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Analysis of Depression Levels, Family Caregiving Burden, and Childhood Trauma Correlations in Adolescents with Depression Accompanied by NSSI

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Abstract: *To explore the correlation between family caregiving burden and depression level and childhood trauma of adolescent depression patients with non-suicidal self-injury (NSSI).256 adolescent depression patients with NSSI were included as study subjects, and the questionnaires included the self-administered General Information Questionnaire (GIB), Childhood Trauma Questionnaire (CTQ), Zarit Burden of Caregiver Interview (ZBI), Hamilton Depression Scale (HAMD), and the Hamilton Depression Rating Scale (HAMD).Childhood Trauma Questionnaire,CTQ), Caregiver Burden Inventory (Zarit Burden Interview, ZBI), and Hamilton Depression Scale (HAMD). According to the score of Childhood Trauma Questionnaire (CTQ), we divided into traumatized and non-traumatized groups, and used chi-square test to compare the differences in general demographic information of the family members of the patients in the two groups, and Spearman's analysis to analyze the correlation between Caregiver's Burden (ZBI), Hamilton Depression Inventory (HAMD) and the total score of the Childhood Trauma Questionnaire (CTQ) as well as the correlation of the various entries. We used the non-parametric test to explore the relationship among the level of depression, the level of burden and the childhood trauma. level and childhood trauma.The total ZBI score for family members of depressed patients in the no-trauma group was 18.5 (15,26) and 22.5 (18,30.5) in the traumatized group; the HAMD score for depressed patients in the no-trauma group was 22.5 (18.75,26) and 25 (21.75,30) in the traumatized group.The total ZBI score was correlated with the CTQ scale total scores, HAMD, emotional abuse, sexual abuse, somatic neglect, and emotional neglect were significantly and positively correlated ($p < 0.05$). Emotional abuse and somatic neglect, emotional neglect differed significantly in depression and family caregiving burden scales ($p < 0.05$). ZBI and HAMD scores were lower in the non-traumatized group than in the traumatized group, and ZBI and HAMD were positively correlated with CTQ scores. Traumatic experiences in childhood increase the burden of family caregiving and the level of depression in such patients.*

Keywords: *Depression, Adolescents, Non-Suicidal Self-Injury, Family Care Burden, Childhood Trauma*

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1. Introduction

Depression is a mental illness characterized by low mood, decreased interest and increased fatigue. Surveys have shown that the onset of depression has been progressively younger in recent years and is more prone to self-injurious behaviors relative to adults with depression. Non-suicidal self-injury (NSSI) is defined as repeated, intentional, and direct physical injury behaviors without suicidal motivation or not resulting in death [1]. Adolescents are the high prevalence of NSSI behaviors, and the detection rate of NSSI among adolescents in China ranges from 5.4% to 23.2%. Numerous studies have shown that NSSI is primarily associated with depressive episodes in patients, and that high levels of depressed mood or symptoms increase an individual's risk of developing depression later in life [2]. Among depressed adolescents NSSI detection rate is as high as 44% or more, which is significantly higher than that of adolescents without depressive symptoms, and more than 70% of adolescents with NSSI behaviors have had suicidal ideation [3]. Therefore, NSSI is a major predictor of suicidal behavior in patients. When intervening with patients with NSSI, attention must be paid to depressive episodes. Prior research has found that individuals with childhood traumatic experiences are at greater risk of developing mood disorders (depression, bipolar disorder, etc.) and self-injurious suicidal behavior in adolescence or adulthood[4]. And as the prevalence of NSSI behaviors in adolescents continues to increase, so does the burden of care for the patient's family. It not only affects the caregiver's daily arrangement, but also brings greater obstacles to their family happiness and quality of life. Therefore, this study investigated the depressed mood and childhood trauma of adolescent depression patients with NSSI and analyzed the relationship between them and the caregiving burden of their family caregivers, with a view to providing a basis for developing care measures to reduce the incidence of adolescent non-suicidal self-injurious behaviors and to reduce the level of depression and the caregiving burden of their families. Therefore, in this study, we chose adolescent depressed patients and their caregivers who attended our psychosomatic department outpatient clinic from May 2023 to July 2023 and reported as follows.

2. Information and Methods

2.1 General information

Adolescent patients with depression with self-injurious suicidal behavior and their patient caregivers attending outpatient clinic of psychosomatic department of our hospital from 05.05.2023 to 07.07.2023 were selected for the study. All health care research matters were approved by the Medical Ethics Committee of our hospital and were rationalized.

2.2 Patient inclusion exclusion criteria

Inclusion criteria:

(1) Meeting DSM-5 diagnostic criteria for depression;

(2) Had self-injurious behavior in the past 12 months;

(3) Normal intelligence and ability to understand and cooperate in completing all tests;

(4) Age between 12 and 18 years (inclusive of 12 and 18 years);

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(5) Informed consent;

Exclusion Criteria:

(1) Comorbidity with other psychiatric disorders such as schizophrenia and bipolar disorder;

(2) Comorbidity with other serious somatic diseases or craniocerebral injury;

(3) Those who are severely excitable, impulsive and uncooperative;

(4) Those with strong suicidal ideation and no treatment motivation;

2.3 Inclusion and exclusion criteria for family caregivers

Inclusion criteria

(1) Caregivers who undertake the main task of caring for the patient and provide financial support for the patient;

(2) Caregiving for more than 1 month;

(3) Knowledge of the patient's situation related to the family after the illness;

(4) Informed consent;

Exclusion criteria

(1) The caregiver has a mental disorder or serious physical illness;

(2) Caregivers with employment relationship;

2.4 Research instruments

2.4.1. General information questionnaire

The form was designed by the investigator. The general information of the caregivers included: gender, age, marital status, education level, type of work unit, relationship with the patient, daily caregiving time, number of caregivers, per capita monthly income of the family, payment method, and monthly expenditure on medicine.

2.4.2. Hamilton Depression Scale (HAMD)

Hamilton Depression Scale 24-item (HAMD-24): used to rate the situation at that time or in the week prior to enrollment, the scale consists of 24 items grouped into a 7-category factor structure (anxiety/somatization, weight, cognitive deficits, day/night changes, blockages, sleep disturbances, and feelings of hopelessness). The scale has a reliability of 0.9 and a validity of 0.92. A total HAMD-24 score of <8 is considered normal, 8-20 is considered possibly depressed, 21-35 is considered moderately depressed, and >35 is considered severely depressed.

2.4.3. Childhood Trauma Questionnaire (CTQ)

Childhood Trauma Questionnaire (Childhood Trauma Questionnaire,CTQ) [5]: 28 entries, 1-5 scale, 5 subscales. When emotional abuse ≥ 13 points, emotional neglect ≥ 15 points, sexual abuse ≥ 8 points, physical abuse ≥ 10 points, physical neglect ≥ 10 points, as long as one of the subscale scores meets the above conditions for a moderately severe childhood traumatized person, this study is considered to have a childhood trauma person. And patients who also satisfy the subscales emotional abuse <13, and

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somatic abuse <10, and sexual abuse <8, and emotional neglect <15, and somatic neglect <10 are considered as those who do not have any form of childhood trauma.

2.4.4. Zarit Caregiver Burden Inventory (ZBI)

ZBI (Zarit Burden Interview) is the Caregiver Burden Scale, which was developed by Zarit in the 1980s to measure the caregiving burden of patient caregivers. This study applied the Chinese version translated by our scholar Wang Lie [6] equal to 2006. The total Cronbach's alpha coefficient of this scale is 0.88, with good internal consistency reliability, content validity, and structural validity [7]. This scale contains 2 dimensions of burden of responsibility and personal burden, with a total of 22 entries and a total score range of 0-88. When the caregiver's score is below 20, it can be assumed that the caregiver does not have a burden of care; when it is above 20 and above 40, the caregiver is recognized to have a mild burden; when it is above 40 and above 60, the caregiver is recognized to have a moderate burden, and when the caregiver's score obtained At a score of 60 or more, the caregiver is considered to have a severe burden. The higher the score, the greater the burden of care.

2.5 Statistical methods

SPSS 26.0 statistical software was used to statistically analyze the study data, and the count data were expressed as rate (%); the chi-square test was used for demographic characterization. Information not conforming to normal distribution was described by median and quartiles, and non-parametric test was used to compare the differences between the two groups. The Spearman test was used for correlation analysis; differences were considered statistically significant at $P < 0.05$.

3. Results

3.1 Description of general data of caregivers of depressed patients

Table 1: Description of general information of caregivers of patients with depression.

		Non-traumatic experience	Traumatic experiences	X^2	P
sex	male	25(30.5)	43(24.7)	0.953	0.329
	female	57(69.5)	131(75.3)		
age	30-40	22(26.8)	50(28.7)	0.943	0.624
	41-50	55(67.1)	108(62.1)		
	>50	5(6.1)	16(9.2)		
marital status	unmarried	0	2(1.1)	1.131	0.770
	married	76(92.7)	157(90.2)		

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	divorcee	5(6.1)	13(7.5)		
	bereaved of one's spouse (literary)	1(1.2)	2(1.1)		
education level	Junior high school and below	41(50)	99(56.9)	1.103	0.576
	senior secondary	13(15.9)	25(14.4)		
	University and above	28(34.1)	50(28.7)		
Relationship with patients	grandparents	2(2.4)	7(4.0)	2.633	0.621
	maternal grandparents	1(1.2)	0		
	parents	75(91.5)	160(92)		
	siblings	1(1.2)	2(1.1)		
	else	3(3.7)	5(2.9)		
profession	business unit	14(17.1)	29(16.7)	2.466	0.651
	functionary	3(3.7)	3(1.7)		
	workers	6(7.3)	7(4)		
	peasants	28(34.1)	60(34.5)		
	else	31(37.8)	75(43.1)		
Family residence	countryside	16(19.5)	44(25.3)	1.091	0.580
	county seat	40(48.8)	81(46.6)		
	cities	26(31.7)	49(28.2)		
revenues	<2000	9(11)	23(13.2)	2.004	0.367
	2000-4999	28(34.1)	72(41.4)		
	>4999	45(54.9)	79(45.4)		

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Caregiving experiences	yes	6(7.3)	24(13.8)	2.259	0.133
	no	76(92.7))	150(86.2)		
Average daily care hours	<4hours	34(41.5)	78(44.8)	1.558	0.669
	4-6hours	13(15.9)	35(20.1)		
	6-8hours	67.3)	10(5.7)		
	>8hours	29(35.4)	51(29.3)		
Number of patients cared for with you	0	6(7.3)	30(17.2)	7.301	0.063
	1	39(47.6)	88(50.6)		
	2	28(34.1))	38(21.8)		
	≧3	9(11)	18(10.3)		
Monthly medical expenses	<500	41(50)	97(55.7)	5.383	0.146
	500-1000	28(34.10	57(32.8)		
	1000-2000	8(9.8)	18(10.3)		
	>2000	5(6.1)	2(1.1)		
settlement terms	Fully self-funded	65(79)	150(86.2)	2.804	0.246
	partial medical insurance	17(20.7)	23(13.2)		
	else	0	1(0.6)		

Of the 256 caregivers of depressed adolescent patients, the general information was comparable with no statistically significant difference between the two groups (P>0.05). See Table 1.

3.2 Correlation analysis of caregiving burden of family members of depressed patients with depression and childhood trauma

Spearman's analysis was applied to caregiver burden and depression and childhood trauma, and the results showed that caregiver's caregiving burden was significantly and positively correlated with depression, emotional abuse, sexual abuse, physical neglect, and emotional neglect (P<0.05), as shown

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in Table 2.

Table 2: Correlation analysis of caregiving burden of family members of depressed patients with depression and childhood trauma.

		HAMD	ZBI	Physicalabuse	Emotionalabuse	Sexual abuse	Physical neglect	Emotional neglect	Total score
HAMD	correlation coefficient	1	.145*	.150*	.196**	0.04	.332**	.203**	.297**
	Sig.	.	0.02	0.016	0.002	0.526	0	0.001	0
	N	256	256	256	256	256	256	256	256
ZBI	correlation coefficient	.145*	1	0.108	.164**	.208**	.258**	.247**	.261**
	Sig.	0.02	.	0.086	0.009	0.001	0	0	0
	N	256	256	256	256	256	256	256	256

3.3 Analysis of the scores of each entry of depression, family burden and childhood trauma of patients in two groups

After the normality test, depression, family care burden and childhood trauma each entry did not conform to normal distribution, using Mann-Whitney U rank sum test for test analysis, patients in the trauma group had higher depression scores, family care burden scores and trauma scores for each entry than those in the non-trauma group, of which the scores were more pronounced in physical neglect and emotional neglect, and the difference was statistically significant ($P<0.05$). See Table 3.

Table 3: Scores of each entry of depression, burden of care for family members and trauma in childhood in both groups.

	non-invasive	nvasive	*Z*	*P*
HAMD	22.5(18.75,26)	25(21.75,30)	-3.603	0.000

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ZBI	18.5(15,26)	22.5(18,30.5)	-3.429	0.001
Physical abuse	5(5,6.25)	6(5,8)	-3.022	0.003
Emotional abuse	8(5,9.25)	11(7,16)	-6.203	0.000
Sexual abuse	5(5,5)	5(5,6)	-4.087	0.000
Physical neglect	7(6,9.25)	12(9,14)	-9.018	0.000
Emotional neglect	10(8,12)	18(16,20)	-12.305	0.000
Total score	36(33,40)	53(46,60.25)	-11.851	0.000

3.4 Comparison of depression level and childhood trauma score in depressed patients

The results showed that the difference between emotional abuse and somatic neglect and emotional neglect in the grading of depression level was significant (P<0.05); the higher the level of depression, the higher the scores of somatic neglect and emotional neglect, whereas the emotional abuse scores were the highest in the case of moderate depression and the lowest in the case of severe depression. See Table 4.

Table 4: Comparison of depression levels and childhood trauma scores in depressed patients.

Depression level	Physical abuse	Emotional abuse	Sexual abuse	Physical neglect	Emotional neglect	Total score
Possible depression	5(5,7.75)	8(6,11)	5(5,5)	8(6,10.75)	13(9,18)	42(34,48.75)
moderate depression	6(5,8)	10(7,14)	5(5,6)	11(8,13)	16(13,19)	50(43,58)
major depression	6(5,9)	7(6,12)	5(5,6)	13(11,14)	17(14,22))	50(45,58)
Z	1.534	9.998	2.418	25.595	9.432	16.557
P	0.464	0.007	0.299	0.000	0.009	0.000

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3.5 Comparison of caregiver burden level and childhood trauma score

Table 5: Comparison of caregiver burden level with childhood trauma score.

	categorization	N(%)	Physical abuse	Emotional abuse	Sexual abuse	Physical neglect	Emotional neglect	Total score
Caregiving burden	no burden	123(48)	5(5,6)	8(6,12)	5(5,5)	9(7,12)	15(10,18)	45(37,63)
	light burden	110(43)	6(5,8)	9(7,13)	5(5,6)	11.5(9,14)	16(12.75,19)	48(43.75,58)
	Medium burden	19(7.4)	7(5,9)	12(9,18)	6(5,7)	13(9,13)	20(17,21)	58(52,64)
	heavy burden	4(1.6)	6(5,7.75)	7.5(5.25,12.75)	5(5,7.25)	9(7,15.5)	20(9.75,22.75)	51(32,62.5)
Z			5.961	12.503	13.469	18.528	19.824	21.819
P			0.114	0.006	0.004	0.000	0.000	0.000

According to the results, emotional abuse, sexual abuse, physical neglect, and emotional neglect had differences across family caregiver burden levels ($p < 0.05$) , and the higher the trauma score, the higher the family caregiving burden level, as shown in Table 5.

4. Discussion

Childhood traumatic experiences can lead to changes in an individual's personality traits, cognition, and defense functions in adulthood. And it is a risk factor for NSSI behaviors in depressed patients[8] In this study, the caregiving burden of caregivers of depressed adolescents with self-injurious suicidal behaviors was significantly and positively correlated with depression, emotional abuse, sexual abuse, somatic neglect, and affective neglect ($P < 0.05$) and the difference was statistically significant among the different levels. That is, adolescents with childhood trauma exacerbate patients' depression levels and the caregiving burden of patients' families. The patients investigated in the study lived mostly with their grandparents since childhood, and their parents mostly worked outside the home to make ends meet. They were cared for by their parents only when they grew up or became ill. And related studies have shown that adolescents raised by grandparents and relatives may feel ignored or abandoned by their parents and experience more childhood trauma [9] Adolescents who leave their parents are full of uncertainty and uneasiness in their living environment, and increased psychological pressure may lead

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to depressive symptoms. And leaving parents to live, due to the lack of childhood companionship will affect the parent-child relationship, often with their parents to throw tantrums, put forward too many demands, and parents can not be in-depth communication with each other. From the parents' point of view, busy with life and work and thus lack of accompaniment to the child, the neglect of the child's growth causes psychological trauma, also leads to parent-child relationship, further aggravating the burden of care.

Data show that family caregivers of depressed patients are mainly female, accounting for 73.4%. The cultural level is generally low. The reasons for this may be analyzed to include the fact that parents may not be able to balance family and work when this type of patient is present in the family, and men, as the backbone of the family, are responsible for the main source of income. Often, women take on the role of the main caregiver of the family. Because women's physical and mental qualities are affected by their physiological conditions, women are more delicate and prone to sentimentalism, and are more able to appreciate the suffering of depressed patients than men, women have a greater burden of thought and mental stress, and their caregiving burden is heavier when they take on caregiving duties.

A survey of 166 patients with major depression showed [10] that somatic neglect and emotional neglect were the most common subtypes of childhood trauma. The data showed [11] that spatial distance from parents does not allow parents to perceive and notice the emotional needs of adolescents in a timely manner, and that parental indifference and neglect in childhood can strengthen an individual's sense of insecurity, making them more likely to adopt a negative approach to coping when encountering difficulties, which can in turn lead to more depressive symptoms. Some studies have pointed out that the cognitive, emotional, and behavioral effects of patients who have experienced childhood abuse can last for decades or even a lifetime, and that the experience of childhood abuse can exacerbate the patient's depressive mood [12] and the risk of suicide is greater [13]. A foreign empirical study shows that individuals with early abuse experience will cause cognitive and emotional regulation disorders, and then produce some behavioral problems, such as violent behavior [14]. This shows that the experience of childhood abuse plays an important role in the physical and mental development of individuals. Society should vigorously publicize the concern for adolescent mental health, and families should communicate more with their children to identify problems and solve them in time.

Adolescents with traumatic experiences of depression usually have moderate depressive mood. There have been some studies exploring the effects of childhood trauma on depression, but the mechanisms are not clear. It has been noted that childhood trauma has a positive predictive effect on depression, indicating that the more trauma experienced in childhood, the higher the level of depression [12]. And adolescents with depression with NSSI behaviors had significantly higher scores on emotional abuse, physical abuse and emotional neglect than adolescents without self-injurious suicidal behaviors, and the results of the analysis indicated that physical abuse was a risk factor for self-injurious suicidal behaviors in adolescents with depression [15].

The results of this study showed that the scores of family caregiver burden in depressed patients with traumatic experiences in childhood were at the level of mild burden. The reasons for this may be analyzed on the one hand because depression is one of the mental illnesses with a high recurrence rate, and with the increase in the number of recurrences, the patient's condition tends to aggravate; on the other hand, it is due to the patient's psychological abnormality and the inability to communicate smoothly with the family caregiver, and the patient is unable to experience the caregiver's emotions or the caregiver is unable to understand the patient. In addition, when a patient receives retreatment, the

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types and doses of drugs increase, costing a lot of money and increasing the financial burden on the family to varying degrees. On the other hand, recurrent relapses may increase the treatment time of the patient and also cost the caregivers time, the longer they take care of the patient, the less time they have to spend on social activities, the more tired they become, and the more burdensome they become due to the long hours of caregiving.

Studies have found [16] that the vast majority of adolescent patients live at home after discharge from the hospital, and careful care by family members helps to consolidate the patient's treatment, reduce the risk of disease, and prevent relapse. However, patients are also often unable to live independently [17], increasing the burden of care on families. The life and work of family caregivers are largely influenced by the patient. This inevitably changes the caregiver's living situation so that the caregiver takes care of the patient and the patient's needs as his/her first priority, and is unable to carry out his/her own plans for a normal work and life because of the need to take care of the patient, and so the patient's caregiver often feels lonely, disappointed, and helpless, among other things. Related studies have found that caregivers not only have a caregiving burden [18], but also have a concurrent impaired quality of life [19]. There are fewer studies combining family caregiving burden with patients' childhood trauma and depression levels. By analyzing the link between the three, and combining the developmental characteristics of adolescents, the present study provides a basis for better developing care measures, easing parent-child relationships, and reducing family caregiving burden in the future.

To summarize, most family caregivers, due to the pressure of work and life, as well as the lack of companionship and care for their children, have to some extent caused emotional and somatic neglect of their children, resulting in poor communication with their children, which leads to avoidance of the child and refusal to communicate with parents. In turn, this increases the burden of parental care, which is consistent with the findings of related studies that psychological problems of adolescents are closely related to family member relationships [20]. Therefore, it is necessary to advocate timely communication and exchange with children to avoid the alienation of parent-child relationship, and also to lay the foundation for reducing the burden of family care. In this study, only one hospital patient was selected as the research object, and the survey time is relatively short, the results of the study may have certain limitations, and the sample size and survey time can be increased in the future for further in-depth research.

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