Factors that Impact Caregivers of Patients with Schizophrenia

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ABSTRACT: Schizophrenia, a term first introduced by Eugen Bleuler in 1911, is a controversial topic, a symbol of profound behavioral and personality disorders. Although schizophrenia mainly affects the patients, directly, it indirectly affects their caregivers. Because caregivers of subjects with schizophrenia experience significant burden in taking care of the patient, usually over a long period of time, we decided to analyze some of the factors that can impact the perceived level of stress. Our study group consisted of caregivers 124 patients with schizophrenia, interviewed between January 2018 and July 2019. We analyzed demographic, clinical and other medical variables of patients and caregivers. We also evaluated caregivers’ burden, using the adapted Zarit interview. The average Zarit score in our study was 42.36±8.64, which shows moderate to high burden. Several factors that influence the perceived burden of the caregiver have been identified, such as patient gender, age of onset, patient and caregiver marital status, patient level of education and social functioning, caregiver age, somatic comorbidities and therapeutic compliance of the patient.

KEYWORDS: Schizophrenia, caregivers, burden, adapted Zarit interview

Introduction

Schizophrenia, a term first introduced by Eugen Bleuler in 1911, is a controversial topic, a symbol of profound behavioral and personality disorders. The question was raised whether "schizophrenia is the most serious disease affecting humanity, without excluding AIDS" (Erlenmeyer, 1993) [1]. It is estimated that, worldwide, 21 to 23 million people are affected by this chronic, severe mental disorder [2]. Its prevalence is about 4.6-5/1000 in the general population, with various studies reporting prevalence rates between 2.7 and 8.3/1000 [3,4].

It is a known fact that schizophrenia is gender related, being more common among males than females, with a ratio of 4:3 in favor of males, and some studies suggest that the onset is earlier among men [5].

Schizophrenia has a major impact in quality of life, being associated with considerable disability and usually it affects educational and occupational performance. It was estimated that patients with this disease are 2-3 times more likely to die early than the general population, because of an increased risk of physical illnesses, such as metabolic, cardiovascular and infectious diseases [2]. The rate of unemployment is extremely high at 80-90% [6,7] and life expectancy is reduced by 10-20 years [8,9].

Especially in later years, it was proven that schizophrenia is treatable. Psychosocial support and various treatments with new types of drugs were proved to be effective, but the main problem is that the majority of people with schizophrenia, because of poor social support and adherence to treatment, in the end lack access to continuous, correctly provided therapy.

Antipsychotics are widely used in the management of patients with schizophrenia. The introduction of second-generation or "atypical" antipsychotics has expanded the use of this drug class, being considered more effective in treating certain symptoms and being better tolerated than those in the first generation [10,11]. Although better tolerated, they are still associated with metabolic, cardiovascular or neurological adverse effects, leading to discontinuation of treatment by patients and low therapeutic compliance, which represents the concordance between the indications and the prohibitions formulated by the doctor and their effective application by the patient [11-15].

Atypical antipsychotics are also called second generation antipsychotics. They are
dopaminergic receptor antagonists D2, (D2, D3, D4), and D1, D5; 5HT2 serotoninergic, nicotinic, muscarinic and histaminic. They have polyvalent action, expressed at the mesencephalic, hippocampal and cortical level [15-17].

Atypical antipsychotics cause antipsychotic action on positive symptoms (hallucinations, delusional ideas, disorganized language, catatonic or flagrantly disorganized behavior) and negative (affective flattening, anhedonia, alogia, avolition, social withdrawal) [15].

Atypical antipsychotics are [16,17]: Clozapine, Olanzapine, Quetiapine, Risperidone, Ziprasidone, Amisulprid, Sertindol, Paliperidone, Aripiprazole The drugs that have depot formulas, as long acting injections (LAI) are: olanzapine, risperidone and aripiprazole.

Atypical antipsychotics have many advantages, for example, by comparison with neuroleptics they rarely give extrapyramidal phenomena or late dyskinesia, but they also have some important side effects that make patients stop therapy:
- Extrapyramidal affect-low probability of inducing EPS
- Weight gain, which can trigger or worsen diabetes
- Non-specific ECG changes of ST, flattening or reversing the T wave
- Orthostatic hypotension, syncope, tachycardia
- Hyperprolactinemia (antagonistic activity against D2)
- Sleepiness
- Anticholinergic symptoms (dry mouth mucosa, blurred vision, constipation) [16-19].

It is considered that therapeutic compliance of patient with schizophrenia to antipsychotic therapy is reduced, with more than 50% of patients not adhering to treatment (either they do not collect their medication or they stop after less than 30 days) [20].

According to data from the specialized literature, we believe that the administration of depot formulas can improve the therapeutic adherence of the schizophrenia patient, thus improving the quality of life. In the case of depot preparations, the administration being done monthly or bi-monthly, the therapeutic daily stress, both of the patient and of the patients, is diminished, and professional reintegration, where appropriate, is made possible easier.

Usually, traditional psychiatric hospitals, over time, are not effective in providing the type of treatment and support needed by patients with this kind of mental disorder. The engagement of personal caregivers, usually family members, and, if possible, of the wider community in providing support is of utmost importance.

Since the common use of antipsychotic drugs and patient deinstitutionalization, families begun to provide some of the functions and care that were formerly addressed only by psychiatric institutions

The problem is that family caregivers provide considerable support to their ill relative and in turn experience significant burden. The negative effects of persons with a serious mental illness on their family members have been explored since the 1950s, and the term “caregiver burden” began to be used in the 1970s.

**Aim**

Because caregivers of subjects with schizophrenia experience significant burden in taking care of the patient, usually over a long period of time, we decided to analyze some of the factors that can impact the perceived level of stress.

**Material and method**

Our study group consisted of caregivers 124 patients with schizophrenia, interviewed between January 2018 and July 2019. Patients were men and women over 18 years of age, which were evaluated and monitored for a period of 12-18 months.

Inclusion criteria were:
- diagnosis of paranoid schizophrenia according to DSM IV TR criteria;
- chronic evolution of over 3 years;
- complete data on the history and evolution of the disease.

We analyzed demographic, clinical and other medical variables of patients and caregivers:
- demographic variables: sex; current age; age at the onset of the disease; educational level; marital status;
- clinical variables: type of onset; possible somatic or psychiatric comorbidities;
- therapeutic compliance.

We also evaluated caregivers’ burden, using the adapted Zarit interview [21].

The data was provided by caregivers by filling a questionnaire for their demographic data and clinical data of patients, by using the adapted Zarit scale with 22 questions and by consulting the necessary medical documents for the corresponding patients.
The study was approved by the Ethics Committee of the University of Medicine and Pharmacy of Craiova. As the responders were not psychiatric patients, the participation was voluntary and anonymous.

Statistical analysis was performed using Microsoft Excel (Microsoft Corp., Redmond, WA, USA), and IBM SPSS Statistics 20.0 (IBM Corporation, Armonk, NY, USA) for processing the data. To describe the numerical data used in the present study, we used the classical statistical indicators: arithmetic mean and standard deviation.

Because the study involved numerical comparisons between data that had Gaussian distributions, we used either Student’s t test (for 2 groups) or ANOVA (for 3 or more groups) to compare the mean values of numerical parameters. If the ANOVA test result was statistically significant, we continued the analysis with “post hoc” tests, such as Fisher’s LSD tests, to identify pairs of categories which have significant differences.

Results

First we analyzed the demographic data of caregivers and patients, as well as several clinical data of patients (Table 1).

A series of statistical correlations were then determined between the level of stress of caregivers and several demographic and clinical items related to the patients.

Table 1. Distributions of demographic and clinical variables within the study group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient gender</td>
<td>71</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient age</td>
<td>20-29 y.o.</td>
<td>30-39 y.o.</td>
<td>40-49 y.o.</td>
<td>50-59 y.o.</td>
<td>&gt;60 y.o.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of onset</td>
<td>&lt;20 y.o.</td>
<td>20-24 y.o.</td>
<td>25-29 y.o.</td>
<td>30-34 y.o.</td>
<td>&gt;35 y.o.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Education</td>
<td>General school-24</td>
<td>High school-92</td>
<td>College-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Marital status</td>
<td>Married-22</td>
<td>Divorced/Widowed-18</td>
<td>Single-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient social functioning</td>
<td>Self-care-24</td>
<td>Dependent-82</td>
<td>Disturbing, aggressive behavior-18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver gender</td>
<td>Male-7</td>
<td>Female-117</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver age</td>
<td>&lt;50 y.o.</td>
<td>50-59 y.o.</td>
<td>60-69 y.o.</td>
<td>&gt;70 y.o.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver Marital status</td>
<td>Married-94</td>
<td>Divorced/Widowed-22</td>
<td>Single-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical symptoms at onset</td>
<td>Abnormal affect-29</td>
<td>Perceptual disturbances and bizarre ideas-72</td>
<td>Cognitive impairment-23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Somatic Comorbidities</td>
<td>Present-96</td>
<td>Absent-28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Therapeutic compliance</td>
<td>Good-56</td>
<td>Aided-38</td>
<td>Low-30</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Medication type</td>
<td>LAI-50</td>
<td>Oral-74</td>
<td></td>
<td></td>
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</table>

The distribution of Zarit scores was between 21 and 63, with an average of 42.36±8.64, showing a Gaussian distribution (Anderson-Darling p>0.05), with a slight asymmetry towards lower values. This finding allowed us to carry out the statistical analysis using parametric tests, such as Student’s t test and ANOVA.

Fig. 1. Distribution of Zarit scores
Comparing the average Zarit scores of male and female patients (Fig.2.), we found a significant difference, caregivers of male patients reporting higher values than caregivers of female patients (p Student=0.015<0.05).

While we encountered slightly higher average values for the Zarit scores of younger patients, the data in our study do not prove a statistically significant difference between the age decades ranging from 20 to over 60 years of age (Fig.3.).

![Fig.2. Comparison of average Zarit score based on patients’ gender](image)

![Fig.3. Comparison of average Zarit score based on patients’ age](image)

![Fig.4. Comparison of average Zarit score based on age of onset](image)
It seems the age of onset has an impact on the present perceived burden, because we found a significant value performing the ANOVA test, $p=0.012<0.05$. Because we obtained a significant result, we continued the data analysis with Fisher’s LSD post-hoc test, and we discovered the 20-24 age of onset to have a significantly greater average score than all the others age categories (Fig.4).

**Fig.5. Comparison of average Zarit score based on patients’ educational level**

Caregivers of patients who managed to attain college education have lower scores than the other two categories, but the significance of this result is just slightly below the 0.05 threshold ($p$ ANOVA=0.049), because of the very small numbers of patients that went to college, fact that induces a greater level of error. (Fig.5.)

**Fig.6. Comparison of average Zarit score based on patients’ marital status**

As expected, the caregivers of patients that have better preserved social relationships and are married report significantly lower burden scores that the caregivers of single or divorced/widowed patients, the result having a 99% confidence level ($p=0.004<0.01$, Fig.6).

**Fig.7. Comparison of average Zarit score based on patients’ social functioning level**
Analyzing the burden differences when grouping the patients based on their social functioning, we found a highly significant result, \( p \text{ ANOVA}<0.001 \) (Fig.7.), caregivers of patients that exhibit often disturbing or aggressive behavior showing much greater levels of burden than caregivers of dependent, but compliant patients, which, in turn, have greater scores than patients that can take care of themselves, under caregiver's supervision.

Even if the difference between the average Zarit scores of male and female caregivers seems very big, 47.36 vs. 42.06, we could not prove statistical significance, because only a small fraction of caregivers, only 5.65%, are male, which leads to a greater statistical margin of error (Fig.8).

We found that younger caregivers tend to have a greater level of stress and perceive a heavier burden than older caregivers, the ANOVA test returning a significant result, \( p=0.018<0.05 \). Continuing the analysis with Fisher’s LSD post-hoc test, we proved that both caregivers aged less than 50 years and between 50-59 years have significantly greater average scores than caregivers aged between 60-69 years or above 70 years (Fig.9).

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**Fig.8. Comparison of average Zarit score based on caregivers' gender**

**Fig.9. Comparison of average Zarit score based on caregivers' age**

**Fig.10. Comparison of average Zarit score based on caregivers' marital status**
Caregivers that are married have lower burden scores than caregivers that are divorced, widowed or single, the result being statistically significant, with an ANOVA $p=0.036<0.05$, presumably because of support from the spouse (Fig.10).

Fig.11. Comparison of average Zarit score based on clinical symptoms at onset

We found no significant differences among the average Zarit scores of caregivers when grouping the patients based on their type of onset, the ANOVA test result being $p=0.218>0.05$ (Fig.11).

Fig.12. Comparison of average Zarit score based on somatic comorbidities

Caregivers of schizophrenic patients that have somatic comorbidities (cardiovascular, metabolic, neurological etc.) have, on average, greater burden scores than the others, Student’s t test showing a significant result, $p=0.007<0.001$ (Fig.12).

Fig.13. Comparison of average Zarit score based on patients’ therapeutic compliance
As expected, there is a highly significant difference (p ANOVA<0.001, Fig.13.) among the average scores recorded for caregivers of patients when grouping them based on their therapeutic compliance. If patient’s compliance is good, the overall score is much lower than if the patient has to be persuaded to take the medication, and is almost 75% of the average score if the patient has a very low therapeutic compliance.

Caregivers of patients that have LAI as main medication have lower Zarit scores than patients that do not use such injections, Student t test showing a difference level of 99% confidence (p=0.009<0.01, Fig.14).

Discussions
The average Zarit score in our study was 42.36±8.64, which shows moderate to high burden.

This value lies in-between other data in literature, an article in Turkey reporting an average of 54.76±16.58 [22], while a Spanish article reports 37.9±15.0 [23].

Another research article, carried out in Chile on a slightly modified Zarit scale, with scores up to 110 instead of 88, describes an average burden of 86.51±12.97, corresponding to intense burden [24], and an Iranian work reports 51.73±18.23 [25].

t might be appropriate to speculate that the average burden is related to socio-economic factors, depending on the income level of the country and other welfare facilities, and this is why there are differences among the average burden reported in various countries for caregivers of schizophrenic patients.

While other articles report a percentage of female caregivers ranging from 64.8% to 76.38% [22-26], and it is estimated by the World Federation of Mental Health that 80% of the caregivers in the world are female [22], in our study females represented 94.35% of all caregivers, of which the greater part were mothers of the patients, and male caregivers for patients with schizophrenia seem to be the exception from the general rule.

Because of the small number of male caregivers we were not able to prove statistically significant difference between the average Zarit scores of male and female caregivers, despite the observed numerical difference, 47.36 versus 42.06.

57.26% of patients were male, with a male:female ratio of 1.34, similar to globally reported data[5], but lower than other studies concerned with caregivers’ burden, the male percentage varying from 76.1% [22], to 67% [23], and 63.41% [24].

Our findings suggest that the average Zarit score for male patients is greater than the score for female patients.

Average age of caregivers is 61.17±13.47 years of age, close to other data in literature (60.1±11.7 [23], 53.3±18.7 [25] or 58.8±15.33 for female caregivers and 60.2±12.6 for male caregivers [26]), while there are other studies reporting a significant lower mean caregiver age, such as one based in Turkey, with an average of 49.68±12.47 [22].

Our finding suggest that a lower caregiver age corresponds to a more intensely perceived burden, similar to another European study[23], while other data suggests the opposite [22,24] or no influence between the caregiver’s age and
level of burden [25,26], in this case caregiving duration being a more important factor that overshadows the age of the caregiver, or assisting a younger patient [25], probably because caregivers do not know yet how to cope with the situation or they feel that they do not have control of it.

75.81% of caregivers were married, 17.74% were widowed or divorced, and 6.45% were single, the percentage of married caregivers being higher than in other European studies [23,26], on the account of a lower percentage of widowed/divorced caregivers.

The marital status of the caregiver impacts the perceived burden, single persons showing a much higher Zarit score than married persons (46.36 vs. 41.51).

More important, patients’ marital status and level of social functioning are factors that significantly influence the perceived level of burden, caregivers of married patients and patients that are capable of self-care under supervision reporting Zarit scores lower than 40, on average, corresponding to moderate to low burden.

Patient and caregiver level of education are important factors in assessing burden, a higher level being associated to lower burden, probably because of a better understanding of the complex situation and of the necessary means to improve the quality of living of both the patient and the caregiver [22,24,25].

While we found no relationship between the caregivers’ burden and the type of psychiatric symptoms at onset, we observed statistically significant difference between caregivers of patients that have other somatic comorbidities and the others, the association of another disease worsening the condition of the schizophrenic patient and increasing the burden.

One of the most important factors that influenced the burden of caregivers was the therapeutic compliance of the patients.

For patients that have a good therapeutic compliance, the average score is much lower than for the other categories, 36.63 vs. 45.24 and 49.41, with a highly significant statistical result (p<0.001).

Also, caregivers of patients that receive depot medication report lower Zarit scores, probably because of a better compliance when receiving a more simplified treatment.

Conclusions

Although schizophrenia mainly affects the patients, directly, it indirectly affects their caregivers.

The study shows that providing care for a permanently, chronically ill family member is very stressful.

Several factors that influence the perceived burden of the caregiver have been identified, such as patient gender, age of onset, patient and caregiver marital status, patient level of education and social functioning, caregiver age, somatic comorbidities and therapeutic compliance of the patient.

The caregivers of persons with schizophrenia show a high level of burden because of the permanent attention needed by the patient, which affects negatively other life areas.

Therefore, healthcare services for schizophrenia patients should also take into consideration aspects of wellbeing of caregivers.

References

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