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## RISKY BEHAVIOURS IN ADOLESCENCE: A BRIEF OVERVIEW OF UNINTENTIONAL INJURIES

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### Abstract

Different risk behaviours pertaining to adolescents, such as sports or motor vehicle accidents, impact on healthy development. Adolescent injuries have been studied in international literature, but very little work has presented a general framework, including the main psychological and relational factors associated with different types of accidents. The present study aims to offer a theoretical overview of adolescents' individual and relational factors related to the phenomenon of unintentional injuries, focusing on psychological, personality functioning and different types of accidents. An extensive review of international literature on adolescent unintentional injuries was conducted in university libraries and in databases such as ProQuest, PsyArticles, PsyInfo, and PubMed. The papers' scientific relevance was verified by Scopus indexing. In particular, different studies and research that have addressed adolescent injuries from several point of view were examined, in an attempt to identify relevant works that contribute to the unravelling of this complex issue. Literature search results highlight the relevance of multiple individual factors that may be associated with accidents in adolescence. Although adolescent injuries have been widely studied, the victims' psychological profiles associated with different types of accidents remain scarcely addressed, because of the complex set of emotional, behavioural, social factors involved. Given the international relevance of the rising phenomenon of adolescent injuries, psychological and relational functioning and their correlates should be better investigated, for the significant impact of accidents on morbidity, particularly in this vulnerable yet important youthful segment of the population.

*Keywords:* Adolescence, psychological functioning, injuries, sports accidents

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## 1. Introduction

Unlike their forebears, adolescents nowadays, participate in various activities that transcend traditional boundaries, some of which involve real risk-taking behaviours (Di Clemente, Hansen, & Ponton, 2013; Kipping et al., 2012). Most of these concern ubiquitous behaviours in society, such as smoking, driving, or low levels of physical activities (Kipping et al., 2012). Moreover, as pointed out by clinicians and researchers, many adolescent risk behaviours, such as tobacco use, alcohol consumption, unprotected sexual behaviours and antisocial conducts, are responsible for most of the adverse health and social outcomes among this group (Karp et al., 2005; Mokdad et al., 2016; Pierobon et al., 2013).

Among the multiple behaviours that can contribute to serious health problems among adolescents, those resulting in unintentional injuries deserve particular attention, because of their short and long-term effects (Beck et al., 2016; Salam et al., 2016).

Unintentional injuries can be defined as set of accidents which occur without forethought, intent or voluntary plans, leading to deleterious consequences for psychological and physical wellbeing. These can include burns, falls, motor vehicle injuries, sports and recreation accidents (Chandran, Hyder, & Peek-Asa, 2010; Salam et al., 2016). Unintentional injuries represent a complex phenomenon in which it is possible to track down a variety of features. Among the various sources of these events, transportation, both as drivers and passengers, is reported to be a very relevant factor. Other relevant causes can be sports and recreation, fires, drowning, and poisonings (Centers for Disease Control and Prevention, 2012a).

Consistent research data show that unintentional injuries are the greater cause of premature morbidity and death among adolescents aged 10-19 years old (Centers for Disease Control and Prevention, 2012b; Sleet, Ballesteros, & Borse, 2010). Specifically, fatal injury rates that occur among males are reported to be twice that of females (Chandran et al., 2010; Gore et al., 2011). In particular, the rate of risk behaviours varies by gender, with girls showing a high use of tobacco and self-harm, and boys reported to show high levels of anti-social behaviours and vehicle-related risk behaviours (MacArthur et al., 2012).

Globally, investigation in this area has identified an alarming increase in the daily rates of adolescent injuries, stressing the urgency to improve awareness of the problem, together with the effectiveness of specific interventions. The most worrying, indeed, is that of late more than 2, 000 children and adolescents have lost their lives due to unintentional injuries, with an estimated rate of death of adolescents aged 11-19 years in motor vehicle crashes at 10.2 per 100,000 (Salam et al., 2016).

## **2. Problem Statement**

Since early maladaptive emotional and behavioural functioning that emerges during the developmental age can shape adult behaviour (Cimino, Cerniglia, & Paciello, 2015; Cimino et al., 2013) and considering that people who display one risk behaviour are likely to display other such behaviours (DuRant et al., 1999), the topic of risk and unintentional injuries among adolescents should not be underestimated as a topic for exhaustive study, due in great part to the costly consequences both on adolescents and society in terms of the loss in potential human resources.

It is undeniable that people usually engage in sport activities to improve physical and psychological well-being. Living in a modern society, adolescents too, can choose from a wide range of sports and leisure activities, to achieve and maintain optimal physical and mental health. With higher disposable incomes, parents of adolescents today present their children with vehicles. Hence, there is now a much higher incidence of adolescents riding motorcycles and bicycles during their free time or to go to school. Due to this phenomenon, most unintentional injuries resulting in significant adolescent morbidity and mortality concern sports related accidents and non-sports related accidents, such as motor vehicle crash injuries.

Problems stem from the fact that such daily behaviors may impact on healthy development when implemented in an unsafe and risky manner.

## **3. Research Questions**

In last decade, much research has focused on risk factors during the developmental age period, in order to identify signs of difficulties and to create effective intervention programs. Specifically, adolescent injuries have been extensively studied in international literature with a great deal of the work focusing on the definition and the major implications of accidents that occur during the developmental age. Nevertheless, based on the investigation undertaken by the researcher, there seems to be a lack of work on presenting a general framework that includes the main psychological and relational factors associated with different types of adolescent accidents.

## **4. Purpose of the Study**

Using the considerations stated earlier as a departure point, the purpose of the present paper was to investigate the topic of risky behaviours and unintentional injuries among adolescents, focusing on some types of activities that they engage in.

More specifically, the present paper intends to offer a brief theoretical review of adolescent individual and relational factors related to the phenomenon of unintentional injuries, focusing on psychological, personality functioning and different types of accidents.

## **5. Research Methods**

Pubmed and other main online databases records were searched to identify research that commented on risk behaviours and unintentional injuries among adolescents. In particular, to perform the search the following specific terms and the key words were employed: adolescent unintentional injuries, motor vehicle accidents, sports accidents, risk behaviours among adolescents.

International literature on adolescent unintentional injuries was traced through an extensive search in university libraries, and through internet-based bibliographic databases such as ProQuest, PsyArticles, PsyInfo, and PubMed which then were verified for scientific relevance and validity by filtering all the work through Scopus index.

With regard to inclusion and exclusion criteria, this review focused on the works that produced quantitative data on unintentional injuries among adolescents, including implications of these negative events in terms of psychological and psychical consequences.

Particular attention was paid to works that had, as their main objective, psychological constructs and concepts for the adolescent age group in general (such as emotional, behavioural functioning, interpersonal relationships, and developmental features) as well as specific concepts concerning the context of injuries (motor vehicle crashes, sport accidents, fatal injuries, risk behaviour). As part of the review, both abstracts and full text contents were analysed.

In carrying this work forward, a theoretical and empirical framework particularly useful for elucidating normal as well as abnormal behaviours during adolescence is based on the concept of Developmental Psychopathology (DP) posited by Cicchetti & Rogosch (2002). This standpoint stresses the role of individual and relational-environmental risk factors across the life cycle in the onset and maintaining of maladaptive social and psychological functioning, resulting in health risk behaviours.

## **6. Findings**

### *6.1. Adolescents' unintentional injuries: sports accidents and motor vehicle crashes*

It should be noted that adolescents often exhibit risk-taking behaviours during leisure activities, such as sports. In fact, epidemiological literature in the area of sports injuries reports that sport accidents are among the most significant causes of death and injuries for children

and adolescents in many countries (Campodonico et al., 2016; Habelt et al., 2011; Selig et al., 2012).

Many studies and research have specifically investigated the link between sports activities and negative consequences on health, revealing that participants in various sports activities are at risk of accidents with severe repercussions (Vanpouille, Vignac, & Soulé, 2016). Indeed, as highlighted by Skokan, Junkins, & Kadish (2003), many adolescents suffer unintentional injuries solely in the context of sports. More specifically, researchers have indicated a number of serious consequences on adolescents' physical status, such as spinal trauma, brain injuries, severe fractures (Patel, Vaccaro, & Rihn, 2013; Theadom et al., 2014).

On top of this, the issue of motor vehicle accidents exacerbates this worrying trend when we consider the developmental age of adolescence (Gorios et al. 2014). Motor vehicle accidents now represent one of the most significant causes of death for adolescents as highlighted by research which has found an unacceptably high percentage of adolescents involved in road collisions with rates exceeding a million in the 2012-2013 period alone. (Insurance Institute for Highway Safety, 2012; Sarma et al., 2013). In the United States, many people lose their lives due to fatal driving injuries, especially young people aged between 5 and 24 years old (Center of Disease Control and Prevention, 2012b). In Italy, as reported by Marengo et al., (2012), more than half the adolescent population are involved in road accidents, especially while driving motorbikes.

Regarding the relationship between sport behaviours and dangerous driving behaviors, in the HEALTH Survey conducted by Baumert, Henderson & Thompson (1998), athletes showed a great risk for unintentional driving-related injuries depending on the excess of speed limit and on careless use of motor vehicles. This study, interestingly, pointed out the high prevalence of several risky behaviours among adolescents involved in athletics activities and organized sports, stressing the relevance of lack of awareness of the risk of injuries (speeding, driving without helmet) (Baumert et al., 1998). This gives credence to the claim that risky behavior in one context often spills over to other contexts as well, posing a heightened threat to life among this vulnerable group.

All these crosscutting features of different risk behaviors can be attributed to the well-known psychological construct of sensation seeking, whereby adolescent health risk behaviors can be interpreted as thrill-seeking behaviours (Zuckerman, 2007).

## *6.2. Individual and environmental factors related to unintentional injuries and health risk behaviours*

Research on health risk behaviours in adolescents are frequently based on the exploration of both negative causal factors and consequences.

### *6.2.1. Risk factors*

Many international studies have highlighted risk factors for adolescents, together with the urgency of prevention programs. As highlighted by Baumert et al. (1998), alcohol consumption represents an important factor in motor vehicle accidents, considering that the majority of high school students reported a massive consumption of alcohol and/or drugs on many occasions (Perrine, Peck, & Fell, 1989). The relationship between sports participation and alcohol use have been highlighted in various studies (Lorente et al., 2014; Sonderlund et al., 2014; Wells & Macdonald, 1999). Similarly, other studies have highlighted unsafe motor vehicle driving tendencies among adolescents (Bina, Graziano, & Bonino, 2006; Everett et al., 1999; Ramisetty-Mikler, & Almakadma, 2016).

Interestingly, Spring, Moller, and Coons (2012), investigated risk taking among adolescents focusing on substance abuse and risky sexual behaviours and they found that engagement in various risky behaviours increases until adulthood.

It is interesting to note that many authors have studied varied adolescent individual features which can result in accidents, focusing on different “entry points”, as the following discussion will highlight.

### *6.2.2. Neurobiological elements*

One entry point into the discussion of adolescent individual features that can result in accidents is recent cognitive neuroscience findings that have indicated a set of modifications in the brain both at structural and functional level: decrease in the number of synapses, changes in the grey matter and complex reorganizations in the limbic system (Petanjek et al., 2011; Wierenga et al., 2014). These modifications of neurobiological features are crucial in terms of the modulations of emotions and thoughts (Crone & Dahl, 2012), response to stimuli and other various areas pertaining to adolescent behaviours (Ernst, 2014; Steinberg, 2008).

Thus, these elements working in tandem may lead to adolescents’ maladaptive behavioural patterns and difficulties in psychological functioning. In particular, there is evidence that adolescents display low awareness and knowledge about the risks they encounter

in everyday life. Indeed, as revealed by Chau (2015), adolescents show poor caution and a lack of knowledge about the experiences they face.

### *6.2.3. Personality features*

Adolescent injuries can also be related to personality characteristics (Galovsky, Malta, & Blanchard, 2006). Indeed, recent studies and research have highlighted a set of psychological elements and psychopathological features, such as depression, anxiety, and anger which are related to maladaptive emotional and behavioural functioning (Steinberg, 2008; Paciello, et al., 2012).

Sensation seeking, a well-known psychological construct, has been often related to risk taking behaviour among adolescents. Sensation seeking refers to the search of emotionally exciting situations which are likely to involve elements of heightened risk and which become dangerous to health and life (Steimberg et al., 2008; Zuckerman, 2007).

### *6.2.4. Psychological profiles*

Adolescents, because of their particular personality and psychological features, may be attracted by risky situations and engage in them with poor awareness of danger and low self-control (Castellanos-Ryan et al., 2016; van Duijvenvoorde et al., 2016). They voluntarily embrace high-risk activities, with an assumption that they have the ability to control situations and think that they can keep the risk at “controllable” levels, which unfortunately, considering their level of physical development and maturity, is a fallacy leading to serious injuries and/or death. Their search for that elusive “thrill” leads them into dangerous and sometimes fatal situations, particularly when driving. (Figner & Weber, 2011; Smorti & Guarnieri, 2014; Zuckerman, 2007).

This seeming lack of care about safety requirements and limits has been indicated as very common among adolescents who experiment with risky situations (Leiter & Rheinberger, 2016). Furthermore, the gap between perceived risk and real risk seems to have an important role in the experience of risky behaviours among adolescents (Chamarro & Fernandez-Castro, 2009).

Still on this, Lalloo, Sheiham, and Nazroo (2003), investigating the behavioural characteristics of children and adolescents involved in accidents, showed that hyperactivity is a specific relevant risk factor for major and minor injuries.

### 6.2.5. *Short and long-term effects*

Unintentional injuries, when not including death, can lead to serious short-term and long-term consequences for health and psychological damage. In the case of sports accidents, injuries incurred in a wide range of sports, can cause many serious negative consequences such as pathophysiological problems and neuropsychological impairment.

In their recent overview of studies in the area of unintentional accidents among young people, Khurana and Kaye (2012) looked at concussions in sports injuries, which account for the majority of injuries among children and adolescents. Interestingly, the authors underscored low velocity impacts as a feature of sport-related concussions, unlike non-sports related concussions. Moreover, disorientation or relative impairment of consciousness seems to be related to sports concussions, rather than loss of consciousness (Elleberg, Henry, Macciocchi, Guskiewicz, & Broglio, 2009; Lovell, 2009).

Ling, Hardy & Zetterberg (2015), who reported several structured brain damages and physical contusions related to sports trauma, highlighted important neurological consequences and clinical features of injuries in sports. Similarly, Zuckerman et al. (2015), focusing on equestrian-related brain injury, highlighted the public health burden that results from such sports accidents.

### 6.2.6. *Protective factors*

Despite the fact that adolescents often experience risky behaviours, accidents and injuries, most are able to face such challenges, thanks to potential protective factors.

A protective factor identified for the adolescents' involvement in risky behaviours is a good family relationship. Indeed, as highlighted by Jackson et al. (2012), prevention interventions in adolescent risky behaviours that involve parents can support an adaptive psychological functioning and reduce the engagement in risky behaviours (substance abuse, risky sexual behaviours).

More specifically, effective parenting programmes across adolescents' development can help parents to function as a consistent and constant supportive pillar of strength for their children, enabling the children to understand and realise the nature and consequences of participating in risky behaviours. In this regard, the author strongly concurs with Kipping et al. (2012) that although parenting programmes are mainly addressed to parents of adolescents with risk factors, a whole population approach is warranted to ensure the problem is nipped in the bud.

It is also important to consider that research has consistently highlighted the benefits of positive peer support on the psychological functioning of adolescents. All forms of



interpersonal relationships from parents to family members, to teachers, and peers, are indeed crucial in helping adolescents cope with difficulties, protecting them from psychological distress and, ultimately, preventing them from participating in risky behaviours with dangerous consequences (Camara, Bacigalupe, & Padilla, 2014).

## **7. Conclusions and Implications**

The current work, a conceptual overview of national and international literature on adolescent risky behaviours and unintentional injuries, has attempted to throw some light on the distinguishing characteristics or features of the phenomenon.

In line with the theoretical framework of Developmental Psychopathology (DP) (Cicchetti & Rogosch, 2002), this review has focused on both risk and protective factors in the onset of different potential problems across the developmental stage, such as emotional and behavioural conducts.

This work, carried out mainly through a search of internet-based bibliographic databases (PsycINFO, Web of Science, Pubmed), shows that the literature generally confirms the importance of both individual and environmental variables in adolescents' difficulties and maladjustments related to unintentional injuries.

International literature has highlighted the multiple individual and environmental factors related to adolescent injuries. In particular, the focus of the research on adolescents' unintentional injuries was not only on the specific negative consequences but also on the set of different elements that could increase the likelihood of experiencing risky behaviours.

Having said that, although adolescent injuries have been widely studied, the victims' psychological profiles associated with different types of accidents, still remain largely unaddressed, because of the complex interplay of emotional, behavioural and social elements involved.

Indeed, although the issue of unintentional injuries among adolescents has received growing attention for its social significance, in the current analysis of the online databases, adolescents' psychological functioning from the perspective of emotional and behavioural aspects still remain underreported. On the contrary, psychological aspects, especially emotional ones, represent key elements for enhancing the understanding of adolescent behaviours and, more generally, their interpersonal relationships. In particular, the understanding of adolescent psychological functioning can be very relevant for identifying possible maladaptive or negative characteristics that can, in turn, have crucial implications for the onset of psychopathological paths in youth (risky behaviour, violence, aggressive conducts).

It is known that psychopathological manifestations during the developmental age period can cover several kind of symptoms, ranging from internalizing problems (e.g. depression and anxiety) to externalizing difficulties (e.g. aggression and hyperactivity) (Achenbach & Rescorla 2000). In terms of predictive implications, in line with the DP framework, recent studies highlight that the early onset of emotional-behavioural problems during childhood can imply several difficulties across the following stages of life, such as adolescence and adulthood (Ammaniti et al., 2012; Cimino et al., 2016). The earlier difficulties are identified, the earlier it is possible to plan support and intervention programs. Thus, support for adolescents facing moments of emotional, relational or social distress should constitute the strategy to deal with the manifestation of problems, psychopathology and mental illness in adults.

Moreover, as noted by Cerniglia et al. (2015), almost all studies on psychological profiles of adolescents involved in road accidents have emphasised psychopathological outcomes (that is, what occurs after the injuries) rather than the psychological conditions that precede the particular negative episode. In this regard, the author strongly concurs with Carbone (2009; 2010), that specific psychological maladaptive patterns among adolescents, such as alexithymic traits and frequent use of defence mechanisms are associated with risky behaviours. Even more, in particular, the psychological functioning that precede accidents can lead to negative consequences, sometimes very severe, on adolescents' health and well-being. Seen from this point of view, risky behaviour that result in unintentional injuries can be considered a form of hidden "cry" for help and attention.

Thus, the contribution that emotion and relational issues can have in adolescents' psychological functioning should be better addressed. Identifying adolescents' psychological difficulties and deepening the knowledge of "what happens before" the onset of risky behaviours can play a crucial role in helping them, especially in terms of effective intervention programs.

Given the international (socio-economic/socio-cultural) relevance of the phenomenon of adolescent injuries, psychological and relational functioning and their correlates should be more thoroughly investigated, above all, for the great impact of accidents on morbidity particularly among this young population.

More specifically, injuries among adolescents should be studied with a specific focus on psychological functioning, also considering short and long-term complications, and potentially negative sequelae (Erriu, 2016). A holistic comprehension of emotional and behavioural functioning is essential in helping adolescents cope with daily challenges and stressors, to protect them from embracing life-threatening behaviors.

In conclusion, the issue of adolescent risky behaviours still remains particularly complex, including a high level of individual suffering that can result in severe psychological and physical damage. For these reasons, in the scientific area of unintentional injuries among adolescents, the author concurs with the conceptual perspective of Developmental Psychopathology (Cicchetti & Rogosch, 2002), as stressed by Cerniglia et al. (2015), which takes into account not only what happens after the accidents (Craig et al., 2016) but also what happens before, and above all, the victims involved. Indeed, only an in-depth knowledge of all contributory factors, scattered causes and individual features brought together can assist psychologists and counsellors to formulate effective intervention programs which can really “protect” adolescents from death and disability, even possibly leading to a reduction of injuries and deaths in future.

The question of adolescent unintentional injuries represents only a small aspect of the complex set of experiences during this vulnerable life stage. Adolescents are a vulnerable yet extremely important group as they are the budding future of the societies and nations they are part of. Thus, any form of damage, psychological or physical, to this group will have serious and long lasting repercussions on the social, cultural and economic future of their countries and the world. Hence, these key public health goals should remain a clear departure point to understand adolescents’ health endangering behaviours and formulate effective prevention programs. Further studies in this area must be prioritized to achieve these important social and scientific goals.

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