



Variables Linked to Attempted Suicide in the Psychiatric Field: A Case Control Study

E. di Giacomo^{1,2*}, E. D. Giampieri² and M. Clerici^{1,2}

¹Department of Neurosciences and Biomedical Technologies. University of Milano Bicocca; via Cadore, 48 - 20052 Monza (MI)-Italy.

²Psychiatric Department– San Gerardo Health Care Trust, via Pergolesi, 33 – 20052 Monza (MI)-Italy.

Authors' contributions

This work was carried out in collaboration between all authors. Author EG designed the study, managed the literature searches performed the statistical analysis, wrote the protocol, managed the analyses of the study and wrote the first draft of the manuscript. Author EDG designed the study, managed the literature searches performed the statistical analysis, managed the analyses of the study and wrote the protocol; and author MC managed the analyses of the study. All authors read and approved the final manuscript.

Research Article

Received 31st December 2012
Accepted 13th March 2013
Published 22nd March 2013

ABSTRACT

Aims: To evaluate variables and factors linked to attempted suicide in psychiatric patients.

Study Design: Case control study.

Place and Duration: Psychiatric Department, S. Gerardo Health Care Trust (Italy), between January 2000 and July 2007.

Methods: We recruited 32 patients (25 females and 7 males) admitted following a suicide attempt and patients with the same clinical diagnosis and no history of attempted suicide matched for socio-demographic characteristics. We administered 6 tests for the evaluation of personality traits (TCI-R), global psychopathology (SCL-90), quality of life (WHOQOL), Social adaptation (SASS), health (SF 36) and interpersonal relationships (IIP).

Results: We obtained statistically significant differences between patients who attempted suicide and patients who did not in two subscales: *harm avoidance* (TCI-R, $p=.021$) and *environmental area* (WHOQOL, $p=.036$).

Conclusion: This study suggests psychiatric patients less prone to inhibiting their

*Corresponding author: Email: ester.digiacomio@yahoo.com;

behaviours and less afraid of the unknown, having a worse perception of their living environment safety and a poorer economic status may be at higher risk of suicide attempt.

Keywords: Attempted suicide; risk factors; TCI-R; WHOQOL; quality of life; psychiatric patients.

1. INTRODUCTION

Attempted suicide (AS) is defined as a self-harming conduct aimed at one's death which includes a spectrum of growing intensity of behaviour. In Italy, the incidence is estimated through the cases confirmed by State Police and Carabinieri statistics (ISTAT 2007- the most recent available statistics) [1] in 5.5/10,000 inhabitants, while WHO's data concerning Italy in 2002 estimated the suicide rate at 7.1/100,000 habitants [2]. The ratio among the young is high, with a AS:S ratio of 200:1, and among women even higher, with a AS:S ratio of 10:1. [1,3,4,5].

Major risk factors are represented by previous suicide attempts and psychiatric illness: 88% of suicide attempts have a positive anamnesis for at least one psychopathology. Other risk factors are social isolation, unemployment (especially among males), physical and psychological abuse during childhood, immigrant status (especially if not integrated in the hosting culture), and gender identity problems [6,7,8,9,10].

Major depression afflicts 60-70% of those who attempt suicide, while 19% of the schizophrenic population under the age of 35 attempts suicide. Anxiety and personality disorders (borderline, in particular) are associated with an increased risk, especially if coexisting with mood disorders [4,11,12,13,14].

Of the subjects surviving a self-damaging act, 16% will repeat it within the following year, while 2% will eventually succeed [7,15].

The aim of our research was to analyze relevant clinical differences among psychiatric patients who have never attempted suicide ("NA" group), and patients who have attempted suicide ("AS" group), matched for clinical diagnosis and socio-demographic conditions (Table 1 and 2).

2. METHODS

We recruited subjects among inpatients of Psychiatric Inpatients Unit and Psychiatric Day Hospital (S. Gerardo Nuovo Health Care Trust, Monza, Italy), from January 2000 to July 2007. For each identified patient consecutively admitted due to a suicide attempt, we recruited a psychiatric control with the same clinical diagnosis (according to DSM IV criteria) and socio-demographic conditions (age, gender, marital status, work and education), but with a negative history of self-injuring behaviours.

Each group consisted of 32 subjects, 25 females (78.1%) and 7 males (21.9%). All the patients signed an informed consent form before their inclusion into the study. We administered six internationally validated tests to evaluate quality of life (SF36 [16] and

WHOQOL [17]), social adaptation (SASS [18]), psychopathological symptoms (SCL-90 [19]), interpersonal relationship (IIP [20]) and personality traits (TCI-R).

The TCI-R test [21] was introduced at a later stage (since the Italian version was validated in 2007); data are therefore not available for every subject we examined. Specifically, it was administered to each one in the "Attempted Suicide" group and to 12 out of 32 patients in the "Non Attempted" group.

Both the "NA" and "AS" groups were, at the time of testing, under psychopharmacological therapy (same classes of drugs for equivalent diagnosis) and were receiving psychotherapy support.

We analyzed data using T Student for independent samples. We used SPSS 14 software for statistical analysis, assuming $p = .05$ as limit for a statistically significant difference.

2.1 Test Description

WHOQOL (WHO Quality of Life) evaluates subject's quality of life. It consists of 4 areas: Physical Area (Normal Values ill 39-75, healthy 55-85), Psychological Area (Normal Values ill 44-74, healthy 54-80), Social Area (Normal Values ill 44-76, healthy 54-82), Environmental Area (Normal Values ill 44-72, healthy 48-78).

TCI-R (Temperament and Character Inventory) classifies normal and abnormal personality features, and evaluates 4 temperament dimensions: Novelty Seeking (linked to the dopaminergic system), Harm Avoidance (linked to the serotonergic system), Reward Dependence (linked to the noradrenergic system) and Persistence and 3 character dimensions, Self-Directedness (perceiving oneself as independent), Cooperativeness (being integrant part of the society) and Self-Transcendence (recognizing oneself as part of the whole).

IIP (Interpersonal Problems Inventory) measures self-perceived interpersonal difficulties. It consists of 13 scales: unsociability because of egocentricity (F1a), unsociability because of lack of initiative (F1b), unsociability because of lack of involvement (F1c), fragility because of suggestibility (F2a), fragility because of lack of responsibility (F2b), involvement difficulty (F3), lack of assertiveness (F4), sexual inhibition and conflicts (F5), empathy and sense of guilt (F6), egocentricity (F7), trusting someone too much or too little (F8), aggressiveness (F9) and problems with authority (F10).

SF36 (Short Form 36 Health Survey Questionnaire) evaluates mental and physical health and how much it influences everyday life. SF36 covers 8 areas: physical activity (n.v 10-30), the role of physical health (n.v. 4-8), physical pain (n.v 2-12), general health (n.v. 5-25), vitality (n.v. 4-24), social activity (n.v. 2-10), emotional role and state (n.v. 3-6), mental health (n.v. 5-30) and changes in health conditions (n.v.1-5).

SASS (Social Adaptation Self-evaluation Inventory) assesses social behaviour and motivations, examining in-depth certain aspects linked to work and to spare time, family and other relationships, intellectual interests, role satisfaction, and the perceived capability to control their own environment (n.v..35-52).

SCL-90 R (Symptom Checklist 90 Revised) analyzes the symptoms most frequently referred by patients to their physicians. The 90 items are divided into 9 symptomathological dimensions: somatization (n.v.<.92), obsessive-compulsive (n.v.<.20), interpersonal sensitivity (nv.<.22), depression (nv.<.31), anxiety (nv.<1.00), hostility (nv.<.33), phobic anxiety (nv.=.00), paranoia (nv.< .67) e psychoticism (nv.=.00).

3. RESULTS

3.1 Socio-demographic Variables

The majority of the "AS" group were female (78.1%), thus confirming Literature data; with an average age of the "AS" group of 44.34 years [SD: 35,64-45,11] (range 23-71).

University graduates represented the predominant educational category (43%); the preminent groups in the classification of marital status were single (43%) and married (46%) In this study, 31.25% of subjects were workers (either clerical or blue collar workers), which was the most represented work category. According to the psychiatric diagnosis standpoint, the prevalent categories were anxiety disorders (25%), borderline personality disorder (28.1%) and major depression (28.1%). (Tables 1 and 2)

Table 1. Socio-demographic variables

	Non attempters ("NA")	Suicide attempters ("AS")	%
Sex			
Male	7	7	21.9
Female	25	25	78.1
Age			
21-30	6	6	18.75
31-40	9	9	28.12
41-50	7	7	21.88
51-60	5	5	15.62
61-70	3	3	9.38
71-80	2	2	6.25
Education			
Primary school	4	4	12.05
Middle school	9	9	28.01
High school	14	14	43.08
University degree	5	5	15.06
Work			
Student	2	2	6.25
Housewife	7	7	21.88
Clerical/Blue collar	10	10	31.25
Manager/Freelance	4	4	12.5
Retired	4	4	12.5
Unemployed	4	4	12.5
Invalid	1	1	3.12
Marital status			
Cohabiting	1	1	3.01
Single	14	14	43.08
Separate	2	2	6.03
Married	15	15	46.09
Total	32	32	100

Table 2. Psychiatric diagnosis

Diagnosis	Non attempters ("NA")	Suicide attempters ("AS")	%
Anxiety disorders	8	8	25
Mood disorders:			
a) Bipolar disorder	2	2	6.26
b) Depression	9	9	28.13
Borderline personality disorder	9	9	28.13
Schizophrenia	1	1	3.12
Eating disorders	1	1	3.12
Organic disorder	1	1	3.12
Drug abuse	1	1	3.12
<i>Total</i>	32	32	100

3.2 SCL-90

Even if we were not able to obtain statistically significant differences, we could observe that the "AS" group obtained higher average scores than the "NA" group in the obsessive-compulsive disorder, depression, hostility, paranoid ideation and psychoticism subscales, while it scored lower on the somatization and interpersonal sensitivity subscales.

The "NA" group yields an average score near the normal limit on the psychoticism scale (normal score limit =1), while the "AS" group achieved an average score within the normal limits in the phobic anxiety scale (Table 3).

Table 3. T Student for independent samples: SCL-90

Variable	Non attempters ("NA")	Suicide attempters ("AS")	F	dF	p
Somatization	1.52 ± .63	1.33 ± .96	7.057	62	.380
Obsessive-compulsive	1.6 ± .84	1.83 ± .80	.148	61	.185
Interpersonal sensitivity	1.58 ± 1.04	1.42 ± .87	1.143	61	.447
depression	2.06 ± .95	2.14 ± 1.00	.350	61	.695
Anxiety	1.97 ± 1.20	1.89 ± 1.07	.096	61	.736
Hostility	0.95 ± .88	1.07 ± .82	.021	61	.485
Phobic anxiety	0.98 ± .83	1 ± .89	.390	61	.917
Paranoia	1.49 ± .94	1.57 ± .83	.794	61	.666
Psychoticism	1 ± .78	1.2 ± .68	.247	61	.185

3.3 TCI-R

The "AS" group scored lower than the "NA" group on the Harm Avoidance subscale, though both scoring higher than 3 (cut-off value). On the basis of the test design, scores higher than 3 on the Harm Avoidance subscale indicate pessimism, fear, shyness and tiredness. We also point out that on the Persistence subscale, the "NA" and "AS" groups scored lower than 3 (i.e. being motionless and pragmatic).

When comparing the "NA" and "AS" groups, only the difference on the Harm Avoidance subscale ($p = .021$) was statistically significant (Table 4).

Table 4. T Student for independent samples: TCI-R

Variable	Non attempters ("NA")	Suicide attempters ("AS")	F	dF	p
Novelty seeking	2.82 ± .40	2.89 ± .48	.048	39	.609
Harm avoidance	3.89 ± .55	3.51 ± .45	.104	39	.021
Reward dependence	3.14 ± .40	3.24 ± .43	.001	39	.473
Persistence	2.68 ± .75	2.88 ± .60	.176	39	.321
Self-directedness	2.78 ± .56	3.05 ± .41	.934	39	.081
Cooperativeness	3.35 ± .33	3.55 ± .40	.668	39	.168
Self-transcendence	2.39 ± .45	2.67 ± .64	1.781	39	.175

3.4 IIP

Even though the outcomes were not statistically significant, we could observe that the "AS" group scores were higher than those of the "NA" group on subscales F2a (fragility because of suggestibility), F2b (fragility because of lack of responsibility), F3 (involvement difficulty) and F8 (trusting someone too much or too little); and scores are lower in subscales F1a (unsociability because of egocentricity), F7 (egocentricity), F9 (aggressiveness) (Table 5).

Table 5. T Student for independent samples: IIP

Variable	Non attempters ("NA")	Suicide attempters ("AS")	F	dF	p
F1a	1.18 ± .93	0.96± .81	.615	62	.243
F1b	1.76 ± 1.20	1.75 ± .96	3.791	62	.951
F1c	1.43 ± .84	1.47 ± .65	1.258	62	.809
F2a	1.98 ± 1.15	2.17 ± .93	1.367	62	.428
F2b	1.78 ± 1.01	1.9 ± .69	5.987	62	.541
F3	1.87 ± .99	1.98 ± .71	4.462	62	.603
F4	1.69 ± .74	1.66 ± .67	.337	62	.859
F5	1.51 ± 1.13	1.52 ± .63	9.29	62	.946
F6	1.67 ± .91	1.99 ± .77	.310	62	.112
F7	0.97 ± .82	0.83 ± .56	4.46	62	.347
F8	1.57 ± .88	1.84 ± .60	3.113	62	.163
F9	1.17 ± .90	0.97 ± .66	2.942	62	.267
F10	1.58 ± .93	1.52 ± .68	2.760	62	.741

3.5 SF36

All scores were within the normal range. Even if we did not obtain any statistically significant difference, it is notable that the "AS" group scored 2 points higher in mental health (Table 6).

Table 6. T Student for independent samples SF-36

Variable	Non attempters ("NA")	Suicide attempters ("AS")	F	dF	p
Physical activity	23.72 ± 6.14	22.94± 7.39	2.563	62	.582
Physical health role	4.97 ± 2.11	5.16 ± 1.81	.479	62	.674
Physical pain	5.69 ± 2.96	6.31 ± 2.88	.079	62	.348
General health	15.03 ± 4.39	16.44 ± 5.14	1.030	62	.183
Vitality	15.06 ± 4.38	15.56 ± 4.51	.10	62	.624
Social activity	5.41 ± 1.70	5.63 ± 1.49	.315	62	.547
Emotional role and state	3.63 ± 1.62	3.31 ± 1.02	3.475	62	.327
Mental health	15.53 ± 6.31	17.25 ± 5.30	1.256	62	.199
Change in health conditions	3.31± 1.33	3.75± 1.36	.037	62	.152

3.6 WHOQOL

"NA" and "AS" groups both scored in the lower part of the pathological range in the Physical Area (representing physical pain and indisposition, energy, tiredness, and sleep quality; pathological range = 39-75) and Environment Area (pathological range = 44-72), and even lower in the Social Area (representing interpersonal relationships as well as sexual intercourse; pathological range = 44-76). They also scored particularly poorly in the Psychological Area (including positive emotions, reasoning capability and self-esteem; pathological range = 44-74).

The only statistically significant result was obtained in the Environmental Area ("NA" – "AS" = .036) (Table 7).

Table 7. T Student for independent samples: WHOQO

WHOQOL					
Variable	Non attempters ("NA")	Suicide attempters ("AS")	F	dF	p
Physical area	44.2 ± 14.50	41.19± 15.65	.001	60	.386
Psychological area	28.65 ± 16.14	26.25 ± 16.92	.111	60	.528
Social area	45.83 ± 23.75	42.78 ± 23.54	.049	60	.558
Environmental area	48.73 ± 12.44	41.88 ± 15.21	1.030	60	.036

3.7 SASS

Both the groups obtained low-range scores at the SASS. The "AS" group had a detachment score higher than the "NA" group. We did not obtain any statistically significant differences between the two groups (Table 8).

Table 8. T Student for independent samples: SASS

SASS					
Variable	Non attempters ("NA")	Suicide attempters ("AS")	F	dF	p
SASS	34.22 ± 10.81	31.71± 9.95	.372	61	.284

4. DISCUSSION

On the basis of these results, we can infer that the “AS” group represents a subgroup of psychiatric patients, defined by the following peculiarities.

First of all, we can confirm Literature data regarding the female prevalence among suicide attempters [4].

Even if we cannot confirm Literature data with regard to unemployment [9], a great part of the subjects in our sample of SA were “housewife”, a condition of social isolation that is often popularly considered very close to unemployment.

We observed some trends that could be interesting in describing possible differences, hoping to be able to confirm them in a broader study (see “Limit of the Study” section). SA seems more fragile (IIP results) and less prone to somatizing their suffering, which could be considered as a form of escaping from personal psychic suffering. (SCL results). SA obtained a lower value than that of psychiatric controls’ in the item *mental health* (SF36), even if they suffered from the same pathology. Social adaptation, even if problematic for both the groups, appears more problematic for attempters, thus underlining the importance and the meaning of social isolation linked to this problem according to Literature [9]. Moreover, SA were less involved in interpersonal relationships and less prone to trusting someone else or their personal resources; this fits well in the setting of the complete narrow-mindedness towards the external world that we expect by people engaging in such extreme behaviour.

As main results, we observed that “NA” and “AS” subjects with the same diagnosis, were different for:

1. Environmental Area: including subgroups such as physical safety, domestic and physical environment, and economic status;
2. Harm Avoidance: representing an anxiety-related temperamental trait that involves the tendency to inhibit behaviours, passive avoidance like being afraid of the unknown, poor resistance to physical and psychological stress.

In particular, in the Environmental Area, SA had an average score lower than NA. This confirms existing data, since risk factors such as physical safety and economic status may influence the risk to engage in self-damaging behaviours [7,8,9].

On the Harm Avoidance subscale, NA obtained higher average scores than attempters. This result confirms what was expected: “AS” are less afraid than “NA” of the unknown, and show less tendency to inhibit their behaviour.

4.1 Limits of the Present Study

The present study has two important limits:

1. The number of subjects recruited is very low; however, the number of patients is the actual number of patients admitted due to attempted suicide during the recruitment period. Nevertheless, we obtained results that confirm current

International Literature providing interesting food for thought; a more ample representation of subjects could reveal more telling differences.

2. Beside the small sample size, TCI-R data are even more problematic, even if analyzed within the matched couple, and give limitative results due to the restricted number of controls.

5. CONCLUSIONS

Even if our study is unable to pinpoint more subtle differences between attempters and non-attempters, it confirms previously reported data, i.e. that people who attempted suicide may feel less safe in their own environment and less supported by economic resources, and less prone to avoiding risk behaviours.

Moreover, we observed some trends on other subscales related to the significance but that did not obtain statistically significant differences, even if without statistical significance. This leads us to speculate that a greater sample size might yield further results, thus allowing better discrimination between these two groups ("AS" and "NA").

As a final note, preliminary results highlight the need for immediate planning and implementation of active preventative measures: paying more attention to individual and family history and closely analyzing the patient's socioeconomic status and environmental safety, any present and/or past abuse, as well as any anomalies, such as – for example – reduced behavioral inhibitions.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

ACKNOWLEDGEMENT

To our Staff, for their constant support, ideas and hard work

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. ISTAT on line available: www.istat.it/dati/catalogo/rapporto2004/dati.html.
2. WHO on line available: www.who.int/topics/suicide/en/.
3. Conwell Y, Thompson C. Suicidal behavior in elders. *Psychiatr Clin North Am.* 2008;31(2):333-56.

4. Haw C, Hawton K. Life problems and deliberate self-harm: association with gender, age, suicidal intent and psychiatric and personality disorder. *J Affect Disord.* 2008;109(1-2):131-48.
5. Hultén A, Jiang D, Hawton WK, Hjelmeland H, De Leo D, Ostamo A, et al. Repetition of attempted suicide among teenagers in Europe: frequency, timing and risk factors. *Eur Child Adolesc Psychiatry.* 2001;10:161-16.
6. Barak Y, Baruch Y, Achiron A, Aizenberg D. Suicide attempt of schizophrenia patients: a case controlled study in tertiary care. *J Psychiatr Res.* 2008;42(10):822-6.
7. Fergusson DM, Boden JM, Horwood LJ. Exposure to childhood sexual and physical abuse and adjustment in early adulthood. *Child Abuse Negl.* 2008; Jun 17.
8. Gladstone GL, Parker GB, Mitchell PB, Malhi GS, Wilhelm K, Austin M. An analysis of pathways from childhood sexual abuse to deliberate self-harm and revictimization. *Am J Psychiatry.* 2004;61:1417-1425.
9. Kposowa AJ. Unemployment and suicide: a cohort analysis of social factors predicting suicide in the US National Longitudinal Mortality Study. *Psychol Med.* 2001;31:127-138.
10. Skegg S, Nada-Raja S, Dickson N, Paul C, Williams S. Sexual orientation and self-harm in men and women. *Am J Psychiatry.* 2003;160:541-546.
11. Hangwood J, De Leo D. Anxiety disorder and suicidal behavior: an update. *Curr Opinion Psychiatry.* 2008;21(1):51-64.
12. Kolla NJ, Eisenberg H, Links PS. Epidemiology, risk factors, and psychopharmacological management of suicidal behavior in borderline personality disorder. *Arch Suicide Res.* 2008;12(1):1-19.
13. Mamo DC. Managing suicidality in schizophrenia. *Can J Psychiatry.* 2007;52(6 Suppl 1):59S-70S.
14. Rihmer Z. Suicide risk in mood disorders. *Curr Opinion Psychiatry.* 2007;20(1):17-22.
15. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm. A systematic review. *Br J Psychiatry.* 2002;181:193-199.
16. Apolone G, Mosconi P. The Italian SF-36 health survey: translation, validation and norming. *J Clin Epidemiol.* 1998;11:1025-1036.
17. De Girolamo G, Becchi MA, Coppa FS, De Leo D, Neri G, Rucci P, et al. *Salute e Qualità della vita.* Torino. Centro Scientifico Editore; 2001.
18. Bosc M, Dubini A, Polin V. Development and validation of a social functioning scale, the Social Adaptation Self-evaluation Scale. *Eur Neuropsychopharmacol.* 1997;7(1):S57-S50.
19. Derogatis LR. *SCL-90-R: Administration, scoring and procedures - Manual II (2^a ed.).* Baltimore. Clinical Psychometric Research; 1983.
20. Clementel-Jones C, Azzone P, Battacchi MW, Freni S, Giampieri E, Marano G. Italian translation of the Inventory of Interpersonal Problems, validity and stability of factor structure. *New Trend in Experimental and Clinical Psychiatry.* 1996;XII,4/96:253-259.
21. Fossati A, Cloninger CR, Villa D, Borroni S, Grazioli F, Giarolli, et al. Reliability and validity of the Italian version of the Temperament and Character Inventory- Revised in an outpatient sample. *Comprehensive Psychiatry.* 2007;48:380-387.

© 2013 Giacomo et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history.php?iid=205&id=12&aid=1144>