ORIGINAL CONTRIBUTION

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# What are the characteristics of adolescent hospitalized suicide attempters?

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■ **Abstract** *Aim* To study the specificity of hospitalized adolescent suicide attempters. *Method* Among a national sample of students (n = 11,718, mean age = 16.6 years) studied in 1999, 9.2 % (n = 1078) made at least one suicide attempt during their life (SA); 21.9 % (n = 234) of them were hospitalized (HSA). We identified the risk factors (family, school, behavioral and psychological) of SA and HSA by comparing (by gender) a) suicide attempters to non-suicide attempters and b) hospitalized suicide attempters to non-hospitalized suicide attempters. *Results* Both for girls and boys, the risk factors for SA varied. However, certain risk factors, particularly depressive mood, low self-esteem and poor parent-child relationships, were not associated with hospitalization. Hospitalized suicide attempters had more personal and social problems. But there is an important difference according to gender: in boys, hospitalization is related to physical fighting (OR = 2.2) and offences (OR = 3.4), in girls to running away (OR = 1.7), consumption of illegal drugs other than cannabis (OR = 2.0), having a living standard outside average (OR = 2.0) and going to a private school (OR = 1.7). *Conclusion* Suicide attempters with problem behavior are more at risk of being hospitalized than others. However, the difference between hospitalized and non-hospitalized subjects was smaller than expected.

■ **Key words** adolescents – school population – suicide attempt – hospitalization – risk factors

## Introduction

Adolescent suicide is a public health problem. In France, it is the second cause of mortality (800 to 900 deaths per year) among 15 to 24 year-olds [1]. Moreover, it is estimated that the number of hospitalizations for suicide attempts (SA) is about 30,000 to 40,000 per year for this age group [1]. The number of SA not detected by the health care system is unknown. According to different school surveys [2, 3], only one adolescent SA out of four (25 %) was hospitalized. Most publications on adolescent SA and associated risk factors are, in France as in most countries, based on hospitalized samples [4].

By comparing hospitalized and non-hospitalized SA, Groholt [5] demonstrated that poor self-esteem, low standard of living and low social support were important risk factors for hospitalization, thus, suggesting that non-hospitalized SA are in better mental and social health than hospitalized SA. However, these factors remain to be confirmed in other cultural contexts. This is especially in France where the health system is quite different than in other countries, since hospitalization is free. In addition, since most studies on adolescent suicide attempt compare clinical samples to controls [6], the question is whether the risk factors are the same or not in population-based samples. Finally, since SA is more common in females than in males in most coun-

tries [3, 7–9], gender-related risk factors have to be considered.

Based on the ESPAD 99 data (the European Study Project on Alcohol and other Drugs [2], we examined general school population (14–19 years olds) to compare suicide attempters to non-suicide attempters and hospitalized attempters to non-hospitalized attempters. The following hypotheses are suggested:

- By comparing SA to non-SA in a school-based population survey, the risk factors of SA are the same as those suggested by clinical-based studies, particularly the poor quality of family relationships, and psychological and behavioral disorders [10–16].
- Hospitalized SA have poorer self-esteem, lower living standards and more relational problems than non-hospitalized SA (Grohold [5])
- These factors are suggested to be different for boys and for girls.

## Method

### ■ Population

The sample was representative of French adolescents following secondary schooling in mainland France in both public and private schools (methodology of ESPAD 99 survey published elsewhere [3, 17]). The sample was performed with the secondary schools (n = 300) and classes grade 8 to 12 (2 per school) being drawn randomly. The sample unit was the class. A total of 563 out of 600 classes (93.8 %) participated in the study, representing 13,590 pupils. 89.1 % of them accepted to participate (n = 12,113). A letter informed parents of minors about the survey before the questionnaire was administered, in order that they could refuse the participation of their child.

Non-participation (10.9 %) was due to refusal from the parents, pupils' absence from school during the study period or the impossibility of performing the study in satisfactory conditions. The non-response rate per question was low: 90 % of questions had a non-response rate lower than 5 %. On the suicide attempt question, 395 subjects (3.3 %) did not specify whether they had or had not made a SA.

### ■ Questionnaire

The aim of the ESPAD 99 survey was to perform a self-administered anonymous questionnaire to measure the prevalence of consumption (tobacco, alcohol, cannabis and other drugs) in adolescents and to study the main risk factors associated (socio-demographic, school, relational and family factors). Thematic modules of deviance and a self-esteem scale (Rosenberg scale) were

included in the French part [18]. Questions on suicidal behavior, running away and absenteeism from school were included, as well as a depressive mood scale (Kandel scale). The following items are selected for in the present analysis.

- Items concerning suicide attempts ("During lifetime, how many times have you attempted suicide: no/once/twice and more") and hospitalization ("If you made a suicide attempt, were you hospitalized for this reason: no/once/twice and more").
- Items concerning school: type of school (general lycee, junior college, vocational school); school statute (private or public); student school results (average mark ≤ 7, average mark ≤ 8 and ≤ 11, average mark ≥ 12).
- Items concerning family life: father and mother study level (primary, secondary or higher); family setting (two parents, a single parent, recomposed family or other situation); relationships with parents (good, average, poor); living standard of the family (much lower, lower, equal or higher than average); family control assessed by the question "Do your parents know where you are on a Saturday evening?": high (always + mostly) poor (sometimes), no control.
- Items concerning friends, personal mood and behavior: relationship with friends (good, average or poor); self esteem assessed by the Rosenberg scale: score ≥ 35 (high self esteem), 25 < score < 35 (good self esteem) and ≤ 25 (low self esteem); depressive mood, assessed by Kandel Scale score > 17; current tobacco consumption (non-smokers, occasional smokers, < 10 cigarettes a day, 10 or more cigarettes a day); alcohol consumption during past 30 days (≤ to 10 times, more than 10 times); cannabis consumption during past 12 months (≤ to 10 times, more than 10 times); lifetime consumption of other than cannabis illicit drug (none, one, 2 or more); physical fighting in last 12 months (≤ 2 times, 3 times or more), stealing in last 12 months (no, at least once); offences in the last 12 months (none, at least once); school absenteeism in last 12 months (never, sometimes, often); running away in last 12 months (none, at least once).

### ■ Statistical analysis

Suicide attempters (at least one lifetime SA) were compared to non-suicide attempters (for girls, for boys) on all selected variables, as well as hospitalized suicide attempters (HSA) to non-hospitalized SA (for girls, for boys). Student t-test was performed for the quantitative variable (age). Chi 2-tests were performed for qualitative variables.

Logistics regressions were performed with SA or HSA as the "variable to be explained", and with variables significantly associated in the bivariate analysis as the

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"explanatory variables". Age was systematically included in the logistic regressions. Statistical analysis was performed with the SAS 8.0 software.

## Results

### ■ Sample

The analyzed sample (n = 11,718, the non-respondents on the SA question being excluded) was composed of 51.9% of girls and 48.1% of boys from grade 8 to 12, aged 11 to 21. 1078 subjects (9.2%) reported at least one SA, 12.6% among girls versus 5.5% among boys (p < 0.0001). No age difference was found between suicide attempters and non-suicide attempters either for boys (16.7 years vs. 16.6 years, ns) or for girls (16.7 years vs. 16.8 years, ns). The relapse rate was of 25.8% in boys and 27% in girls (ns difference). The hospitalization rate for SA was of 23.4% for boys and of 21.4% for girls (ns difference). In boys, hospitalized suicide attempters were significantly younger than non-hospitalized ones (16.3 years vs. 17 years, p = 0.01) whereas in girls, the hospitalized subjects were older (17.1 years vs. 16.6 years, p = 0.002).

### ■ Comparison of suicide attempters and non-suicide attempters

In boys, univariate analysis showed important differences between suicide attempters and non-suicide attempters. The SA had the following characteristics: a father with primary level education (15% vs. 10%, p = 0.01); a lower than average standard of living (19% vs. 9%, p < 0.0001); a single parent family (42% vs. 29%, p < 0.0001); a lack of family control (14% of the parents of suicide attempters not knowing where their children were on a Saturday evening vs. 4%, p < 0.0001); poor relationship with their mother (17% vs. 6%, p < 0.001); poor relationship with their father (26% vs. 11%, p < 0.001); poor relationship with their friends (5% versus 2%, p < 0.001); poor self-esteem (33% vs. 13% had a Rosenberg score ≤ 25, p < 0.0001); depressive mood (35% vs. 10% have a Kandel score ≥ 17, p < 0.0001); regular alcohol consumption (23.4% vs. 13.4% consuming alcohol > 10 times per month, p < 0.0001); high tobacco consumption (22% vs. 7% smoking at least 10 cigarettes per day, p < 0.0001); regular cannabis consumption (34% vs. 17% taking cannabis at least 10 times per year, p < 0.0001); frequent other illicit consumption (29% vs. 8% having experimented several times with another illicit drug, p < 0.0001); physical fighting (50% vs. 25% at least twice a year, p < 0.0001): stealing (45% vs. 21% committing at least one theft per year, p < 0.0001), offences (56% vs. 21% committing at least one offence in

the year, p < 0.0001) or running away (21% versus 3%, p < 0.001); absenteeism from school (32% vs. 14% often absent, p < 0.0001) and poor school results (9% vs. 3% with an average mark lower than 7/20, p < 0.0001). On the other hand, there was no difference between the two groups with regard to the type of school (general lycée, junior college, vocational school), private or public establishment or according to the mother's level of study (primary, secondary or higher).

Logistic regression analysis (including age and factors significantly associated with SA) made it possible to classify the associated factors, in the following order of importance; running away (OR = 3.7, CI 95% 2.5–5.5), Kandel score > 17 (OR = 2.8, CI 95% 2.0–3.7), tobacco 10+/day (OR = 2.7, CI 95% 1.7–4.3), Rosenberg score ≤ 25 (OR = 2.5, CI 95% 1.6–4.0), repeated consumption of illicit drugs other than cannabis (OR = 2.5, CI 95% 1.7–3.7), poor relations with mother (OR = 1.7, CI 95% 1.1–2.5), consumption of cannabis 10+/year (OR = 1.6, CI 95% 1.1–2.3), physical fighting 2+/year (OR = 1.6, CI 95% 1.2–2.2) and often absence from school (OR = 1.6, CI 95% 1.03–3.2).

In girls, the SA had the following characteristics: lower-than-average standard of living (5% vs. 1%, p < 0.0001); a single parent family (35% vs. 28%, p < 0.0001); a lack of family control (19% vs. 9%, p < 0.0001); poor relationships with mother (18% vs. 2%, p < 0.001), with the father (34% vs. 16%, p < 0.001) and with their friends (14% vs. 9%, p < 0.001); poor self-esteem (50% vs. 27%, p < 0.0001); depressive mood (60% vs. 30%, p < 0.0001); regular alcohol consumption (6% vs. 2%, p < 0.0001); high tobacco consumption (57% vs. 28%, p < 0.0001), regular cannabis consumption (19% vs. 7%, p < 0.0001); experience with other illicit drugs (19% vs. 4%, p < 0.0001); physical fighting (26% vs. 8%, p < 0.0001); theft (18% vs. 7%, p < 0.0001); offences (19% vs. 6%, p < 0.0001); running away (20% versus 3%, p < 0.001); absenteeism from school (25% vs. 12%, p < 0.0001) and poor school results (5% vs. 2%, p < 0.0001). They also followed their studies less often in a general lycée (30% vs. 35%, p < 0.001).

Logistic regression analysis (including age and factors significantly associated with SA) made it possible to classify the associated factors, in the following order of importance: running away (OR = 3.8, CI 95% 2.8–5.2), tobacco 10+/day (OR = 3.8, CI 95% 2.8–5.2), experience with illicit drugs other than cannabis (OR = 3.0, CI 95% 2.2–4.1), Kandel score > 17 (OR = 2.0, CI 95% 1.7–2.6), physical fighting 2+/year (OR = 1.9, CI 95% 1.5–2.4), Rosenberg scale ≤ 25 (OR = 1.8, CI 95% 1.3–2.7), poor relations with father (OR = 1.6, CI 95% 1.2–2.0), poor relation with mother (OR = 1.4, CI 95% 1.08–1.9), poor relation with friends (OR = 1.5, CI 95% 1.1–2.0), having a single-parent family (OR = 1.5, CI 95% 1.1–2.1), and pursuing studies in an institution other than a general lycée (OR = 1.4, CI 95% 1.1–1.7).

### ■ Comparison between hospitalized and non-hospitalized suicide attempters

Comparison between HSA and NHSA (Tables 1 and 2) indicates:

- Compared to NHSA boys, HSA boys were more often from junior college and vocational school, living outside their family, absent from school, having a regular consumption of alcohol, tobacco or illicit drugs other than cannabis, committing several thefts, fights or criminal offences and having a previous history of running away from home and of SA. There was no difference between HSA and NHSA boys concerning sector of education, educational level of the parents, living standards of the family, relation with parents or with friends, family control, self-esteem, depressive mood and cannabis consumption.

- Compared to NHSA girls, HSA girls were more often from a junior college and vocational school, private school, with a highly educated mother, a higher or lower stand level than the average youth population, having several experiences of illicit drugs other than cannabis, committing criminal offences and having a previous history of running away and of SA. But there is no difference between HSA and NHSA girls concerning educational level of the father, family setting, relation with parents or with friends, family control, self-esteem, depressive mood, tobacco, alcohol and cannabis consumption, theft, or fights.

For boys (Table 3), after multivariate analysis, only violent behavior remained significantly associated with hospitalization (i. e., offences, OR = 3.4 and having been involved in many physical fights, OR = 2.2), whereas for girls (Table 4), two social class variables (standard of living, OR = 2.0, and private school education, OR = 1.6) and two personal variables (running away, OR = 1.7, illicit drug use other than cannabis, OR = 2.0) remained related.

## Discussion

### ■ Prevalence rates of SA and HSA

The lifetime prevalence rate of SA was 9.9 % in our school sample, which is probably a minimum rate for French school children aged 14 to 19, especially for boys. In fact, since school absenteeism (boys) is associated with SA, one could expect a higher SA rate among non-participant males.

This 9.9 % prevalence rate represents a significant increase compared to the study in 1993 in which the figure was 6.5 % [1]. This increased rate of SA has been confirmed elsewhere, but that has not been accompanied by an increased rate of mortality due to suicide [2]. There may be several reasons for this discrepancy; either SA

receive better management, thereby decreasing the risk of mortality; or the means used by suicide attempters are less serious. The slight decrease in the rate of hospitalization for suicide attempters (25 % in 1993 vs. 22 % at present) supports the latter hypothesis. However, it may be that it is now easier to declare SA than five years ago, because there has been wide media coverage of suicide and attempted suicide among young people.

In our population, the rate of HSA was 22 %, a figure slightly lower than in 1993 [1]. Data from general practitioners and hospital data [2, 28] suggest that only one SA out of eight (all ages) is not detected by the hospital system. This proportion is far from that observed in our adolescent sample. This difference might be explained either by a lack of hospitalization among SA adolescents, but this is very unlikely and would be in contradiction with the recommendations made by the consensus conference of the ANAES in 1998 [28]. It is more likely explained by the weakness of the statistical tool used. In effect, it is almost impossible to include in the official statistics any SA that does not lead to contact with the health care system [2].

### ■ Risk factors of suicide attempt (SA)

Our analysis of the risk factors of SA confirms the results previously reported in the literature, based on hospitalized SA showing that family problems [13, 15, 16, 19–22], mood disturbances [5, 11, 23], poor self-esteem [5, 12, 24], violent behavior [13, 14, 24], alcohol consumption [14, 19, 25] and illicit drug use [14, 25] are risk factors often reported. Most of these factors are also revealed in our school-based sample which was examined with a self-administered questionnaire.

In our sample, running away and school absenteeism are important risk factors associated with suicide attempt [8, 26], yet they received little attention in the psychiatric hospital-based context. Nevertheless, these behaviors as well as SA can reflect avoidance from very difficult social and family situations.

In most studies, little attention has been paid to the level of tobacco use in young suicide attempters. In our analysis, this consumption is highly associated to SA in boys and in girls, whereas the association between alcohol and SA was no longer present after adjustment on the other variables. Only Tomori et al. [27] noted that smokers may be characterized according to their drug use, family disturbances and previous SA. In a survey of Swiss adolescents [8], the authors attributed this absence of link between alcohol and SA to the positive image of alcohol consumption in their culture, which is similar to French culture.

Our study shows a quite different SA model according to gender. While depression, loss of self-esteem, substance consumption and running away were found both

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**Table 1** Comparison between hospitalized and non-hospitalized attempters by gender, on demographic, school, family and psychological variables

| | BOYS | | | GIRLS | | |
|---|---|---|---|---|---|---|
| | Hospitalized n = 71 (%) | Non-hospitalized n = 232 (%) | p | Hospitalized n = 163 (%) | Non-hospitalized n = 600 (%) | p |
| Type of school | | | | | | |
| General lycée | 16.4 | 29.5 | p = 0.01 | 33.1 | 31.1 | p = 0.0032 |
| Junior college | 49.3 | 35.1 | | 30.7 | 42.1 | |
| Vocational lycée | 26.1 | 19.2 | | 22.7 | 15.6 | |
| Multi-purpose lycée | 8.2 | 16.2 | | 13.5 | 11.2 | |
| Sector of education | | | | | | |
| Public | 83.6 | 83.8 | NS | 69.9 | 79.1 | p = 0.013 |
| Private | 16.4 | 16.2 | | 30.1 | 20.9 | |
| Absenteeism (last year) | | | | | | |
| Often | 49.2 | 26.7 | p = 0.0007 | 28.7 | 23.5 | NS |
| Sometimes | 28.4 | 51.7 | | 53.2 | 51.8 | |
| Never | 22.4 | 21.6 | | 18.1 | 24.7 | |
| Living with | | | | | | |
| Two parents | 42.2 | 62.2 | p = 0.004 | 51.2 | 56.7 | NS |
| Recomposed | 14.1 | 10.9 | | 16.2 | 15.3 | |
| Single parent | 16.9 | 15.6 | | 12.6 | 14.6 | |
| Other | 26.8 | 11.3 | | 20.0 | 13.4 | |
| Educational level of mother | | | | | | |
| Primary-secondary | 76.6 | 72.6 | NS | 71.1 | 81.1 | p = 0.007 |
| Higher | 23.4 | 27.4 | | 28.9 | 18.9 | |
| Educational level of father | | | | | | |
| Primary | 16.6 | 14.5 | NS | 13.2 | 12.5 | NS |
| Secondary | 66.7 | 59.0 | | 67.4 | 67.2 | |
| Higher | 16.7 | 26.5 | | 19.4 | 20.3 | |
| Standard of living | | | | | | |
| Equivalent | 42.0 | 48.0 | NS | 40.0 | 56.9 | p = 0.0001 |
| Lower or higher | 58.0 | 52.0 | | 60.0 | 43.1 | |
| Family control | | | | | | |
| High | 74.1 | 75.2 | NS | 79.0 | 82.0 | NS |
| Poor | 10.3 | 12.0 | | 12.9 | 10.2 | |
| No control | 15.6 | 12.8 | | 8.1 | 7.8 | |
| Relationships with mother | | | | | | |
| Good | 53.1 | 59.6 | NS | 45.0 | 47.5 | NS |
| Average | 12.5 | 16.4 | | 17.2 | 19.4 | |
| Poor | 34.4 | 24.0 | | 37.8 | 33.1 | |
| Relationships with father | | | | | | |
| Good | 72.1 | 65.6 | NS | 61.9 | 62.1 | NS |
| Average | 10.3 | 17.8 | | 15.0 | 17.2 | |
| Poor | 17.6 | 16.6 | | 23.1 | 20.7 | |
| Relationships with friends | | | | | | |
| Good | 87.1 | 89.6 | NS | 84.5 | 86.1 | NS |
| Average | 4.3 | 6.9 | | 9.9 | 10.9 | |
| Poor | 8.6 | 3.5 | | 5.6 | 3.0 | |
| Depressive mood (Kandel scale) | | | | | | |
| Score < 17 | 60.9 | 65.9 | NS | 33.7 | 41.4 | NS |
| Score ≥ 17 | 39.1 | 34.1 | | 66.3 | 58.6 | |
| Self-esteem (Rosenberg scale) | | | | | | |
| ≥35 (high) | 13.1 | 17.1 | NS | 5.8 | 8.9 | NS |
| > 25 or < 35 (good) | 57.4 | 49.1 | | 40.4 | 42.3 | |
| 25 (low) | 29.5 | 33.8 | | 53.8 | 48.8 | |

**Table 2** Comparison between hospitalized and non-hospitalized attempters by gender and behaviors

| | BOYS | | | GIRLS | | |
|---|---|---|---|---|---|---|
| | Hospitalized n = 71 (%) | Non-hospitalized n = 232 (%) | p | Hospitalized n = 163 (%) | Non-hospitalized n = 600 (%) | p |
| Running away (last year) | | | | | | |
| No | 69.7 | 82.0 | p = 0.03 | 73.0 | 82.0 | p = 0.01 |
| Yes | 30.3 | 18.0 | | 27.0 | 18.0 | |
| Offences (last year) | | | | | | |
| No | 28.1 | 63.6 | p < 0.0001 | 73.3 | 82.6 | p = 0.007 |
| Yes | 71.9 | 36.4 | | 26.7 | 17.4 | |
| Theft (last year) | | | | | | |
| 0 to 2 | 32.8 | 61.3 | p < 0.0001 | 79.7 | 82.6 | NS |
| ≥ 3 | 67.2 | 38.7 | | 20.3 | 17.4 | |
| Fights (last year) | | | | | | |
| 0 to 2 | 29.7 | 56.0 | p = 0.0002 | 72.3 | 74.7 | NS |
| ≥ 3 | 70.3 | 44.0 | | 27.7 | 25.3 | |
| Tobacco | | | | | | |
| 0 to 10 cigarettes a day | 68.1 | 80.2 | p = 0.032 | 75.9 | 82.7 | NS |
| ≥10 cigarettes a day | 31.9 | 19.8 | | 24.1 | 17.3 | |
| Consumption of alcohol (last month) | | | | | | |
| 0 to 10 times a month | 67.1 | 79.4 | p = 0.03 | 87.2 | 89.5 | NS |
| > 10 times a month | 32.9 | 20.6 | | 12.8 | 10.5 | |
| Cannabis (last 12 months) | | | | | | |
| No | 68.6 | 71.8 | NS | 82.0 | 81.1 | NS |
| Yes | 31.4 | 28.2 | | 18.0 | 18.9 | |
| Other illicit drugs (lifetime) | | | | | | |
| 0 to 1 | 52.0 | 76.5 | p < 0.0001 | 73.6 | 84.1 | p = 0.02 |
| ≥ 2 | 48.0 | 23.5 | | 26.4 | 15.9 | |
| Previous history of SA (lifetime) | | | | | | |
| No | 45.2 | 81.6 | p < 0.0001 | 62.0 | 77.5 | p < 0.0001 |
| Yes | 54.8 | 18.4 | | 38.0 | 22.5 | |

in boys and girls, absenteeism from school occurred only in boys, while poor affective relations with family and friends play a more important role in girls. Kelly et al. [19] also found that poor family relationships were predictive of SA only in adolescent girls. These findings strengthen the hypothesis of a significant gender difference in SA that should be further investigated by other more sociological research.

### ■ Risk factors for hospitalization for suicide attempt (HSA)

The variables associated with hospitalization reflect the personal difficulties encountered by the suicide attempter, such as criminal offences, violence, drug use and running away. Groholt [4] pointed out the importance of poor self-esteem, low socio-economic status and low support from the entourage as being risk factors for hospitalization. In our population, we did not find any association with poor self-esteem, and socio-eco-

nomic status was not known. Nevertheless, the higher rate of hospitalization in suicide attempters attending private schools suggests an opposite tendency. On the other hand, the link between running away and hospitalization might indicate a breakdown with the entourage.

The variables associated with hospitalization differ according to gender. In boys, violent behavior was more frequent, as were offences. Since violent adolescents are more at risk of SA [13, 14, 24], their more frequent hospitalization might be due to the greater violence of their suicidal act. In girls, running away and illicit drug use other than cannabis were associated. In any respect, the variables associated with hospitalization reflect a high degree of personal difficulties, whose mode of expression differs according to the gender: self-aggressive behavior for girls (running away, illicit drugs) and hetero-aggressive behavior for boys (violence and criminal offences).

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**Table 3** Risk of hospitalization among SA boys.[1] Multivariate analysis (%, OR, CI 95%)

| Logistic regression | HSA boys (%) | p | OR (CI 95%) |
|---|---|---|---|
| Type of school | | | |
| General lycée | 14.8* | NS | |
| Junior college | 30.5 | | |
| Vocational lycée | 29.7 | | |
| Multi-purpose lycée | 13.6 | | |
| Living with | | | |
| Two parents | 17.3 | NS | |
| Recomposed | 25.0 | | |
| Single parent | 28.7 | | |
| Other | 42.2 | | |
| Absenteeism (last 12 months) | | | |
| Often | 23.1 | NS | |
| Sometimes | 13.7 | | |
| Never | 34.7 | | |
| Consumption of tobacco (current) | | | |
| 0 to 10 cigarettes a day | 19.6 | NS | |
| ≥10 cigarettes a day | 32.3 | | |
| Consumption of alcohol (last 30 days) | | | |
| 0 to 10 times a month | 20.8 | NS | |
| > 10 times a month | 33.3 | | |
| Offences (last 12 months) | | | |
| No | 11.2 | p < 0.0005 | 3.38 (1.70, 6.71) |
| Yes | 35.9 | | |
| Theft (last 12 months) | | | |
| 0 to 2 | 13.2 | NS | |
| ≥ 3 | 33.1 | | |
| Fights (last 12 months) | | | |
| 0 to 2 | 13.1 | p = 0.024 | 2.23 (1.11, 4.48) |
| ≥ 3 | 31.2 | | |
| Consumption of other illicit drugs (lifetime) | | | |
| 0 to 1 | 17.5 | NS | |
| ≥ 2 | 38.9 | | |
| Previous history of SA (lifetime) | | | |
| No | 14.7 | NS | |
| Yes | 48.2 | | |

[1] Only associated factors (bi-variate analysis) were included in the logistic regression

* 14.8% of suicide attempters attending a general lycée were hospitalized

**Table 4** Risk of hospitalization among SA girls.[1] Multivariate analysis (%, OR, CI 95%)

| Logistic regression | HSA girls (%) | p | OR (CI 95%) |
|---|---|---|---|
| Type of school | | | |
| General lycée | 16.3* | NS | |
| Junior college | 22.2 | | |
| Vocational lycée | 28.0 | | |
| Multi-purpose lycée | 24.4 | | |
| Sector of education | | | |
| Public | 19.2 | p = 0.017 | 1.65 (1.09, 2.48) |
| Private | 27.2 | | |
| Educational level of mother | | | |
| Primary-secondary | 19.0 | NS | |
| Higher | 29.0 | | |
| Standard of living | | | |
| Equivalent | 15.8 | p = 0.0002 | 2.00 (1.39, 2.89) |
| Lower or higher | 27.0 | | |
| Running away (last 12 months) | | | |
| No | 19.3 | p = 0.017 | 1.70 (1.09, 2.60) |
| Yes | 28.8 | | |
| Offences (last 12 months) | | | |
| No | 19.4 | NS | |
| Yes | 29.4 | | |
| Consumption of other illicit drugs (lifetime) | | | |
| No | 15.4 | p = 0.0002 | 2.00 (1.39, 2.90) |
| Yes | 27.0 | | |
| Previous history of SA (lifetime) | | | |
| No | 17.7 | NS | |
| Yes | 31.2 | | |

[1] Only associated factors (bi-variate analysis) were included in the logistic regression

* 16.3% of suicide attempters attending junior college were hospitalized

### Limitations

Since the present population concerns only adolescents attending school, those hospitalized in health care system (< 0.5% of the youth population) or having left school between 16 and 18 years (< 10% of the youth population) are not represented in this study. Moreover, there is a survival bias because only suicide attempters having survived their SA were able to reply, while between 200 and 300 deaths by suicide per year occur among 15 to 19 years old.

The data were obtained via adolescent self-reported questionnaires. This may have limited the validity of the measures, but it is interesting to note that most risk factors found in clinical samples are also present in this school sample. The relations examined were cross-sectional and no assertions can be made about the temporal relations of the variables. Despite these limitations, the data are satisfactory since the rate of participation was high and the results in coherence with other surveys. In addition, the main advantage of this survey was to bring into light the high non-hospitalized SA rate.

In conclusion, this study of a representative sample of school adolescents confirms the SA risk factors. Our findings also suggest that running away, high tobacco consumption and experimentation with illicit drugs other than cannabis are three risk factors that may be easily detected. Moreover, adolescents hospitalized for

SA would seem to have more social and personal problems than non-hospitalized SA, but the difference was not as important as expected. For this reason, each SA (hospitalized or not) has to be considered seriously within the framework of school and general practice.

# References

1. Badeyan G, Parayre C, Mouquet MC, Tellier S (2001) Suicides et tentatives de suicide en France une tentative de cadrage statistique. DREES N°109 avril
2. Choquet M, Ledoux S, Hassler C (1999) Alcool, tabac, cannabis et autres drogues illicites parmi les élèves de collège et de lycée. ESPAD 99 France
3. Rey Gex C, Narring F, Ferron C, Michaud P-A (1998) Suicide attempts among adolescents in Switzerland: prevalence, associated factors and comorbidity. Acta Psychiatr Scand 98: 28–33
4. Choquet M (1999) Suicide à l'adolescence en France: ampleur, facteurs de risque et prise en charge. Frontières 12: 54–61
5. Groholt B, Ekeberg E, Wichstrom L, Haldorsen T (2000) Young suicide attempters: a comparison between a clinical sample and an epidemiological sample. J Am Acad Child Adolesc Psychiatry 39:868–875
6. Overholser JC, Adams DM, Lehnert KL, Brinkman CD (1995) Self-esteem deficits and suicidal tendencies among adolescents. J Am Acad Child Adolesc Psychiatry 34(7):919–928
7. Moscicki EK (1994) Gender differences in completed and attempted suicides. Ann Epidemiol 4:152–158
8. Gasquet I, Choquet M (1993) Gender role in adolescent suicidal behavior: observations and therapeutic implications. Acta Psychiatr Scand 87:59–65
9. Diekstra RFW, De Graaf AC, Van Egmond M (1984) On the epidemiology of attempted suicide: a sample-survey study among general practitioners. Crisis 5(2):108–118
10. Matthew KN, Kazdin AE (2002) Examination of affective, cognitive, and behavioral factors and suicide-related outcomes in children and young adolescents. J Clin Child Adolesc Psychol 31:48–58
11. Pfeffer CR (2001) Diagnosis of childhood and adolescent suicidal behavior: unmet needs for suicide prevention. Biol Psychiatry 49:1055–1061
12. Pfeffer CR, Hurt SW, Peskin JR, Siefker CA (1995) Suicidal children grow up: ego functions associated with suicide attempts. J Am Acad Child Adolesc Psychiatry 34:1318–1325
13. King RA, Schwab-Stone M, Flisher AJ, Greenwald S, Kramer RA, Goodman SH et al. (2001) Psychosocial and risk behaviors correlates of youth suicide attempts and suicidal ideation. J Am Acad Child Adolesc Psychiatry 40(7):837–846
14. Wagman Borowsky I, Ireland M, Resnick MD (2001) Adolescent suicide attempts: risks and protectors. Pediatrics 107:485–493
15. Gould MS, Fisher P, Parides M, Flory M, Shaffer D (1996) Psychosocial risk factors of child and adolescent completed suicide. Arch Gen Psychiatry 53: 1155–1162
16. Chastang F, Rioux P, Dupont I, Baranger E, Kovess V, Zarifian E (1998) Risk factor associated with suicide attempt in young French people. Acta Psychiatr Scand 98:474–479
17. Ledoux S, Miller P, Choquet M, Plant M (2002) Family structure, parent-child relationships, and alcohol and other drug use among teenagers in France and the United Kingdom. Alcohol and Alcoholism 37:52–60
18. Vallieres EF, Vallerand RJ (1990) Traduction et validation canadienne-française de l'échelle de l'estime de soi de Rosenberg. Intern J Psychol 25: 305–316
19. Kelly TM, Lynch KG, Donovan JE, Clark DB (2001) Alcohol use disorders and risk factor interactions for adolescent suicidal ideations and attempts. Suicide Life Threat Behav 31:181–193
20. Pfeffer CR, Normandin L, Kakuma T (1998) Suicidal children grown up: relations between family psychopathology and adolescents' lifetime suicidal behavior. J Nerv Ment Dis 186:269–275
21. de Wilde EJ, Kienhorst IC, Diekstra RF, Wolters WH (1992) The relationship between adolescent suicidal behavior and life events in childhood and adolescence. Am J Psychiatry 149:45–51
22. Dube SR, Anda RF, Felitti VJ, Chapman DP, Willamson DF, Giles WH (2001) Chidhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: findings from the adverse childhood experiences study. JAMA 286(24):3089–3096
23. Halfon O, Laget J, Barrie M (1995) An epidemiological and clinical approach to adolescent suicide. A comparison between suicidal and non suicidal clinical groups in a health foundation center for French students. Eur Child Adolesc Psychiatry 4:32–38
24. Flannery DJ, Singer MI, Wester K (2001) Violence exposure, psychological trauma, and suicide risk in a community sample of dangerously violent adolescents. J Am Acad Child Adolesc Psychiatry 40(4):435–442
25. Borges G, Walters EE, Kessler RC (2000) Association of substance use, abuse, and dependence with subsequent suicidal behavior. Am J Epidemiol 151: 781–789
26. Askevis M, Choquet M (2000) Dépression, fugue et troubles associés. Neuropsychiatrie Enfance Adolescence 48: 188–193
27. Tomori M, Zalar B, Kores Plesnicar B, Ziherl S, Stergar E (2001) Smoking in relation to psychosocial risk factors in adolescents. Eur Child Adolesc Psychiatry 10:143–150
28. Prise en charge hospitalière des adolescents après une tentative de suicide. Recommandations 1998 Agence Nationale d' Accréditation des Etablissements de Santé