Coping Inventory, namely, helpless approach, submissive approach, and seeking for social support, were found to be significantly higher in the CGSC group than in the CGHC group (p<0.05). Emotion-focused passive approach was found to be higher in the CGSC group and a significant difference was reported between the groups (p<0.05) (Table 2).

Stress levels of the CGSC were found to be higher a CSI score of 7.67±3.98 CSI, and those of the CGHC were found to be within normal limits with a CSI score of 6.44±3.61. Stress levels differed significantly between the groups (p<0.05) (Table 2).

Table 2. CSI, DASS and WCI mean scores of the caregivers and the differences between groups

	CGSC mean ± se	CGHC mean ± se	p
CSI	7.67±3.98	6.44±3.61	**0.009**
DASS Stress	8.66±5.91	6.29±4.87	**0.001**
DASS Anxiety	6.52±5.78	4.41±4.43	**0.003**
DASS Depression	8.16±6.20	5.92±5.12	**0.003**
WCI Self-Confidence Approach	13.82±3.96	13.52±4.50	0.703
WCI Optimistic Approach	8.82±3.80	9.18±3.24	0.784
WCI Helpless Approach	12.36±6.40	9.50±5.28	**0.000**
WCI Submissive Approach	8.32±3.74	6.65±3.34	**0.001**
WCI Seeking for Social Support Approach	7.44±2.47	6.49±2.22	**0.019**
WCI PFA	30.09±7.75	29.20±8.84	0.629
WCI EFP	20.69±9.41	16.15±7.90	**0.000**

CSI: Caregiver Strain Index; CGSC: Caregivers special need children; CGHC: Caregivers healthy children; DASS: Depression Anxiety Stress Scale, WCI: Ways of Coping Inventory, PFA: Problem-focused/active; EFP: Emotion-focused/passive; se: Standard error; $p<0.05$

Factors that have a significant relationship with CSI of the caregivers in both groups are presented in Table 3.

Table 3. Relationship of the demographic data and family observations with the CSI

Parameters	r	p
Closeness status	**-0.167**	**0.007**
Caregiver education level	0.015	0.806
Caregiver age range	0.006	0.926
Child's age range	-0.005	0.936
Working status during quarantine	**-0.224**	**0.000**
SNC's independence level	-0.077	0.388
Steady income status	-0.005	0.933
Increased workload	**-0.314**	**0.000**
Thinking that the child's care is affected	**-0.461**	**0.000**

Knowledge of telerehabilitation	0.65	0.304
State of requesting telerehabilitation	**-0.194**	**0.002**
Medical follow-up status	**0.153**	**0.014**
Decreased physical activity	**-0.209**	**0.001**
Behavior change status	**-0.273**	**0.000**
Sleep disorder	**-0.259**	**0.000**
Malnutrition	**-0.313**	**0.000**
Social communication disorder	**-0.290**	**0.000**
Mental activity disorder	**-0.256**	**0.000**
Continuing treatment at home	**0.225**	**0.010**
Making house arrangements	-0.603	0.318
Gross motor condition disorder	0.110	0.771
Fine motor condition disorder	0.012	0.848

CSI: Caregiver Strain Index; SNC: Special need children; r: Pearson correlation coefficient; $p<0.05$

Separate simple linear regression analysis and multiple linear regression analysis were conducted for both groups. In simple linear regression analysis, it was found that the risk factors of *"increased workload (β=-2.573), thinking that the child's care is affected (β=-3.792), decreased physical activity (β=-1.653), malnutrition (β=-1.479), social communication disorder (β=-2.006), and mental activity disorder (β=-1.644)"* have an impact on the CSI score. Multiple linear regression analysis showed that the potential risk factor of *'thinking that the child's care is affected (β=-3.169)'* accounted for 24.3% of the variation in the CSI score among caregivers of healthy children (Table 4).

Table 4. Linear regression analysis between the CSI scores of the caregivers of healthy children and risk factors and demographic data

Variables	**β**	**se**	**t**	**p**	**R^2**
-Constant*	5.932	0.616	9.631	0.000	0.007
-Closeness status*	0.332	0.342	0.969	0.969	
-Constant*	11.344	2.950	3.846	0.000	0.022
- Working status during quarantine*	-2.511	1.502	-1.672	0.097	
-Constant*	10.230	0.937	10.916	0.000	0.127

- Increased workload*	**-2.573**	0.603	-4.269	**0.000**	
-Constant*	12.622	0.977	12.924	0.000	0.258
- Thinking that the child's care is affected*	**-3.792**	0.575	-6.601	**0.000**	
-Constant*	7.950	0.957	8.304	0.000	0.022
- State of requesting telerehabilitation*	-1.154	0.691	-1.672	0.097	
-Constant*	6.977	1.054	6.621	0.000	0.002
- Medical follow-up status*	-0.346	0.647	-0.535	0.594	
-Constant*	8.394	1.023	8.207	0.000	0.031
- Decreased physical activity*	**-1.653**	0.823	-2.008	**0.047**	
-Constant*	7.716	0.988	7.807	0.000	0.015
- Behavior change status*	-0.875	0.642	-1.363	0.175	
-Constant*	6.969	0.965	7.219	0.000	0.003
- Sleep disorder*	-0.399	0.688	-0.580	0.563	
-Constant*	8.479	0.951	8.916	0.000	0.040
- Malnutrition*	**-1.479**	0.651	-2.272	**0.025**	
-Constant*	9.062	0.935	9.687	0.000	0.066
- Social communication disorder*	**-2.006**	0.675	-2.972	**0.004**	
-Constant*	8.939	1.004	8.901	0.000	0.052
-Mental activity disorder*	**-1.644**	0.628	-2.618	**0.010**	
-Constant**	14.097	1.352	10.423	0.000	
- Increased workload**	-0.419	0.757	-0.554	0.581	
-Thinking that the child's care is affected**	-3.169	0.843	-3.761	**0.000**	**0.243**
-Decreased physical activity**	-0.378	0.851	-0.444	0.658	
- Malnutrition**	0.272	0.711	0.382	0.703	
-Social communication disorder**	-0.786	0.721	-1.090	0.278	
-Mental activity disorder**	-0.510	0.636	-0.802	0.424	

CSI: Caregiver Strain Index; *Simple linear regression analysis; **Multiple linear regression analysis; se: Standard error; β: Regression coefficient; $p<0.05$

In simple linear regression analysis, it was found that the risk factors of *'working status during quarantine (β=-2.632), increased workload (β=-2.468), thinking that the child's care is affected (β=-3.161), state of requesting telerehabilitation (β=-2.126), medical follow-up status (β=2.897), decreased physical activity (β=-2.390), sleep disorder (β=-3.806), malnutrition (β=-3.818), social communication disorder (β=-3.095), mental activity disorder (β=-2.653), continuation of treatment at home (β=1.222) and caregiver being a mother (β=1.829)'* have an impact on the CSI score. Multiple linear regression analysis showed that the potential risk factor of *'sleep disorder (-2.446), malnutrition (-1.582), thinking that the child's care is affected (-3.656) and the caregiver being a mother (1.418)'* accounted for 47.3% of the variation in the CSI score among caregivers of special need children (Table 5).

Table 5. Linear regression analysis between the CSI scores of the caregivers of special need children and risk factors and demographic data

Variables	**β**	**se**	**t**	**p**	**R²**
-Constant*	5.271	0.774	6.809	0.000	0.085
- Closeness status*	**1.829**	0.530	3.449	**0.001**	
-Constant*	12.576	1.872	6.717	0.000	0.052
- Working status during quarantine*	**-2.632**	0.989	-2.662	**0.009**	
-Constant*	11.452	1.085	10.556	0.000	0.096
-Increased workload*	**-2.468**	0.686	-3.597	**0.000**	
-Constant*	12.670	1.080	11.734	0.000	0.160
- Thinking that the child's care is affected*	**-3.161**	0.665	-4.753	**0.000**	
-Constant*	10.065	1.230	8.181	0.000	0.031
- State of requesting telerehabilitation*	**-2.126**	1.051	-2.022	**0.045**	
-Constant*	3.577	0.996	3.592	0.000	0.129
- Medical follow-up status*	**2.897**	0.664	4.360	**0.000**	
-Constant*	10.692	1.029	10.396	0.000	0.070
- Decreased physical activity*	**-2.390**	0.770	-3.105	**0.002**	
-Constant*	12.056	0.999	12.071	0.000	0.144
- Behavior change status*	**-3.028**	0.653	-4.636	**0.000**	
-Constant*	13.416	0.978	13.713	0.000	0.230
- Sleep disorder*	**-3.806**	0.616	-6.180	**0.000**	
-Constant*	13.742	1.060	12.962	0.000	0.221
- Malnutrition*	**-3.818**	0.638	-5.980	**0.000**	

-Constant*	12.312	1.063	11.580	0.000	0.149
- Social communication disorder*	**-3.095**	0.663	-4.669	**0.000**	
-Constant*	12.045	1.192	10.106	0.000	0.102
- Mental activity disorder*	**-2.653**	0.695	-3.816	**0.000**	
-Constant*	4.301	1.165	3.691	0.000	0.067
-Continuation of treatment at home*	**1.222**	0.404	3.028	**0.003**	
-Constant**	14.526	3.260	4.456	0.000	
- Closeness status**	**1.418**	0.421	3.364	**0.001**	
- Working status during quarantine**	-0.616	0.822	-0.750	0.455	
-Increased workload**	1.742	1.042	1.666	0.099	
- Thinking that the child's care is affected**	**-3.656**	1.068	-3.423	**0.001**	
- State of requesting telerehabilitation**	-0.288	0.904	-0.319	0.750	**0.473**
- Medical follow-up status**	0.970	0.634	1.529	0.129	
- Decreased physical activity**	0.755	0.772	0.978	0.331	
- Sleep disorder**	**-2.446**	0.724	-3.379	**0.001**	
- Malnutrition**	**-1.582**	0.741	-2.134	**0.035**	
- Social communication disorder**	-0.287	0.694	-0.414	0.680	
- Mental activity disorder**	-0.326	0.644	-0.507	0.613	
- Continuation of treatment at home**	0.203	0.349	0.581	0.563	

CSI: Caregiver Strain Index; *Simple linear regression analysis; **Multiple linear regression analysis; se: Standard error; β: Regression coefficient; p<0.05

Discussion

In this study, factors believed to affect the mental health of CGSC and CGHC during disaster periods, coping strategies with stress, and the psychological state of caregivers during the period were examined. It was found that CGSC had higher levels of depression, anxiety, and stress compared to CGHC. Additionally, it was concluded that CGSC exhibited emotion-focused/passive approaches to coping with stress.

The majority of caregivers participating in the study in both groups were mothers. Similar to previous studies, there was a predominance of women in the caregiving process[22-24]. Higher than expected stress levels are associated with the fact that the primary caregivers are generally female and the number of male caregivers participating in our study is relatively low. This conclusion is also supported by previous studies reporting that women experience more stress than men[25,26]. The majority of the CGSC participating in our study were undergraduates, and the majority of the CGHC were high school graduates, they were mostly aged 31-40 years. There was no significant difference

between the stress levels of the participants in the study and their educational status and age. In contrast to this finding, Qiu et al. reported that educational level and caregiver age were associated with stress levels during disaster periods[27]. In the current study, the lack of differences in educational levels and ages among the groups can be explained by the fact that during disaster periods, all caregivers, regardless of their educational level and age, have a similar level of awareness regarding the care of their children and assume similar responsibilities in supporting them.

In this study, there was no relationship between the stress levels of caregivers and the child's independence level. This result was similar to the reported findings[24]. This suggests that various factors, such as living conditions, the caregiver's mood, and the child's health, may affect the caregiver's stress level, and studies are needed to investigate this.

It is reported that stress levels are higher among families caring for low-income SNC, and this stress increases further during disaster periods when businesses face difficulties and experience reduced income, which aligns with our study[24]. Another reported reason for the increase in stress is the inability to fully meet financial needs[28]. During the disaster period, the closure or risk of closure of many businesses has led to financial difficulties for employees, and the fear of becoming unemployed at any moment has negatively impacted them psychologically[29-31]. Economic difficulties in meeting family members' needs and the psychological pressure to continue treatment at home are thought to lead to disruptions among family members, which may in turn increase caregivers' stress levels.

In the current study, we concluded that, during the disaster, children's physical activity levels and gross-fine motor skills decreased, and they experienced changes in sleep, nutrition, social communication, mental functions, and behaviors. Studies indicate that SNC experience social communication and behavioral issues during disasters, which supports our study[9,32]. In line with our study, it has also been reported that SNC suffer from sleep and eating disorders during and after disasters due to various factors[9,12,13]. Our study concluded that declines in fine and gross motor skills in SNC needs do not affect the stress levels of their caregivers more than they do for caregivers of healthy children. It is believed that this situation is related to the continuation of treatment at home for children who have been receiving treatment for a long period. In the study, it was found that all behavioral changes except the decrease in gross and fine motor skills affected the stress levels of the caregivers, and there was a difference between groups.

We think that children experience sleep disorders due to their inability to spend the energy they need to spend in daily life in relation to the decrease in their physical activity levels, and that changes in the lifestyles that children are used to cause nutrition, mental functions, and behavioral disorders, and this may increase the stress level of the families.

During the disaster period, education, health, and rehabilitation services were postponed or canceled for many individuals[9]. It has been reported that caregivers of SNC visit the doctor approximately 5 times a year and attend around 4 therapy sessions per week[33]. This means that any issues in healthcare services would significantly impact both SNC and healthy children. However, tele-rehabilitation can provide support to families with SNC in various ways, prevent the onset of complications that could negatively affect children's activities and participation, and enable prompt initiation of treatment, which is highly beneficial[34,35]. There was a significant inverse relationship between the provision of tele-rehabilitation facilities and stress levels. We found that the majority of caregivers providing care to SNC and healthy children made household adjustments during the disaster period. There was no significant relationship between caregivers' household adjustments and stress levels. We believe that families are doing their best for the mental and physical development of their children, but changing stress levels alone is not enough; we also believe that different factors contribute to stress levels.

In our study, it was determined that stress levels were normal and anxiety and depression levels were mild in the CGHC group. New studies supporting our findings have reported that preventive interventions implemented during disaster periods worsen the psychological condition and lead to increased depressive symptoms in the CGHC group[36,37]. It has been reported that CGHC has a higher risk of depression compared to non-caregivers, and the feeling of isolation can further increase this risk[28,38]. We believe that the increase in caregivers' stress levels for various reasons contributes to the escalation of anxiety and depression symptoms. Additionally, factors such as reduced participation in social activities, devoting more time to caregiving, decreased likelihood of encountering positive emotions, loss of loved ones, and financial losses can lead to caregiver withdrawal and a decrease in their sense of caregiving. We believe that this situation may contribute to caregivers experiencing more pronounced anxiety and depression symptoms.

In this study, it was found that the stress levels in the CGSC group were mild, while the levels of depression and anxiety were moderate, and a significant difference was observed between the groups. It has been reported that during non-pandemic periods,

CGSC tends to have higher levels of anxiety and depression compared to CGHC[26,39]. There are several studies in the literature that support an increase in depression and anxiety levels among CGSC caregivers[40-42]. Additionally, it has been reported that CGSC experienced a significant worsening of depression, anxiety, and stress levels in the post-disaster period compared to the pre-disaster period[43]. Providing the entire day's physical/mental education for children without professional support during these periods, the development of a sense of inadequacy, and the additional difficulties arising from the children's limitations have been found to increase the psychological burden on caregivers[40,41,43]. We believe that the high level of stress experienced by CGSC, resulting from the increased financial and moral burden, fear of their children's deteriorating mental/physical well-being, and anxiety about being inadequate in their caregiving, may contribute to the manifestation of depression and anxiety symptoms in caregivers.

Differences were observed in the coping styles of the participating caregivers. It was found that the helpless approach, submissive approach, seeking social support approach, and emotion-focused/passive approaches were significantly higher in CGSC. In the post-disaster period, CGSC caregivers attempted to maintain optimism by adopting a denial approach and envisioning a lower threat level in the future due to the challenges they faced in daily life. On the other hand, CGHC exhibited a more composed and realistic attitude, striving to generate more detailed solutions to cope with stress.

Although the factor of perceiving a negative impact on childcare was found to be statistically significant in both groups through multiple linear regression analysis, it was observed that this indicator was insufficient in predicting the average stress levels of caregivers. It is believed that various other factors influence caregivers' stress levels, and the combination of these factors leads to changes.

We believe that factors such as increased responsibility, fear of inadequacy towards their children, financial concerns, anxiety about the future, disruption of education and healthcare services, inadequate access to telerehabilitation, social isolation, and fear are effective in the changes in caregivers' stress levels during disaster periods. Studies have reported emotional exhaustion, low personal achievement, and the presence of psychological distress among caregivers during disaster periods, which in turn result in mental health burdens[44]. Given that caregivers' psychological well-being weakens negatively affects the care provided to children, it is crucial to prevent or intervene in the escalation of stress levels, especially in the early stages. The triggering factors for this

condition have been mentioned in our study, and we recommend making adjustments for these and future disasters.

This study has some limitations. As it is a cross-sectional study conducted during the pandemic and post-disaster period, it is not clear whether the stress, depression, and anxiety levels of CGSC are associated with the effects of the disaster or the ongoing caregiving process. To clearly distinguish between pre-and post-disaster conditions, a retrospective survey could be considered. Additionally, phone or face-to-face interviews can be conducted for caregivers who are technologically challenged or unable to access the survey.

Conclusion

In this study, various factors affecting the stress levels of caregivers were identified, and it was determined that caregivers of special needs children (CGSC) have higher stress levels compared to caregivers of healthy children (CGHC). These risk factors include financial difficulties during disasters, increased workload, concerns about the impact on the child's care, need for telerehabilitation, medical follow-up status, decreased physical activity, sleep disorders, malnutrition, social communication disorders, mental activity disorders, interruptions in children's routines, continuation of treatment at home, and the caregiver being a mother. Additionally, the emotional and passive coping strategies of CGSC contribute to higher stress levels. It was emphasized that during disaster periods, not only CGSC but also all caregivers need to be supported, and necessary policies should be developed. Policies should focus on financial assistance, psychological support, and the continuity of education, health, and rehabilitation services to mitigate caregiver stress. Targeted support strategies are essential to address the multifaceted nature of caregiver stress and ensure their well-being.

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