Investigation of coronavirus anxiety and caregiving burden among the parents of children with cancer during the COVID-19 outbreak: A descriptive and cross-sectional study

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Abstract
Objective: This study aimed to investigate the coronavirus anxiety and caregiving burden of parents of children with cancer during the COVID-19 outbreak.

Methods: This descriptive and cross-sectional study, including 136 parents of children with cancer, was administered through an online survey at a university hospital from 1 to 31 January 2021. Participants completed a questionnaire form, the Zarit Caregiver Burden Scale and the Coronavirus Anxiety Scale.

Results: This study identified a significant difference in the caregiving burden scores of parents according to whether their relatives had been diagnosed with COVID-19, whether they were exposed to coronavirus in their environment and whether their children had other illnesses. A significant difference in the coronavirus anxiety scores of parents was observed according to their child’s sex and the time elapsed since their child’s cancer diagnosis. No correlation was identified between the Zarit Caregiver Burden Scale scores and the Coronavirus Anxiety Scale scores.

Conclusion: Oncology nurses and other health professionals should be aware of and consider the factors that influence the caregiving burden and coronavirus-related anxiety experienced by parents of children with cancer during the COVID-19 outbreak.

Keywords
anxiety, caregiver burden, COVID-19, paediatric cancer

1 | INTRODUCTION

Globally, COVID-19 has been related to additional health issues, including depressive symptoms, stress, fear, anxiety, anger, sleeplessness and disavowal (Torales et al., 2020). Increased stress and anxiety are the primary mental health and psychological impacts that have been reported among the general public to date (World Health Organization, 2020). A study performed on the adult population in India during the COVID-19 outbreak reported that their anxiety levels were high (Roy et al., 2020). A systematic review reported reduced psychological well-being and increased depression and anxiety scores among the general population compared with the levels reported by pre-COVID-19 studies (Vindegaard & Benros, 2020). A study performed in Turkey during the COVID-19 outbreak revealed that ‘women and people with chronic diseases’ were among the groups that were the most psychologically impacted by the COVID-19 outbreak (Özdin & Bayrak Özdin, 2020).

Children constitute a small proportion of total cases of COVID-19 and typically experience mild symptoms. Nevertheless, some paediatric cases can progress to serious illness (Choi et al., 2020). It has been indicated that children with cancer face the same risk of serious illness from COVID-19 as their healthy peers (Ruggiero et al., 2020). Hrusak et al. (2020) found that in paediatric haematology/oncology wards, severely immunocompromised patients are at high risk..
of contracting infectious illnesses, such as COVID-19. However, no alarming statistics regarding COVID-19 infections among children being treated for cancer have been reported thus far (Kaspers, 2020).

High levels of psychological distress are experienced by the parents of children with cancer (Rahmani et al., 2018; van van Warmerdam et al., 2019). Köse et al. (2019) revealed that among the parents of children diagnosed with cancer, the anxiety and care burden levels increased together. Ahmadi et al. (2019) found that the factors influencing the care burden of parents of children with cancer were the cancer type, the number of hospitalisations, the duration of illness, the parent’s age and income and the age of the child.

The COVID-19 pandemic has led to additional psychological pressure on cancer patients and their parents and siblings. Parents experience great anxiety because of their lack of knowledge regarding the actual risk of serious illness from COVID-19 among children diagnosed with cancer (Sullivan et al., 2020). Darlington et al. (2021) found that during the COVID-19 outbreak, most parents of children with cancer were concerned about transmitting COVID-19 virus to their children. Mirlashari et al. (2021) revealed that the COVID-19 outbreak placed an additional psychological and physical burden on children with cancer and their families through multiple mechanisms.

Although studies on children with cancer generally show that parents are psychologically affected by their children’s illness (Carlsson et al., 2019; Köse et al., 2019; Rahmani et al., 2018), in the literature, we did not identify any studies examining the relationship between coronavirus anxiety and caregiving burden among the parents of children with cancer during the COVID-19 outbreak. We also did not find research investigating the factors affecting coronavirus anxiety and caregiving burden. During the COVID-19 outbreak, the factors that influence anxiety and caregiving burdens among parents may differ from those in other periods. Determining these factors among parents of children with cancer and alleviating them are among the important responsibilities of nursing care. Nurses can play a key role in identifying the factors that influence the distress experienced by the parents of children with cancer during the COVID-19 outbreak and in providing parents with additional support.

The aim of this study is to investigate the coronavirus anxiety and caregiving burden of parents of children with cancer during the COVID-19 outbreak.

The questions for this study are as follows: Are there significant differences in the caregiving burden experienced by parents during the COVID-19 outbreak according to differences in the characteristics of parents and children diagnosed with cancer? Are there significant difference in coronavirus anxiety experienced by parents during the COVID-19 outbreak according to differences in the characteristics of parents and children diagnosed with cancer? Do any correlations exist between children’s and parents’ ages and parents’ caregiving burden and coronavirus anxiety or between said burden and anxiety during the COVID-19 outbreak?

2 | METHODS

2.1 | Design and participants

This descriptive, cross-sectional study was executed at a university hospital located in a city in the Mediterranean region of Turkey. Data were collected via an online survey from 1 to 31 January 2021.

The study population consisted of the parents of 143 children diagnosed with cancer who were hospitalised for treatment and care at a university hospital paediatric haematology oncology clinic between the specified dates. The final study sample included 136 parents who met the following criteria: aged 18 or older; voluntarily participated in the study; had a child diagnosed with cancer; were able to communicate and cooperate; had no health problems.

All of the children included in the study were receiving chemotherapy treatment. According to the chemotherapy protocol, a child is usually hospitalised once every 3 weeks for approximately 7–10 days. As a general rule of the hospital, including during the pandemic, only one parent is permitted to accompany a child for the duration of his or her hospital stay. Thus, only one parent (mother or father) per child was included in the study since the children’s caregivers were their parents.

The required study sample size calculated in the G*Power (3.1.9.6) software package, based on the correlation results reported by Köse et al. (2019), using an effect size of 0.715, a power of 0.80 and an α of 0.05, indicated that a minimum of 12 parents was necessary. The study was completed using 136 parents who met the study criteria, as described above. Post hoc analysis in the G*Power (3.1.9.6) software package revealed that, based on the correlation between caregiving burden and coronavirus anxiety, a sample size of 136 parents with α = 0.05 and an effect size of 0.705, the power was calculated as 1.00. A power of 0.80 or higher indicates a sufficient sample size (Malone et al., 2016). The participants were recruited through the convenience sampling method.

Figure 1 shows the process of the study.

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**FIGURE 1** The process of the study

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2.2 | Instruments

2.2.1 | Questionnaire form

The questionnaire form consisted of questions regarding the age of both the parent and the child; the sex of both the parent and the child; the parent's educational level and marital status; the level of family income; the total number of children in the family; protective measures taken by the parents against coronavirus; COVID-19 cases among relatives; COVID-19 cases in their environment (neighbourhood, workplace); and the diagnosis and illness status of the child being treated for cancer.

2.2.2 | Coronavirus anxiety scale

The Coronavirus Anxiety Scale (CAS) is a short mental health scale developed by Lee (2020) to determine cases of dysfunctional anxiety related to the COVID-19 crisis. The unidimensional scale includes five questions answered on a 5-point Likert-type scale that ranges from 0 = never to 4 = almost every day in the last 2 weeks. The validity and reliability of the scale in Turkish society were determined by Bicer et al. (2020), who found a Cronbach's $\alpha$ of 0.83. The Cronbach's $\alpha$ in our study was 0.78.

2.2.3 | The Zarit caregiver burden scale

The Zarit Caregiver Burden Scale (ZCBS) was developed by Zarit et al. (1980). This scale is used to identify the stress experienced by those who care for an ailing or older individual. Answers can be self-reported by caregivers or recorded by a researcher. The scale has one dimension and includes 22 items that identify the effects of caregiving on the respondent's life. Items are scored on a 5-point Likert-type scale that ranges from 0 = never to 4 = nearly always. The total score can range from 0 to 88; a higher score demonstrates a higher level of distress (Zarit et al., 1980). The validity and reliability of the scale in Turkish society were ascertained by Inci and Erdem (2008), who reported a Cronbach's $\alpha$ of 0.95. The Cronbach's $\alpha$ in our study was 0.78.

2.3 | Procedure and ethical aspects

Prior to carrying out the study, the researcher obtained ethical approval from the Clinical Research Ethics Committee. Permission to perform the study was also received from the hospital. The study was executed in accordance with the Helsinki Declaration.

The parents of children with cancer who were hospitalised in the paediatric haematology oncology clinic of a university hospital were contacted by the researcher (a nurse in the clinic), who approached the parents in person at the clinic. The researcher invited the parents to participate in the study. After providing verbal and written consent, the parents were asked to fill out an online survey created in Google Forms. A link to the survey was provided to parents who agreed to participate in the study via WhatsApp or Telegram, which allowed the participants to access the study from their smartphones. The details of the study, including information about the research objectives, procedures, consent and confidentiality, were provided on the landing page of the survey. During the first part of the survey, the parents were informed that this study was conducted for research purposes, that the data would be used for scientific purposes and that participation was voluntary. The parents confirmed their consent to participate in the study by responding positively to the question, 'Would you like to participate in the study voluntarily?' In addition, the parents were informed that the online survey would take approximately 15 minutes to complete. If a parent had more than one child with cancer, the parent was asked to fill out the online survey for only one child. As explained above, only one parent (either the mother or the father) was asked to complete the online survey. The researcher answered any questions that the parents had regarding any aspect of the study over WhatsApp or Telegram.

2.4 | Data analysis

SPSS 22.00 (IBM Corp, Chicago) was used for statistical analyses. The Shapiro–Wilks test was applied to assess data normality. The descriptive statistics, the Mann–Whitney $U$ test, the Kruskal–Wallis test (followed by the Dunn–Bonferroni post hoc test if the results of the former test were significant), and Spearman's correlation analysis were used to analyse the data. The Cronbach's $\alpha$ coefficients of the scales were determined. The level of significance was set at $p < 0.05$.

3 | RESULTS

3.1 | Characteristics of children with cancer and their parents

The average age of the parents was 36.29 ± 7.50 years. Of the parents, 76.5% were women, 46.3% were primary school graduates, 45.6% had two children and 54.4% perceived their income level as being equal to their expenses. All the parents included in the study were married and no divorces occurred during the diagnosis and treatment of the children with cancer. All reported responses from parents refer to the children receiving treatment for cancer.

The average age of the children was 9.29 ± 4.89 years. Of the children, 64.0% were boys, 44.9% were diagnosed with acute lymphoblastic leukaemia, 44.1% were diagnosed with cancer 1 day–6 months prior to survey completion and 14.0% had other illnesses aside from cancer (chronic illnesses such as diabetes mellitus, immunodeficiency or hypertension).

The study determined that 96.3% of the parents paid attention to hand hygiene, 97.1% to wearing a mask and 91.9% to social distancing rules. In addition, 49.3% of the parents reported COVID-19 cases in their environment, while 38.2% reported COVID-19 cases among their relatives (Table 1).
| Characteristics                                                                 | n   | %   |
|---------------------------------------------------------------------------------|-----|-----|
| **Sex of parents**                                                              |     |     |
| Female                                                                          | 104 | 76.5|
| Male                                                                            | 32  | 23.5|
| **Marital status of parents**                                                   |     |     |
| Married                                                                         | 136 | 100 |
| **Education level of parents**                                                  |     |     |
| Primary education                                                               | 63  | 46.3|
| High school                                                                     | 62  | 45.6|
| University and above                                                             | 11  | 8.1 |
| **Income**                                                                      |     |     |
| Income lower than expense                                                        | 58  | 42.6|
| Income equal to expense                                                          | 74  | 54.4|
| Income higher than expense                                                       | 4   | 3.0 |
| **Number of children**                                                          |     |     |
| One                                                                             | 24  | 17.6|
| Two                                                                             | 62  | 45.6|
| Three                                                                           | 36  | 26.5|
| Four and over                                                                   | 14  | 10.3|
| **Sex of children**                                                             |     |     |
| Female                                                                          | 49  | 36.0|
| Male                                                                            | 87  | 64.0|
| **Cancer diagnosis type in children**                                           |     |     |
| Acute lymphoblastic leukaemia                                                   | 61  | 44.9|
| Acute myeloid leukaemia                                                         | 22  | 16.2|
| Lymphoma                                                                        | 12  | 8.8 |
| Solid tumours                                                                    | 41  | 30.1|
| **Time since diagnosis**                                                        |     |     |
| 1 day–6 months                                                                  | 60  | 44.1|
| 7 months–1 year                                                                 | 39  | 28.7|
| 2–4 years                                                                       | 33  | 24.3|
| ≥5 years                                                                        | 4   | 2.9 |
| **Presence of other illnesses in children (chronic illnesses such as diabetes mellitus, immunodeficiency and hypertension)** |     |     |
| Yes                                                                             | 19  | 14.0|
| No                                                                              | 117 | 86.0|
| **Paying attention to hand hygiene**                                            |     |     |
| Yes                                                                             | 131 | 96.3|
| Partially                                                                       | 5   | 3.7 |
| **Paying attention to wearing a mask**                                          |     |     |
| Yes                                                                             | 132 | 97.1|
| Partially                                                                       | 4   | 2.9 |
| **Paying attention to social distance rules**                                   |     |     |
| Yes                                                                             | 125 | 91.9|
| Partially                                                                       | 11  | 8.1 |
| **Having coronavirus illness in their environment**                             |     |     |
| Yes                                                                             | 67  | 49.3|
| No                                                                              | 69  | 50.7|
3.2 | Caregiving burden scores according to the demographics of parents and children

Significant differences in the mean scores for caregiving burden among parents were identified according to whether their children had other illnesses, whether COVID-19 cases were present in their environment and whether COVID-19 cases were present among their relatives \((p < 0.05)\). Parents who reported other illnesses in their children and COVID-19 cases among their relatives or in their environment had significantly higher mean total caregiving burden scores than those who did not report these factors \((p < 0.05)\).

No significant differences were identified in the mean total caregiving burden scores of parents according to the parents' sex and education level; family income; the number of children; the children's sex and cancer diagnosis; the time elapsed since diagnosis; and whether parents paid attention to hand hygiene, wearing a mask or social distancing rules \((p > 0.05, \text{Table 2})\).

3.3 | Coronavirus anxiety scores according to the demographics of parents and children

Significant differences in the mean scores for coronavirus anxiety among parents were observed according to the sex of the child being treated for cancer and the time elapsed since diagnosis \((p < 0.05)\). In the advanced analysis performed to identify which groups were associated with the difference, the coronavirus anxiety scores of the parents of children diagnosed 1 day–6 months prior to questionnaire completion were found to be significantly lower than those of parents of children diagnosed 2–4 years prior to questionnaire completion. The average coronavirus anxiety score for parents of girls diagnosed with cancer was significantly higher than that for parents of boys diagnosed with cancer.

No significant differences in the mean total coronavirus anxiety scores were observed among parents according to the parents' sex and education level; family income; the number of children; the cancer diagnosis of the child; the presence of other illnesses in the child; whether parents paid attention to hand hygiene, wearing a mask and social distancing rules; and the presence of COVID-19 cases in the parents' environment or among their relatives \((p > 0.05, \text{Table 2})\).

3.4 | Distribution of scores for the Zarit caregiver burden scale and coronavirus anxiety scale and relationships between the caregiving burden of parents, the coronavirus anxiety of parents, the age of the child and the age of the parents

This study found that parents had mean scores of 31.24 ± 9.43 (min: 3, max: 57) and 0.97 ± 2.06 (min: 0, max: 10) for caregiving burden and coronavirus anxiety, respectively.

No significant relationships were identified between the two scale scores and the variables \((p > 0.05)\) or between the two scale scores \((p > 0.05, \text{Table 3})\).

4 | DISCUSSION

This study investigated the coronavirus anxiety and caregiving burden of the parents of children with cancer during the COVID-19 outbreak.

The study found that the parents who reported COVID-19 cases among their relatives had higher scores on the ZCBS than those who did not. Vindegaard and Benros (2020) identified various factors, including having relatives diagnosed with COVID-19, that were related to reduced psychological well-being or a higher risk of psychiatric symptoms. Dorman-Ilan et al. (2020) found that patients with COVID-19 and their relatives reported concerns about their own health and well-being and that of other family members, as well as a fear of transmitting the virus to others. In this study, parents who reported having relatives diagnosed with COVID-19 experienced a greater caregiving burden, likely due to the increased risk of transmitting COVID-19 virus to their children.

This study also found that parents who reported COVID-19 cases in their environment had higher scores on the ZCBS than those who did not. The danger of being exposed to SARS-CoV-2 in a community or hospital environment has caused anxiety to be common in the families of children with cancer (Kotecha, 2020). In the current study, the danger of being exposed to COVID-19 and psychological conditions such as anxiety were likely associated with the observed increase in parents' caregiving burden.

Additionally, parents who reported the presence of other (chronic) illnesses in their children had higher scores on the ZCBS than...
| Variables | n   | %   | Zarit caregiver burden scale scores Mean ± SD Q2 (Q1–Q3) | Test value and p-value | Coronavirus anxiety scale scores Mean ± SD Q2 (Q1–Q3) | Test value and p-value |
|-----------|-----|-----|----------------------------------------------------------|------------------------|----------------------------------------------------------|------------------------|
|            |     |     | Test value and p-value |                      | Test value and p-value |                      |
| Sex of parents |    |     | U = 1467.00 p = 0.312 |                      | U = 1409.50 p = 0.096 |                      |
| Female     | 104 | 76.5| 31.67 ± 10.13 31.50 (25–38) |                      | 1.13 ± 2.24 0 (0–1) |                      |
| Male       | 32  | 23.5| 29.84 ± 6.64 31 (24–33.75) |                      | 0.47 ± 1.22 0 (0–0) |                      |
| Education level of parents |    |     | U = 1409.50 p = 0.096 |                      | K = 0.37 p = 0.831 |                      |
| Primary education | 58 | 42.6| 32.83 ± 9.37 33 (25–39) | K = 3.47 p = 0.176 0 (0–1) | 1.02 ± 2.08 0 (0–1) | K = 0.37 p = 0.831 |
| High school | 74  | 54.4| 30.10 ± 8.92 30 (24.75–33.5) |                      | 0.95 ± 2.14 0 (0–0.25) |                      |
| University and above | 4  | 3.0 | 28.64 ± 11.84 31 (23–34) |                      | 0.82 ± 1.60 0 (0–1) |                      |
| Income |    |     | K = 5.71 p = 0.058 |                      | K = 2.65 p = 0.266 |                      |
| Income lower than expense | 58 | 42.6| 33.59 ± 10.68 33 (25–41) |                      | 1.29 ± 2.46 0 (0–1.25) |                      |
| Income equal to expense | 74 | 54.4| 30.00 ± 7.46 31 (25–34) |                      | 0.72 ± 1.68 0 (0–0) |                      |
| Income higher than expense | 4 | 2.9 | 20.25 ± 13.30 22.5 (6.5–31.75) |                      | 1.00 ± 2.00 0 (0–3) |                      |
| Number of children |    |     | K = 0.89 p = 0.828 |                      | K = 2.96 p = 0.397 |                      |
| One | 24 | 17.6| 31.17 ± 9.59 32 (23.25–35.75) |                      | 0.63 ± 2.08 0 (0–0) |                      |
| Two | 62 | 45.6| 31.79 ± 10.26 32 (25–36.25) |                      | 1.03 ± 2.22 0 (0–0.25) |                      |
| Three | 36 | 26.5| 29.94 ± 7.97 30 (25–37) |                      | 1.19 ± 2.07 0 (0–2) |                      |
| Four and over | 4 | 2.9 | 20.25 ± 13.30 22.5 (6.5–31.75) |                      | 1.00 ± 2.00 0 (0–3) |                      |
| Gender of children |    |     | K = 1744.50 p = 0.079 |                      | U = 1699.50 p = 0.012* |                      |
| Female | 49 | 36.0| 33.59 ± 10.19 32 (26.5–39.5) |                      | 1.45 ± 2.56 0 (0–2) |                      |
| Male | 87 | 64.0| 29.92 ± 8.76 31 (25–35) |                      | 0.70 ± 1.68 0 (0–0) |                      |
| Cancer diagnosis type in children |    |     | K = 1.68 p = 0.641 |                      | K = 1.68 p = 0.641 |                      |
| Acute lymphoblastic leukaemia | 61 | 44.9| 31.26 ± 7.38 32 (27–35.5) | K = 7.41 p = 0.060 | 0.93 ± 2.14 0 (0–0.5) |                      |
| Acute myeloid leukaemia | 22 | 16.2| 28.14 ± 10.98 24 (21–34.25) |                      | 1.09 ± 2.56 0 (0–1) |                      |
| Lymphoma | 12 | 8.8 | 32.33 ± 15.62 36 (25.75–42.25) |                      | 1.42 ± 1.83 0 (0–3.75) |                      |
| Solid Tumours | 41 | 30.1| 32.56 ± 8.98 32 (25–38.5) |                      | 0.83 ± 1.75 0 (0–1) |                      |
| Time since diagnosis |    |     | K = 17.28 p = 0.001* |                      | K = 17.28 p = 0.001* |                      |
| 1 day to 6 months | 60 | 44.1| 31.87 ± 7.83 32.5 (29–36) | K = 4.08 p = 0.253 | 0.32 ± 1.00 0 (0–0) |                      |
| 7 months to 1 year | 39 | 28.7| 29.46 ± 5.59 27 (25–33) |                      | 1.10 ± 1.97 0 (0–2) |                      |
| 2–4 years | 33 | 24.3| 31.52 ± 14.18 29 (21–43) |                      | 2.12 ± 3.03 0 (0–4) |                      |
| Variables                                      | n  | %  | Zarit caregiver burden scale scores Mean ± SD | Test value and p-value | Coronavirus anxiety scale scores Mean ± SD | Test value and p-value |
|-----------------------------------------------|----|----|---------------------------------------------|------------------------|--------------------------------------------|------------------------|
|                                               |    |    | Q2 (Q1–Q3)                                  |                        | Q2 (Q1–Q3)                                 |                        |
| ≥5 years                                      | 4  | 2.9| 37.00 ± 12.91                               | 0.00 ± 0.00            | 0.00 ± 0.00                                | 0 (0–0)                |
| Presence of other illnesses in children       |    |    |                                             |                        |                                            |                        |
| Yes                                           | 19 | 14.0| 36.42 ± 10.17                               | U = 723.00 p = 0.015   | 1.63 ± 2.87                                | U = 969.50 p = 0.255  |
| No                                            | 117| 86.0| 30.40 ± 9.08                                 |                        | 0.86 ± 1.89                                |                        |
| Paying attention to hand hygiene             |    |    |                                             |                        |                                            |                        |
| Yes                                           | 131| 96.3| 31.31 ± 9.57                                 | U = 299.00 p = 0.741   |                                            |                        |
| Partially                                     | 5  | 3.7 | 29.60 ± 5.08                                 |                        |                                            |                        |
| Paying attention to wearing a mask           |    |    |                                             |                        |                                            |                        |
| Yes                                           | 132| 97.1| 31.13 ± 9.54                                 | U = 163.50 p = 0.195   |                                            |                        |
| Partially                                     | 4  | 2.9 | 35.00 ± 3.16                                 |                        |                                            |                        |
| Paying attention to social distance rules    |    |    |                                             |                        |                                            |                        |
| Yes                                           | 125| 91.9| 31.53 ± 9.27                                 | U = 645.00 p = 0.734   |                                            |                        |
| Partially                                     | 11 | 8.1 | 28.00 ± 11.14                                |                        |                                            |                        |
| Having coronavirus illness in their environment|    |    |                                             |                        |                                            |                        |
| Yes                                           | 67 | 49.3| 33.06 ± 9.65                                 | U = 1761.50 p = 0.017  |                                            |                        |
| No                                            | 69 | 50.7| 29.48 ± 8.94                                 |                        |                                            |                        |
| Having coronavirus illness in their relatives |    |    |                                             |                        |                                            |                        |
| Yes                                           | 52 | 38.2| 33.54 ± 8.63                                 | U = 1635.50 p = 0.014  |                                            |                        |
| No                                            | 84 | 61.8| 29.82 ± 9.68                                 |                        |                                            |                        |

Abbreviations: SD, standard deviation; K, Kruskal–Wallis test; U, Mann–Whitney U test; Q2, median; Q1, the first 25% of the data; Q3, the first 75% of the data.

*p < 0.05.

**Table 3** Distribution of scores for the Zarit caregiver burden scale and the coronavirus anxiety scale and the relationships between Zarit caregiver burden scale, coronavirus anxiety scale, age of the child, and age of parents

| Scales                              | Mean ± SD | Min-max score of them | Spearman’s r | p-value | Age of parent (years) | Spearman’s r | p-value | Age of child (years) | Spearman’s r | p-value | Coronavirus anxiety scale | Spearman’s r | p-value |
|-------------------------------------|-----------|------------------------|--------------|---------|------------------------|--------------|---------|----------------------|--------------|---------|--------------------------|--------------|---------|
| Zarit caregiver burden scale        | 31.24 ± 9.43 | 3–57                   | 0.077        | 0.374   | –0.109                 | 0.206        | 0.059   | –0.059               | 0.498        |         |
| Coronavirus anxiety scale           | 0.97 ± 2.06 | 0–10                   | 0.025        | 0.774   | 0.149                  | 0.083        | -       | -                    | -            |         |

Abbreviations: SD, standard deviation; Min–Max, minimum–maximum.
those who did not. Köse et al. (2019) reported that no significant relationship was found between parents’ burden of care and their children having another disease in addition to cancer. Therefore, the results of the current study did not agree with those of previous ones. In this study, parents whose children had other illnesses in addition to cancer reported a higher caregiving burden, which may be due to the combined burden of care associated with other illnesses and COVID-19.

In the present study, no significant differences in the coronavirus anxiety and caregiving burden of parents were identified according to the parents’ sex. However, it was observed that mothers mostly took on the caregiver role.

Having a child diagnosed with cancer creates a potentially traumatic situation for parents and is also a cause of anxiety (Feki et al., 2021). This study found that parents whose children were diagnosed with cancer 1 day to 6 months prior to the study had lower CAS scores than those with children diagnosed 2–4 years prior to the study. Köse et al. (2019) found that the Beck Anxiety scores of parents whose children were diagnosed with cancer 1 day to 1 year prior were higher, on average, than those of parents with children diagnosed with cancer 5 years prior or more. The results of the current study did not align with those of Köse et al. (2019), which may be due to the parents of children newly diagnosed with cancer being more focused on cancer than on COVID-19. Parents may think that children who have had cancer for longer may experience more severe illness should they contract COVID-19. In addition, previous studies did not measure the anxiety associated with coronavirus.

This study found that the mean CAS score of parents of girls with cancer was higher than that of parents of boys with cancer. In contrast, Köse et al. (2019) found no significant association between the children’s sex and their parents’ anxiety levels. These results did not align with those of Köse et al.’s (2019) study. The reason for the increased anxiety of the parents of girls in our study may be that they see their girls as more delicate and fragile.

In this study, no significant relationships were identified between children’s and parents’ ages and parents’ caregiving burden and coronavirus anxiety or between said burden and anxiety. Ozdemir Koyu and Tas Arslan (2021) identified no relationship between the burden of caregiving and children’s ages. However, Ahmadi et al. (2019) identified a relationship between parental age, child age and parental care burden. Moreover, studies revealed a positive correlation between the anxiety and care burden of parents of children with cancer (Köse et al., 2019; Ozdemir Koyu & Tas Arslan, 2021; Wang et al., 2017). This study’s result, which stands in contrast to the literature, is thought to be due to the fact that only anxiety towards coronavirus was measured rather than overall anxiety. In addition, this study is not compatible with Ahmadi et al.’s (2019) study may be due to the different age groups of the children.

4.1 | Limitations

This research had some limitations. The study used a convenience sampling technique. The data were obtained from a single paediatric haematology oncology clinic at a university hospital in Turkey. In the study, only anxiety about coronavirus was measured when evaluating parents’ anxiety. Therefore, the generalisability of the results may be limited, and the inclusion of additional data (on parents’ general anxiety, for example) might change the results.

5 | CONCLUSIONS

The results of this study revealed that COVID-19 cases among relatives or in parents’ environment and the presence of other illnesses in children with cancer increase the caregiving burden on parents.

The parents of children diagnosed with cancer 2–4 years prior to the study experienced more coronavirus anxiety than parents whose children were diagnosed 1 day to 6 months ago. In addition, parents of girls diagnosed with cancer experienced more coronavirus anxiety than parents of boys diagnosed with cancer.

6 | IMPLICATIONS FOR PRACTICE

The COVID-19 outbreak has had many adverse effects on humans, and the influences of the outbreak on the parents of children with cancer represent an important issue. The pandemic can increase the burden on parents who are trying to cope with their child’s cancer. Parental support is important for the recovery of children with cancer and a family-centred approach is necessary. In this study, some characteristics of the parents and children affected the caregiving burden and coronavirus anxiety of this population during the COVID-19 outbreak. Paediatric oncology nurses, oncologists and other healthcare professionals should evaluate parents’ coping mechanisms, especially during the COVID-19 pandemic. Necessary support should then be provided to help parents care for their children with cancer. This support should include family-centred interventions and counselling as necessary. Communication, spirituality and distraction techniques with digital media can also be used to alleviate parents’ psychological distress (Patil et al., 2021). In addition, the caregiving burden and anxiety of parents should be regularly monitored using objective tools.

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CONFLICT OF INTERESTS

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AUTHOR CONTRIBUTIONS

PB: Concept and designed the study, drafted the manuscript, data analysis, interpretation of data and gave final approval of the version to be published; ME: collected the data and interpretation of data and
gave final approval of the version to be published; EE: Concept and designed the study, drafted the manuscript, interpretation of data and gave final approval of the version to be published.

DATA AVAILABILITY STATEMENT
The data that support this study results are available from the authors upon reasonable request.

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