INTRODUCTION

Many patients with severe mental illnesses (SMI), such as schizophrenia and autism spectrum disorders (ASD) rely on relatives for emotional support, instrumental and financial assistance because of their functional impairment. Family members play an essential role as informal caregivers (providing unpaid care and support to a family member in a non-professional capacity) for the people with SMI and have been consistently reported to experience a certain level of burden.1-4 As the caregiving burden of the patients is placed on the shoulders of the families, psychological, social, health, financial condition, and as a whole quality of life of the family members are also affected.5-8 The family's distress caused by caregiving, deterioration of the quality of life, negative effects on work and social life, and psychological problems are considered as caregiver burden. Although there is no exact conceptual definition of the family or caregiver burden, Zarit et al.9 defined the burden as the extent to which caregivers perceived their emotional, physical health, social life, and financial status as suffering because of caring for their relative. The burden has two components as objective referring to the quantifiable challenges faced by the family members in everyday life such as financial costs, loss of free time, and disrupted social relations, and subjective burden referring to the intangible or emotional costs faced by the family members because of their loved one's illness. Likewise, terms such as stress, distress, tension, and burnout could be used instead of the burden. Caregiver burden can be shortly ascribed as the level of multifaceted strain perceived by the caregiver from caring for a family member.10 Despite cultural variations, the caregiver burden is a global issue that family members encounter in many parts of the world.11 Caregiver burden has been studied for different SMIs and burden predictors have often been considered as not receiv-
Social support as prominent factors predicting the family burden. 22, 27-29

There are studies comparing caregiving burdens in different SMI families. For example, a study comparing schizophrenia with affective disorders and a study comparing schizophrenia with other mental disorders show that the burden is higher in families caregiving to patients with schizophrenia. 30-33

Also, the study compared ASD with Down Syndrome and Diabetes Mellitus showed that the burden was higher in families of the patients with ASD than others. 26 To the best of our knowledge, there is no study comparing schizophrenia with ASD in terms of caregiver burden. Comparing the family burden for both diseases might shed light on the question of which illness is more burdensome for family members. Our hypothesis is that ASD, which is started earlier than schizophrenia, has more burdensome than schizophrenia.

Although depression and stigmatization are generally analyzed in caregiver burden studies, the self-stigmatization experience that might be a contributory factor for the burden of caregiving was not studied enough. 33 There is little work on self-stigma and burden relations. This study aims to compare the caregiver burden and related factors in schizophrenia and ASD families. Identifying the factors associated with the burden will inform the professionals about the relevant protective interventions to prevent the devastating effects of the caregiver burden for both illnesses.

### METHODS

#### Participants

Family members were recruited from a university hospital outpatient clinic for patients with schizophrenia and ASD, and three rehabilitation centers for patients with ASD in the same catchment area. The reason for choosing rehabilitation centers to interview ASD families was that these patients use the outpatient clinic less frequently. It was possible to meet with more family members in these centers. The inclusion criteria were that patients diagnosed with schizophrenia or ASD according to the DSM-5, 25 having diagnosed for a minimum of one year, that family member-caregiver living with the patient for at least one year and being intimately involved in their care, being more than 18 years of age, and having no diagnosed chronic physical illness that leads to disability. One hundred ASD and 80 schizophrenia family members were eligible for the study. Of those, 96 ASD and 67 schizophrenia family members accepted to participate in the study.

#### Procedures

Ethical approval of the study was obtained from Kocaeli University Non-Invasive Clinical Research Ethical Committee (KÜ GOKAEK 2019/135). Informed consent was taken from all the participants. Data were collected from the hospital files and the interviews with family members when they come to a psychiatric out-patient clinic appointment and/or while attending rehabilitation centers. All interviews were conducted between April 2019 and September 2019. Caregivers completed the Beck Depression Inventory (BDI), the Self-Stigma Inventory for families (SSI-F), and the Zarit Caregiver Burden Scale (ZCBS).

#### Measures

The socio-demographic form

The form included the sociodemographic characteristics of the patients (age, gender, marital status, education, employment status, age of illness onset, illness duration, number of hospitalizations, self-destructive behaviors, need for self-care, physical aggression, verbal aggression, sexual aggression, suicide attempt) and the caregivers (age, gender, marital status, education, employment status, monthly income per person in a family, having a psychiatric illness, having another person needing care in the family, having guardian’s allowance, and relationship to the ill person).

Beck Depression Inventory (BDI)

The BDI was developed by Beck34 to assess physical, emotional, and cognitive symptoms observed in depression and
the study of its Turkish adaptation was conducted by Hisli. A high correlation coefficient was in between the caregiver burden, self-stigma, and depression were shown for each group in Table 3. Correlation coefficients among the caregiver burden, self-stigma, and depression were statistically different between the two groups. To understand the degree of difference between the groups univariate ANCOVA was used by controlling confounding variables (i.e., family members’ age, gender, employment position, having guardian’s allowance, and relationship). The analysis yielded a significant difference between the groups regarding the caregiver burden (partial beta square=0.121) and depression (partial beta square=0.026). The results are shown in Table 2.

Caregiver burden, self-stigma, and depression
As shown in Table 1, the levels of caregiver burden, self-stigma, and depression were statistically different between the two groups. To understand the degree of difference between the groups univariate ANCOVA was used by controlling confounding variables (i.e., family members’ age, gender, employment position, having guardian’s allowance, and relationship). The analysis yielded a significant difference between the groups regarding the caregiver burden (partial beta square=0.121) and depression (partial beta square=0.026). The results are shown in Table 2.

Predictors of the caregiver burden
When both illnesses were evaluated together to determine the predictive factors for caregiver burden, logistic regression analysis was preferred because the distribution of the data did not comply with normality. To this end, firstly, a median ZCBS score of ≥51 was used to dichotomize the sample into the low and high levels of burden scores. The rate of the high burden was 48.5% in total sample. High burden score (HBS) was significantly more in ASD families (63.5%) than schizophrenia families (26.9%) (χ²=21.121, df=1, p<0.001). Afterward, significantly related sociodemographic factors with the HBS were determined in the total sample (Table 1). These factors were analyzed by the binary logistic regression using enter method. The model was fit into the analysis (Hosmer and Lemeshow Test: chi-square=6.406, df=8; p=0.602). Logistic regression analysis yielded that the patients’ need for self-care, patients’ self-destructive behaviors, family members’ level of self-stigma, depression, and level of income were predictive factors for caregiving burden. The results are shown in Table 4. When the diagnosis was removed from the equation, the factors determining the HBS did not change, but the OR for the need

RESULTS
Participant characteristics
The main characteristics of the caregivers and patients are presented in Table 1. The key caregivers were the mothers of the patients for both illnesses. Regarding the patients, the majority were men and had been ill for almost 7 and 9 years (respectively for ASD and schizophrenia). Differences between the groups were shown in Table 1. Based on the bivariate analysis, several sociodemographic and clinical factors were found to be significantly associated with HBS for both illnesses. The results were shown in Table 1.

Self-Stigma Inventory for Families (SSI-F)
The SSI-F is a self-report scale developed by Yildiz et al. to evaluate the self-stigmatization of the family members of patients with schizophrenia. The Cronbach’s alpha coefficient of the scale was 0.88. It is a 14-item self-assessment scale and has a 3-factor (perceived devaluation, social withdrawal, and concealment of the illness) structure. Higher scores indicate greater self-stigmatization. Since there is no Turkish self-stigma scale for the families of ASD patients, we used the SSI-F for this group as well. The internal consistency (α=0.85) of the scale for this sample was good.

Zarit Caregiver Burden Scale (ZCBS)
ZCBS was developed by Zarit et al. for assessing the burden of caregivers of patients with Alzheimer’s disease. Özli et al. conducted its reliability and validity study with relatives of the patients with schizophrenia. The Turkish version of the scale consisted of 19 items and 5-factor (distress and impairment of private life, nervousness and restrictedness, impairment of social relations, financial strain, dependence) structure. The internal consistency of the scale was 0.83. Higher scores (range=19–95) indicate a greater burden.

Statistical analysis
All analyses were carried out using the Statistical Package for the Social Sciences for Windows, version 22 (IBM Corp., Armonk, NY, USA). Comparisons between two groups were carried out using chi-square for categorical variables and independent t-test or Mann Witney U test for continuous variables according to normality. Univariate ANCOVA test was used to compare the two groups’ caregiver burden, self-stigma, and depression levels by controlling statistically significant demographic factors between the family groups. Correlation coefficients among the caregiver burden, self-stigma, and depression for both illnesses were calculated. To assess the contribution in predicting caregiver burden, binary logistic regression analysis was performed with high burden scores (HBS) as the dependent variable, and other parameters which had demonstrated the significant associations (p<0.05) with the HBS on bivariate analyses as independent variables.

1182 Psychiatry Investig 2021;18(12):1180-1187
DISCUSSION

The results of the study showed that the caregiver burden assessed using the ZCBS was found to be higher in ASD families than schizophrenia families both in total and in all subscales. It is noteworthy that the biggest difference is in the financial strain subscale (Table 2). Despite the families of patients with ASD were taken guardian’s allowance more than those of the patients with schizophrenia (p<0.001) and there was no statistical difference between the monthly income for both illnesses (Table 1), the results highlighted the issue of the financial strain for the ASD families. Likewise, the level of monthly income was a predictive factor for caregiver burden for both illnesses. It can be said that economic support is essential in reducing the caregiver burden especially for the families of patients with chronic and debilitating illnesses. Financial strain as a prominent predictor for the caregiving burden has been demonstrated in other studies for both illnesses. However, it should be kept in mind that the financial burden associated with caregiving is attributable not only to the care expenses and providing financial support to the care recipient

**for self-care and self-destructive behaviors slightly changed to 4.5 and 3.3 respectively.**

**Table 1.** Sociodemographic characteristics of the patients and the family members, and their associations with the high burden score (HBS≥51)

| Characteristics                | ASD (N=96) | Schizophrenia (N=67) | Group differ* | Relation with HBS (N=163) |
|--------------------------------|------------|----------------------|---------------|---------------------------|
|                                | Mean±SD (range) | Mean±SD (range) | p t/χ² | p t/χ² |
| Patients                       |            |                      |               |                           |
| Age (years)                    | 9.1±4.7 (4–24) | 32.0±10.8 (18–64) | <0.001†      | 3.115†                    | 0.002²† |
| Gender/male                    | 77 (80)    | 46 (69)              | 0.093         | 0.050                     | 0.824   |
| Education (years)              | 2.8±3.6 (0–12) | 11.7±2.8 (5–16)     | <0.001†      | 3.158†                    | 0.002†   |
| Marital status/single          | 96 (100)   | 56 (84)              | <0.001†      | 0.688                     | 0.407   |
| Unemployment                   | 94 (98)    | 48 (72)              | <0.001†      | 1.03                      | 0.310   |
| Age of illness onset           | 2.3±1.2 (0–6) | 22.6±7.0 (13–45)    | <0.001†      | 4.427†                    | <0.001† |
| Illness duration (years)       | 6.8±4.7 (2–23) | 9.3±8.5 (1–44)      | 0.031†       | -0.675                    | 0.501   |
| Number of hospital             | 0.03±0.3 (0–3) | 2.0±1.7 (0–10)      | <0.001†      | 2.671†                    | 0.008†   |
| Self-destructive beh           | 27 (28)    | 11 (16)              | 0.083         | 10.059†                   | 0.002†   |
| Need for self-care             | 73 (76)    | 7 (10)               | <0.001†      | 28.929†                   | <0.001† |
| Physical aggression            | 47 (49)    | 24 (36)              | 0.097         | 9.130†                    | 0.003†   |
| Verbal aggression              | 39 (41)    | 24 (36)              | 0.537         | 1.237                      | 0.266   |
| Sexual aggression              | 22 (23)    | 2 (3)                | <0.001†      | 7.885†                    | 0.005†   |
| Suicide attempt                | 1 (1)      | 12 (18)              | <0.001†      | 0.163                      | 0.687   |
| Family members                 |            |                      |               |                           |
| Age (years)                    | 39.5±9.5 (20–70) | 52.4±10.8 (26–73)  | <0.001†      | 2.397†                    | 0.018†   |
| Gender/female                  | 81 (84)    | 40 (60)              | <0.001†      | 6.906†                    | 0.099†   |
| Education (years)              | 10.1±3.7 (5–18) | 9.2±4.2 (3–17)      | 0.158        | -0.471                    | 0.638   |
| Marital status/marr            | 87 (91)    | 54 (81)              | 0.066         | 1.482                      | 0.223   |
| Relationship/mother            | 72 (75)    | 25 (37)              | <0.001†      | 8.184†                    | 0.004†   |
| Employment                     | 23 (24)    | 38 (57)              | <0.001†      | 4.492†                    | 0.034†   |
| Monthly income‡                | 1167.5±908.4 (250–6,000) | 1358.3±953.5 (250–5,000) | 0.198 | 2.008† | 0.046† |
| Guardian's allowance           | 30 (31)    | 2 (3)                | <0.001†      | 8.682†                    | 0.003†   |
| Another FM need care           | 7 (7)      | 6 (9)                | 0.701         | 0.030                      | 0.862   |
| Psychiatric illness            | 15 (16)    | 10 (15)              | 0.903         | 1.563                      | 0.211   |
| Caregiver burden               | 57.0±14.6 (26–88) | 41.5±14.5 (19–79)  | <0.001†      |                           |         |
| Depression                     | 12.6±7.8 (0–32) | 7.3±7.7 (0–28)      | <0.001†      |                           |         |
| Self-stigma                    | 25.2±9.4 (14–53) | 21.4±7.6 (15–43)   | 0.007†       |                           |         |

*Independent t-test or Mann-Wittney U test for continuous variables according to the normality and χ² test for categorical variables; †statistically significant; ‡per person in a family as Turkish Lira. ASD, autism spectrum disorders; FM, family member.
but also to the lost income of the family members.4,40,41

There was no difference between the groups regarding the total self-stigma score, but the social withdrawal subscale score was higher in ASD families than schizophrenia families (Table 2). Regression analysis showed that self-stigma was a predictive factor for the HBS for the whole group alongside the depression and low income for families caring for patients with ASD and schizophrenia independent from the diagnosis. The level of depression was also higher in ASD families than schizophrenia families even though it’s small effect size. There was a significant correlation among these parameters (Table 3). The correlations between the burden and self-stigma and depression in ASD families, and the correlation between the burden and depression in schizophrenia families are prominent. It is noteworthy that there might be reciprocal relations among depression, self-stigma, and burden. The fact that depression, self-stigma, and low income determine the high caregiver burden can be interpreted as the indirect effect of other variables that are significant in bivariate analyses (i.e., the age of illness onset, number of hospitalizations, sexually or physically aggressive behaviors, suicide attempts of the patients, and family member’s age, gender, employment, etc.). Negative characteristics of chronic illnesses impose a significant risk in terms of self-stigmatization.33,42,43 Self-stigma is related to the factors like low self-esteem, depression, shame, hopelessness, and helplessness which could be resulted from struggling with the negative aspects of chronic illnesses. There may be an inter-relationship between self-stigmatization, depression, psychiatric illnesses, and caregiving burden. For example, the caregivers who experience both stigma and financial strains are likely vulnerable to social isolation which may hinder access to support, intensifying the overall negative effect upon mental health. Further, it is reasonable to expect that caregivers who have a

### Table 2. Comparison of the caregiver burden, self-stigma, and depression scores between the groups after controlling the confounding factors

| Measurement tools                      | ASD (N=96) Mean±SD (range) | Schizophrenia (N=67) Mean±SD (range) | F-test* | p-value | ηp² |
|----------------------------------------|----------------------------|--------------------------------------|---------|---------|-----|
| Zarit Caregiver Burden Scale           | 57.0±14.6 (26–88)          | 41.5±14.5 (19–79)                    | 21.374  | <0.001  | 0.121 |
| Distress and impairment of private life| 19.2±6.6 (7–35)            | 14.2±6.2 (7–29)                      | 14.626  | <0.001  | 0.086 |
| Nervousness and restrictedness         | 9.0±2.8 (3–15)             | 6.6±2.6 (3–13)                       | 16.407  | <0.001  | 0.095 |
| Impaired social relations              | 5.9±2.8 (3–14)             | 4.8±1.9 (3–10)                       | 5.386   | 0.022   | 0.033 |
| Financial strain                       | 15.0±4.0 (4–20)            | 10.1±3.9 (4–20)                      | 20.283  | <0.001  | 0.115 |
| Dependence                             | 7.8±2.3 (2–10)             | 5.9±2.6 (2–10)                       | 12.428  | 0.001   | 0.074 |
| Self-Stigma Inventory-Family           | 25.2±9.4 (14–53)           | 21.4±7.6 (15–43)                     | 0.803   | 0.371   | 0.005 |
| Perceived devaluation                  | 9.5±4.1 (6–27)             | 8.2±2.7 (6–17)                       | 1.087   | 0.299   | 0.007 |
| Social withdrawal                      | 10.7±4.4 (6–25)            | 7.9±3.0 (6–19)                       | 4.201   | 0.042   | 0.026 |
| Concealment of the illness             | 4.9±3.1 (3–15)             | 5.3±3.8 (3–15)                       | 1.456   | 0.229   | 0.009 |
| Beck Depression Inventory              | 12.6±7.8 (0–32)            | 7.3±7.7 (0–28)                       | 4.154   | 0.043   | 0.026 |

*ANCOVA analysis of covariance; ηp² partial eta-squared. ASD, autism spectrum disorders; SD, standard deviation.

### Table 3. Correlation coefficients among the caregiver burden, self-stigma, and depression for both illnesses

|                      | ASD (N=96) | Schizophrenia (N=67) |
|----------------------|------------|----------------------|
| Self-stigma          | 0.559      | 0.256                |
| Depression           | 0.481      | 0.492                |

ANOVA analysis of covariance; ηp² partial eta-squared. ASD, autism spectrum disorders; SD, standard deviation.
families of patients with ASD and schizophrenia.\textsuperscript{13,17,21,31,44-46}

The reason why there was no correlation between the family members’ psychiatric illness and caregiver burden in our study might be due to the self-report information. If the family members were examined by a psychiatric interview, the results could have been different. Therefore, we can say that psychological strains like self-stigma and self-report depression were important factors that predict family caregiving burden, and psychiatric illnesses experienced by the family members due to the chronic illness should not be overlooked. It could be addressed that family members having patients with ASD, and schizophrenia should be provided the necessary support for mitigating their depression and self-stigma experiences.

There are two studies using the Turkish version of ZCBS to determine the predictive factors for family members of the patients with ASD and schizophrenia.\textsuperscript{16,21} The caregiver burden for the families of patients with ASD was found to be predicted by depression and behavioral problems, not the caregiver’s age and level of education. The caregiver burden of the patients with schizophrenia was found to be predicted by the level of income, functioning of the patients, caregivers’ level of education, not the number of hospitalizations, and caregiver’s age. Parallel to our study, these results have common features regarding the predictive factors as depression, level of income, and functioning of the patients.

As patients’ characteristics, the need for self-care (OR=3.6) and self-destructive behaviors (OR=3.4) were the predictive factors for the HBS. We didn’t use any instrument to assess the functioning of the patients which includes patients’ self-caring and behavioral problems. Instead, we questioned the aggressive behaviors as verbal, physical, sexual, suicidal, or self-destructive ones whether there were or not. Although there was no difference between the groups in terms of verbal aggression, physical aggression, and self-destructive behaviors, sexually aggressive behavior was significantly more in patients with ASD than patients with schizophrenia, suicide attempt was significantly more in patients with schizophrenia than patients with ASD. Patients’ need for self-care was significantly more in patients with ASD than patients with schizophrenia. Physical aggression, sexual aggression, verbal aggression, and suicide attempt were not predictive for the HBS. In our study, among behavioral problems, only self-destructive behaviors were determined as a predictive factor for HBS. In our study, among behavioral problems, only self-destructive behaviors were determined as a predictive factor for HBS. In our study, among behavioral problems, only self-destructive behaviors were determined as a predictive factor for HBS. In our study, among behavioral problems, only self-destructive behaviors were determined as a predictive factor for HBS. In our study, among behavioral problems, only self-destructive behaviors were determined as a predictive factor for HBS.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|c|c|c|}
\hline
Variables\textsuperscript{*} & B & SE & Wald & df & Sig. & Exp (B) & 95\% CI for Exp (B) \\
\hline
Diagnosis & 1.573 & 1.379 & 1.301 & 1 & 0.254 & 4.821 & 0.323–71.951 \\
Patient’s age & 0.065 & 0.038 & 2.949 & 1 & 0.086 & 1.067 & 0.991–1.149 \\
Patients’ education & 0.037 & 0.074 & 0.253 & 1 & 0.615 & 1.038 & 0.897–1.201 \\
Age of illness onset & -0.033 & 0.058 & 0.326 & 1 & 0.568 & 0.968 & 0.864–1.084 \\
Number of hospitalizations & -0.002 & 0.223 & 0.000 & 1 & 0.992 & 0.998 & 0.644–1.545 \\
Self-destructive behavior & 1.210 & 0.580 & 4.358 & 1 & 0.037\textsuperscript{†} & 3.354\textsuperscript{†} & 1.077–10.446 \\
Need for self-care & 1.287 & 0.559 & 5.293 & 1 & 0.021\textsuperscript{†} & 3.622\textsuperscript{†} & 1.210–10.842 \\
Physical aggression & 0.365 & 0.478 & 0.584 & 1 & 0.445 & 1.440 & 0.565–3.673 \\
Sexual aggression & 1.083 & 0.719 & 2.270 & 1 & 0.132 & 2.953 & 0.722–12.076 \\
FMs gender & -0.710 & 0.825 & 0.742 & 1 & 0.389 & 0.492 & 0.098–2.474 \\
FMs age & 0.018 & 0.023 & 0.596 & 1 & 0.440 & 1.018 & 0.973–1.065 \\
Relationship & -0.406 & 0.668 & 0.369 & 1 & 0.543 & 0.666 & 0.180–2.469 \\
Guardian’s allowance & -0.320 & 0.624 & 0.264 & 1 & 0.608 & 0.726 & 0.214–2.465 \\
FMs employment & -0.746 & 0.645 & 1.339 & 1 & 0.247 & 0.474 & 0.134–1.678 \\
Monthly income & -0.001 & 0.000 & 5.335 & 1 & 0.021\textsuperscript{†} & 0.999\textsuperscript{†} & 0.999–1.000 \\
Self-stigma & 0.066 & 0.032 & 4.278 & 1 & 0.039\textsuperscript{†} & 1.069\textsuperscript{†} & 1.003–1.138 \\
Depression & 0.121 & 0.035 & 12.223 & 1 & 0.000\textsuperscript{†} & 1.128\textsuperscript{†} & 1.054–1.207 \\
Constant & -3.345 & 1.545 & 4.688 & 1 & 0.030 & 0.035 & \\
\hline
\end{tabular}
\caption{The predictive factors for high caregiver burden (N=163)}
\end{table}

\textsuperscript{*}predictive factors did not change after removing the diagnosis from the equation. Hosmer and Lemeshow Test: chi-square=6.406, df=8; p=0.602.

\textsuperscript{†}statistically significant. FM, family member; CI, confidence interval
means family members of patients who needed to provide more assistance for daily functioning were more likely to have a higher caregiver burden.28

In conclusion, the results of the study pointed out that the patients’ self-destructive behaviors and need for self-care, family members’ levels of income, self-stigma, and depression are determinative in terms of family burden. There is a great need to develop interventions that address the caregivers’ stresses and patients’ management. It could be said that the patients’ behavioral problems and their need for self-care are more troubling factors for the family members. Accessibility for the treatment and rehabilitation services, availability of the day-care and respite care services, availability of the occupational therapeutic activities in both rehabilitation facilities and boarding-care facilities and at home, should be provided for all the patients and the families who needed. The family members living with the patient should be provided psychological, social, and economical support to buffer the negative effects of depression, self-stigmatization, and financial strains on caregiving. It could be recommended that formal caregiving services should be put in place by the governmental institutions to help the family caregivers minimize the caregiving burden and maximize the families’ wellbeing.

**Limitations**

One main limitation of this study was its small sample size. Thus, larger sample size can increase the power of the study and the accuracy of the results. Another limitation of this study was performing the study in a university psychiatric hospital and rehabilitation centers for patients with ASD. Thus, a generalization of the results to other patients at the national level should be done with caution. Comorbid disorders, such as attention deficit hyperactivity disorder and mental retardation was not evaluated in patients with ASD. Whereas the presence of comorbid disorders in patients with ASD is an important factor that increases the caregiver burden.39 The time spent by family members with their patients has not been evaluated as well. It is known that, as the time spent on caregiving for the patient increases, the burden increases.40 Additionally, social support and social stigma which are possible predictive factors for the family burden was not examined in this study.1,12,15,18,44

Lastly, because this study is a cross-sectional design it cannot give a causal relationship between caregiver burden and its correlates. Future studies should employ prospective design to clarify this issue.

**Availability of Data and Material**

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

**Conflicts of Interest**

The authors have no potential conflicts of interest to disclose.

**Author Contributions**

Conceptualization: Mustafa Yıldız, Yasemin Demir, Ayşe Kircali. Data curation: Yasemin Demir, Ayşe Kircali, Ayse Incedere. Formal analysis: Mustafa Yıldız, Ayşel Incedere. Investigation: Yasemin Demir, Ayşe Kircali. Methodology: Mustafa Yıldız, Yasemin Demir, Ayşe Kircali. Project administration: Mustafa Yıldız. Resources: Yasemin Demir, Ayşe Kircali. Supervision: Mustafa Yıldız. Writing—original draft: all authors. Writing—review & editing: Mustafa Yıldız. All authors have read and agreed to the present version of the manuscript.

**ORCID iDs**

Mustafa Yıldız https://orcid.org/0000-0003-0769-1628

Yasemin Demir https://orcid.org/0000-0002-5116-7009

Ayşe Kircali https://orcid.org/0000-0001-8948-4512

Ayse Incedere https://orcid.org/0000-0001-8181-1371

**Funding Statement**

None

**Acknowledgments**

We are grateful to the family members who gave their time to participate in this study.

**REFERENCES**

1. Tsang HWH, Tam PKC, Chan F, Cheung WM. Sources of burdens on families of individuals with mental illness. Int J Rehabil Res 2003;26:123-130.

2. Papadopoulos C, Ladder A, Constantinou G, Randhawa G. Systematic review of the relationship between autism stigma and informal caregiver mental health. J Autism Dev Disord 2019;49:1665-1685.

3. Siddiqui S, Khalid J. Determining the caregivers’ burden in caregivers of patients with mental illness. Pak J Med Sci 2019;35:1329-1333.

4. Kamil SH, Velligan DI. Caregivers of individuals with schizophrenia: who are they and what are their challenges? Curr Opin Psychiatry 2019;32:157-163.

5. Caqueo-Urizar A, Gutierrez-Maldonado J. Burden of care in families of patients with schizophrenia. Qual Life Res 2006;15:719-724.

6. Kaschowitz J, Brandt M. Health effects of informal caregiving across Europe: a longitudinal approach. Soc Sci Med 2017;173:72-80.

7. Bibé JM, Salamero M, Pérez-Testor C, Mercedal J, Aguilara C, Cleris M. Quality of life in family caregivers of schizophrenia patients in Spain: caregiver characteristics, caregiving burden, family functioning, and social and professional support. Int J Psychiatry Clin Pract 2018;22:25-33.

8. Alnazry EK, Abojedi A. Psychological distress and perceived burden in caregivers of persons with autism spectrum disorder. Perspect Psychiatr Care 2019;55:501-508.

9. Zarit SH, Todd PA, Zarit JM. Subjective burden of husbands and wives as caregivers: a longitudinal study. Gerontologist 1986;26:260-265.

10. Liu Z, Heffernan C, Tan J. Caregiver burden: a concept analysis. Int J Nurs Sci 2020;7:438-445.

11. Chan SW. Global perspective of burden of family caregivers for persons with schizophrenia. Arch Psychiat Nurs 2011;25:339-349.

12. Grandón P, Jenaro C, Lemos S. Primary caregivers of schizophrenia outpatient: burden and predictor variables. Psychiatry Res 2008;158:335-343.

13. Gülsen L, Cam B, Karaköç B, Yigit T, Danaci AE, Cubukcuoğlu Z, et al. The perceived burden of care and its correlates in schizophrenia. Türk Psikiyatri Derg 2010;21:203-212.

14. Rabinowitz J, Berardo CG, Bugarski-Kirola D, Marder S. Association of
prominent positive and prominent negative symptoms and functional health, well-being, healthcare-related quality of life and family burden: a CATIE analysis. Schizophr Res 2013;150:339-342.

15. Jagannathan A, Thirhali J, Hamza A, Nagendra H, Gangadhar B. Predictors of family caregiver burden in schizophrenia: study from an inpatient tertiary care hospital in India. Asian J Psychiatr 2014;8:94-98.

16. Yazici E, Karabulut U, Yildiz M, Baskan Tekes S, Inan E, Cakir U, et al. Burden on caregivers of patients with schizophrenia and related factors. Noro Psikiyat Arş 2016;53:96-101.

17. Souza ALR, Guimaraes RA, de Araujo Vilela D, de Assis RM, de Almeida Cavalcante Oliveira LM, et al. Factors associated with the burden of family caregivers of patients with mental disorders: a cross-sectional study. BMC Psychiatry 2017;17:353.

18. Yu Y, Liu ZW, Tang BW, Zhao M, Liu XG, Xiao SY. Reported family burden of schizophrenia patients in rural China. PLoS One 2017;12:e0179425.

19. Hajeji A, Nasrabadi M, Minooleti A. Burden experienced by caregivers of schizophrenia patients and its related factors. Med J Islam Repub Iran 2019;33.54.

20. Peng MM, Zhang TM, Liu KZ, Kong K, Huang CH, Dai GZ, et al. Perception of social support and psychotic symptoms among persons with schizophrenia: a strategy to lessen caregiver burden. Int J Soc Psychiatry 2019;65:548-557.

21. Baykal S, Karakurt MN, Cakar M, Karabekiroglu K. An examination of the relations between symptom distributions in children diagnosed with autism and caregiver Burden, anxiety and depression levels. Community Ment Health J 2019;55:311-317.

22. Vogan V, Lake JK, Weiss JA, Robinson S, Tint A, Lunskey Y. Factors associated with caregiver burden among parents of individuals with ASD: differences across intellectual functioning. Fam Relat 2014;63:554-567.

23. Chadda RK, Singh TB, Ganguly KK. Caregiver burden and coping: a study from an inpatient tertiary care hospital in India. Asian J Psychiatr 2014;8:94-98.

24. Rhee TG, Rosenheck RA. Does improvement in symptoms and quality of life and family burden of schizophrenia patients in rural China. PLoS One 2017;12:e0179425.

25. Shiraishi N, Reilly J. Positive and negative impacts of schizophrenia on family caregivers: a systematic review and qualitative meta-summary. Psychiatr Clin Psychopharmacol 2019;29:463-471.

26. Zhou T, Wang Y, Yi C. Affiliate stigma and depression in caregivers of schizophrenia patients and its related factors. Med J Islam Repub Iran 2019;33.54.

27. Cantrell SM, et al. Factors associated with the burden of family caregivers of patients with mental disorders: a cross‐sectional survey in Japan. J Ment Health 2018;27:583-587.

28. Konstantareas MM, Homatidis S. Assessing child symptom severity and stress in parents of autistic children with autism spectrum disorder in China: effects of self-esteem, shame and family functioning. Psychiatry Res 2018;264:260-265.

29. Zarrt SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: correlates of feelings of burden. Gerontologist 1980;20:649-655.

30. Özlü A, Yıldız M, Aker T. A reliability and validity study on the Zarit Burden of Schizophrenia Scale. J Ment Health 2019;48:179-182.

31. Grover S, Chakrabarti S, Ghormode D, Dutt A. A comparative study of caregivers’ perceptions of health-care needs and burden of patients with bipolar affective disorder and schizophrenia. Nord J Psychiatry 2015;69:629-636.

32. Gupta S, Isherwood G, Jones K, Van Impe K. Assessing health status in informal schizophrenia caregivers compared with health status in non-caregivers of other conditions. BMC Psychiatry 2015;21:162.

33. Fernando SM, Deane FP, McLeod HJ, Davis EL. A carer burden and stigma in schizophrenia and affective disorders: experiences from Sri Lanka. Asian J Psychiatr 2017;26:77-81.

34. Beck AT. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561-571.

35. Hidi N. Beck Depresyon Envanterinin üniversite öğrencileri için geçerliliği, güvenceprürlüğü. Psikoloji Dergisi 1989;7:3-13.

36. Yildiz M, Incendere A, Kiras F, Abut FB, Kircali A, Ipci K. Development of Self-Stigma Inventory for Families of the Patients with schizophrenia (SSI-F): validity and reliability study. Psychiatr Clin Psychopharmacol 2019;29:463-471.

37. Hisli N. Beck Depresyon Envanteri'nin üniversite öğrencileri için geçerliliği, güvenceprürlüğü. Psikoloji Dergisi 1989;4:561-571.

38. Konstantareas MM, Homatidis S. Assessing child symptom severity and stress in parents of autistic children with autism spectrum disorder in China: effects of self-esteem, shame and family functioning. Psychiatry Res 2018;264:260-265.

39. Suresh APC, Benjaminn TE, Crasta JE, Alwinesh MTJ, Kannappan G, Padankattti SM, et al. Comparison of burden among primary care-givers of children with autism and intellectual disability against children with intellectual disability only in a hospital population in India. Indian J Pediatr 2014;81(Suppl 2):179-182.

40. Rogge N, Janssen J. The economic costs of autism spectrum disorder: a literature review. J Autism Dev Disord 2019;49:2873-2900.

41. Inogbo CE, Olotu SO, James BO, Nna EO. Burden of care amongst caregivers who are first degree relatives of patients with schizophrenia. Pan Afr Med J 2017;28:284.

42. Mak WWS, Kwok YTY. Internalization of stigma for parents of children with autism spectrum disorder in Hong Kong. Soc Sci Med 2010;70:2045-2051.

43. Singh P, Ghosh S, Nandi S. Subjective burden and depression in mothers of children with autism spectrum disorder in India: moderating effects of social support. J Autism Dev Disord 2017;47:3097-3111.

44. Zhou T, Wang Y, Yi C. Affiliate stigma and depression in caregivers of children with Autism Spectrum Disorders in China: effects of self-esteem, shame and family functioning. Psychiatry Res 2018;264:260-265.

45. Kate N, Grover S, Kulhara P, Nehra R. Relationship of caregiver burden with coping strategies, social support, psychological morbidity, and quality of life in the caregivers of schizophrenia. Asian J Psychiatr 2013;6:380-388.

46. Konstantareas MM, Homatidis S. Assessing child symptom severity and stress in parents of autistic children. J Child Psychol Psychiatry 1989;30:459-470.