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ADOLESCENTS' PSYCHOLOGICAL FUNCTIONING AND UNINTENTIONAL INJURIES: MOTOR VEHICLES AND SPORTS ACCIDENTS

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Abstract

Adolescence represents a crucial period for psychological development. Adolescents have been shown more prone to injuries than adults have and they are frequently involved in motor vehicle and sports accident. Although adolescents' injuries have been widely investigated in international literature, victims' psychological profiles associated with different types of accidents have been scarcely addressed. The present study aimed to identify adolescents' psychological functioning associated with different types of injuries among a population of Italian adolescents who visited an emergency department. Moreover, the present paper intended to compare psychological profiles of adolescents who have had road and sports accidents. The sample was composed by N= 60 adolescents who attended an emergency department in central Italy. Subjects completed self-report measures assessing emotional and behavioural functioning and the use of defence mechanisms. Both road and sport accidents were associated with adolescents' maladaptive psychological functioning. Adolescents involved in motor vehicle accidents showed a problematic emotional and behavioural functioning in general and a massive use of defense strategies; their peers who had sport accidents also show various difficulties in internalizing and externalizing functioning. Several adolescents' emotional-behavioural variables are associated with injuries rates. Risk taking behaviours and other victims' psychological profiles should be considered to have an exhaustive picture of individual factors that can impair a healthy development.

Keywords: Adolescence, Motor vehicle accidents, Sports accidents.

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1. Introduction

1.1. The developmental time window of adolescence: main properties

Adolescence represents a well-known crucial developmental phase, during which important changes and adjustments to social, behavioural and affective-motivational functioning occur (Crone & Dahl, 2012; Steinberg, 2008; van Duijvenvoorde, Peters, Braams & Crone, 2016). Nowadays adolescents have to go through continuous challenges and tasks across development, including approaching unknown environmental situations, forming new relationship, gaining independence from parents (Bornstein & Bradley, 2014; Paciello, Fida, Cerniglia, Tramontano, & Collie, 2012).

In general, adolescents are often indicated as very vulnerable, involving in a variety of risk taking behaviours in their everyday life (negative behaviours, delinquency, substance abuse, compensatory eating) that in turn can lead to premature death or lifelong impairment (Crone & Dahl, 2012; Steinberg, 2008; Willoughby et al., 2013).

Recent cognitive neuroscience findings, together with research on adolescents' brain development, indicated various and continuous brain modifications, such as decrease in synapse, transformation at the level of grey matter, neuronal patterns reorganization in limbic system (Petanjek et al., 2011). These pronounced variations are very relevant in terms of emotions and thoughts' modulation (Crone & Dahl, 2012), response to stimuli and other various areas of adolescent's behaviours (Ernst et al., 2014; Steinberg, 2008).

Although on the one hand all these elements lead to a potential behavioural flexibility, higher knowledge and greater adaptive response, it may also result in adolescents' use of maladaptive patterns and maladaptive psychological functioning. Indeed, it was found that adolescents exhibit low levels of risk knowledge and danger awareness when they are in different situations of everyday life. In particular, adolescents seem to be careless and little aware about various events that they experience (Chau, 2015). These distinguished characteristics are very common in adolescent context and they may represent relevant injuries risk factors in this period (Chau, Kabuth & Chau, 2014). Therefore, it is not surprising that adolescents have been shown more prone to injuries than adults: they can have up to twice-higher injury risk, compared to adults, and they are frequently involved in motor vehicle and sports accidents (Ramisetty-Mikler & Almakadma, 2016).

The scientific relevance of risk in adolescence is underlined by the fact that researcher and professionals show a growing interest in investigating various aspects, which characterized this period of life, such as positive or negative developmental patterns and maladaptive behaviours.

1.2. Adolescents' risk taking behaviours

For aforementioned reasons, risky behaviours are very common among adolescents, who engage in activities involving a high possibility of injuries or even death.

Indeed, adolescents, depending on their well-known sensitive personality and psychological characteristics, can try for very dangerous experiences, showing poor ability to manage their own activities and actions.

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In fact, it was found that adolescents often and voluntary seek risky activities, because they over valuate their capacity and ability and assume to keep the risk at a governable level: they are often in search of emotionally strong and enthralling experiences (Figner & Weber, 2011; Zuckerman, 2007).

It also may be noted that little care about safety information is very common among adolescents, such as in people who involve in risky experiences (Leiter & Rheinberger, 2016). Inaccurate consciousness of risks together with a gap between real and perceived risk are also relevant in the analysis of experience of involvement in risky behaviour (Ali, Amorim, & Chamorro-Premuzic, 2009).

Many activities such as motor vehicle driving and sports engagements are very common among adolescents, but they can represent a serious risk factor for adolescents' psychological health. Indeed, many common adolescents' activities were found to be associated with a relevant risk of injury (Gabbe, Finch, & Cameron, 2007). Depending on the various forms of risky behaviours, the outcomes may include heavy consequences on adolescents' health, such as behaviours and health-related problems, poor health conditions (drug use, obesity), poor psychological health (Alink, Cicchetti, Kim, & Rogosch, 2009; Cicchetti, 1998).

Hence, in adolescence, risk behaviour can be a crucial contributor to injuries and accidents.

In this sense, for these reasons, it is very important to understand the distinguishing characteristic of risky behaviours, investigating the potential risk factors in adolescence. According with Chau (2015), we strongly believe that adolescents' injuries deserve to be investigated to provide more knowledge about injury mechanism for future design injury prevention.

Thus, the conceptual model we adopted in the current study to explore risky behaviour and unintentional injuries among adolescents refers to Developmental Psychopathology theory, which stresses the contribute of individual variables and environmental factors in onset and maintaining of health-compromising behaviours, consistent with a large amount of empirical work (Cicchetti, & Rogosch 2002).

1.3. Unintentional injuries among adolescents

Unintentional injuries represent a relevant cause of death among adolescents and the great number of adolescents victims of accidents increasingly alarms public opinion and society.

In general, the relevance of injuries among adolescence has been acknowledged and empirically supported (Beck, Arif, Paumier, & Jacobsen, 2016; Gorios, Souza, Gerolla, Maso, Rodrigues, & Armond, 2014; Smorti, & Guarnieri, 2014).

Researchers have traditionally defined injuries as "accidents" or unavoidable events but recently, the understanding of the factors that can cause injuries has changed this definition; the term unintentional injury replaces that of 'accidental injury' in recognition of the fact that 'most injuries are preventable', with major consequences on public health (Davis, & Pless, 2001; Bonilla-Escobar, & Guiterrez, 2014).

Injury occurring is related to the specific activity concerned and the ability to deal with them. Adolescents' unintentional injuries, such as motor vehicle accidents and sports accidents, can have severe repercussions for adolescents' physical and psychological health. More specifically, motor vehicle traffic injuries represent more than half of fatal injuries among adolescents (Blum & Qureshi, 2011), while out

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of school injuries (Blum, & Qureshi, 2011) and sport accidents (Patel, Vaccaro, & Rihn 2013; Theadom et al., 2014) are becoming an ongoing public health issue.

Among the various types of accidents involving adolescents we specifically focus on motor vehicle accidents and on sporting accidents.

1.3.1. Sports accidents

Sports activities represent a widespread medium for keeping fit and achieve physical, social and psychological benefits. Adolescents, as well as people in general, can engage in sport activities to improve their physical and psychological well-being.

In our modern society, there is a growing interest in outdoor sport, such as mountain sports, climbing, mountain racing, cross-country biking. Football, cycling, hockey, equestrian activities and gymnastic are among the most popular sporting activities pursuits.

It often happens that adolescents take on the risky behaviors during sports activities. In fact, when in sport context, participants can engage in various activities that may increase the likelihood of potentially harmful accidents; adolescents, thus, may incur in brain injuries, spinal trauma and other severe fractures (Patel, Vaccaro, & Rihn, 2013; Theadom et al., 2014).

Moreover, sport injuries are among the leading cause of death for American adolescents. Several studies report high percentages of adolescents and children who incur in unintentional injuries during enjoyment activities, such as sport (Selig, Hüpfl, Trimmel, Voelckel, & Nagele, 2012; Skokan, Junkins, & Kadish, 2003).

Thus, the issue takes on even more complex proportions if we consider internet as related to risk taking factor. Indeed, internet and its contents can represent a relevant source of important information for individual interested in recreation activities. In this respect, Plank (2016), for instance, investigated risk-taking behaviour in a context of an online outdoor sports platform, revealing a high risk associated with adventure recreation activities and ski tour.

1.3.2. Motor vehicle accidents

The problem of motor vehicle accidents is very relevant when we refer to adolescence (Gorios et al. 2014).

Motor vehicle crashes are reported to be the most relevant cause of adolescents' fatal accidents (Sarma, Carey, Kervick, & Bimpeh, 2013). Many young people lose their lives in a very high number of accidents, such as indicated by data from national agencies (Insurance Institute for Highway Safety, 2012) In particular, in the United States people aged between 5 and 24 years die due to motor vehicle accidents (World Health Organization [WHO], 2014). As for Italy, road crashes are the cause of death of many young people, especially, as reported by Marengo Marengo, Settanni, Vidotto, & Ciairano (2012) in the case of adolescents driving motorbikes.

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2. Problem Statement

2.1. Understanding health-endangering and maladaptive behaviours in sports and driving

Clinical and researchers should explore the field of unintentional injuries specifically addressing individual psychological functioning and personal features.

The attention of researches has focused not only on the negative consequences but also on the risk factors that increase the likelihood of experiencing it.

Many studies highlighted the relationship between adolescents' personality and unintentional accidents (Galovsky, Malta, & Blanchard, 2006; Marengo, Settanni, Vidotto, & Ciairano, 2012), together with various constellation of psychological aspects, such as depression, anxiety and impulsivity (Paciello, Fida, Cerniglia, Tramontano, & Collie, 2012). It is known that the construct of sensation seeking plays a central role in risk taking behaviours, in the aspect of temperamental predisposition: it refers to a seeking after relevant experiences from the emotional point of view in a context in which individual's poor awareness of risk may increase the risk of negative behaviours (Zuckerman, 2007; Steinberg, 2008).

However, as well highlighted by Cerniglia et al. (2015), the majority of studies on adolescents' psychological functioning and unintentional injuries has concentrated more on psychopathological consequences that occur after the crashes and collisions, than on the psychological and emotional aspects preceding the road accidents.

About this, Carbone (2009; 2010) stated that adolescents' maladaptive emotional functioning, e.g. alexithymic traits, and other dysfunctional psychological functioning, such as a massive use of defense strategies, are related to the high-risk behaviours. In fact, these particular maladaptive patterns, when preceding the road accidents, can lead to negative consequences that we see in severe injuries and collisions. In this perspective, adolescents' accidents seem to be an unconscious psychological help request.

3. Research Questions

The majority of researches on unintentional injuries have paid much attention to the role of environmental, individual and psychopathological variables, whereas little attention has been given to an exploration of emotional and psychological factors related to injuries among adolescence.

More specifically, although the rates of adolescents' injuries have been widely investigated in international literature, there is still a lack of data on the victims' psychological profiles. Few studies, to our knowledge, have examined psychological and emotional variable related to unintentional injuries (Cerniglia et al., 2015) and to date we have no data about psychological functioning of adolescents who get involved in different types of accidents.

Thus, it is crucial to identify adolescents' psychological profiles in the context of unintentional injuries, also taking into account the main frequent accident scenarios. Only a detailed knowledge of the primary causes and contributory factors (in term of individual and relational features related to the various forms of accidents) may lead to realize effective program of prevention and intervention.

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4. Purpose of the Study

Taking into account the aforementioned considerations, the current study intends to report a contribution towards the understanding of adolescents' unintentional injuries, considering them as form of psychological help request, which do not necessarily overlap with irreparable consequences.

Thus, the purpose of the present study was to investigate emotional psychological profiles of adolescents involved in unintentional injuries. More precisely, we aimed to verify whether some adolescents' unintentional injuries, such as motor vehicle accidents and sports accidents, are related to specific psychological features, such as emotional difficulties and use of defense strategies.

Moreover, we wanted to assess the adolescents' psychological functioning associated with different types of injuries specifically among a population of Italian adolescents who visited an emergency department. A parallel goal of our study was to compare psychological profiles of adolescents who had road and sports accidents.

Since emotional competence has an important role in the adaptive psychological functioning by which adolescents attempt their environmental situations, we hypothesized that unintentional injuries among adolescents can be related to maladaptive psychological profiles and psychological sufferance.

More specifically, we hypothesize that personnel difficulties in identifying and describing emotions and use of defensive strategies characterize adolescents' psychological functioning when involved in unintentional injuries.

In other words, we expected that:

Adolescents admitted to emergency departments due to unintentional injuries reveal difficulties in identifying and describing their own emotions;

Adolescents admitted to emergency departments due to unintentional injuries report massive use defense strategies;

Adolescents specifically involved in motor vehicle and sports accidents can show specific emotional psychological profiles, such as alexithymic traits and use of defensive mechanisms.

5. Research Methods

5.1. Subjects and procedure

We proceeded as follows.

In order to carry out our research, a sample of adolescents who attended an emergency department, located in cities of Italy, was enrolled.

We selected N= 58 adolescents (total males: 32; total females: 26; age range: 14–23 years) who visited an Italian emergency department over a period of one year (from May 2015 to May 2016) and who were involved in various type of accidents. The mean age of the subjects was 17.72 (s.d. = 2.56).

Participants took part in this study, with two different groups of adolescents being involved, according to the type of accident they had: Group 1: adolescents that have suffered sports accidents (N = 29; 16 boys and 13 girls); Group 2: adolescents that have suffered motor vehicle accidents (N = 29; 16 boys and 13 girls).

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Participants in the study were recruited while they were in the emergency department. The majority of them were Caucasian. All subjects came from families with middle or high socioeconomic status. All participants were told about the goals of this study. They were voluntary and anonymous.

Subjects completed data on all study variables (self-reported instruments assessing emotional functioning and use of defense strategies) and none of those who accepted dropped the task.

Participation time was approximately 45 minutes and trained psychologists administered the instruments.

Prior permission was obtained from the Ethical Committee of the Medicine and Psychology Faculty at Sapienza University of Rome, in accordance with the Declaration of Helsinki.

5.2. Measures

5.2.1 Assessment of the ability to describe and identify emotions

We used one of the most frequently applied measure on ability to describe and identify emotions: The Toronto Alexithymia Scale (TAS-20) developed by Bagby, Parker, & Taylor (Bagby, Parker, &Taylor, 1994; Italian version La Ferlita, Bonadies, Solano, De Gennaro, & Gonini, 2007).

The TAS-20 is a self-report scale comprising 20 Items for emotional functioning. Respondents were asked to indicate on a 5 point scale, from 1 (strongly disagree) to 5 (strongly agree); five items are negatively keyed.

Scores for the subscales are obtained by summing the response categories selected by the participants. The scale presents a three-factor structure congruent with the alexithymia construct. The first factor consists of items that assess the ability to identify and to distinguish feelings. The second factor comprise items measuring the ability to describe feelings. The third factor includes items assessing externally oriented thinking.

Higher score reflects increasing levels of more maladaptive emotional functioning.

The instrument shows a good internal consistency (Cronbach's α 0.86).

5.2.2. Assessment of defense strategies

Use of defense strategies was measured using The Response Evaluation Measure for Youth (REM-71; Steiner, Araujo, & Koopman, 2001; Italian version by Prunas et al., 2009): the REM-71 is a self-report scale comprising 71-items that assess a series of defenses listed as following: Acting out, Splitting, Displacement, Dissociation, Fantasy, Passive aggression, Projection, Repression, Omnipotence, Undoing, Conversion, Somatization, Withdrawal, Suppression, Denial, Humor, Intellectualization, Reaction Formation, Idealization, Altruism, Sublimation.

Questions to be answered are scored on a 9-point scale from ''strongly disagree" (scored as 1) to ''strongly agree" (scored as 9).

Higher scores on this measure reflect a more massive and frequent use of the defense strategies.

5.3. Statistical analysis

Before performing the analyses, a preliminary screening of the data was conducted and only a few data items were missing for each instrument.

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To evaluate the adolescents' emotional profiles and the use of defense strategies in the two groups, multivariate analyses of variance (MANOVAs) was carried out, considering age and gender.

All analyses were performed with SPSS software (Version 22.0).

6. Findings

Adolescents' alexithymic traits emerged from the current study, with participants showing difficulties in identifying and describing their emotions, together with use of defense strategies.

6.1. Assessment of the ability to describe and identify emotions

To verify whether adolescents involved in motor vehicle, sports accidents show difficulties in recognizing and describing their emotions, a MANOVA on the two group scores on all subscales of TAS-20 was carried out, considering the effect of age and gender. Group 1: adolescents who have experienced sports accidents (N = 29). Group 2: adolescents who have experienced motor vehicle accidents (N = 29).

Adolescents' scores on all TAS 20's scales were higher, with the majority of scores indicating a possible presence of alexithymia. N = 2 subjects in Group 1 and N = 2 subjects in Group 2 exceed the clinical cut-off at TAS-20's total scores.

No significant difference between group 1 and group 2 on the TAS 20's subscales was found (λ = 9.73; F = .250; p .861). Moreover, Group 1 and Group 2 have been shown to have difference based on gender as regard adolescents' scores on Factor 3 (F = 9.437; p < .005).

6.2. Assessment of defense strategies

To verify whether adolescents involved in motor vehicle and sports accidents strongly use defense strategies we conducted a MANOVA on the two group scores on all subscales of REM 71. MANOVA conducted on the two groups' scores showed no significant differences between adolescents belonging to Group 1 and adolescents belonging to Group 2 a regard to the use of defense strategies, except on Projection (F = 27.70; p < .05) Conversion (F = 32.79; p < .001), Altruism (F = 14.53; p <.001).

In general, although no significant differences in scores on the subscales of the TAS-20 and 71 REM were found among adolescents who had experienced motor vehicle accidents and sports accidents, data indicated that adolescents who have turned to an emergency department, due to unintentional injuries, tend to manifest difficulty in identifying and qualifying their emotions, also using defensive strategies. More precisely, regardless of the specific type of accidents suffered, the fact of incurring an unintentional injury can be read as a signal of distress and individual suffering during adolescence. In accord with Carbone (2009; 2010), indeed, accidents among adolescents can be interpreted as an expression of deep psychological distress, implying an unspoken help request.

Overall, results obtained evidenced that both road and sport accidents occurred to our sample subjects are related to adolescents' psychological suffering. Thus, our findings generally support the hypothesis of this study.

In line with previous research, risk taking behaviours and injuries among adolescents proved to be related to general suffering, maladaptive psychological patterns and disadvantaged individual.

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These results suggest that risk behaviour tends to be related to maladaptive responses that are established by adolescents to face up their emotional difficulties.

Finally, according to our data, victims' psychological profiles should be considered to have an exhaustive picture of individual factors that can impair a healthy development.

7. Conclusion

The main aim of this study was to investigate psychological functioning within adolescents who were involved in unintentional injuries.

We expected that adolescents who incurred motor vehicle accidents and sports accidents would have shown difficulties in coping with their emotions as well as we expected that they would have turned to a massive use of defense strategies.

Overall, the results are consistent with previous research (Cerniglia et al., 2015), showing both in males and females, high levels of alexithyimic traits among adolescents who have had unintentional injuries, suggesting a significant impairment of psychological well-being, as well as physical, resulting in accidents.

Specifically, our findings reveal that almost all participants experienced some form of psychological maladaptive functioning, regardless of the type of accident. Moreover, the results of the present study show also in our sample a high prevalence of psychological suffering and emotional difficulties related to the number of accidents actually occurred (Cerniglia et al., 2015; Erriu, 2016).

These data support the notion that having difficulties or poor emotional competence might have a key role in facing the daily challenges and tasks among adolescents. We do know that emotional and behavioural difficulties during developmental age are potential sources of maladaptive emotional functioning in adulthood (Cimino, Cerniglia, & Paciello, 2015; Cimino, Cerniglia, Paciello, & Sinesi, 2013).

For these reasons, our results, combined with previous findings of Cerniglia et al. (2015), would seem to suggest that it is crucial understanding psychological conditions in adolescents, particularly their experienced feelings. Indeed, most personal difficulties are modifiable for prevention and intervention (Nilsson, Stigson, Ohlin, & Strandroth, 2017; Salam et al., 2016) and many problems can be solved through an early assessment and treatment nowadays.

Our results should be viewed in the light of several methodological limitations.

The assessment of adolescents' psychological functioning was based on self-report measures, so that the current study is based on reports from adolescents at one point in time rather than teacher or parents or peers. We believe that it would be advisable to employ different sources, objective measures and alternative methodologies such as individual interviews.

Moreover, the cross sectional design of our study cannot allow a longitudinal assessment of psychological functioning across the development. Thus, future research should add different evaluation times to better explore the experience of emotions in adolescents overtime and adolescents psychopathological outcomes.

Another important limitation could be attributed to the small sample size, as the study could be underpowered to detect small differences. Indeed, our sample size limits the generalizability of the

current study. The findings should be confirmed in a future study involving a greater number of participants.

Hence, firm conclusions about the adolescents' psychological profiles in the context of unintentional injuries cannot be made: it appears necessary then to replicate and extend the results in order to overcome these methodological problems.

Despite the aforementioned limitations, the current study adds to our knowledge about adolescents' psychological functioning, providing information to better investigate such an important period of life as the adolescent.

Adolescents should be helped to be conscious of their problems and our research can be used to develop interventions aimed to support them, considering the need of more empirical studies in Italy.

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