

Adolescents in the Hospital: accidents and pre-traumatic psychological dynamics

Paola Carbone, Anna Bovet, Ludovico Bracci, Elisa Casini, Silvia Cimino, Anna Ferrari

Abstract

Objective: To explore the psychological characteristics and relationship factors pertaining to adolescents admitted to surgical and orthopaedic hospital wards for accidents of various kinds, in order to increase knowledge of the dynamics which contribute to accident risk among adolescents.

Method: A sample of 205 subjects (between 14 and 24 years of age) compared with a control group of 205 subjects was studied. Clinical semi-structured interviews were conducted by six psychotherapists specializing in adolescent psychotherapy. A modified Defence Mechanism Inventory was employed. Categorical data from the interviews were analysed by χ^2 tests and DMI scales scores were analysed by two-factor analyses of variance. A cluster analysis of the entire sample based on DMI scores and all categorical variables, except the case/control variable, was done using SPAD.

Results: Young people who have had accidents, and in particular those who have had more than one, appear to have more problems than controls. These problems cover various areas of their present and past. In addition to these difficulties, there are two important psychodynamic elements: quality of self-esteem and how they are attempting to deal with the process of separation and individuation.

Conclusions: Many elements have emerged which confirm the necessity of not undervaluing the psychological context in which an accident occurs, especially for multiple accidents cases. The accident can be interpreted as the expression of a tendency to "act out" problems and suffering which cannot be dealt with on a psychological level.

Key words: adolescence, accident, dynamic risk factors

Introduction

The Hospital is usually considered a "place of treatment," but it is also the context which could put one in touch with the psychological dilemmas of young patients.

It could in particular represent the ideal environment for implementing strategies for the secondary prevention of accidents.

Adolescence is a period of important somatic, cognitive and emotional change, which brings about identity crises of varying length and intensity. It is only rarely that psychological symptoms of the adolescent crisis are consciously experienced (e.g. neurosis), and more often psychological suffering is revealed by acting out or risk-taking and transgressive behaviour aimed at avoiding awareness of internal conflicts. Owing to the severity of their consequences, accidents are a very dangerous form of acting out behaviour.

Accidents and adolescence

According to international estimates, accidents are the primary cause of death of adolescents and young adults between 15 and 24 years of age. Italian national statistics on road accidents (Istat 2000) show that, in the years preceding the beginning of the present study, 1,267 young people died and 75,608 were seriously injured in accidents; moreover, in contrast with a decrease in mortality recorded for later periods of life, there has been no decrease in the 15-24 age range. This seems to indicate that young people have not positively responded to the introduction of various protective measures and have progressively taken greater risks (Taggi, 1999).

Faced with the dimension of this phenomenon, most of the research in this field has concentrated upon epidemiological characteristics and prevention is mostly orientated towards strengthening the safety of so-called external factors (such as the means of transport, roads, etc.), and towards information campaigns which, in fact, have turned out to be not particularly effective (M.Guire, 1964; Plant, 1992; Bell, 1993; Mannetti, 1997).

In the last decade, some studies have explored the so-called "individual factors" (Assailly, 1997) and socio-psychological characteristics, which, in combination, expose young people to the risk of accidents.

Studies on the cognitive aspects of accident risk (e.g. Tursz et al., 1986; Quadrel et al., 1993; Gonzales et al., 1994) have cast light on a very important element of prevention. It has been found that young people generally have a realistic appreciation of the dangers (and, therefore, do not need to be informed about it), but tend to overestimate their own capacities of control (omnipotence) and to see themselves as invulnerable.

Studies on risk-taking behaviours show the importance of placing the risk of accidents within a complex picture of problematic behaviours, which together may be said to constitute a "syndrome" (e.g. Jessor et al., 1989; Trimpop, 1994). Another key suggestion is to analyse risk in relation to both the subjects' childhood history (Pullkinen, 1995; Cobb et al., 1995) and the need to face various types of dangers, in order to achieve and maintain a high level of emotional activation (homeostatic risk theory) (Wilde, 1972; Zuckerman, 1971).

These findings show that young people are prone to having accidents and are also consistent with what has been learned from the clinical point of view for the

psychodynamic of adolescent psychopathology: in a period of life characterised by important changes and by physiological narcissistic fragility (Choquet et al., 1991; Braconnier, 1991), mental pain tends to be expressed through acting out behaviours (Blos, 1971); frequently or intensively resorting to such a mechanism may result in enhanced psychosomatic vulnerability.

Hypothesis

From a psychodynamic perspective, our hypothesis is that in most accidents, not only external factors are involved, but also emotional factors, both conscious (dares, sensation-seeking, the need to show off, etc.) and unconscious (depression, self-destructiveness, etc.). Briefly, the accident seems to represent a reaction through which a variety of adolescent problems can be manifested (Carbone, 1997; 1999; 2000; 2001; 2003). The effectiveness of this in concealing his own suffering from the subject has been described by Pullkinen (1995) and by Gonzales et al. (1994), who found that subjects with transgressive behaviour, or a history of involvement in multiple accidents, showed low levels of awareness of depression or anxiety. Choquet (1991) believes that running risks in adolescence allows the subject to locate the source of his anxiety in the external world: the accident, therefore, seems to emerge from a background of stressful events which have not been sufficiently reflected upon or dealt with at a psychological level.

Objectives of the study

Our research was aimed at increasing knowledge of the emotional factors which contribute to accident risk among adolescents. To this purpose, we decided to explore the psychological characteristics and relationship factors (family and school background, peer relationships, etc.) of adolescents admitted to surgical and orthopaedic hospital wards for accidents of various kinds (sporting, traffic, etc.), and to compare them with those of adolescents of a control group.

- 1) We defined the type of accident which was the target of our research very precisely (in many studies it was not clear whether the accident under consideration implied injury). In our study, we refer to the term "accident" as a traumatic, not intentional, event which has resulted in a subject's important somatic injuries.
- 2) We did not exclusively concentrate on road accidents, as many studies do, and gave greater relevance to the dynamics (exposure to risk) that lead to the accident rather than to the context in which the accident happens (road, home, sports field).
- 3) We interviewed the subjects in hospital a few days after the accident, when they still had a fresh and vivid memory of the episode in their minds, which had not yet been reconstructed. We believe that such a method of sampling and data collection is specific and relevant to this type of empirical analysis and our theoretical considerations.

Method

A case-control study design was employed.

A. Subjects

The clinical sample was included 205 subjects, 147 males and 58 females, between 14 and 24 years of age, admitted to wards of four Roman hospitals for accident injuries. Data from two cases were lost, so the number of cases analysed is 203. The case sample was divided in two subgroups: single accident involvement cases (who had had their first accident: 95 subjects, 63 males, 32 females) and multiple accident involvement cases (who had previously been involved in other accidents: 108 subjects, 86 males, 58 females).

The control group included 205 subjects (147 males, 58 females), randomly recruited from local schools and the working population, matching the clinical sample as to the type of urban background, sex and age, with the exception that they had not been involved in accidents during adolescence. The subjects' ages ranged from 14 to 24 years, a range which was chosen because in the last few years this group has proved to be at greatest risk of accidents.

The lower proportion of females in our sample corresponds to the lower risk for accidents generally shown by epidemiological studies for this population.

The accident was attributed to external causes by 61% of the single accident cases and by 57.4% of the multiple accident cases ($\chi^2(1) = .28$; $p = .605$).

The prognosis was favourable (total recovery) in 97.9% of single accident cases and in 89.8% of multiple accident cases ($\chi^2(1) = 4.24$; $p = .039$).

B. Measures

1. *The Clinical Interview*. Clinical semi-structured interviews were conducted by five psychotherapists specializing in adolescent psychotherapy (D. Biondo, A. Bovet, Q. Cocciante, S. Cordiali, M.F. Natali). They met every two weeks for clinical discussions and supervision (P. Carbone). The interviews, which lasted about one hour, were made a few days after hospital admission, when the shock and pain of the trauma were beginning to lessen, but the memory and feelings related to the event were still fresh. The interview covered the following areas: previous accidents and somatic traumas; the subjects' and their relatives' psychological and somatic pathologies; subjects' psychological and relationship problems with relatives and peers, both in infancy and in adolescence; school problems either in infancy or in adolescence; emotional problems; significant events in the past year; self-esteem and autonomy levels; and the dynamics and experience of the accident. At the end of the interview, the interviewer filled in a specially created form. Data from these forms was successively aggregated in 34 items, as shown in tables 2 to 6.

2. *The Defence Mechanism Inventory (DMI)*. The DMI (Gleser and Ihilevich, 1969; Italian, modified version by D'Angelo, San Martini and Tomasello, 2000) is

a self-report measure of five clusters of defences: Turning against Object (TAO, excessive and inappropriate attack on the real or presumed source of the perceived danger, including identification with the aggressor and displacement), Projection (PRO), Intellectualization (INT, the use of platitudes, clichés, truisms and sophistry to obfuscate inner conflicts or perceived external threats), Turning against the Self (TAS, intrapunitive manoeuvres deployed to falsify reality in order to reduce perceived threats to one's self-esteem) and Reversal (REV, including defences such as negation, denial, reaction formation and repression). The original version of the inventory (Gleser and Ihilevich, 1969) consists of ten stories describing five different types of interpersonal conflicts. Each story is followed by four questions requesting information about the subject's actual behaviour in such a situation, impulsive fantasy response, thoughts and affect. For each of these four questions five different responses representing the five defences clusters are provided. For each question subjects are asked to select the response that is most representative of their own reaction.

In order to avoid ipsative scores, in the Italian version (D'Angelo, San Martini and Tomasello, 2000) the response format was modified using 5-point Likert scales for separate responses. Furthermore, five stories have been added, one for each type of conflict, bringing the total number of items from 200 to 240 (see D'Angelo et al., 2000 for details). In this form the questionnaire takes approximately 45 minutes to be completed.

The decision to use this questionnaire was taken in the second stage of the study (after the pilot study), so the questionnaire was administered to 297 subjects. As ten cases did not fill in the questionnaire for several reasons, DMI scores are available only for 157 controls (109 males, 48 females), 76 single accident cases (47 males, 29 females) and 64 multiple accident cases (52 males, 12 females).

Table 1

Composition of the sample

	CONTROL S	CASES		TOTAL
		Single accident involvement	Multiple accident involvement	
MALES	147	63	86	296
FEMALE S	58	32	22	112
TOTAL	205	95	108	408

C. Analysis of the data

1. Categorical data from the interview was analysed by x square tests. Individual comparisons controls vs. single and vs. multiple accident cases were performed, in case overall x square test were significant.
2. DMI scales scores were analysed by two-factor analyses of variance, with gender and group (controls, single cases and multiple accident cases) as independent variables.
3. A cluster analysis of the entire sample, based on DMI scores and all categorical variables except the case/control variable, was done using SPAD (1996, version 4; Cedex, Montreuil). Association between belonging to group and cluster was analysed by x square tests. All statistical analyses, except the cluster analysis, were performed through SPSS.

Results

The semi-structured interview

Premise. Given the exploratory character of the study, critical values of α for the x square tests are held at .01 level (for the single tests) without controlling for the experiment-wise error rate. When the general x square tests were significant, we also performed x square tests on the difference between controls and the subgroup of cases showing values closer to the controls. A. *Family features.*

Table 2

Family features. Percentages of controls and cases with single and multiple accidents, x square tests and, in parentheses, post-hoc cell contributions (standardised residuals)

	CONTROLS	CASES		
		Single accident	Multiple accident	
	%	%	%	
Presence of both parents	89.3 (2.03)	84.2 (-.5)	80.5 (-1.81)	$\chi^2(2) = 4.65$ p = .097
Deceased fathers	2.9 (-1.47)	2.1 (-1.25)	9.3 (2.86*)	$\chi^2(2) = 8.29$ p = .015
Fathers' illnesses	26.3 (1.1)	13.7 (-2.69*)	28.7 (1.33)	$\chi^2(2) = 7.46$ p = .023
Fathers' somatic traumas	17.6 (-1.17)	14.7 (-1.43)	28.7 (2.6*)	$\chi^2(2) = 7.56$ p = .022
Deceased mothers	0.9	2.1	0.9	$\chi^2(2)$ not evaluated

Mothers' illnesses	17.6 (.49)	15.8 (-.26)	15.7 (-.3)	$X^2(2)=.24$ p= .888
Mothers' somatic traumas	10.7 (-.5)	9.5 (-.71)	14.8 (1.25)	$X^2(2)=1.67$ p= .43
Siblings' illnesses	15.1 (-1.1)	18.9 (.53)	19.5 (.74)	$X^2(2)=1.21$ p= .546
Siblings' somatic traumas	18.5 (-3.45*)	33.7 (1.95)	33.3 (2.03)	$X^2(2)=11.88$ p= .002

() = standardised residuals *= p < .01

Control subjects have brothers and sisters with histories of physical impairments significantly less often than cases, without differences between adolescents involved in single and in multiple accidents. In the multiple accidents group the percentage of subjects with deceased fathers is higher than in the other two groups. We may also note two non-significant tendencies ($.01 < p < .05$) in the data. The cases with multiple accidents show a higher percentage of fathers with histories of somatic traumas compared to controls and single accident cases; cases with single accidents show lower percentages of ill fathers compared to both controls and multiple accident cases. *B. Childhood features.*

Table 3

Childhood features. Percentages of controls and cases with single and multiple accidents, x square tests and, in parentheses, post-hoc cell contributions (standardised residuals)

	CONTROLS	CASES		
		Single accident	Multiple accident	
	%	%	%	

Presence of a caregiver	84.9 (-1.76)	92.6 (1.29)	89.8 (.79)	$X^2(2)=3.26$ p=.195
Family difficulties	18 (.08)	20 (.61)	15.7 (-.68)	$X^2(2)=.63$ p=.729
Socialization difficulties	15.1 (.98)	13.7 (.07)	10.2 (-1.17)	$X^2(2)=1.48$ p=.476
Learning difficulties	8.8 (-2.15)	12.6 (.13)	18.5 (2.31)	$X^2(2)=6.45$ p=.043
Positive valuation of important life events	21 (2.35)	7.4 (-2.78*)	16.7 (0)	$X^2(2)=8.63$ p=.013
Important negative events recalled	17 (-.56)	16.8 (-.37)	21.3 (.99)	$X^2(2)=99$ p=.609

() = standardised residuals

* = p< .01

Regarding childhood, the general x square analysis showed that the percentage of subjects who report positive events was higher among controls if compared to single accident cases ($x^2(1) = 7.7$; p = .005). The difference between controls and

multiple cases ($\chi^2(1) = 58$; $p = .444$). We also noticed a marginally significant tendency for controls to report fewer learning problems than multiple accident cases ($\chi^2(1) = 5.41$; $p = .020$). The difference between controls and single accident cases was not significant ($\chi^2(1) = .68$; $p = .408$). *C. Adolescence features.*

Table 4

Adolescence features. Percentages of controls and cases with single and multiple accidents, x square tests and, in parentheses, post-hoc cell contributions (standardised residuals)

	CONTROL	CASES	
	S		

		Sing le accident	Mult iple accidents	
	%	%	%	
Serious illnesses	14.1 (-.18)	9.5 (-1.58)	19.4 (1.72)	X ² (2)=4.1 p=.129
Emotional and relationship difficulties	19 (-1.94)	21.1 (-.52)	32.4 (2.7*)	X ² (2)=7.4 2 p= .024
Family difficulties	26.3 (-2.41)	36.8 (1.19)	37.9 (1.59)	X ² (2)=5.8 1 p= .054
Socialization difficulties	14.1 (.1)	8.4 (-1.78)	18.5 (1.59)	X ² (2)=4.3 p= .116
Learning difficulties	18.5 (-4.55*)	34.7 (1.49)	42.6 (3.73*)	X ² (2)=22. 24 p= .000
Positive evaluation of important events	23.4 (3.83*)	8.4 (-2.4)	10.2 (-2.04)	X ² (2)=14. 8 p=.000
Negative evaluation of important events	20 (-1.01)	18.9 (-.84)	28.7 (1.94)	X ² (2)=3.8 1 p=.148

() = standardised residuals * = p < .01

Learning problems during adolescence were significantly less frequent in controls compared to multiple ($\chi^2(1) = 19.64$; $p = .000$) and to single accident ($\chi^2(1) = 8.56$;

p = .003) cases. The percentage of subjects reporting positive events was higher among controls compared to single and multiple accident cases. There were fewer problematic family relationships within the control group; while the multiple accident group (vs both the single accident group and the control group) tended to have more troubled sentimental and sexual relationships. *D. Features of the year preceding the interview.*

Table 5

Year preceding the interview. Percentages of controls and cases with single and multiple accidents, χ^2 square tests and, in parentheses, post-hoc cell contributions (standardised residuals)

	CONTROLS	CASES		
		Single accident	Multiple accident	
	%	%	%	
Relationship difficulties	25,4 (-2.63*)	36,8 (1.31)	37,9 (1.72)	X ² (2)=6.93 p=.031
Family difficulties	19,5 (-.78)	16,8 (-1.16)	27,8 (1.99)	X ² (2)=4.24 p=.12
Socialization difficulties	9,3 (-.99)	10,5 (-.09)	13,9 (1.21)	X ² (2)=1.58 p=.454
Learning difficulties	20,5 (-3.17*)	30,5 (.77)	37,9 (2.85*)	X ² (2)=11.43 p=.003
Positive evaluation of important events	17 (1.21)	16,8 (.59)	9,3 (-1.93)	X ² (2)=3.74 p=.153
Negative evaluation of important events	16,1 (-2.25)	22,1 (.42)	27,8 (2.15)	X ² (2)=6.08 p=.047

() = standardised residuals * = p < .01

Learning problems were significantly less frequent in controls compared to multiple accident ($\chi^2(1) = 10.21$; $p = .001$) but not in comparison to single accident cases ($\chi^2(1) = 3.09$; $p = .078$). Sexual and sentimental problems are less frequent among controls than clinical cases; there is a tendency to report more negative events among the multiple accident group and perhaps also the single

accident group. *E. Self-esteem, autonomy and body acceptance as evaluated by the interviewer.*

Table 6

Self-esteem and autonomy as evaluated by the interviewer. Percentages of controls and cases with single and multiple accidents, x square tests and, in parentheses, post-hoc cell contributions (standardised residuals)

		CONTROLS	CASES		
			Single accident	Multiple accident	
		%	%	%	
Self esteem	Too High.	3,9 (-4.15*)	14,7 (1.74)	17,6 (3.04*)	x ² (4)=20.62 p= .000
	Normal	80,5 (3.61*)	67,4 (-1.29)	62 (-2.85*)	
	Too Low	15,6 (-.96)	17,9 (.14)	20,4 (.95)	
Autonomy.	Too High	2,4 (-5.35*)	15,8 (1.9)	21,3 (4.25*)	x ² (4)=35.34 p= .000
	Normal	81,9 (4.77*)	62,1 (-2.27)	59,3 (-3.23*)	
	Too Low	15,6 (-1.33)	22,1 (1.15)	19,4 (.41)	

() = standardised residuals * = p < .01

There was a smaller proportion of excessive self-esteem among controls versus both single ($x^2(1) = 9.68$; $p = .001$) and multiple accident ($x^2(1) = 15.13$; $p = .000$) cases, and a larger proportion of normal self-esteem among controls versus

multiple ($\chi^2(1) = 11.61$; $p = .000$) and, marginally, single ($\chi^2(1) = 5.48$; $p = .019$) accident cases.

Controls showed normal levels of autonomy more frequently than both multiple ($\chi^2(1) = 17.82$; $p = .000$) and single ($\chi^2(1) = 12.83$; $p = .000$) cases, and excessively high levels of autonomy less frequently than both single ($\chi^2(1) = 16.51$; $p = .000$) and multiple ($\chi^2(1) = 28.61$; $p = .000$) cases. *General summary of the data emerging from the semi-structured interviews.* Significant or marginally significant differences have been found between controls and cases in the following areas: Accidents within the family. The clinical cases have a significantly higher number of siblings who have had accidents; fathers of the multiple accident involvement cases show a tendency to have more accidents; Deceased fathers. Within the multiple accident involvement subgroup there is a significantly higher number of subjects whose father has died. Learning difficulties/School failures. The clinical cases have had difficulties more frequently than controls. This data emerges as a tendency in childhood and becomes a significant difference between controls and cases during adolescence, and, in the previous year, it is significant only for the multiple accident involvement cases.

Relationship and emotional difficulties. The clinical cases show a tendency to report difficulties in family and sentimental relationships during adolescence and in the previous year. Memory of positive events. The clinical cases recall a lower number of positive events than controls. During childhood, this difference is significant only for the single accident involvement cases; during adolescence the difference is significant for all cases.

Negative events in the last year. Clinical subjects report a higher number of negative events than controls for the previous year.

Self-esteem and autonomy. The clinical cases show excessively high levels of self-esteem and autonomy, compared to the controls.

The Defence Mechanism Inventory (DMI)

Mean values for the three groups of subjects regarding the five defence style scales are displayed in table 7.

Table 7

Means of the total scales

	<i>CONTROLS</i>	<i>CASES</i>	
		Single accident	M u l t i p l e a c c i d e n t
INT	84,1	88,3	94,6

REV	74,4	81,9	86,5
TAS	46,3	47,5	52
TAO	83,1	80,9	84,6
PRO	70,9	70,3	73,7

Separate, two way, (gender by group), analyses of variance were performed on the five scale scores (see table 8).

Table 8

Levels of significarne of the accident

	Source	D F	Error MS	E f f e c t MS	F	P
INT	group	2/291	538,79	322758	599	3
	sex	1/291		179233	3327	69
	grp sex	2/291		113349	2104	124
REV	group	2/291	788,89	252533	3201	42
	sex	1/291		114777	145	703
	grp sex	2/291		37237	472	624
TAS	group	2/291	667,11	102654	1539	216
	sex	1/291		5038779	7553	6
	grp sex	2/291		72625	1089	338
TAO	group	2/291	905,30	126837	1401	248
	sex	1/291		367043	4054	45
	grp sex	2/291		475661	5254	6
PRO	group	2/291	694,55	555404	800	450
	sex	1/291		241978	3484	63
	grp sex	2/291		152148	2191	114

REV and INT: There was a significant effect of the *group* without interaction both for the INT scale (F=5.99; p = .003) and for the REV scale (F=3.2; p = .042). Subsequent pair-wise comparisons showed these effects to be accounted for by significantly higher scores of the multiple accident cases compared to controls. The differences between controls and single accident cases had a similar orientation, but they appeared only marginally significant (for INT: p = .092; for REV: p = .052).

TAS: There was a significant effect of gender, consisting in females scoring higher than males. There were no group or interaction effects.

TAO: There were no main gender and group effects but there was a highly significant interaction between the two variables. Separate analyses of the simple main effects showed a marginally significant effect of the group for females (F= 2.96; p= .057) and a non-significant effect for males. Subsequent pair-wise

comparisons for the female group showed that multiple accident cases had significantly higher scores than controls ($p = .034$). In this group, the difference between controls and single accident cases was similar and marginally significant ($p = .098$).

On the TAO scale, the results of the ANOVA showed a certain significance in *the sex-accident interaction* ($F=5.2$, $p=.006$), the females of the two subgroups (single/multiple) having scored higher, not only as regards the females of the control group, but also in comparison with the two subgroups (single/multiple) of males.

PRO: There were no significant main or interaction effects for this variable.

In short: a) clinical cases showed higher INT, REV and TAO (only females) scores than controls: these differences were only marginally significant in the single accident cases; b) females showed higher TAS scores than males.

Analysis of the clusters

We decided to perform a cluster analysis on our sample (cases and controls) as well, in order to divide the sample into classes which appear to be homogeneous with respect to the characteristics presented by the individuals of which they are made up. (This sample was made up of 312 subjects interviewed; 96 subjects from the Pilot Research sample were not included in this analysis. They are described on the basis of the variables of the initial semi-structured interview.).

The variables were first divided into active and illustrative variables according to whether or not they contribute to cluster definitions.

The illustrative variables include "context" variables (sex, age, profession, etc.) and all variables which concerned only clinical cases (type of accident, etc.); those variables which would imply a division of the sample into two groups (study and control) from the beginning, since they apply to questions asked only to subjects involved in accidents.

The algorithm chosen is of the associative type: that is, starting from the elementary units individuals join in along the way to make up classes of greater dimensions.

The association was done by the Ward method, which determines the divisions on the basis of a criterion of optimisation, minimising differences within the group and maximising differences between groups.

The classes are characterised by the fact that certain types of variables are present in a significantly greater quantity than is to be found in the whole/general population. The number of divisions is, in theory, equal to $n-1$, where n represents the number of individuals in the population. For the purposes of the analysis a division into four classes was chosen, which adequately represents the different types characterised.

Description of the classes

The first class is made up of 155 subjects. This is the largest class and covers about half of the people interviewed. On the whole, a picture of normality seems to emerge, in which virtually no signs of a problematic nature appear to be present. Significantly, scholastic and learning problems relative to the adolescent period

and the most recent period, are absent, as are difficulties in relationships with peers (socialisation) and with relatives (family conflicts).

In particular, this class shows very significant values regarding background response to any somatic pathologies in childhood and adolescence, characterised by considerable support from the family. Concerning the process of separation/individuation and the level of self-esteem, subjects in this class appear to be normal for their age group.

Finally, it is interesting to note how the substantially positive picture which emerges covers the whole sample, since there is no majority of subjects belonging to the control group in this class. In other words, the accident experience in this class is not linked to variables of a problematic nature. **The second class** is made up of 45 subjects. This class is characterised by a greater number of problems relating to childhood. The young people belonging to this group described negative experiences which had happened long before more often than other groups. In particular, with regard to the whole sample, problems relative to childhood in areas of learning, socialisation and family relationships appear statistically significant; these problems are brought up during clinical interviews as situations which are still emotionally involving and meaningful. This group also shows difficulty in relationships with peers (socialisation) and school failures (learning difficulties) in the adolescent period.

Problems of socialisation, learning and emotional adjustment appear to have been present in the months before the accident.

Another very important aspect is that of the interviewer's estimation of the process of separation/individuation and of the quality of self-esteem: 59% of the youths in this group appear to be extremely dependent on their families and to have a low level of self-esteem. This percentage is much higher than the average of 18% found in the general population.

These statistics, together with a pronounced use of the defence mechanism "Turning against the self" (TAS), characterise this group as decidedly depressive.

The third class is made up of 46 subjects. This is the least significant class, in the sense that subjects possess characteristics on par with average values in the general population.

The most relevant aspects shared by subjects in this class is that they belong to the control group and they have not experienced previous traumas. In particular, it can be seen that 72% of the subjects in this class are controls (compared to the 50% chosen during the sampling); together with the absence of previous somatic traumas, this characteristic seems to place the youths belonging to this class in a dimension of normality and absence of risk.

The fourth class is made up of 65 subjects. This class greatly differs from the above-mentioned groups. 76% of the subjects are part of the group of study cases and analysis of the different variables reveals that, in contrast to the third class, they are homogeneously characterised by a certain degree of problematic individual adjustment and family context.

A reaction of uneasiness or indifference regarding family background, both in childhood and adolescence, significantly emerges.

Another outstanding feature of this class concerns the process of separation/individuation and quality of self-esteem. 38% of subjects show excessive involvement in behaviour related to the search for individuality and too high a level of self-esteem; this percentage is much higher than the 12% found in the normal population and represents an obsessive mode which could explain the increased exposure to risk.

In fact, this class seems to be characterized by a number of subjects involved in single or multiple accidents which is higher than the average percentage.

This is the only class in which the variables connected to the accident seem to be significant. In particular, the prevalence of traffic accidents, the active role taken by the person involved, and refusal to admit responsibility for the accident can be noted.

We must remember that the variables linked to the accident and its description did not contribute to the formation of the group as active variables; therefore, the significant presence of these variables is of even greater importance in the light of the "spontaneous" formation of the group on the basis of other characteristics.

The set of variables which overlap to form the group seems to confirm the possibility of a type of hypo- manic functioning in which the accident is intended as an attempt to "escape forward" from depressive issues which would be difficult to deal with by other means.

Multiple Correspondence Analysis

To complete the cluster analysis, we performed a multiple correspondence analysis. This analysis, like all factorial analyses, has the purpose of summarizing the original information by identifying several principal factors (or axes) through the linear combination of the original variables. The first two main factors account for about 16% of the original data. Although not very high in itself, this percentage indicates the breadth of the questionnaire both in terms of the number of variables considered, and in the variety of answers given by the subjects (which do not overlap). On the first axis, we find a very clear distribution of all variables related to problematic dimensions, thus identifying a problematic extreme (on the negative semi-axis) vs non-problematic (on the positive semi-axis). The picture that emerges is characterised by the partition of the variables according to the following criteria: on the positive semi-axis we find the values of those variables typical of the normal adolescent development process (such as good social and learning abilities, emotional and sentimental relationships, absence of difficulties in the previous year); opposite this, on the other semi-axis we find the values of the variables that are characteristic of difficult/problematic development (conflicts within the family, emotional and relationship difficulties, school failures).

The second axis describes a two-mood polarity (depression vs. manic), and two relational opposites: excessive dependence vs. excessive autonomy. Joint examination of the data resulting from the two different techniques employed (cluster and multiple correspondence analyses) has provided us with interesting information.

It allowed us to provide a geometric description of the subjects in each of the four classes, by placing the subjects on a Cartesian plan defined by the two aforementioned factorial axes.

In short: the **first** and **third** classes are positioned in the two areas defined by the positive semi-axis of the first axis, and from neutral values (values close to the origin of the axis) of the second axis; an area characterised by the absence of problematic type variables, as the cluster analysis also demonstrates. The **second** class is positioned in the area of the "problematic/depression-dependence" variables. This is the class in which subjects have values which are distant to the origin of the axis, thus showing high levels of significance and reaching the extreme values of the two axes. This data seems to confirm that the difficulties observed are linked to a mode of functioning characterised by traits of depression and dependency. In this class we find the same number of controls and cases. The **fourth** class is positioned in the area defined by problematic/manic variables. For subjects belonging to this class, variables of a problematic type are characterised by hypo-manic functioning (excessive attempts at separation from the family, excessively high levels of self-esteem, denial of responsibility, etc.), as also shown by cluster analysis. In this class we find a high percentage of study cases and in particular, single accident involvement cases.

Discussion

The results of our study seem confirm our hypothesis: young people who have had accidents (and in particular those who have had more than one) appear to have more problems than controls. These difficulties cover various areas of their present and past. Youths who have had accidents come from families in which there have been more traumas (accidents and deaths); they have had school failures; they have had greater difficulties in relating to their peers; they report experiencing family conflict and relationship failures; they tend to recall mostly negative events from their recent and remote past.

In addition to these difficulties, there are two important psychodynamic elements: quality of self-esteem, and ways in which they are attempting to deal with the process of separation and individuation. While the control group is within mean values (they are more or less content with themselves and feel independent, despite relying on their families) the clinical cases seem to waver between two opposing and dysfunctional styles of excessive over-evaluation and under-evaluation of their own worth and of their ability to be independent.

As seems clear from analysis of clusters and multiple correspondences, the multiple accident involvement cases subgroup (subjects who have had more than one accident during adolescence) seems in particular to show hypo-manic consideration of self (excessively high levels of self-esteem) and of autonomy (over-evaluation of their own independence); these characteristics, in concurrence with more frequent family

and personal problems, seem to indicate an attempt to escape from depression through manic behaviour.

The data emerging from the DMI show that adolescents involved in accidents use, in a significantly greater way than controls, two defensive styles: the REV defensive style, which covers defences such as refusal, denial and reaction-formation, and the INT defensive style, which covers defences such as intellectualisation, rationalisation and isolation.

These two styles (REV and INT) are positively correlated in the DMI, and both refer, in different ways, to the tendency to avoid conflict and to reach a state of well-being by repressing or isolating affect.

The accident can be interpreted as an expression of a tendency to "act out" problems and suffering which cannot be dealt with on a psychological level. We suggest that the set of data presented should be read in this way: (insert diagram 1)

This diagram shows not only the relationship between psychological problems, difficulties in dealing with them and accidents, but also evidences the possibility that the adolescent involved in an accident could be caught up in a spiral or a vicious circle, in which the tendency to "act out" results in accidents and that accidents then increase the tendency to "act out."

In fact, after the accident, the suffering from which the adolescent has attempted to escape is transferred from its original source and is concentrated completely on the organ or limb injured, with the result that the psychological dynamic which led to the accident is transformed - with the collusion of doctors and relatives - to a broken leg or arm.

The danger of entering into this spiral of recurring accidents is high; we must bear in mind the fact that more than half of the group of case studies had already had at least one accident and some subjects were in hospital for the third or fourth time.

Conclusions

In spite of the importance of the phenomenon, accidents still do not receive sufficient consideration: common opinion holds that an accident is a chance event (Carbone, 2003) and psychological literature has devoted less attention to accidents than to other adolescent risk-taking behaviours (drug use, unprotected sex, etc.).

Many elements confirming the necessity of not undervaluing the psychological context in which an accident happens have emerged from our research.

One indication in particular, useful for concentrating prevention on a group at risk, has been identified: adolescents who have already been involved in more than one accident.

While young people at their first accident (single accident involvement cases) are not very different from controls, those who have been involved in more than one accident (multiple accident involvement cases) appear to have experienced more troubled lives. This finding seems to support the hypothesis according to which an

"acting-out accident" can be accounted for by the mechanism of the compulsion to repeat.

The results emerging from our research seem to confirm the interesting clinical observation of some authors (Tursz, 1986) who refer to a type of adolescent with a tendency to "drug" by passing from one accident to another and who shows traits and behaviour similar to those of drug addicts (intolerance of frustration, difficulty in managing relationships, use of refusal, counter-dependent attitudes, etc.) as an "accident addict."

Although the subjects in our sample do not seem to demonstrate such extreme features, the somatic and psychological problems of youths who tend to be repeatedly involved in accidents (with noteworthy costs and consequences both on a personal and a collective level) are considerable. Therefore, we believe that it would be extremely useful to offer a clinical interview, with both a psycho-diagnostic assessment and preventive purpose, to all adolescents injured in an accident, during their admission to hospital. Particular attention should be given to those adolescents who have previously had other accidents and who are in danger of being caught up in the compulsive spiral of reiteration.

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Summary

Introduction; Accidents and adolescence; Hypothesis; Objectives of the study; Method; Subjects; Measures; The Clinical Interview; The Defence Mechanism Inventory (DMI); Analysis of the data; Results; The semi-structured interview; Description of the classes; Multiple Correspondence Analysis; Discussion; Conclusion.

Prof.ssa Paola Carbone: Professore Associato, Facoltà di Psicologia 2, "Sapienza" Università degli Studi di Roma; Psicoanalista S.P.I.

Anna Bovet: Psicologa

Ludovico Bracci: Ricercatore ISTAT

Dott.ssa Elisa Casini: Dottorando di ricerca, Facoltà di Psicologia 1, "Sapienza" Università degli Studi di Roma; Specializzanda in Psicoterapia A.R.P.A.D.

Dott.ssa Silvia Cimino: Dottore di Ricerca "Sapienza", Facoltà di Psicologia 1, Università degli Studi di Roma; Ricercatore a Tempo Determinato, Università Telematica Internazionale "Uninettuno".

Dott.ssa Anna Ferrari: Specializzanda in Psicoterapia, Facoltà di Psicologia 1, "Sapienza" Università degli Studi di Roma.

Mail per la corrispondenza: Dott.ssa Silvia Cimino: silcimin@tin.it

Tradotto dall'italiano da Susanna Soria