

**UNDERSTANDING RISK FACTORS ASSOCIATED WITH SELF-HARM BEHAVIOR  
IN ADOLESCENTS – HBSC**

**Marta Reis<sup>1,2,3</sup>, Gina Tomé<sup>1,2,3</sup>, Lúcia Ramiro<sup>1,2</sup>, Susana Gaspar<sup>1,2</sup> & Margarida Gaspar de Matos<sup>1,2</sup>**

<sup>1</sup>University of Lisbon, Faculty of Human Motricity

<sup>2</sup>University of Lisbon, Faculty of Medicine, Institute of Environmental Health

<sup>3</sup>FCT - Foundation for Science and Technology / SFRH / BPD / 110905/2015 - SFRH / BPD / 108637/2015

**ABSTRACT**

Self-harm behaviors have been increasing systematically, particularly in adolescents. The national HBSC study evaluated the prevalence of self-harm behaviors and associated risk factors in Portuguese adolescents. The sample consisted of 5695 adolescents, of whom 46.1% were boys, with a mean age of 15 years. The results showed that 18% reported having experienced self-harm behavior. Regarding the risk factors associated with "self-harm", it was found that young people, with more symptoms, more depression, more unhappy, with lower quality of life, worse relationship with their parents and absence of family support were more likely to have engaged in self-harm behaviors.

**Key Words:** self-harm, prevalence, risk factors, protective factors, adolescents, Portugal.

**1. INTRODUCTION**

Non-Suicidal Self-Injury (NSSI), commonly referred to as self-harm or self-injury, has been the target of increasing interest from the scientific community in recent years, as it is a serious public health problem (Gaspar, Reis, Sampaio, Guerreiro, & Matos, 2019; Reis et al., 2017). According to scientific studies, self-harm behaviors begin in adolescence, between 12 and 14 years old although it is not an exclusive phenomenon of adolescents. It is often defined as the intentional destruction of body tissue and occurs without any conscious suicide intent. The most common forms of NSSI include self-cutting, scratching, burning and hitting. Self-harm is one of a broader spectrum of self-harm behaviors that may also include ingesting a medication in excess of the prescribed or generally recognized therapeutic dose (ISSS, 2018).

There are many reasons why youth might engage in self-harming behaviors. In some cases, there may be more than one reason. Common functions appear to include regulation of affect, such as to reduce tension or relieve dysphoric or unpleasant feelings. Self-harm may also be used for self-punishment, interpersonal reasons, sensation seeking and as an anti-dissociation mechanism (ISSS, 2018; Reis, Matos, Ramiro, & Figueira, 2012; Reis et al., 2017). Young people who engage in self-harm behaviors may do so as a method to cope with stress—hurting themselves is often seen as a way to control their upsetting feelings. Others do so to dissociate from their problems (e.g. to distract themselves from emotional pain). Other motivations for why teens may self-harm include: to alleviate angry feelings; to reduce anxiety/tension; to reduce sadness and

loneliness; to punish oneself due to self-hatred; and to escape from feelings of numbness (e.g. to feel something) (Plener et al., 2016a; Reis, et al., 2017).

Some studies have sought to assess the prevalence of self-harm in both the general population and specific samples. With regard to the general population, the percentages in adolescents and young adults range from 17% to 18% (Gaspar et al., 2019; Plener, et al., 2016a, Reis et al, 2012; 2017; Reis, Gaspar, Ramiro, Oliveira, & Matos, 2019; Swannell, Martin, Page, Hasking, & Jonh, 2015) and in clinical samples with adolescents, studies show a prevalence between 15% and 20% (Nock, Joiner, Gordon, Lloyd-Richardson & Prinstein, 2006).

In Portugal, in the Health Behavior in School-aged Children study by WHO, the percentages of self-harm behaviors in adolescents attending the 8th and 10th years of schooling was 15.6% in 2010 and in 2014 there was an increase to 20.3% (Matos, 2011; Matos et al., 2015).

As a matter of fact, self-harm behaviors appear to be more frequent in clinical populations, as well as in adolescence and early adulthood, with a tendency to decrease in later ages (ISSS, 2018; Reis, et. al, 2019), which integrates what is the common perception of the prevalence of this behavior.

There are a number of factors associated with self-harm behavior. These include being female, having symptoms of depression, anxiety, impulsivity, or disruptive disorders, low self-esteem, increased emotional distress, problems with anger control and anger discomfort and drug misuse (Ross & Heath, 2002; Laye-Gindhu & Schonert- Reichi, 2005; Nixon et al., 2008; De Leo & Heller, 2004).

Social factors associated with self-harm behavior include awareness of self-harm in peers, having self-harming family members, and families having problems affording basic necessities. Family factors include emotional neglect (Lipschitz, Winegar, Nicolaou, Harnick, Wolfson, & Southwick, 1999), impaired communication (Tulloch, Blizzard, & Pinkus, 1997) and family related stressors (Rubenstein, Halton, Kasten, Rubin, & Stechler, 1998). In the most recent scientific research, family cohesion appears as protective variables of self-harm behavior (Gallagher & Miller, 2018; Halstead, Pavkov, & Hecker, 2014; Klemra, Brooks, Chester, Magnusson, & Spencer, 2017).

However, as many of these researches were conducted with clinical samples, some questions arise regarding these associations when evaluated with community samples.

In Portugal, studies addressing both the prevalence issues and the risk factors associated with self-harm behaviors in adolescents are scarce. Therefore, contributing to a greater understanding of these issues is one of the central objectives of this study.

## 2. METHODS

This study was based on data from the Health Behaviour in School-Aged Children (HBSC) Portuguese survey (Inchley et al., 2016; Matos et al., 2015, 2018). The Health Behaviour in School-aged Children (HBSC) is a collaborative WHO study, undertaken in 44 countries with the aim to study school-aged behavior regarding health and risk behaviors in adolescence. Portugal is part of this group of countries since 1996. The HBSC is a school-based survey of adolescents' health behaviors, carried out every 4 years. Collected data is used at a national and international level, using an internationally standardized methodological protocol (Roberts et al., 2009) to gain a new vision into young people's health and well-being, so as to understand the

social and psychological determinants of health and to incorporate policies to improve young people's lives.

The 2018 HBSC study in Portugal was approved by the Ethics Committee and the MSS (Monitoring Surveys in the School). School groups agreed to participate and informed consent was obtained from parents or legal tutors. Survey responses (online) were voluntary and anonymous.

Although numerous aspects of health behavior were addressed in the survey, only those relating to socio-demographic characteristics, self-harming behavior, issues associated with self-harm behavior and questions related to the protection self-harm behavior were selected. The main focus of the present study was to: 1a) analyze the frequency of self-harm in Portuguese adolescents, 1b) identify the type of self-harm and which part of the body was hurt, 1c) verify if there are differences between genders and school years, namely between 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> years, and 2a) analyze the factors associated with self-harm behaviors. Connections between these elements of study were examined descriptively in addition to evaluating their potential for prevention.

### 3. PARTICIPANTS

The 2018 HBSC study included 8215 students, 42 groups and 476 classes randomly selected, with an average age of 14.36 years ( $SD = 2.28$ ), 52.7% of females, from the five educational regions of Continental Portugal, and the results are representative for students of 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> years.

This specific study will include 5695 adolescents, of which 46.1% are boys and 53.9% girls, with an average age of 15.46 years ( $SD = 1.80$ ). Most adolescents are of Portuguese nationality (91.7%). With regard to the school year, 48.6% attend the 8<sup>th</sup> year, 30.0% the 10<sup>th</sup> year and 21.4% the 12<sup>th</sup> year and are proportionally distributed among the 5 educational regions of the Continent (North, Center, Lisbon and Tagus Valley, Alentejo and Algarve).

### 4. MEASURES

From the survey, which covers a wide range of questions about health behaviors and lifestyles in adolescence, we selected questions related to sociodemographic characteristics (gender and school years), having had self-harm behavior (no; yes, once in a lifetime; yes, 2 to 3 times; and yes, 4 times or more), most frequently chosen bodyparts (arms, legs and/or stomach with yes and no response options), issues associated with self-harm (psychological symptoms - sadness, anger or bad mood, nervousness and fear with response options like likert 1 = rarely or never, 2 = almost every month, 3 = almost every week, 4 = more than once a week, 5 = almost every day; and the depression scale consisting of 10 items with varying response options from 1 = rarely or never to 4 = always or all the time) and questions related to the protection of self-harm behavior (happiness assessed through a question about the perception of feeling happy vs. unhappy, the quality of life consists of 10 items with a response option ranging from 1 = poor quality of life to 5 = good quality of life; the relationship with family consists of 10 items where the response

option ranges from 0 = very poor to 10 = very good, and the family support consisting of 4 items where the response option ranges from 1 = strongly disagree to 7 = strongly agree).

**Table 1 – Description of the variables included in the study. (n=5695)**

Study variables	Coding	Recoding	Cronbach's Alpha
<b>Gender</b>	1=Male; 2= Female	-	-
<b>Age (school years)</b>	1=8 <sup>th</sup> grade; 2=10 <sup>th</sup> grade; 3=12 <sup>th</sup> grade	-	-
<b>Having had self-harm behavior</b>	1-No; 2- Yes, once in a lifetime; 3-Yes, 2 to 3 times; 4-Yes, 4 times or more	The item 1-No recoded for 0-No; and the items 2- Yes, once in a lifetime; 3-Yes, 2 to 3 times; 4-Yes, 4 times or more recoded for 1-Yes;	-
<b>Body parts used to self-harm behavior (a) arms, b) legs and/or c) stomach</b>	a) arms: 1-Yes; 2 – No; b) legs: 1-Yes; 2 – No; c) stomach: 1-Yes; 2 - No	-	-
<b>Psychological symptoms</b> In the last 6 months, how often have you felt the following: a) Sadness b) Anger or bad mood c) Nervousness d) Fear	Psychological Symptoms - Scale with 4 items, with a score from 1 = almost every day to 5= rarely or never; Scores ranged from 4 to 20; Higher values indicate less psychological symptoms.	Psychological symptoms scale, with 4 items recoded (scores from 1 = rarely or never to 5 = almost every day), the higher the value the more psychological symptoms.	.79
<b>Depression Scale</b>	Scale with 10 items, with response options like likert 1= rarely or never to 4= always or all the time	Recoding of items b) I felt hope for the future and c) I felt happy, and sum of 4 items with response options from 1 = rarely or never to 4 = always or all the time; scores ranged from 10 to 40; higher values reveal more depression.	.82
<b>Happiness</b>	1=I feel very happy; 2= I feel happy; 3= I feel little happy; 4= I feel unhappy	The item 1=I feel very happy; 2= I feel happy; 3= I feel little happy recoded for 0= Happy; and the item 4= I feel unhappy recoded for 1= Unhappy	-
<b>KIDS (quality of life)</b>	The quality of life consists of 10 items with a response option ranging from 1 = poor quality of life to 5 = good quality of life; scores ranged from 10 to 50; higher values indicate very good quality of life.	-	.84
<b>Relation with family</b> The figure represents a ladder. The top of the ladder	0-Very bad relationship with your family	-	-

<p>is "10" and it represents very good relationship with your family, the bottom of the ladder is "0" and represents very bad relationship with your family.</p>	<p>10- Very good relationship with your family</p>
<p><b>Family support</b></p>	<p>Family support -</p> <p>Scale with 4 items, with a score from 1 = strongly disagree to 7 = strongly agree; scores ranged from 4 to 28; higher values indicate very good family support.</p> <p style="text-align: right;">.95</p>

**5. DATA ANALYSIS**

Analyses and statistical procedures were carried out in the Statistical Package for Social Sciences program (SPSS, version 24.0 for Windows). Frequencies and other descriptive statistics were performed to characterize the sample. Self-harm behavior was then compared between genders, school years, and students reporting having engaged in self-harming behaviors, using Chi-square ( $\chi^2$ ). The level for statistical significance was set at  $p < .05$ . The association between the independent variables (gender, age, school years), psychological symptoms, depression, happiness, quality of life, relationship with family, and family support) and the dependent variable (self-harm behavior) were determined using multivariate logistic regression analysis. Odds ratios (OR) and 95% confidence intervals (CI) were calculated for all independent variables. Only significant results were discussed.

**6. RESULTS**

Frequency distributions of adolescents regarding self-harming behavior and differences between genders and school years

The majority of adolescents said that they had never engaged in self-harm behaviors (n= 4042; 82,0%) while 18% (n= 890) reported having had self-harm behavior, namely 8th year students.

Considering the total sample, statistically significant differences were found regarding the year level ( $\chi^2 (2) = 55.586; p < .001$ ). The results revealed that it is the younger (8th year) than the older (10th and 12th years) who most frequently perform self-harm behavior. No statistically significant differences were found regarding gender.

Among the adolescents who reported having performed self-harm behavior (n = 890), the results show that more than one third of adolescents perform their behavior once (38.2%) and 2 or 3 times (37.2%), and over one-fifth of young students reported doing so 4 times or more (24.6%) in the last 12 months.

Regarding the parts of the body most often used to perform self-harm behavior, most adolescents reported arms (58.2%), more than one-fifth legs (25.3%) and 10.2% stomach.

No statistically significant differences were found regarding gender and school years to perform self-harm behavior. However, regarding the parts of body more used to perform the self-harm behavior, statistically significant differences were found between gender and arms ( $\chi^2 (1) = 76,212$ ;  $p < .001$ ).

The results showed that girls (70.8%) mentioned more often than boys (41.7%) using their arms as their main body part to perform self-harm behavior.

No statistically significant differences were found regarding the school years.

**Table 2 – Frequency distributions of adolescents regarding self-harming behavior and differences between genders and school years. (N=5695)<sup>1</sup>**

	Total (n=4932)		Gender (n=4932)				$\chi^2$	School years (n=4932)						$\chi^2$
			Male		Female			8 <sup>th</sup>		10 <sup>th</sup>		12 <sup>th</sup>		
	N	%	N	%	N	%		N	%	N	%	N	%	
No	4042	82.0	1866	82.9	2176	81.2	4.576 <sup>n.s</sup>	1790	78.0	<b>1267</b>	<b>84.1</b>	<b>985</b>	<b>87.2</b>	55.586 <sup>***</sup>
Yes, once in a lifetime	340	6.9	158	7.0	182	6.8		<b>202</b>	<b>8.8</b>	82	5.4	56	5.0	
Yes, 2 to 3 times	331	6.7	135	6.0	196	7.3		<b>174</b>	<b>7.6</b>	102	6.8	55	4.9	
Yes, 4 times or more	219	4.4	93	4.1	126	4.7		<b>130</b>	<b>5.7</b>	56	3.7	33	2.9	

<sup>1</sup> total numbers differ considering that some participants have not replied to some variables.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; n.s = not significant

In bold – values that correspond to an adjusted residual  $\geq |1.9|$

**Only adolescents who reported having engaged in self-harming behavior**

	Total (n=890)		Gender (n=890)				$\chi^2$	School years (n=890)						$\chi^2$
			Male		Female			8 <sup>th</sup>		10 <sup>th</sup>		12 <sup>th</sup>		
	N	%	N	%	N	%		N	%	N	%	N	%	
Yes, once in a lifetime	340	38.2	158	40.9	182	36.1	2.304 <sup>n.s</sup>	202	39.9	82	34.2	56	38.9	4.927 <sup>n.s</sup>
Yes, 2 to 3 times	331	37.2	135	35.0	196	38.9		174	34.4	102	42.5	55	38.2	
Yes, 4 times or more	219	24.6	93	24.1	126	25.0		130	25.7	56	23.3	33	22.9	
<b>Parts of the body most often chosen</b>														
Arms (% Yes)	518	58.2	161	41.7	<b>357</b>	<b>70.8</b>	76.212 <sup>***</sup>	296	58.5	142	59.2	80	55.6	.525 <sup>n.s</sup>
Legs (% Yes)	225	25.3	106	27.5	119	23.6	1.715 <sup>n.s</sup>	133	26.3	67	27.9	25	17.4	5.934 <sup>n.s</sup>
Stomach (% Yes)	91	10.2	42	10.9	49	9.7	.320 <sup>n.s</sup>	55	10.9	23	9.6	13	9.6	.562 <sup>n.s</sup>

<sup>1</sup> total numbers differ considering that some participants have not replied to some variables.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; n.s = not significant

In bold – values that correspond to an adjusted residual  $\geq |1.9|$

Differences between genders and school years for variables related to the risk and protection of self-harming behavior

Of the adolescents who engaged in self-harm behaviors, more than a third of the adolescents report feeling unhappy (39%), have average values for psychological symptoms ( $M = 11.56$ ;  $SD = 4.91$ ) and slightly above average on the depression scale ( $M = 20.83$ ;  $SD = 6.53$ ). However, they report having a good quality of life ( $M = 32.4$ ;  $SD = 7.85$ ), a good relationship with family ( $M = 7.70$ ;  $SD = 2.35$ ) and good family support ( $M = 20.03$ ;  $7.91$ ).

Statistically significant differences were found between the gender and school years for happiness ( $\chi^2(2) = 38.078$ ;  $p = .000$ ;  $\chi^2(3) = 30.942$ ;  $p = .000$ , respectively); quality of life ( $F(1, 888) = 35.930$ ,  $p = .000$ ;  $F(2, 887) = 8.097$ ,  $p = .000$ ; respectively); relation with family ( $F(1, 776) = 11.842$ ,  $p = .001$ ;  $F(2, 775) = 5.264$ ,  $p = .005$ ; respectively); family support ( $F(1, 888) = 14.052$ ,  $p = .000$ ;  $F(2, 887) = 3.222$ ,  $p = .040$ ; respectively); psychological symptoms ( $F(1, 888) = 138.737$ ,  $p = .000$ ;  $F(2, 887) = 9.212$ ,  $p = .000$ ; respectively) and depression scale ( $F(1, 743) = 19.922$ ,  $p = .000$ ;  $F(2, 742) = 11.829$ ,  $p = .000$ ; respectively).

Regarding gender differences, the results showed that girls report more often feeling unhappy (47.8%), have higher level of psychological symptoms ( $M=13.14$ ,  $SD=4.61$ ) and higher level of depression ( $M=21.70$ ,  $SD=6.14$ ) than boys (27.5%;  $M=9.50$ ,  $SD=4.51$ ;  $M=19.56$ ,  $SD=6.89$ , respectively). These in turn reported to higher levels of quality of life ( $M=34.20$ ,  $SD=8.38$ ), better relationship with family ( $M=8.03$ ,  $SD=2.15$ ); and greater family support ( $M=21.15$ ,  $SD=7.79$ ) than girls ( $M=31.08$ ,  $SD=7.14$ ;  $M=7.45$ ,  $SD=2.46$ ;  $M=19.16$ ,  $SD=7.90$ , respectively).

As regards the differences between school years, the results showed that younger adolescents (8th year) report more often feeling happy (68.8%) than older adolescents (10th and 12th years) (52.9%; 47.2%; respectively).

The Post-hoc comparisons by the Games-Howell method indicated that younger adolescents (8th year) reported having more quality of life ( $M = 33.31$ ,  $SD = 8.22$ ) when compared with the other two age groups (10th year:  $M = 31.68$ ,  $SD = 7.52$ ; 12th year:  $M = 30.64$ ,  $SD = 6.56$ , respectively). Tenth year students showed significantly worse relation with family ( $M = 7.28$ ,  $SD = 2.50$ ) when compared with the other two age groups (8th year:  $M = 7.84$ ,  $SD = 2.33$ ; 12th year:  $M = 7.97$ ,  $SD = 1.98$ , respectively).

The Post-hoc comparisons by the Tukey method indicated that younger adolescents (8th year) reported having more family support ( $M = 20.61$ ,  $SD = 7.93$ ) when compared with the other two age groups (10th year:  $M = 19.32$ ,  $SD = 8.04$ ; 12th year:  $M = 19.14$ ,  $SD = 7.45$ , respectively), and also showed that younger adolescents (8th year) reported having less psychological symptoms ( $M = 7.28$ ,  $SD = 2.50$ ) and less depression levels ( $M = 19.80$ ,  $SD = 6.58$ ) when compared with the other two age groups (10th year:  $M = 12.39$ ,  $SD = 4.97$ ,  $M = 21.86$ ,  $SD = 6.13$ ; 12th year:  $M = 12.31$ ,  $SD = 4.56$ ,  $M = 22.43$ ,  $SD = 6.48$ , respectively).

**Table 3 – Differences between genders and school grades for variables related to the risk and protection of self-harming behavior. (N=890)<sup>1</sup>**

Only adolescents who reported having engaged in self-harming behavior															
	Total (n=890)		Gender (n=890)				$\chi^2$	School years (n=890)						$\chi^2$	
			Male		Female			8 <sup>th</sup>		10 <sup>th</sup>		12 <sup>th</sup>			
	N	%	N	%	N	%		N	%	N	%	N	%		
Happiness <sup>2</sup>							38.078***							30.942***	
Feel happy	543	61.0	<b>280</b>	<b>72.5</b>	263	52.2		<b>348</b>	<b>68.8</b>	127	52.9	68	47.2		
Feel unhappy	347	39.0	106	27.5	<b>241</b>	<b>47.8</b>		158	31.2	<b>113</b>	<b>47.1</b>	<b>76</b>	<b>52.8</b>		
							F							F	Post Hoc
			Male		Female			8 <sup>th</sup> (a)		10 <sup>th</sup> (b)		12 <sup>th</sup> (c)			
	M	SD	M	SD	M	SD		M	SD	M	SD	M	SD		
Kids (quality of life) <sup>2</sup>	32.44	7.85	<b>34.20</b>	<b>8.38</b>	31.08	7.14	35.930***	<b>33.31</b>	<b>8.22</b>	31.68	7.52	30.64	6.56	8.097***	a>b>c
Relationship with family <sup>2</sup>	7.70	2.35	<b>8.03</b>	<b>2.15</b>	7.45	2.46	11.842***	<b>7.84</b>	<b>2.33</b>	7.28	2.50	<b>7.97</b>	<b>1.98</b>	5.264**	b<a<c
Family support <sup>2</sup>	20.03	7.91	<b>21.15</b>	<b>7.79</b>	19.16	7.90	14.052***	<b>20.61</b>	<b>7.93</b>	19.32	8.04	19.14	7.45	3.222*	a>b>c
Psychological symptoms <sup>3</sup>	11.56	4.91	9.50	4.51	<b>13.14</b>	<b>4.61</b>	138.737***	10.95	4.90	<b>12.39</b>	<b>4.97</b>	<b>12.31</b>	<b>4.56</b>	9.212***	a<b>c
Depression Scale <sup>3</sup>	20.83	6.53	19.56	6.89	<b>21.70</b>	<b>6.14</b>	19.922***	19.80	6.58	<b>21.86</b>	<b>6.13</b>	<b>22.43</b>	<b>6.48</b>	11.829***	a<b<c

<sup>1</sup> total numbers differ considering that some participants have not replied to some variables. <sup>2</sup>Variables related to the protection of self-harming behavior. <sup>3</sup>Variables related to risk of self-harming behavior.

\* p< .05; \*\* p< .01; \*\*\* p< .001; n.s = not significant

In bold – values that correspond to an adjusted residual  $\geq |1.9|$

**Factors associated with self-harm behavior in Portuguese adolescents**

A logistic regression analysis was performed using the enter method to evaluate the risk and protective factors for self-harm behavior. Possible predictor independent variables were psychological symptoms, depression, happiness, quality of life, relationship with family, family support, as well as the gender and age (school years) variables.

An adjusted model (Hosmer and Lemeshow  $\chi^2= 11.256 (8) p = .188$ ) was obtained and the regression equation explained 20% of variance (Nagelkerke  $R^2 = 0.202$ ) and 81.8% of the cases of having engaged in self-harm behavior. In this model the explanation of the condition of “having engaged in self-harm behavior” is made with greater weight by the variables age (school years), younger adolescents with higher probability of "having engaged in self-harm behaviors" ( $\beta=-.567$ ); happiness, in the negative sense, indicating that the more unhappy participants are, the higher the probability of "having engaged in self-harm behavior" ( $\beta=-.241$ ); gender, the girls with more probability of "having engaged in self-harm behavior" ( $\beta=.202$ ); psychological symptoms, indicating how much more psychological symptoms there are, the higher the probability of "having engaged in self-harm behavior" ( $\beta=.083$ ); relationship with family, in the negative sense, indicating the worse the relationship with one’s family, the higher the probability



of "having engaged in self-harm behavior" ( $\beta=-.065$ ); quality of life (KIDS), in the negative sense, indicating the worse the quality of life, the higher the probability of "having engaged in self-harm behavior" ( $\beta=-.046$ ); depression, indicating the more depressed participants are, the higher the probability of "having engaged in self-harm behavior" ( $\beta=.036$ ); family support, in the negative sense, indicating the worse the family's support, the higher the probability of "having engaged in self-harm behavior" ( $\beta=-.046$ ).

**Table 4 – Factors associated with self-harm behavior in Portuguese adolescents. (N=890)**

	$\beta$	SE	<i>p</i>	OR	95% IC
Gender (Male)	.202	.097	.036	1.224	(1.013 – 1.479)
Age (School Years)	-.567	.063	.000	0.567	(0.502 – 0.641)
Happiness (Happy)	-.241	.119	.043	0.786	(0.623– 0.992)
Quality of life (KIDS)	-.046	.008	.000	0.955	(0.941 – 0.969)
Relationship with family	-.065	.025	.010	0.937	(0.892 – 0.984)
Family support	-.026	.008	.001	0.975	(0.960 – 0.989)
Psychological symptoms	.083	.012	.000	1.086	(1.060 – 1.113)
Depression	.036	.009	.000	1.037	(1.019 – 1.55)
<b>Constant</b>	1.303	.412	.002	3.679	-
$R_N^2 = .202$					
$\chi_{HL}^2 p = 11.256$					

OR: adjusted odds ratios for all table variables; CI: confidence interval

## 7. DISCUSSION

The goal of this national cross-sectional study with adolescents was to analyze the prevalence of self-harm behaviors, to examine out which body part is most used to perform this behavior, as well as to evaluate gender differences and school years. And finally risk and protective factors are associated with engaging in self-harm behaviors.

The results showed that most adolescents did not perform self-injurious behaviors. However, 18% of adolescents reported having engaged in self-harm behaviors, in which more than one third performed from one to 3 times in their life time, and more than a fifth of young people had 4 or more self-harm behaviors in the last 12 months, namely the adolescents attending the 8th year.

The prevalence rate obtained was consistent with other studies, as well as the body area most commonly used in the arms, thus indicating that self-harm behavior should be seriously considered in this population. Most other studies reported a lifetime prevalence of self-harm from 12% to 24% (Gaspar et al., 2019; Guerreiro, & Sampaio, 2013; ISSS, 2018; Plener et al., 2016a), and as for the arms being the most commonly reported injured body area is also reiterated in other studies (Moran et al., 2012; Plener et al., 2016a; 2016b). Moreover, when

comparing the percentages obtained in the different series of the Portuguese HBSC study between 2010 and 2018, there is no decrease in the percentage of self-harm behaviors since the 2010 study, but a stability of this since 2014. The fact that the numbers are stable since 2014 does not mean that self-harm behaviors should not continue to be considered a priority area of intervention, though, since they represent a significant minority that is engaging in risky behaviors.

Considering this significant at-risk minority, and when analyzing gender differences and the variables related to risk and/or protection, results showed that girls more often report feeling unhappy, having higher level of psychological symptoms and higher level of depression than boys. Boys reported higher levels of quality of life, better relationship with family; and greater family support than girls. These results clearly showed that girls are at higher risk than boys.

Concerning the differences between school years of adolescents who reported having engaged in self-harming behavior, results showed that younger adolescents (8th year) more often report feeling happy, having more quality of life, more family support, less psychological symptoms and less depression levels when compared with the other two age groups (10th and 12th years). And young people 10th year showed significantly worse relation with family when compared with the other two age groups (8th and 12<sup>th</sup>years). These results showed that young people 10th and 12th years are at higher risk than young people 8th year.

Through the analysis of the risk factors associated with self-harm behavior, it was found that younger adolescents, girls, those who are most unhappy, those with poorer quality of life, worse relationships with family and family support; are those who have the most psychological symptoms and higher depression level. These results were not surprising, considering previous research that showed that being engaged in self-harm behavior begins in adolescence, as well as being associated with an attempt to alleviate psychological pain by causing physical pain (Guerreiro, & Sampaio, 2013; Moran et al., 2012; Plener et al., 2015). But it was observed that family environment is fundamental to prevent this behavior in young people, for example, the results showed that for this specific problem the relationship with family and family support are very important, allowing to reflect on the importance that the family can have in promoting psychological well-being in young people. And, on the other hand, there are several authors who mention the need to prevent these behaviors as early as possible, and to work on the social and emotional skills of children and adolescents, since studies show that the involvement in self-harm behaviors begins around 12 or 14 years old (Gallagher & Miller, 2018; ISSS, 2018; Klemra et al., 2017).

In general, self-harming adolescents have low self-esteem, manifesting difficulties in interpersonal relationships. They often feel alone, distressed, unable to cope with the situations they perceive as stressors, using self-harm behavior as a kind of "emotional pain reliever". Many adolescents have great difficulty expressing their emotions and thoughts. Unable to verbalize their problems with anyone, they accumulate and increase levels of distress and frustration, leading them to adopt "emotional pain relief behaviors" like cutting themselves, for example. Other young people report that they hurt themselves as a form of self-punishment because they feel they are useless and a failure (Gaspar et al., 2019; Reis et al., 2012; 2017).

When experiencing physical pain, the brain releases pain-relieving neurotransmitters, the endorphins. These chemicals in excess can cause addiction, making this behavior as a supposedly necessary one that momentarily generates "well-being", that is, the behavior

becomes uncontrollable by the adolescent, who simultaneously feels the need to practice it and feels shame/guilt after the action. As a way of hiding as much as possible the result of their behavior (wounds, scars or other marks), the adolescent avoids any activity in which the display of the body is required, such as going to the beach or practicing sports (Guerreiro, & Sampaio, 2013; Reis et al., 2012; 2019).

Given what was previously mentioned and the results obtained, it is essential to invest in educational programs that can address this issue, as well as sensitize young people's families. There are several types of programs that may have some success in addressing self-harming behavior, either directly addressing self-harming or indirectly addressing the associated risk factors.

Finally, it should be noted that there are some limitations in this national study that should be considered when interpreting the results, namely that measures are self-reported and may reflect biases; the analyzes are based on cross-sectional data and the study only covers school-aged students and cannot be generalized to young Portuguese or those leaving school. However, it has the advantage of being a large-scale study, representative of the Portuguese adolescent population, with a rigorous methodology that allows comparing results in each series nationally and subsequently at an international level and with the various countries included in the HBSC network.

## **8. CONCLUSIONS AND RECOMMENDATIONS FOR PROFESSIONALS AND PUBLIC POLICY**

In conclusion, the findings may have significant implications for providing information and directing future educational programs. Despite the growing interest in self-harm with regard to its etiology and epidemiology, many aspects of self-harm behavior remain relatively poorly understood. As such, future investigations remain necessary to better understand and respond to the growing need for young people experiencing self-harm behavior. One of the main barriers to progress in this field is the scarcity of available data sources that include self-harm measures, prevention strategies and how to intervene in this regard. A recommendation for future researches is to incorporate self-harm measures, particularly among adolescents and young adults, so that the prevalence and epidemiology of self-harm can be studied in different populations and environments. Finally, while self-harm is clearly a complex and multifaceted problem, efforts to better understand this issue and find ways to develop prevention and intervention strategies are sorely needed.

The results also suggest that educators are very important in order to help young people, but they need to recognize the symptoms and the signals related to self-harming behavior. And some adolescents are at high risk of severe suffering and suicide-related behaviors. The reticence of those who practice self-harm behavior to seek advice makes it critical for educators to find effective strategies for recognizing and preventing self-harm behavior.

Considering that self-harming adolescents find extremely difficult to talk about themselves and their behavior because they are afraid of rejection or of being judged (because they believe no one can understand and help them), these adolescents need to be supported and their anguish must be acknowledged since most of what they are feeling is caused by a psychic disorganization they are experiencing at this developmental stage.

In order to prevent self-harming behavior, it is necessary to inform and educate their parents, educators and the adolescents themselves about this problem. Educational programs can help adolescents look for other ways to deal with frustrations, they help to identify the implicit problems that cause self-injurious behaviors and they can also help better manage distress/worry, help regulate impulsivity and other emotions, increase self-esteem, improve relationships, and develop more assertive problem-solving skills. Parents, teachers and friends should be aware, and when they notice changes in adolescent behavior that may fit into a self-harming clinical state, they should encourage them to seek psychological help voluntarily, for example.

All the findings mentioned throughout this paper become a concern in terms of prevention and promotion of public and mental health of at-risk adolescents. With regard to young people and particularly students, with all the individual, family, social and economic repercussions that involve self-harming behaviors, the investment that should be made in preventing self-harm in school, with family members and in health centers is highlighted. Schools and health centers, teachers and school health workers can play a very important role both in the early detection of students with psychological problems and in the diagnosis of at-risk young people, thus contributing to their early referral to specialized services. As for family members, they will be the key agents in this whole process of personal and individual development of the young person.

**Key finds:**

- Self-harm is an attempt to alleviate psychological pain by provoking physical pain without the intention of suicide.
- The most common self-harm behaviors include cuts, burns, knocking, scratching, pulling one's hair and breaking bones, the most common form being cutting.
- It is urgent to develop guidelines for the identification, intervention, referral and treatment of self-harm.

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