

Joan-Carles Suris, MD, PhD, MPH, André Jeannin, MA, Isabelle Chossis, MD, and Pierre-André Michaud, MD
Research Group on Adolescent Health, University Institute of Social and Preventive Medicine, Lausanne, Switzerland

Piercing among adolescents: Body art as risk marker

A population-based survey

Practice recommendation

Without stigmatizing adolescents with piercing, use the topic of body piercing as a starting point for discussing unhealthy behaviors

Implications

Our results indicate that body piercing (other than earlobes) is a marker for risk behaviors, and that, among females, multiple piercing seems to be a cumulative marker. We should pay particular attention to potential harmful behaviors among these adolescents. We should not stigmatize pierced adolescents. (See Dr Susman's editorial, "Perspicacity, profiling, and prejudice," on page 83.) Body art is more than just an indicator of deviancy.¹¹ In other words, as all adolescents should be screened for risky behaviors, this specific population offers the advantage of piercing as a starting point for a discussion.

We found that body piercing is increasingly popular among adolescents in Switzerland, especially among females. Our prevalence rates are higher than those reported by Roberts,³ but (as they suggest) it may well be due to the societal trend, as their data were collected in 1996.

Body piercing among young people has been linked with risk behaviors such as the abuse of legal and illegal substances,¹⁻⁵ risky sexual behavior,^{2,5} school truancy and running away,² suicide ideation and attempts,² and delinquent behavior.⁴

Body art and, more specifically, piercing is becoming normative among adolescents,^{6,7} with prevalence close to 70% in some studies.¹ However, studies of adolescents are few,^{1-5,8-10} and most used local¹⁰ or convenience^{2,5,8,9} samples or populations known to be at high risk, such as detainees.¹ To date, the only population-based study among adolescents reported a prevalence rate of 7.2% among females and 1.5% among males.³

Our objectives:

- to ascertain the prevalence of piercing among a nationally representative sample of adolescents
- to assess whether a piercing is a marker for risk behaviors
- to assess whether having more than one piercing is a cumulative marker for risk behaviors.

The pierced and the unpierced

Academic performance was the main sociodemographic difference between pierced and unpierced adolescents. As a marker of risk, piercing was negatively associated with academic performance, as found elsewhere regarding healthy behaviors.¹² Like other studies, this sample exhibited increased drug use^{1,3,5} and risky sexual behavior,¹⁰ but no increase in suicide attempt.³

SEE ALSO

Dr. Susman's editorial: Perspicacity, profiling, and prejudice

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CORRESPONDENCE

Joan-Carles Suris, MD, PhD, MPH

Groupe de recherche sur la santé les adolescents, Institut universitaire de médecine sociale et préventive, Bugnon 17, 1005 Lausanne, Switzerland
joan-carles.suris@chuv.ch

Tattoos, piercings, and problems in US youth

Since the late 1990s, estimates for body modification among US adolescents range from 10% to 25%.^{8,14} A 2002 study⁵ assessed tattoos and body piercing as markers of risk-taking in 484 adolescents presenting to an adolescent clinic in California; both were markers of greater instances of, and participation in, such behaviors as eating disorders, illegal drug use, sexual activity, and suicide. Tattooing was reported by 13.2% of respondents, with 5.2% having more than 1 tattoo. Excluding earlobes, 26.9% of adolescents had body piercings at some point during their lifetime, and 11.8% had a history of multiple piercings. Tattooing and body piercing were found to be more common in females than males, 16.6% vs 8.1% for tattoos and 36.7% vs 10.1% for body piercings, respectively. Index scores on 5 of 6 risk-taking indices—including the Disordered Eating Behavior Index, the Gateway Drug Index, the Hard Drug Index, the Sexual Behavior Index, and the Suicide Index—were significantly higher in participants with at least 1 tattoo or body piercing compared with those with neither. Illegal drug use also increased with the number of piercings.

Another study¹⁵ looked at 14- to 18-year-olds presenting to an urban adolescent clinic in Massachusetts. Of 210 surveyed, 48% reported at least 1 body modification, with girls more likely than boys (59% vs 28%; $P \leq .0005$). Forty-two percent reported piercings, 10% had tattoos, 4% had scarification; 21% had more than 1 type of modification. One third of the sample screened positive for problem substance use. Controlling for age, adolescents with body modification had 3.1 times greater odds of problem substance abuse with alcohol or drugs than those without (95% CI, 1.7–5.8).

Among females in our sample, more than 1 piercing is associated with having multiple sex partners and marijuana use. Carroll et al⁵ also found that having multiple piercings was associated with illegal drug use. For males in our study, the only association with multiple piercings was an increase in suicide attempts.

From our results, it could be hypothesized that more than 1 piercing is a cumulative marker for some risk behaviors, mainly among females. Though associations for males were similar to those for females, the differences between pierced and unpierced groups did not reach statistical significance. However, the relatively small sample of pierced males discourages definitive conclusions.

Pierced adolescents were less satisfied with their bodies than their unpierced counterparts, though the difference is significant only for females.

Young people indicate that the main reasons they obtain a piercing are a sense of uniqueness or self-expression, with only one fifth indicating that they obtain it for aesthetics only.^{2,8} As we did not assess the reasons to obtain a body piercing in this study, it could be that they had it done to

increase their body satisfaction, that their body satisfaction was lower after having it done, or simply that they do not get pierced to increase their satisfaction with their body.

■ Methods

Population. Data were drawn from the 2002 Swiss Multicenter Adolescent Survey on Health database, a survey of 7548 students ages 16 to 20 years (3658 of whom were female). In Switzerland, school is mandatory up to age 16. Afterwards, about 30% of adolescents follow to further high school, 60% go to vocational school as an apprentice (1 or 2 days of class per week and the rest spent at work), and 10% do not continue their education.

Classroom survey. The survey was an anonymous classroom questionnaire approved by the ethical committee of the Medicine Faculty in Lausanne. The questionnaire and sampling method are described elsewhere.¹³ Ninety-one subjects (1%) did not answer the question referring to body piercing and were excluded. The final sample had 7457 subjects (3628 females).

FAST TRACK

2 US studies assessed tattoos and body piercing as markers of risk-taking

TABLE 1

Selected characteristics of pierced and unpierced adolescents—females (N=3628) and males (N=3829)

	FEMALES				MALES			
	PIERCED (N=1225)	UNPIERCED (N=2403)	P VALUE	AOR (95% CI)	PIERCED (N=283)	UNPIERCED (N=3546)	P VALUE	AOR (95% CI)
Age (years ± SD)	17.98 ± 1.17	17.77 ± 1.13	<.001	0.94 (0.88–1.01)	18.21 ± 1.20	17.86 ± 1.18	<.001	0.90 (0.80–1.00)
Academic track (apprentice)	73.1%	53.1%	<.001	2.05 (1.75–2.41)	91.5%	71.0%	<.001	2.97 (1.92–4.62)
Body satisfaction (dissatisfied)	67.4%	71.2%	.02	0.96 (0.82–1.14)	82.3%	86.3%	.064	—
Nationality (Swiss)	10.9%	13.5%	.027	0.72 (0.57–0.92)	16.6%	13.3%	.119	—
Perceived puberty (advanced)	36.6%	30.2%	<.001	1.06 (0.91–1.25)	39.6%	23.3%	<.001	1.41 (1.07–1.86)
Parental status (not together)	31.3%	20.8%	<.001	1.30 (1.10–1.55)	32.5%	21.7%	<.001	1.35 (1.02–1.79)
Father's education (low)*	11.4%	15.9%	<.001	0.67 (0.53–0.84)	15.5%	14.0%	.476	—
Mother's education (low)*	21.2%	22.9%	0.24	—	23.0%	20.8%	.379	—
Sensation seeking (high)	21.9%	15.5%	<.001	1.14 (0.94–1.39)	53.0%	40.0%	<.001	1.13 (0.87–1.47)
Feeling depressed (yes)	45.0%	36.2%	<.001	1.16 (0.98–1.36)	29.0%	21.7%	.005	1.05 (0.78–1.42)
Number of sexual partners (≥4)	20.6%	8.3%	<.001	1.50 (1.20–1.87)	45.6%	17.9%	<.001	1.71 (1.29–2.28)
Condom use at last intercourse (no)	46.9%	27.5%	<.001	1.63 (1.39–1.92)	39.6%	19.5%	<.001	1.49 (1.12–1.98)
Regular smoker (yes)	48.9%	21.9%	<.001	2.06 (1.74–2.45)	66.4%	30.9%	<.001	2.28 (1.72–3.02)
Intoxication (last 30 days)	26.9%	15.7%	<.001	1.19 (0.98–1.44)	60.8%	39.0%	<.001	1.51 (1.15–1.97)
Cannabis use (last 30 days)	40.9%	20.6%	<.001	1.58 (1.32–1.89)	67.5%	39.1%	<.001	1.37 (1.05–1.79)
Illegal drug use (last 30 days)	8.7%	3.4%	<.001	1.67 (1.21–2.31)	26.9%	8.3%	<.001	2.17 (1.59–2.98)
Suicide ideation (last 12 months)	26.8%	21.2%	<.001	1.07 (0.88–1.29)	22.6%	15.5%	.002	1.22 (0.87–1.72)
Suicide attempt (last 12 months)	5.3%	2.7%	<.001	0.97 (0.65–1.45)	3.2%	1.4%	.02	1.02 (0.45–2.31)

AOR, adjusted odds ratio; CI, confidence interval.
Statistically significant differences are in bold.
*Low education = mandatory schooling or less.

TABLE 1 lists selected characteristics and background variables analyzed. Analyses were performed separately by gender, as the literature indicates that females are more likely to have piercings.^{2–5} We conducted all analyses with Stata 8 (College Station, TX), which computes coefficient estimates taking into account sampling weights, clustering, and stratification procedure. All significant variables in the bivariate analysis were included in a logistic regression.

In a second step, adolescents having one piercing were compared with those having more than one piercing, using the same method.

Results

Overall, 20.2% (95% confidence interval [CI], 19.3–21.1) of our sample had a piercing, and it was significantly more prevalent among females than males: 33.8% (95% CI, 32.2–35.3) vs 7.4% (95% CI, 6.6–8.2); *P*<.001.

Single piercing

Bivariate analysis. Having a piercing was significantly associated with all the risk behavior variables both in males and females. In both genders, pierced adolescents were significantly older, more frequently on an apprentice academic track, per-

ceived advanced puberty, not living with both parents, had felt depressed, and were sensation-seeking. Additionally, pierced females were less likely to be satisfied with their body, less likely to be foreign-born, and more likely to have a mother with low education (mandatory school or less).

Multivariate analysis. Controlling for all significant background variables, pierced females were more likely to have had multiple sexual partners, not to have used a condom at last intercourse, to be regular smokers, and to be current users of cannabis or other illegal drugs. Among males, all risk behavior variables remained significant, except suicide ideation and attempt (**TABLE 1**).

Multiple piercings

One third (34.1% [95% CI, 31.7–36.5]) of pierced subjects had more than 1 piercing, with similar rates for males (35.3% [95% CI, 29.8–40.9]) and females (33.8% [95% CI, 31.1–36.4]).

Bivariate analysis. Among females, having more than one piercing was associated with being an apprentice, perceived advanced puberty, parents not living together, sensation seeking, and being depressed. With the exception of condom use at last intercourse, they were significantly more likely to engage in all risky behaviors.

For males, the only difference between single and multiple piercings was that the latter were more likely to have attempted suicide (**TABLE 2**).

Multivariate analysis. The only variables associated with females having more than one piercing were having multiple sexual partners (adjusted odds ratio [OR]=1.53 [95% CI, 1.13–2.09]) and using cannabis (adjusted OR=1.39 [95% CI, 1.06–1.82]).

Limitations of this study

The main strength of our study is that it is based on a nationally representative sample of adolescents. However, a few

Will legislation cut down on complications?

Body piercing leads to medical complications in a non-negligible percentage of cases^{7,9,10} particularly if done by nonprofessionals.⁹ Given the high prevalence of adolescents, particularly females, who do body piercing, and their greater tendency to engage in risk-taking behaviors (and thus may be less careful about potential medical consequences), it seems important to make sure that they can do it under the safest conditions. Indeed, in Switzerland, new legislation regulating body piercing went into effect in 2006.

limitations need to be stressed.

The cross-sectional nature of our survey does not allow us to assess causality. The questionnaire was filled in the classroom, which excludes absentees and drop-outs, both known to be at higher risk.¹² Additionally, we do not know the location or the size of the piercings; some locations (eg, nipples or genitalia) are more likely associated with risk behaviors.^{3,4}

Can these results be generalized?

But to what extent can our results be generalized to other, non-European adolescent populations? The prevalence rate is similar to those found among North American adolescents^{4,5} and college students.² All published studies seem to indicate that pierced adolescents are more likely to be risk-taking.

That would indicate that our results are on the right track. However, more population-based studies need to be done to fully confirm this. ■

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REFERENCES

1. Braithwaite R, Robillard A, Woodring T, Stephens T, Arriola KJ. Tattooing and body piercing among adolescent detainees: relationship to alcohol and other drug use. *J Substance Abuse* 2001; 13:5–16.
2. Armstrong ML, Roberts AE, Owen DC, Koch JR. Contemporary college students and body piercing. *J Adol Health* 2004; 34:224–229.
3. Roberts TA, Aunger P, Ryan SA. Body piercing and high-risk behavior in adolescents. *J Adol Health* 2004; 34:224–229.

FAST TRACK

Cannabis use and multiple sexual partners were the only variables associated with females having multiple piercings in the multivariate analysis

TABLE 2

Characteristics of adolescents with more than 1 piercing

	FEMALES			MALES		
	1 PIERCING (N=811)	>1 PIERCING (N=414)	P VALUE	1 PIERCING (N=183)	>1 PIERCING (N=100)	P VALUE
Age (years ± SD)	17.97 ± 1.16	18.01 ± 1.18	.55	18.15 ± 1.23	18.34 ± 1.15	.190
Academic track (apprentice)	67.7%	83.8%	<.001	91.3%	92.0%	.830
Body satisfaction (dissatisfied)	67.7%	66.9%	.781	81.4%	84.0%	.587
Nationality (Swiss)	11.2 %	10.4%	.658	16.9%	16.0%	.839
Perceived puberty (advanced)	33.8%	42.3%	.004	35.5%	47.0%	.059
Parental status (not together)	28.1%	37.4%	.001	29.0%	39.0%	.085
Father's education (low)*	11.6%	11.1%	.803	15.3%	16.0%	.877
Mother's education (low)*	20.3%	22.9%	.292	21.9%	25.0%	.548
Sensation seeking (high)	81.5%	72.0%	<.001	47.5%	46.0%	.804
Feeling depressed (yes)	42.7%	49.5%	.023	29.5%	28.0%	.789
Number of sexual partners (≥4)	16.9%	28.0%	<.001	47.0%	43.0%	.519
Condom use at last intercourse (no)	45.2%	50.0%	.115	36.6%	45.0%	.168
Regular smoker (yes)	44.1%	58.2%	<.001	65.0%	69.0%	.499
Intoxication (last 30 days)	23.8%	33.1%	.001	57.4%	67.0%	.113
Cannabis use (last 30 days)	36.1%	50.2%	<.001	67.2%	68.0%	.893
Illegal drug use (last 30 days)	6.9%	12.3%	.002	24.6%	31.0%	.245
Suicide ideation (last 12 mo)	24.4%	31.4%	.009	20.2%	27.0%	.192
Suicide attempt (last 12 mo)	3.9%	8.0%	.003	1.6%	6.0%	.046

Statistically significant differences are in bold. * Low education = mandatory school or less.

- Deschesnes M, Finès P, Demers S. Are tattooing and body piercing indicators of risk-taking behaviours among high school students? *J Adol* 2006; 29:379-379.
- Carroll ST, Riffenburgh RH, Roberts TA, Myhre EB. Tattoos and body piercings as indicators of adolescent risk-taking behaviors. *Pediatrics* 2002; 109:1021-1027.
- Muldoon KA. Body piercing in adolescents. *J Ped Health Care* 1997; 11:298-301.
- Stirn A. Body piercing: medical consequences and psychological motivations. *Lancet* 2003; 361:1205-1215.
- Greif J, Hewitt W, Armstrong ML. Tattooing and body piercing. *Clin Nursing Res* 1999; 8:368-385.
- Gold MA, Scorzman CM, Murray PJ, Downs J, Tolentino G. Body piercing practices and attitudes among urban adolescents. *J Adol Health* 2005; 36:352 e15-e21.
- Mayers LB, Judelson DA, Moriarty BW, Rundell KW. Prevalence of body art (body piercing and tattooing) in university undergraduates and incidence of medical complications. *Mayo Clin Proc* 2002; 77:29-34.
- Armstrong ML, Roberts AE, Owen DC, Koch JR. Toward building a composite of college student influences with body art. *Issues Comprehensive Ped Nursing* 2004; 27:277-295.
- Michaud PA, Delbos-Piot I, Narring F. Silent dropout in health surveys: are nonrespondent absent teenagers different from those who participate in school-based health surveys? *J Adol Health* 1998; 22:326-333.
- Jeannin A, Narring F, Tschumper A, et al. Self-reported health needs and use of primary health care services by adolescents enrolled in post-mandatory schools or vocational training programmes in Switzerland. *Swiss Medical Weekly* 2005; 135(1-2):11-18.
- Armstrong ML, Pace Murphy K. Tattooing: Another adolescent risk behavior warranting health education. *Applied Nurs Res* 1997; 10:181-189.
- Brooks TL, Woods ER, Knight JR, Shrier LA. Body modification and substance use in adolescents: is there a link? *J Adolesc Health* 2003; 32:44-49.