Factors Associated with Lifetime History of Eating Disorder in Non-psychotic Patients with Suicidal Ideation

Факторы, ассоциированные с расстройством пищевого поведения в течение жизни у пациентов с непсихотическими психическими расстройствами и суицидальной идеацией

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Original research

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ABSTRACT

BACKGROUND: Data on the sociodemographic, biographical, and clinical factors associated with a lifetime diagnosis of eating disorders (ED) in patients with non-psychotic mental disorders (NPMD) and suicidal ideation (SI) are scarce.

METHODS: A cohort study was conducted at the Moscow Research and Clinical Center for Neuropsychiatry. The sample consisted of consecutive patients with non-psychotic mental disorders and SI, aged 18–45 years. Participants with a lifetime diagnosis of anorexia and/or bulimia (then in remission or recovery) were compared with those without ED in terms of their sociodemographic profile, clinical characteristics, lifetime traumatic events, and some behavioral patterns. All participants underwent the Russian version of the Self-Injurious Thoughts and Behaviors Interview and completed the Brief Reasons for Living Inventory, the State and Trait Anxiety Inventory, and the Beck Depression Inventory.

RESULTS: A total of 892 patients with non-psychotic mental disorders and SI were included in the study. The mean age was 25.7 years, and 84% were assigned female at birth. Same-sex experience was more common in the ED group. Patients with an ED were more likely to have a history of physical and sexual abuse and to have witnessed domestic violence. The proportion of participants with piercings, tattoos, or severe body modifications was significantly higher in the ED group. Patients with a lifetime ED were more likely to engage in nonsuicidal self-injurious behaviors and to have a history of suicide attempts.

CONCLUSION: Lifetime ED in NPMD patients with SI is associated with younger age, being assigned female at birth, having an alternative gender identity, having same-sex experience, having more than one psychiatric diagnosis, having been diagnosed with bipolar disorder, experiencing severe depression and anxiety, being exposed to multiple traumatic experiences, having various body modifications, practicing NSSI, and having a lifetime story of suicide attempts.

АННОТАЦИЯ

ВВЕДЕНИЕ: На сегодняшний день имеется недостаточно данных о социально-демографических, биографических и клинических факторах, связанных с наличием диагноза расстройство пищевого поведения (РПП) у пациентов с непсихотическими психическими расстройствами и суицидальными мыслями.

МЕТОДЫ: Когортное исследование проведено на базе ГБУЗ «Научно-практический психоневрологический центр имени З.П. Соловьева» ДЗМ. Выборка состояла из последовательно отобранных пациентов с непсихотическими психическими расстройствами и суицидальными мыслями в возрасте 18–45 лет. Участников с диагностированной в течение жизни анорексией и/или булимией (и находящихся сейчас в стадии ремиссии или выздоровления) сравнивали с участниками без РПП по социально-демографическому профилю, клиническим характеристикам, наличию психотравмирующих событий в течение жизни, а также по некоторым поведенческим паттернам. Все участники прошли русскоязычную версию интервью об аутоагрессивных мыслях и поведении (SITBI), а также заполнили краткий опросник причин жизни (bRFL), опросник ситуативной и личностной тревожности (STAI) и опросник депрессии Бека (BDI).

РЕЗУЛЬТАТЫ: В исследование было включено 892 пациента с непсихотическими психическими расстройствами и суицидальными мыслями. Средний возраст составлял 25,7 года, и у 84% участников при рождении был определен женский пол. Однополый опыт был более распространен в группе РПП. Пациенты с РПП чаще имели историю физического или сексуального насилия и были свидетелями домашнего насилия. Доля участников с пирсингом, татуировками или серьезными модификациями тела была значительно выше в группе РПП. Пациенты в группе РПП были более склонны к несуицидальному самоповреждающему поведению (НССП) и совершению суицидальных попыток.

ЗАКЛЮЧЕНИЕ: РПП в истории жизни у пациентов, проходящих стационарное лечение по поводу неспихотического психического расстройства с суицидальной идеацией, ассоциировано со следующими параметрами: более молодой возраст; женский пол при рождении; альтернативная гендерная идентичность, опыт сексуальных отношений с лицами своего биологического пола, два и более психиатрических диагноза, диагноз биполярное расстройство, большая тяжесть депрессии и тревоги; множественные психотравмирующие события в анамнезе; различные модификации тела; нанесение НССП и попытки суицида.

Keywords: *suicide; nonsuicidal self-injury; anorexia; bulimia; resilience*
Ключевые слова: *суицид; несуицидальное самоповреждение; анорексия; булимия; устойчивость*

INTRODUCTION

Mental disorders are associated not only with a reduced quality of life [1], but also with reduced life expectancy. A meta-analysis by Walker et al. (2015) found that the mortality rate of people with mental disorders is more than double that of the general population [2]. One of the causes of this high mortality rate is suicide [3]. According to some studies, approximately 60% of people who die by suicide meet the diagnostic criteria for a depressive disorder [4]. The Netherlands Study of Depression and Anxiety (NESDA) confirmed the high prevalence of suicidal ideation (SI) and suicide attempts (SA) in patients with comorbid anxiety and depression [5]. Follow-back studies have found that suicide occurs in up to 10% of cases of borderline personality disorder (BPD) [6].

Despite a considerable body of research, most suicidologists agree that suicide prevention at the individual level remains woefully ineffective [7]. This difficulty may be explained by a lack of knowledge about the factors involved in the transition from SI to SA. In this regard, further research focusing on less studied parameters is important to identify the high-risk groups for the transition from thoughts to attempts. Recent studies report that variables such as previous mental disorder (currently inactive due to recovery or remission) may still be risk factors for adverse outcomes, including death by suicide [8, 9].

Anorexia and bulimia nervosa are major public health problems with lifetime prevalence rates of 0.1–4.6% and the typical age of onset in adolescence [10]. Most people with eating disorders (EDs) never achieve complete remission.

Approximately 60% of people with anorexia nervosa (AN) do not remit even after 20 years of illness, experiencing multiple relapses and descending into a chronic course of the disorder [11]. It is therefore understandable that those who suffer from such severe and enduring forms of EDs are exposed to many negative consequences. Interestingly, not only current ED, but also a lifetime diagnosis of ED is associated with a poor prognosis [12]. In fact, ED has one of the highest rates of premature mortality among mental disorders [13]. In addition to the adverse somatic consequences of ED, some authors suggest that an increased risk of SA may also explain the high mortality rates. According to a meta-analysis by Arcelus et al. (2011), one in five people with a diagnosis of AN who died committed suicide [14]. Zerwas et al. (2015), who analyzed Danish registries from 1989 to 2006, showed that SA and death by suicide were five times more common in women and men with ED compared to their healthy counterparts [15]. The significant risk of SA and mortality in patients with a lifetime history of ED was further reported by Yao et al. (2016) [16].

To date, the factors associated with a lifetime history of ED diagnoses in patients with non-psychotic mental disorders (NPMD) and SI remain understudied. We hypothesized that the sociodemographic, biographical, and clinical profiles of patients currently suffering from NPMD and SI with a history of ED would differ from those who have never had an ED.

The aim of this study is to investigate the biographical, sociodemographic, and clinical factors associated with a lifetime diagnosis of ED in patients with NPMD and SI.

METHODS

Design

A retrospective cohort study was conducted at the Moscow Research and Clinical Center for Neuropsychiatry between January 2021 and January 2023.

The study protocol was approved by the local ethics committee of the Moscow Research and Clinical Center for Neuropsychiatry. Written informed consent was obtained from all patients enrolled in the study by trained psychiatrists before all study procedures.

Participants

In the present study, we enrolled consecutive adult inpatients (18 years and older) with non-psychotic mental disorders and SI. All the patients were screened for self-injurious thoughts and behaviors prior to admission as part of the Center's routine admission protocol. The exclusion criteria were past/present psychotic disorders with delirium, organic disorders, schizophrenia, and delusional disorders; severe neurological and somatic disorders; ongoing substance use disorder; and cognitive deficit below the level of understanding of the investigator's questions and the items of the self-report instruments. All participants were assessed by an experienced psychiatrist, who provided an ICD-10 mental disorder diagnosis. Assessment of ED history was based on a direct clinical interview according to ICD-10 criteria.

Those who met the criteria for lifetime anorexia nervosa (AN), bulimia nervosa (BN), or both, were included in the ED group, similar to the Micali et al. (2016) study [17]. We limited the age of participants to 45 years to reduce potential recall bias and the effect of menopause on participants' current status. All patients meeting criteria for ongoing ED were also excluded, so only those in remission or recovery from ED were included in the final analysis. To achieve the aim of the study, we compared parameters between patients who had experienced ED in the past (ED+) and those who had not (ED-).

Measures

The relevant sections of the Self-Injurious Thoughts and Behaviors Interview (SITBI) were used to assess SI, SA, and nonsuicidal self-injurious (NSSI) behavior. The SITBI is a structured interview that assesses the presence, frequency, and characteristics of suicidal and NSSI thoughts and behavior [18]. The Russian-language version was developed using the standard forward-backward translation procedure. The final version of the tool has already been used successfully in both clinical and research settings [19, 20].

Demographic and clinical variables were recorded on an ad hoc case record form. All participants underwent the SITBI and completed the Russian versions of the Beck Depression Inventory (BDI), the State-Trait Anxiety Inventory (STAI), and the Brief Reasons for Living Inventory (bRFL).

The last of the above tools has been developed to assess suicide resilience factors. The bRFL is a self-report instrument that assesses such suicide-resilience factors as survival and coping beliefs, responsibility to family, child-related concerns, fear of suicide, fear of social disapproval, and moral objections [21, 22]. The psychometric properties of the Russian language version of the bRFL [23] were

similar to those of the original English [24] and German language [25] versions of the inventory. To date, no work has been done to normalize its scores.

The BDI was used to measure the level of depression in the study participants [26]. The BDI is a self-report, 21-item, multiple-choice inventory with a total score ranging from 20 to 80 (higher scores indicate deeper levels of depression). Cut-off scores for the BDI are as follows: 0–9 for minimal depression, 10–18 for mild depression, 19–29 for moderate depression, and 30–63 for severe depression. The Russian version of the BDI has shown good psychometric properties and is widely used in clinical and research settings [27].

The STAI was used to measure anxiety levels. The STAI is a self-report measure consisting of 40 items, with 20 items each in the State Anxiety (STAI-S) and Trait Anxiety (STAI-T) subscales [28]. Items are answered on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much), and the total score ranges from 20 to 80, with higher scores indicating greater severity of anxiety symptoms. A cut-off score of 40 is commonly used to define likely clinical levels of anxiety. The Russian version was validated by Khanin (1983) and has shown good psychometric properties [29].

Statistical analysis

Categorical variables are presented as frequencies (%) and continuous variables as means (standard deviation (SD)). The Student's t-test was used to compare quantitative variables and the Pearson's chi-squared test for categorical variables. The Benjamini-Hochberg correction was used to correct for multiple comparisons of mental disorder diagnoses in this analysis [30, 31]. All statistical tests were performed at a two-tailed significance level of p <0.05. Data analysis was performed using Jamovi software v1.6.2.

RESULTS

Sample characteristics

A total of 892 patients with NPMD and SI were included in the study. The mean age was 25.72 (7.42; 18–45) years. Seven hundred and forty-eight (84%) patients were female. However, 58 (6.5%) of them had an alternative gender identity (the majority of which were non-binary gender identities).

Most patients were diagnosed with mood disorders (unipolar depressive disorder — 267 (29.9%); bipolar disorder — 201 (22.5%) and personality disorders (218 (24.4%)). Sixty-six patients (7.4%) had more than one psychiatric diagnosis. The mean age at first contact with mental health services was 22.49 (6.96) years.

We assessed participants only for lifetime fulfillment of the criteria for anorexia or bulimia, but not for other EDs. A lifetime history of ED was established in 305 (34.2%) patients. Sixty-nine (7.7%) patients had anorexia; 110 (12.3%) — bulimia; and 126 (14.1%) — "mixed" type (at different stages of life, meeting the criteria for both disorders). The mean age of onset of ED was 16.80 (5.10) years.

The clinical and demographic variables of the sample are presented in Table 1.

Factors associated with EDs

Compared with the controls, patients with EDs were significantly younger (23.49 (5.74) vs. 26.89 (7.66), p <0.001), had been assigned a female sex at birth (293 (96.7%) vs. 455 (77.5%), p <0.001), and had an alternative gender identity (30 (9.8%) vs. 28 (4.8%), p=0.004). As shown in Table 1, significantly more patients with ED had incomplete higher education and were students (0.05). There were no differences in marital status between the groups.

Patients with ED had their first contact with mental health services at a significantly younger age (20.60 (5.42) vs. 23.47 (7.45), p <0.001). Bipolar disorder was significantly more common in the ED group (93 (30.5%) vs. 108 (18.4%), p <0.001), while anxiety disorders were more common in the control group (19 (6.2%) vs. 116 (19.8%), p <0.001). There were no differences in the prevalence of other mental disorder diagnoses between the groups. Patients with ED were more likely to have more than one additional mental disorder diagnosis (34 (11.1%) vs. 32 (5.5%), p=0.002).

Patients with ED had significantly higher scores on the BDI (32.03 (10.09) vs. 29.32 (9.84), p <0.001, Cohen's d=0.272, indicating a moderate difference between the two groups) and the STAI-S (62.59 (9.71) vs. 61.03 (10.39), p=0.047, Cohen's d=0.155, indicating a small effect size). However, the groups did not differ on the STAI-T scores.

Participants with ED were more likely to have been exposed to physical (206 (67.5%) vs. 313 (53.3%), p <0.001) and sexual (114 (37.4%) vs. 142 (24.2%), p <0.001) abuse and to have witnessed domestic violence (143 (46.9%) vs. 216 (36.8%), p=0.004). Same-sex experience was more common in the ED group (118 (38.7%) vs. 146 (24.9%), p <0.001). Significantly more patients with ED had piercings (134 (43.9%) vs. 156 (26.6%), p <0.001), tattoos (162 (53.1%) vs. 198 (33.7%), p <0.001), tattoos covering scars (39 (13.8%)

Table 1. Demographic and clinical characteristics of the total sample, cases, and controls

Variable	Level	ED+ (*n*=305)	ED- (*n*=587)	Total (*n*=892)	Statistical test
Age, mean (SD)[a]		23.49 (5.74)	26.89 (7.66)	25.72 (7.24)	t=-6.81[b], *p* <0.001
Sex assigned at birth, *n* (%)[b]	Male	10 (3.3%)	132 (22.5%)	142 (16.0%)	χ^2=56.86, df=1, *p* <0.001
	Female	293 (96.7%)	455 (77.5%)	748 (84.0%)	
Gender identity, *n* (%)[b]	Cisgender	275 (90.2%)	559 (95.2%)	834 (93.5%)	χ^2=8.47, df=1[a], *p*=0.004
	Alternative gender identity	30 (9.8%)	28 (4.8%)	58 (6.5%)	
Level of education, *n* (%)[b]	Elementary/Middle school	15 (4.9%)	25 (4.9%)	40 (4.5%)	χ^2=14.55, df=4, *p*=0.006
	High school	55 (18.0%)	84 (14.3%)	139 (15.6%)	
	Vocational education	42 (13.8%)	84 (14.3%)	126 (14.1%)	
	Incomplete higher education	114 (37.4%)	172 (29.3%)	286 (32.1%)	
	Completed higher education	79 (25.9%)	222 (37.8%)	301 (33.7%)	
Employment, *n* (%)[b]	Employed	110 (36.1%)	237 (40.4%)	347 (38.9%)	χ^2=8.64, df=3, *p*=0.034
	Student	100 (32.1%)	156 (26.6%)	256 (28.7%)	
	Retired	4 (1.3%)	24 (4.1%)	28 (3.1%)	
	Unemployed	91 (29.8%)	170 (29.1%)	261 (29.3%)	
Marital status, *n* (%)[b]	Single	159 (52.1%)	312 (53.2%)	471 (52.8%)	χ^2=0.19, df=2, *p*=0.911
	Married	89 (29.2%)	172 (29.3%)	261 (29.3%)	
	Other type of relationship	57 (18.7%)	103 (17.5%)	160 (17.9%)	
	Same sex experience	118 (38.7%)	146 (24.9%)	264 (29.6%)	
Age at first contact with mental health services (in years), mean (SD)[a]		20.60 (5.42)	23.47 (7.45)	22.49 (6.96)	t=-5.97, *p* <0.001
Mental disorders diagnosis, *n* (%)[b]	Schizotypal disorder	43 (14.1%)	57 (9.7%)	100 (11.2%)	χ^2=3.88, df=1, *p*=0.049
	Bipolar disorder	93 (30.5%)	108 (18.4%)	201 (22.5%)	χ^2=16.82, df=1, *p* <0.001
	Depressive disorder	82 (26.9%)	185 (31.5%)	267 (29.9%)	χ^2=2.05, df=1, *p*=0.152
	Anxiety disorders	19 (6.2%)	116 (19.8%)	135 (15.1%)	χ^2=28.62, df=1, *p* <0.001
	Obsessive-compulsive disorder	2 (0.7%)	12 (2.0%)	14 (1.6%)	χ^2=2.50, df=1, *p*=0.113
	Personality disorders	79 (28.9%)	139 (23.7%)	218 (24.4%)	χ^2=0.54, df=1, *p*=0.464
Multiple psychiatric diagnoses, *n* (%)[b]	Yes	34 (11.1%)	32 (5.5%)	66 (7.4%)	χ^2=9.50, df=1, *p*=0.002
BDI score, mean (SD)[a]		32.03 (10.09)	29.32 (9.84)	30.27 (10.01)	t=3.56, *p* <0.001
STAI-S score, mean (SD)[a]		62.59 (9.71)	61.03 (10.39)	61.57 (10.18)	t=1.99, *p*=0.047
STAI-T score, mean (SD)[a]		62.64 (9.35)	61.63 (10.21)	61.98 (9.93)	t=1.33, *p*=0.185
Physical violence history, *n* (%)[b]	Yes	206 (67.5%)	313 (53.3%)	519 (58.2%)	χ^2=16.68, df=1, *p* <0.001
Domestic violence witnessing, *n* (%)[b]	Yes	143 (46.9%)	216 (36.8%)	359 (40.2%)	χ^2=8.49, df=1, *p*=0.004
School bullying, *n* (%)	Yes	215 (70.5%)	391 (66.6%)	606 (67.9%)	χ^2=1.39, df=1, *p*=0.239
Sexual abuse history, *n* (%)[b]	Yes	114 (37.4%)	142 (24.2%)	256 (28.7%)	χ^2=17.05, df=1, *p* <0.001
Lifetime drug use experience, *n* (%)[b]	Yes	157 (51.5%)	262 (44.6%)	419 (47.0%)	χ^2=3.77, df=1, *p*=0.052
Body Piercing, *n* (%)[b]	Yes	134 (43.9%)	156 (26.6%)	290 (32.5%)	χ^2=27.56, df=1, *p* <0.001
Tattoos, *n* (%)[b]	Yes	162 (53.1%)	198 (33.7%)	360 (40.4%)	χ^2=31.33, df=1, *p* <0.001
Severe body modifications, *n* (%)[b]	Yes	36 (11.8%)	29 (4.9%)	65 (7.3%)	χ^2=3.88, df=1, *p* <0.001
Lifetime SA, *n* (%)[b]	Yes	159 (52.1%)	208 (35.4%)	367 (41.1%)	χ^2=23.11, df=1, *p* <0.001
Lifetime NSSI, *n* (%)[b]	Yes	262 (85.9%)	361 (61.5%)	623 (69.8%)	χ^2=56.75, df=1, *p* <0.001

Note: [a] Student's t-test, [b] Chi-squared test; # — significant after Benjamini-Hochberg correction; SA=suicide attempt; NSSI=nonsuicidal self-injury; ED=eating disorders; STAI-S=State anxiety; STAI-T=Trait anxiety; BDI=Beck's depression inventory.

vs. 32 (5.5%), p <0.001), and severe body modifications (36 (11.8%) vs. 29 (4.9%), p <0.001).

Significantly more patients with ED had a lifetime history of SA (159 (52.1%) vs. 208 (35.4%); p <0.001) and NSSI (262 (85.9%) vs. 361 (61.5%); p <0.001).

As shown in Table 2, patients with ED had significantly lower scores on the bRFL subscales such as survival and coping beliefs (4.00 (1.51) vs 4.22 (1.42), p=0.032), responsibility to family (3.65 (1.55) vs 4.02 (1.62), p=0.001), child-related concerns, and moral objection (1.85 (1.31) vs 2.44 (1.64), p <0.001). Total bRFL mean scores were also significantly lower in the main group (2.87 (0.93) vs 3.25 (1.14), p <0.001). There were no differences between the groups on factors such as fear of suicide and fear of social disapproval.

DISCUSSION

The age of the sample was limited to 45 years in order to reduce the effect of menopause on the current status of participants and to minimize potential recall bias. The age of the participants in our study was relatively low (25.7 years), which is in line with previous studies reporting an earlier onset of various mental disorders in people with ED [32]. The age characteristics of the sample may also partly explain the higher than expected prevalence of NSSI and nonfatal SA among the participants.

The majority of patients in our sample were female, which is consistent with the literature on the higher prevalence of anxiety, depression [33, 34], SI, and non-lethal SA [35] in women, and the greater number of women among those seeking psychiatric help [36].

The significant number of people with incomplete and completed higher education in our sample is due to the specifics of the Russian population and is consistent with data from the Organization for Economic Cooperation and Development (OECD) on the high percentage of people with higher education among citizens of the Russian Federation aged 25–64. According to this indicator, the Russian Federation ranks second out of 35 OECD member countries [37].

When comparing the groups of patients with and without a lifetime diagnosis of ED, a significant number of differences in clinical and socio-demographic parameters were found. In the group of persons with ED, there was a significantly higher proportion of people who were assigned female at birth, which is consistent with the higher prevalence of ED in women [38]. There was also a significant difference in gender: those with ED were more likely to have an alternative gender identity, identifying as bigender, gender-fluid, or agender. All participants with an alternative gender identity were assigned female at birth. The association found between alternative gender identity and ED is consistent with the results of previous studies. In a study of 289,000 US college students, transgender people were 4.6 times more likely than cisgender women to self-report an ED in the preceding year [39]. Another study reported that non-binary individuals were three times more likely to self-report a history of AN or BN than transgender men and women [40]. Lifetime same-sex experience was also more common among patients with ED, which is also consistent with the literature on a higher prevalence of ED among bisexual and homosexual individuals [41].

Patients with ED were significantly younger, which explains the greater number of people with incomplete higher education and student status in this group. The usual age of onset for many EDs is between 14 and 19 years [42], and sometimes even earlier [43], which is lower than for other non-psychotic disorders [44]. This may explain the

Table 2. Brief Reasons for Living Inventory scores

	Mean (SD)		Student's t-test (df=890)	Cohen's d
	ED+ (n=305)	ED- (n=587)		
Survival and coping beliefs[a]	4.00 (1.51)	4.22 (1.42)	t=-2.14, p=0.032	0.150[b]
Responsibility to family[a]	3.65 (1.55)	4.02 (1.62)	t=-3.24, p=0.001	0.233[b]
Child-related concerns[a]	2.84 (1.83)	3.53 (1.99)	t=-5.00, p <0.001	0.356[c]
Fear of suicide[a]	3.35 (1.56)	3.53 (1.71)	t=-1.63, p=0.103	0.108[b]
Fear of social disapproval[a]	2.43 (1.56)	2.65 (1.66)	t=-1.88, p=0.060	0.135[b]
Moral objection[a]	1.85 (1.31)	2.44 (1.64)	t=-5.30, p <0.001	0.384[c]
Total mean	2.87 (0.93)	3.25 (1.14)	t=-4.88, p <0.001	0.354[c]

Note: [a] Absolute range — 1–6; ED=eating disorders; [b] small effect size; [c] medium effect size.

younger age of first contact with mental health services in people with ED.

The high comorbidity between ED and other psychiatric disorders has been widely reported. The lifetime prevalence of at least one DSM-IV comorbidity varies from 45% to 97%, depending on the source [45, 46]. This is confirmed by the significant number of people with ED (34.2%) in our consecutively recruited sample of patients with NPMD and SI. The study groups differed in the frequency of diagnoses of BD (more common in patients with ED) and anxiety disorders (more common in the group without ED). This is consistent with the meta-analysis by Fornaro et al. (2020), which found an association between EDs and BD. Thus, BN occurred in 7.4% (95%CI=6–10%) of individuals with BD, while 6.7% (95%CI=12–29.2%) of individuals with BN had a diagnosis of BD. AN occurred in 3.8% (95%CI=2–6%) of individuals with BD; 2% (95%CI=1–2%) of individuals with BD had a diagnosis of AN [47]. It is noteworthy that despite the lower frequency of anxiety disorder diagnoses in the ED group, the severity of state anxiety was actually higher in this group. ED was also associated with higher depression scores on the BDI. In addition, participants in the ED group were more likely to have more than one psychiatric diagnosis, again reflecting the greater severity of psychiatric disorders in this group.

The present study uncovered a high prevalence of traumatic experiences (childhood physical abuse and witnessing domestic violence) among patients with ED. Similar data have been reported in other studies [48]. The prevalence of adverse childhood experiences in our study is higher than previously reported [49], which may be explained by the fact that these adversities predict not only ED, but also suicidality (inclusion criteria of our study).

A higher number of patients exposed to sexual trauma among participants with ED is also consistent with the literature data showing that sexual trauma precedes and contributes to the development of ED: particularly bulimia [50].

Tattoos, piercings, and body modifications have been found to be more common in patients with ED in several studies, including studies of ED without comorbid psychiatric disorders [51]. Previous studies have found these variables to be more prevalent in young people and in those with indirect and direct self-injurious behaviors [52] — variables that are prevalent in our study population.

In our study, the prevalence of NSSI was high in both groups, which could be explained by the higher prevalence of NSSI in people with SI. We found that an ED in patients with SI was associated with involvement in NSSI practices. On the one hand, the higher prevalence of NSSI could be explained by the younger age of the participants and the predominance of women in the ED group [53]. On the other hand, a meta-analysis by Cucchi et al. (2016) reported odds ratios for NSSI according to the ED subtype (ranging from 20 to 32.7%) [54] and a bidirectional relationship between NSSI and ED was proposed [55]. A recent study in the Russian Federation [52] found that the prevalence of ED in psychiatric inpatients with NSSI and SI stood at 51%, and that the odds ratio for having NSSI in participants with both SI and ED was 4.9. The exclusion of people aged 45 years and over in our study may explain the difference in the prevalence of NSSI between this study and ours.

Suicide is one of the leading causes of excess mortality in patients with ED, according to recent studies [56]. Previous studies have examined the relationship between SA and ED [57], but there is still no consensus as to whether there is a difference in the degree of risk of SA depending on the subtype of ED: some authors have suggested that there is no difference between subtypes of ED [58], while others have reported a significant increase in risk in patients with AN [59]. However, the existence of an association between the presence of an ED and the risk of SA has been confirmed in a large number of studies, including this one [60, 61]. At the same time, our findings should be interpreted with caution, as many of the factors associated with lifetime ED diagnoses have previously been identified as risk factors for SA. For example, a recent study from Moscow found a strong association between NSSI and suicidality in people with epilepsy [62]. Further research is needed to identify the possible common biological and psychological underpinnings of these often co-occurring factors [63, 64].

According to the ideation to action research framework, the transition from suicidal ideation to suicide attempt may have to do with the tension between the pro-suicidal drive and resilience factors. To test whether the patients who had shown a proclivity to develop ED during their lifetime also had lower resistance to suicide, we measured the number of beliefs that could potentially be important as reasons not to commit suicide in both groups. We did not find any studies that used the Reasons for Living Inventory in people with ED prior to our study. We found that participants with ED had a lower total score on the bRFL, as well as lower scores on several suicide-resilience

factors such as "survival and coping beliefs", "responsibility to family", "child-related concerns", and "moral objections".

We believe that many of the characteristics we have identified in patients with ED are similar to those previously reported in patients with BPD. At the same time, no difference was found between the groups in terms of personality disorder diagnosis after Benjamini-Hochberg correction. The fact that borderline BPD is often underdiagnosed in people with other psychiatric conditions [65] may explain this discrepancy. In our study the diagnosis of mental disorder was based on expert opinion. Further studies using a diagnosis based on the results of structured psychiatric interviews are needed to assess whether BPD is more common in non-psychotic patients with SI and lifetime ED.

Strengths and limitations of the study

Our study has both strengths and limitations. We used consecutive sampling to avoid selection bias. To the best of our knowledge, our study is the first attempt to assess reasons for living in patients with ED and SI, the group at high risk of suicide.

Age differed significantly between the groups in our study. This may be a limitation of the study if we consider it as a simple covariate. However, it is possible that age simply reflects generational differences between people who grew up in different environments. Long-term prospective cohort studies are needed to answer the question of whether parameters such as ED and NSSI decrease with age or whether they remain stable in intrinsic value across generations.

The main shortcoming of our study is that EDs were diagnosed retrospectively. Many of the participants recovered from an ED in early adulthood; so, recall bias can't be completely ruled out. Another limitation is our approach to psychiatric diagnosis, which was based on expert opinion, only. The potential impact of this on the frequency of personality disorder diagnoses has been discussed above. Patients with psychotic disorders and those older than 45 years were not included in our study, so our results should not be extrapolated to these populations.

CONCLUSION

Lifetime ED in NPMD patients with SI is associated with younger age, being assigned female at birth, having an alternative gender identity, having had a same-sex experience, having more than one psychiatric diagnosis, having a diagnosis of bipolar disorder, experiencing more severe depression and anxiety, having been exposed to multiple traumatic experiences, having various body modifications, practicing NSSI, and having a lifetime history of SA. Patients with ED are vulnerable to the development of suicidal behavior because of their low resilience to the transition from SI to SA.

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