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CLINICAL REPORT

Cutaneous Deliberate Self-harm in Polish School Teenagers – An Interdisciplinary Challenge

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Self-harm of the skin is a complex problem encountered mainly in adolescents and young adults. The aim of the study was to assess the prevalence of deliberate cutaneous self-harm without suicidal intent among secondary school teenagers of the Lodz region. A self-administered specially designed anonymous questionnaire was delivered to 1,448 secondary school teenagers, aged 12–19 years. The lifetime prevalence of self-reported deliberate self-harm was 19.5%, out of which 14.4% confirmed isolated cutaneous self-injury (self-cutting in the vast majority of cases), 1.7% ingested a substance or drug in excessive amounts and 3.5% declared both behaviours. Our results indicate that skin is the organ most commonly involved in deliberate self-harm. Dermatologists, especially those focussed on dermatosurgery and aesthetic dermatology, should understand the special issues relating to such patients before taking decisions concerning performing any procedures on these individuals, since deliberate self-harm has been recognised as one of the main risk factors of suicide. ***Key words: youth; deliberate self-harm; psychodermatology; suicide; risk factors.***

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Deliberate self-harm (DSH) of the skin is an interdisciplinary issue of interest to both psychiatrists and dermatologists. Dermatological assessment carried out even for a skin condition like acne may be the first opportunity to reveal the signs of DSH such as self-cutting, scratching and burning. DSH is also a recognised risk factor of suicide, which is the second or third most frequent cause of death among adolescents in several countries (1–3)[1].

Self-inflicted skin lesions are a complex problem encountered mainly in adolescents and young adults and are a frequent cause of emergency admission to the Department of Adolescent Psychiatry of the Medical University of Lodz. Among psychiatric juvenile patients hospitalised over the last 6 years, the proportion of patients with DSH has doubled (from 27% up to 47%) (5). Teenagers do not always understand the motives driving their own behaviours (6–8). However in adults the skin plays a key role in social contacts and adults may seek medical help to get rid of the signs and stigma of their teenager DSH behaviour. The prevalence of DSH among teenagers varies between 1% and 38% (9–12).

In order to understand DSH, it is important to identify the risk factors for such behaviour, other than serious mental disorder. Risk factors include geopolitical and family conditions, gender, use of psychoactive substances and suicidal attempts among close relatives (3, 13, 14). In a pilot study performed, in one randomly selected secondary school in Lodz, DSH in the form of self-cutting of the skin, mainly of the thighs, was detected in 15% of the teenagers examined (15).

The psychological stimulus of self-injury in teenagers is mainly regarded as an attempt to cope with negative emotions including emotional strain, anger, fear or low self-esteem (16, 17). Use of "coping with stress" strategies in an active and optimistic way seems to be correlated with better psychological well-being and better functioning in everyday life (18).

The aim of this study was to evaluate the prevalence of cutaneous DSH cases without suicidal intent among secondary school teenagers and identify any relationship between DSH and selected psychosocial factors in the studied population.

MATERIALS AND METHODS

Sample

The random sampling involved public schools, where both students and parents declared voluntary participation in the local authorities programme entitled "Health Promoting Schools".

[1] According to the WHO/Euro Multicentre Study Working Group and the Child and Adolescent Self-harm in Europe (CASE) Study Group, the definition of DSH is "an act with a non-fatal outcome in which an individual deliberately, with or without suicidal intentions, performed one or more of the following acts: initiated behaviour (for example, self cutting or jumping from height), with the intention to cause self-harm; ingested a substance or drug in excess of the prescribed or generally recognisable therapeutic dose; ingested a non-ingestible substance or object" (1–3). A more practical definition by Favazza & Rosenthal (4) focuses on DSH as a deliberate, direct destruction or alteration of body tissues without conscious suicidal intent, resulting in injury severe enough for tissue damage, e.g. scarring (5).

Out of 50 different types of public high schools in Lodz we randomly picked 13 (27%). In each school we then randomly selected one class (20–30 students) on each level (I, II, III). On the day of performing questionnaire sampling the absence rate in each class was about 10%. Only one student returned the questionnaire form with unfilled items and was thus excluded from the study. The population studied included 1,448 secondary school students in Lodz, aged between 12 and 19 years.

Procedure

A DVD educational presentation on the objectives of the project was shown to both teenagers and their teachers before distribution of the anonymous questionnaires. All questions raised were immediately answered by the study investigator (A.G.) after the DVD presentation. The questionnaires were filled in during classes, thus the students have some "free" time from teaching hours. Students were also motivated by being asked by university teachers for help in a very important scientific study addressing the issues of suicide. Such approach probably resulted in lack of refusals to fill in the questionnaire. Additionally, before returning the forms, students were kindly asked to check whether all questions had been answered.

The study was performed during one school year and completed in 2010 by a series of lectures and workshops presented to participating students and teachers. This educational activity was based on the results obtained from the questionnaires. The study was approved by the Medical University of Lodz Bioethics Committee (approval number RNN/165/09/KE).

Measures

A specially designed anonymous questionnaire comprising 17 questions was developed for the study. In order to assess the test reliability we carried out the test-retest procedure on a group of 20 inpatients of the Department of Adolescent Psychiatry in Lodz. We obtained a good repeatability when comparing the results acquired from the subjects within one week interval. The questionnaire form included closed questions on the following issues: 1 – gender, 2 – age, 3 – living situation – living with both parents or other, 4 – use of psychoactive substances (such as alcohol, drugs). Question number 5 regarded one's behaviour at school: 5a – escapes from home, 5b – truancy, 5c – conflict with the law, 5d – class repeats). One's mental problems including psychiatric treatment – 6a, and learning difficulties – 6b were also recorded. Family history including psychiatric disorders – 7a, substance use (such as alcohol, drugs) –7b, DSH prevalence in relatives – 7c, suicidal attempts – 7d, and cases of psychological violence – 7e were noted. One's physical violence experience and suffering from it for at least 1 hour – 8a, feelings of fear, sadness, despair, aggression, nightmares or low mood states (for more than two weeks) – 8b were also recorded. Furthermore, the self-injury rate in the examined students without any intent of suicide, taking into account location of self-injuries – 9, number of DSH episodes – 10, ways of performing them (such as self-cutting, getting burnt, self-pricking, scratching) – 11, triggering factors of self-injuries – 12, aims for performing them – 13, medical help seeking because of self-injuries – 14 were also noted. Dissatisfaction with appearance – 15a and fitness – 15b, the sense of uncontrolled behaviours such as anxiety – 16a, sadness – 16b, lack of control experience – 16c and bursts of anger – 16d as well as the occurrence of suicidal thoughts, independently of DSH episodes-17 were also documented. Regarding psychological variables, only emphatic answers, such as "yes/no", "often/rarely" were considered in the statistical analysis, while ambivalent answers were neglected. The selection of variables was performed on the basis of the CASE study recommendations (1, 2).

Statistical analysis

The two-tailed χ^2 test for comparison of proportions was used for the assessment of the bivariate relationship of demographic and psychosocial variables with reported DSH prevalence. The factors, independently associated with the reported DSH ($p < 0.10$), provided input to the backward stepwise logistic regression analysis. A two-sided p-value < 0.05 was considered as statistically significant. The Hosmer-Lemeshow statistical test determined the appropriate fit for the model. The ability of the fitted model to discriminate between DSH-reporting and not reporting participants was evaluated by the receiver operator characteristic (ROC) analysis, area under curve (AUC), standard error (SE) and confidence interval (CI).

RESULTS

The following two groups were identified: students with deliberate self-harm history (DSH: ≥ 1) and students who did not confirm any DSH episodes.

A total of 1,448 participants filled in the questionnaires. The study comprised 897 (62%) boys and 551 (38%) girls (aged ≥ 13 years = 97%). Living with both parents was reported by 73% of the participants, while 25% stayed with one parent or caregiver. The lifetime prevalence of DSH was 19.5% for all the participants (282 teenagers out of 1,448) including 14.4% who confirmed cutaneous self-injury only, 1.7% ingested a substance or drug and 3.5% reported both behaviours. Cutaneous self-harm included self-cutting (90% of cases, on thighs and forearms), getting-burnt, self-pricking of the skin or mixed acts. Having suicidal thoughts (independent of DSH episodes) was confirmed by 58.6% ($n = 163$) of the students in the DSH group, while in the group without DSH episodes, suicidal thoughts were reported by 17.5% ($n = 203$) of the students. Only 14% of the teenagers sought medical help after a DSH act. A univariate analysis of all the demographic and psychosocial variables resulted in bivariate correlates of self-reported DSH (see Table I). Neither the subjects' age (above and below 13 years), conflict with the law, nor failing the year was significantly and independently related to DSH. The lack of both self-image satisfaction and physical fitness satisfaction was reported more frequently by teenagers with DSH ($p < 0.001$). Coping with stress strategies, anxiety, sadness, lack of control experience and anger outbursts were also more often reported by DSH teenagers ($p < 0.001$) (see Table I). All significantly related DSH variables were incorporated into a multivariate stepwise logistic regression analysis. The best fitted model with the highest discriminate ability contained 9 demographic and psychosocial factors (Table II). The factors most strongly associated with self-reported DSH included home escapes, family history of DSH and psychiatric treatment (OR 3.80, 3.15 and 2.78, respectively) (see Table II). The ROC analysis confirmed significant predictive power of the model ($p < 0.001$) with AUC of 0.789, SE 0.015 and 95% CI 0.759–0.819.

Table I. *Self-reported demographic, psychosocial characteristics of 1,448 participants in the school-based survey of youth*

Characteristic feature	Self-reported deliberate self-harm behaviour: No *n* = 1,166 (80.5) *n* (%)	Yes *n* = 282 (19.5) *n* (%)	*p*-value
Gender			
Male	762 (65.4)	135 (47.9)	
Female	404 (34.6)	147 (52.1)	<0.001
Age			0.858
<13 years	31 (2.7)	7 (2.5)	
>13 years	1,129 (97.3))	275 (97.5)	
Current living status			<0.001
With both parents	872 (74.9)	184 (65.2)	
With 1 parent	261 (22.4)	77 (27.3)	
Other	31 (2.7)	21 (7.4)	
Alcohol use	318 (27.3)	141 (50.0)	<0.001
Substance use	38 (3.3)	26 (9.2)	<0.001
Home escapes	21 (1.8)	31 (11.3)	<0.001
Truancy	477 (41.0)	181 (64.4)	<0.001
Conflict with law	35 (3.0)	13 (4.7)	0.165
Learning difficulties	474 (40.8)	166 (59.3)	<0.001
Class repeats	125 (10.8)	40 (14.2)	0.1
Psychiatric treatment	24 (2.1)	32 (11.6)	<0.001
Family history of:			<0.001
Psychiatric disorders	111 (9.6)	74 (26.5)	
Substance use	300 (26.0)	149 (53.8)	
DSH	87 (7.5)	94 (33.7)	
Suicide attempt	68 (5.9)	65 (23.3)	
Psychic violence	85 (7.3)	68 (24.4)	<0.001
Physical violence	205 (17.6)	111 (39.6)	<0.001
Self-image satisfaction			<0.001
Not satisfied	84 (7.2)	45 (16.0)	
Variable	574 (49.5)	141 (50.2)	
Satisfied	502 (43.3)	95 (33.8)	
Physical fitness satisfaction			0.001
Not satisfied	122 (10.5)	50 (17.9)	
Variable	416 (35.9)	104 (37.1)	
Satisfied	621 (53.6)	126 (45.0)	
Anxiety experience			<0.001
No	726 (63.0)	114 (41.2)	
Rare	353 (30.6)	107 (38.6)	
Frequent	74 (6.4)	56 (20.2)	
Sadness experience			<0.001
No	763 (66.0)	112 (40.1)	
Rare	311 (26.9)	101 (36.2)	
Frequent	82 (7.1)	66 (23.7)	
Lack of control experience			<0.001
No	810 (70.3)	122 (44.0)	
Rare	289 (25.1)	113 (40.8)	
Frequent	54 (4.7)	42 (15.2)	
Angry outbursts			<0.001
No	391 (33.8)	40 (14.5)	
Rare	586 (50.7)	127 (46.0)	
Frequent	179 (15.5)	109 (39.5)	

p-values according to χ^2 test; differences in total frequencies are the result of missing data exclusion.

Table II. *Predictors of deliberate self-harm (DSH) resulting from multivariate logistic regression analysis of the school-based survey of youth data*[a]

Predictor	Coefficient	OR (95% CI)	*p*-value
Constant[b]	–3.31		
Home escapes (yes vs no)	1.34	3.80 (1.86–7.77)	<0.001
Family history of DSH (yes vs no)	1.15	3.15 (2.09–4.73)	<0.001
Psychiatric treatment (yes vs no)	1.022	2.78 (1.36–5.67)	0.005
Physical violence (yes vs no)	0.92	2.50 (1.75–3.57)	<0.001
Gender (female vs male)	0.84	2.32 (1.64–3.27)	<0.001
Sadness experience (frequent vs no)	0.83	2.28 (1.43–3.64)	0.001
Alcohol use (yes vs no)	0.68	1.97 (1.41–2.76)	<0.001
Truancy (yes vs no)	0.53	1.71 (1.22–2.38)	0.002
Family history of substance use (yes vs no)	0.36	1.44 (1.02–2.02)	0.036

[a]χ^2 =285.142; df = 10; p < 0.0001. The Hosmer-Lemeshow goodness-of-fit-test: χ^2 =12.391; df = 7; p = 0.088. Nagelkerke's R square = 0.301.
[b]The odds of DSH, corresponding to the value of –3.31, is 0.037. Because the other predictors merely increase the odds of DSH, the value of 0.037 represents the most favourable patient profile.
OR: odds ratio; CI: confidence interval.

DISCUSSION

Our results indicate a slightly higher prevalence of DSH among secondary school students in Lodz (every fifth student affected) in comparison to the results from other countries. The difference could result from the use of more specific diagnostic criteria (20, 21). Our earlier studies, performed on a representative population of secondary school students in Lodz, demonstrated DSH with overt suicide attempt in 7% of the studied population (22). During the 5 years since 2001 there was no significant increase in suicide intent-related DSH in the general population of adolescents (pilot studies by Lewandowska et al. (15) on cutaneous self-cutting revealed a 15% prevalence of DSH among secondary school students), whereas this number was doubled in the hospitalised population (5). This could be because of the "Werther effect" (imitation), triggered by concurrent mental symptoms, such as impulsiveness, sadness or fear (2, 3, 20, 23). Even if there was no relationship between the occurrence of DSH in young inpatients and the presence of specific psychiatric disorders, clinicians should still remain alert to these symptoms (5). Groholt et al. (24) have demonstrated that depressive symptoms are risk factors for both clinical and non-clinical DSH-affected adolescents (OR 4.7 and 3.1, respectively). Untreated DSH may precede suicide (25–27). In the examined general population with DSH, almost two-thirds of the patients confirmed suicidal ideation (without any association with DSH), while sadness experience or low mood states were observed in 23.7% of patients (OR 2.28; 95% CI 1.43–3.64).

It is important to distinguish between the different DSH methods: self-injury or overdose (1–3). Cutaneous self-injury by self-cutting is the most frequently observed DSH method (23, 25, 27). However, substance abuse may be more prevalent, observed in 76% of students (25). Such differences may result from differing study enrolment criteria. Our study demonstrated that secondary school students were much more inclined to cutaneous self-injury than to overdose (14.4% vs 1.7%). It further demonstrated the importance of psychodermatological issues in everyday medical practice, underlining the importance of including psychoderma-

tological topics in standard dermatological training. This is especially important as there is evidence of an increase in emotional problems among youths and lack of educational activities aiming at dealing with them in medical undergraduate curricula (28–30).

Female gender is a predictor of DSH (23, 25, 26, 31–33). In our study there was an atypical gender distribution as more male-dominated trade/vocational schools were selected by the randomisation process because of the high numbers of such schools in the Lodz region. However, there was an almost 3 times higher prevalence of DSH in girls in our study. The fact that girls dominate in the DSH group has prompted a number of authors to search for separate, gender-associated risk factors (17, 25, 31, 32). The cultural reasons given are that girls have less chance than boys to discharge emotional strain, e.g. through fights (26, 32). This is also true for Polish culture. This observation is of relevance to the high predominance of women, in comparison to men, seeking help from dermatologists and plastic surgeons to perform aesthetic procedures. Also patients with acne excoriée, neurotic excoriations and other self-injurious behaviour of the skin are increasingly seeking medical help during adolescence (30, 34–39).

Only 14% of the teenagers that we studied sought medical help after DSH, which is in accordance with previous reports (23). This may be explained by the perception in Poland that self-injury is a behaviour that is highly embarrassing to others. Therefore, DSH is revealed mainly in serious or life-threatening cases and often not reported when less dramatic. However, when teenagers grow up, the scars that remain seem to be an important issue to them.

Due to the possibility of underlying psychological/psychiatric problems, dermatologists performing aesthetic procedures and plastic surgeons should be aware of dealing with "interdisciplinary" patients, whose mental health status should be taken into account before performing any interventions. Such an approach could prevent the development of disappointment from aesthetic dermatology in patients who are already not in a psychologically stable state, such as those with borderline personality disorder, disruptive disorders (conduct disorder, oppositional defiant disorder) or body dysmorphic disorder (dysmorphophobia) (30, 36, 38, 40, 41). Our results concerning the influence of anxiety and sadness experience, lack of control, outbursts of anger, family history of psychotic disorders and substance abuse could help dermatologists in a more appropriate management of their patients. About 30% of dermatological out-patients and up to 60% of dermatological in-patients have some psychological abnormalities, and so all dermatologists should be aware of this in their approach to their patients (19).

The much higher prevalence rate of DSH observed among those teenagers who had left home (OR 3.8), may indicate family dysfunctions and/or disruptive disorders to be triggers for DSH attempts/acts. This hypothesis seems to be further confirmed by other factors, revealed in the multivariate stepwise logistic regression analysis: family history of DSH (OR 3.15) and substance abuse (OR 1.4), with regards to the examined students themselves – psychiatric treatment (2.78), alcohol ingestion and truancy. Alcohol abuse by one or both parents, as well as disturbed family relations are important factors characterising families of self-harming teenagers (4, 11, 14, 15, 24). Furthermore, alcohol abuse, truancy and/or leaving home by DSH–affected adolescents may result rather from their weaker social abilities and low self-esteem than from their family situation itself (in self-harmers twice as often as in students without DSH, 15% vs. 7.9%). DSH may also be a manifestation of the lack-of-control experience (in 11.8% of self-harmers and in 5.9% of non-self-harmers) and of anger outbursts (in 36.9% and 17.3%, respectively).

Traumatic experience in childhood, i.e. physical or psychological violence, is regarded as one of the main factors triggering not only DSH but also other forms of psychopathology (33). The fact that the examined students with DSH significantly more frequently (OR 2.5) experienced physical violence from the close family environment, may be explained by Linehan's theory, which assumes that self-injuries may be a consequence of specific environmental effects (42). A child growing up in an environment where any communication of personal experience induces unpredictable answers and where the expression of personal feelings is questioned and punished, does not acquire the basic abilities of verbalisation and adequate expression of personal emotions. Self-harm of the body may then function as an acquired ability of independent and controlled coping with disorders at the level of emotional strain. The results of other studies confirm that self-harm may function as a specific mechanism of physiological tension discharge (13, 17). It is known that the effects of DSH (tension discharge) are short-lasting, and are often followed by emotions such as self-anger, a sense of guilt, a sense of helplessness, as well as sadness and self-complaining, that leads to repeated DSH episodes and finally a vicious cycle is established. Thus, it seems advisable to include in school curricula some educational activities on learning and further mastering such personal resources as coping with stress strategies, anger management techniques or working on self-esteem (18, 29, 43).

In conclusion, DSH is an interesting and challenging issue for both dermatologists and psychiatrists. Dermatologists specialising in dermatosurgery and aesthetic dermatology should be aware of this problem before taking any medical decisions and performing any procedures on identified patients.

The issues identified in the multivariate regression analysis may be used by both dermatologists and psy-

chiatrists as the basis for screening for DSH when taking a patient's history.

Limitations of the study

One limitation of the current study was the lack of both dermatological and psychiatric consultations of the school teenagers. Furthermore, over-representation of trade/technical schools in the Lodz region and the lack of verification for the obtained data by specific validated questionnaires/scales are additional limitations. We used the questionnaire specially designed for the study, so it is not a validated one. However, we performed the test–retest procedure within one week interval and obtained a good repeatability.

There was also a low number of teenagers below the age of 13 years, which is regarded as a turning point in puberty, with intensification of self-harming behaviour (27, 32). This limitation, however, directly resulted from the adopted randomisation process. The statistical analysis did not reveal any differences in age-related DSH prevalence. However, our approach was previously successfully adopted in similar studies (14). The selected methodology also resulted from limited funding and lack of parental consent for medical consultations, especially psychiatric ones, in some schools.

Finally we accepted and included into the study the questionnaires with single missing answers and carefully calculated the responses only from the questions actually answered. This could, however, create some bias but to the best of our knowledge there is no reliable way to check whether any given answers are really true ones.

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