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

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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.

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...
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 serotoninergic 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 symptomatological dimensions: somatization (nv.<.92), obsessive-compulsive (nv.<.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 preeminent 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**|                       |                           |     |
| Cohabitng        | 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|
| Total                              | 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               | .906 | 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 | .348  |
| 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  |
| Menthal 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

| 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

| 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.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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