

Prevalence and Characteristics of Body Piercing and Tattooing Among High School Students

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ABSTRACT

Background: Although body piercing and tattooing seem to be gaining popularity among a diversity of social and age groups, studies of these practices in general adolescent populations are scarce. This study establishes the prevalence of body modification (tattooing and body piercing) among high school students in grades 7-11 (aged 12 to 18).

Methods: Data come from a 2002 in-school survey conducted among a representative sample of 2,180 students (81% response rate) enrolled in the 23 high schools of the Outaouais region in Quebec. Systematic sampling was performed. Specific data on tattooing and body piercing are available for 2,145 students (1% non-response rate).

Results: A prevalence of 27% for body piercing and 8% for tattooing is observed among high school students. Differences between girls and boys are observed in many ways: i.e., frequency and number of tattoos or piercings; aftercare practices. While most teens say that a "professional" in a studio performed their body modification and that they received aftercare instruction, a high percentage of students report health complications following the procedure.

Conclusion: Results show that tattooing and body piercing are common among adolescents and may involve health risks. Consequently, appropriate preventive measures should be adopted by professionals such as school counsellors, nurses, physicians and others who are in contact with teenagers to help them make informed choices.

MeSH terms: Tattooing; body piercing; adolescents; survey

La traduction du résumé se trouve à la fin de l'article.

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Most articles on tattooing and body piercing published in the last 10 years suggest that the popularity of these practices is on the rise in Western societies, especially among youth.¹⁻⁴ Today, these practices are perceived by many as adornment or artwork,^{1,5} while others categorize them as deviant behaviour.^{6,7} The reasons invoked by youth for tattooing or piercing refer mostly to the expression of individuality (i.e., to feel unique and special), to the confirmation of their personal identity, and to aesthetics.^{2,7,8}

Studies among adolescents are very limited, particularly regarding body piercing, and respondents are often those identified as "at-risk" youth, such as prison detainees and military population. According to the studies, the prevalence of tattoos in adolescents ranges from 4.5-23%.⁹⁻¹³ One American study of body piercing identified a prevalence of 27%.¹⁰

Literature pertaining to the medical complications of body piercing and tattooing remains relatively scant.^{2,14} Complications arising from body piercing and tattooing are mostly limited to case reports.^{14,15} They cover allergies and sensitivity to dyes used in tattoos, allergic reactions to certain metals used in body jewellery, and scar tissue formation.^{16,17} Body piercing has also been associated with bacterial infections,¹⁸ bleeding, skin tissue tearing, hypertrophic scars, dermatitis and endocarditis.^{2,15} Many authors recognize tattooing and body piercing as possible vectors for the transmission of blood-borne diseases such as hepatitis B, hepatitis C or HIV.^{8,17,19-22} A 1999 United Kingdom survey of family practitioners showed that 95% of them have seen patients with complications resulting from a piercing.²³

In order to gain a more current picture of these practices among the general adolescent population, the objectives of the present study were to: 1) establish the prevalence of tattooing and body piercing in a population of high school students, and 2) describe these practices in terms of number of tattoos and piercings (other than earlobes), status of the performer, reasons for getting it done, aftercare instruction, and medical complications.

METHODS

Data come from a 2002 in-school survey conducted among a representative sample

of students grades 7-11 (aged 12 to 18) enrolled in all high schools (N=23) of the Outaouais region in Quebec (located in proximity to Canada's national capital). A systematic sampling was used from the complete list of students (N=20,700) from each school and across each grade. Of the 2,700 students selected, 2,180 participated in the survey (81% response rate). Twelve percent were lost due to their being absent on the day of the survey (absences were justified by parents) or because they had moved. Questions pertaining to body modification represent one of the many dimensions of the survey, which included an array of health-related issues. Data on tattooing and body piercing were available for 2,145 students (1% non-response rate). Participants' socio-demographic characteristics reflect those observed in the general high school student population of the region. Most participants (73%) live in an urban area. Their average age is 14.7 years (SD=1.51), with girls making up 52% of the sample. Three quarters (74%) of students spoke French as their first language, 19% spoke English, and 7% spoke another language.

Selected students who completed the anonymous self-administered questionnaire were assured of the confidentiality of responses. All of the questions relating to tattooing (n=9) and body piercing (n=10) are from the «Body Art Survey» designed by Armstrong for high schools students.¹¹ Face and content validity of the instrument were confirmed by an expert panel of physicians, nurses, and counsellors in a study among college students.²⁴ The questionnaire was pre-tested in one class each of grade 7 and 8 students (N=50; not included in the study) in order to ensure that the vocabulary level was relevant and the questions were understood by the students. See the Appendix for a sample of questions retained for the study. Approval from the Ethics Committee of the University of Quebec in the Outaouais was obtained before conducting the survey.

Comparisons of variables relating to body piercing or tattooing by sex and by age were tested using Pearson Chi-Square, at a level of significance of 0.05. Analyses were performed using SPSS 9.0 for Windows.

TABLE I

Prevalence of Tattooing and Body Piercing, by Gender and by Age Groups

Gender		Tattooing		Body Piercing	
		%	p-value	%	p-value
Gender	Girls (n=1,077)	9.8	<0.001*	43.7	<0.001*
	Boys (n=1,068)	5.6		10.6	
	Total (n=2,145)	7.7		27.3	
Age Groups (years)	12 to 13 (n=557)	3.8	<0.001†	19.3	<0.001†
	14 to 15 (n=876)	6.1		26.7	
	16 to 18 (n=712)	12.9		34.0	

* p-values are shown for the comparison between girls and boys.

† p-values are shown for the comparison between age groups.

RESULTS

Overall, 7.7% of students reported having a tattoo while 27.3% of them reported a body piercing other than on their earlobe. Girls are more likely than boys to indicate that they have a tattoo and both forms of body modification increase with age (Table I). Most (79%) tattooed students only have one tattoo and the majority (62.1%) of those with a body piercing only have one. Among tattooed students, 7% have three or more tattoos while 16.8% of pierced youth have three or more piercings. While boys are three times more likely than girls to have three or more tattoos (11.9% vs. 4.1%, n.s.), girls are twice as likely to have three or more piercings (18.8% vs. 7.8%, p<0.01).

Age at first tattoo or piercing

Both practices begin at an early age: 32.1% of tattooed students and 52.7% of pierced students got their first tattoo or piercing, respectively, before age 15. Boys are proportionally more likely than girls to have been tattooed (16.9% vs. 1.0%, p<0.001) or pierced before age 12 (29.4% vs. 13.1%, p<0.001).

Body piercing sites

Sites most frequently chosen for a body piercing vary greatly according to gender. For example, while boys most often opt to have their eyebrow pierced (46.4%), only 9% of girls choose this site (p<0.001); conversely, girls prefer to have their navel pierced (61.8%) while very few boys choose this site (0.9%)(p<0.001). On the whole, girls prefer to have their navel (61.8%), upper ear (43%) or nose (16.5%) pierced, while boys most often opt to have their eyebrow (46.4%), nipple (19.1%) or lip (10.9%) pierced. Genital site is rarely chosen among students of both genders (G: 1.5%, B: 3.6%). Analysis by age shows that tongue is the only site that becomes

increasingly popular with age: 6.6% of 12 and 13 year-olds; 13.5% of 14 and 15 year-olds; and 17.0% of 16 to 18 year-olds (p<0.05).

Reasons invoked for getting body modification

Both boys and girls most frequently invoke aesthetic reason ("beauty mark") for acquiring their first tattoo or piercing (Table II).

Status of tattoo or body piercing artist

Most students called on a "professional" in a studio for their first tattoo (90.4%) or their first body piercing (89.9%). Girls are proportionally more likely than boys to have called on a "professional" for a tattoo (94.9% vs. 82.5%; not significant) or a piercing (91.6% vs. 81.7%, p<0.01) rather than to have used the services of an amateur or to have performed the procedure on themselves.

Medical complications

Table III shows that skin irritation is the most frequent health complication reported (19%) among tattooed teens, followed by unusual bleeding (10.1%). In the case of body piercing, infection at the site is the more prevalent complication (45.8%) and the second one is skin irritation (32%). Boys are more likely than girls to report complications in most documented categories.

Aftercare instructions

Most tattooed (92.9%) or pierced (95.0%) students indicate that they received some aftercare instructions following the procedure. More specifically, 56.6% of those with tattoos and 46.2% of those with body piercing received both verbal and written instructions concerning the care of their tattoo or piercing. These proportions are higher among girls than among boys (tattoo: 64.2% vs. 43.3%, p<0.01; body piercing: 48.3% vs. 37.8%, p<0.05).

TABLE II

Frequencies (%) of Reasons Given by Tattooed or Pierced Students for Body Modification, by Gender

Reasons	Tattooing				Body Piercing			
	Girls (n=98)	Boys (n=57)	Total (n=155)	p-value*	Girls (n=446)	Boys (n=96)	Total (n=542)	p-value*
Beauty mark	33.3	35.1	34.0	n.s.	39.6	34.4	38.7	n.s.
To remember an event in my life	27.3	35.1	30.1	n.s.	28.2	21.9	27.1	n.s.
To be different	18.2	35.1	24.4	0.018	15.4	26.8	17.5	0.008
"Femininity/Masculinity"	17.3	28.1	21.3	n.s.	20.0	7.3	17.7	0.003
To feel independent	16.3	30.4	21.4	0.041	11.9	23.7	14.0	0.002
For luck	14.1	28.1	19.2	0.034	8.3	10.4	8.7	n.s.
"Someone forced me"	4.1	8.9	5.8	n.s.	0.7	9.3	2.2	<0.001
To be part of the group	1.0	8.8	3.8	0.015	3.8	7.2	4.4	n.s.
Sexual enhancement	1.0	8.8	3.8	0.015	5.6	17.7	7.7	<0.001
Other ("for the heck of it", "I just wanted one")	28.3	14.3	23.2	0.047	30.9	33.3	31.3	n.s.

* p-values are shown for the comparison between girls and boys.

TABLE III

Frequencies (%) of Complications Following a Tattoo or Body Piercing, by Gender

Complications	Tattooing				Body Piercing			
	Girls (n=94)	Boys (n=64)	Total (n=158)	p-value*	Girls (n=422)	Boys (n=99)	Total (n=521)	p-value*
Unusual bleeding	4.3	18.8	10.1	0.003	3.3	7.1	4.0	n.s.
Skin irritation at the site	16.0	21.9	19.0	n.s.	34.3	22.2	32.0	0.021
Infection at the site	3.2	12.5	7.0	0.024	46.9	41.4	45.8	n.s.
Allergy to the dye or metal	2.1	10.9	5.1	0.019	6.6	7.0	6.5	n.s.
Swollen glands several times close to the site	1.1	9.4	4.4	0.013	2.6	8.1	3.6	0.009

* p-values are shown for the comparison between girls and boys.

DISCUSSION

Body modification practices are frequent in the general high school population of Eastern Quebec. To our knowledge, these are the first data available in Canada for a general adolescent population. They are identical to the results obtained by Carroll et al.¹⁰ for older youth aged 12 to 22 who attended a military clinic in California. Prevalence of tattooing in our study is slightly lower than that obtained by Armstrong et al. in 1993 (9%)¹¹ and 1995 (10%)¹² for high school students, using the same instrument. It does differ markedly, however, from the prevalence found by Roberts and Ryan (4.5%)⁹ and Houghton et al. (13.6%)¹³ among high school students.

Our results confirm higher prevalence rates for tattoos and body piercing among young women and a greater frequency of multiple tattoos among men.^{10,25} Results also show that tattoos and body piercing increase with age, as was the case in other studies.¹⁰ Overall, the sites most often chosen by adolescents for body piercing (excluding the earlobes) are the navel and upper ear, and some sites seem gender-specific. The reasons for getting body modification are mostly aesthetic and identity-related in nature. This confirms results from previous studies.^{5,12,26}

Most students with body modification indicate that they used the services of a

"professional". This result is similar to that observed by Carroll et al.¹⁰ but differs greatly from the results obtained by Houghton et al.¹³ from a sample of high school students in Australia, which revealed that the majority of the tattooed participants had self-administered tattoos. The main complications associated with tattooing and piercing were similar to results obtained by Greif et al. for American college students.²⁴ In our study, boys were more likely than girls to resort to an amateur or to do the procedure themselves and they reported more complications than girls in general.

Limitations

The population under study does not include adolescents who have dropped out of school, which may lead to a slight underestimation of the practices as drop-outs and street youth are proportionately more likely to have undergone some body modification.²⁷ Because results of the present study rely on self-reports, some information pertaining to medical complications or aftercare instructions may suffer from a lack of precision. For example, as suggested by Marcoux,²⁸ in many cases, tattoos and body piercing are done in tattoo parlors, by so-called "professionals" (i.e., tattoo artists working in custom shops), who may have limited knowledge about sanitation standards, infection con-

trol and skin care procedures. Concomitant to research data, information about studios and parlors warrants further study (artist qualifications, type of procedures used, type of aftercare instructions given, etc.), as do cases where health services were sought out following body modification procedures. Moreover, the choices presented to participants about their motivation for getting a tattoo or a body piercing do not allow us to ascertain their true meaning. It may be possible that "to be different" refers to a form of aesthetic expression for one respondent and a mark of rebellion against authority for another. As a structured survey does not allow for the probing of deep information, qualitative data would be necessary in the future to better interpret these results. Nevertheless, results show the diversity of reasons that lead adolescents to desire body modification and they most probably represent a quest for individuality within a framework of conformity for some, and of revolt for others.^{26,29}

CONCLUSION

The popularity of tattooing and piercing warrants a more systematic documentation of physical and psychosocial risks that may be associated with them. The potential health risks involved with skin piercing procedures suggests the importance of set-

ting guidelines and educating artists and operators.^{2,16,22,30} In Canada, the Centre for Infectious Disease Prevention and Control (Health Canada)¹⁴ has established guidelines describing procedural norms required to prevent infectious disease in tattooing and body piercing. However, at present, no law regiments these practices, leaving the door open to procedures that may compromise adolescents' health.

Health education measures aimed at adolescents also need to be put in place in order to prevent undesired consequences among those wishing to experience body modification.³ These measures should inform youth about potential health risks associated with body modification and about precautions that should be taken in order to make an informed and safe decision (i.e., avoiding impulsive choices, clandestine studios, etc.). Education originating from well-informed health care professionals, free of prejudice towards tattooed or pierced individuals, is essential to ensure that these measures are appropriate for youth.^{1,8}

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Appendix

Examples of questions on tattooing and body piercing

Tattooing and Body Piercing

- Did you ever get a tattoo?
 - Yes
 - No If you answered NO, go to question 4.
- How old were you when you got your first tattoo? _____
- How many tattoos do you have? _____
- Did you ever get a body piercing? (besides your earlobe)
 - Yes
 - No If you answered NO, go to question 8.
- How old were you when you got your first body piercing? _____
- How many body piercings do you have? _____ (Do not count those in your earlobe)
- Where are your body piercings? Circle all answers that apply.

1. Eyebrow	5. Nipple
2. Nose	6. Navel
3. Lip	7. Genital organ
4. Tongue	8. Ears (besides your earlobe)

The following statements apply to tattoos and/or body piercing.

If you don't have any tattoos or body piercing, go to question 12

- Why did you get your first tattoo or body piercing? (Check all the answers that apply)

	Tattoo	Body Piercing
A. To mark my femininity/masculinity	<input type="checkbox"/>	<input type="checkbox"/>
B. To feel independent	<input type="checkbox"/>	<input type="checkbox"/>
C. For no reason	<input type="checkbox"/>	<input type="checkbox"/>
D. I wanted one	<input type="checkbox"/>	<input type="checkbox"/>
E. Someone made me do it	<input type="checkbox"/>	<input type="checkbox"/>
F. For good luck	<input type="checkbox"/>	<input type="checkbox"/>
G. To remind me of an event in my life	<input type="checkbox"/>	<input type="checkbox"/>
H. As a beauty mark	<input type="checkbox"/>	<input type="checkbox"/>
I. To be different	<input type="checkbox"/>	<input type="checkbox"/>
J. To be part of a group	<input type="checkbox"/>	<input type="checkbox"/>
K. To increase stimulation and sensual pleasure	<input type="checkbox"/>	<input type="checkbox"/>
L. Other (please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>

RÉSUMÉ

Introduction : Le tatouage et le perçage corporel semblent de plus en plus populaires dans des groupes sociaux très divers. Cependant, les études menées auprès de populations générales d'adolescents sont encore rares. Notre étude vise à décrire ces pratiques de modification corporelle et à établir leur prévalence chez des élèves du secondaire âgés de 12 à 18 ans.

Méthode : Les données proviennent de l'enquête transversale réalisée en 2002 auprès d'un échantillon représentatif de 2 180 élèves inscrits dans les 23 écoles secondaires de la région de l'Outaouais au Québec. L'échantillonnage a été réalisé de façon systématique à partir de la liste complète des élèves de chaque école. Le taux de réponse était de 81 %. Les données spécifiques sur le tatouage et le perçage corporel sont disponibles pour 2 145 élèves (taux de non-réponse partielle de 1 %).

Résultats : Des prévalences de 27 % pour le perçage corporel et de 8 % pour le tatouage ont été observées chez les élèves. Plusieurs différences existent selon le sexe, comme par exemple au niveau du nombre de modifications. Bien que la plupart des adolescents affirment avoir fait faire leur modification corporelle par un « professionnel » et avoir reçu de l'information sur les soins à prendre, un pourcentage élevé d'élèves fait état de complications de santé après l'intervention.

Conclusion : Les résultats montrent que le tatouage et le perçage corporel sont fréquents chez les adolescents, et qu'ils peuvent représenter un risque pour leur santé. Par conséquent, des mesures préventives appropriées devraient être adoptées par les professionnels qui sont en contact avec les jeunes (conseillers en milieu scolaire, infirmières, médecins et autres), de manière à les aider à faire des choix éclairés sur la base d'informations valides.

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Book Reviews/Recension

Public Health: Past, Present and Future. Celebrating Academic Public Health in Edinburgh, 1902-2002

Raj Bhopal and John Last (Eds.), Norwich, UK: The Stationery Office (Nuffield Trust), 2004

The celebration of 100 years of academic public health at the University of Edinburgh brought together approximately 330 participants with 17 contributors. The output from this meeting is the content of this book. There are three sections, as noted in the title.

The discussion of the development of Edinburgh and the effects of these developments on the health of the inhabitants speaks to the interactions of crowding, poor sanitation, poverty and poor health care on morbidity and mortality. The section on the past also outlines the roles that medical officers of health played in bringing about the changes necessary to improve the lot of the citizenry. I enjoyed the historic reviews that comprised the first five chapters. There was considerable overlap and repetition of the material, but it clearly demonstrated the interactions that occur in public health.

The next six chapters were less informative as the authors discussed issues that are currently being debated in public health circles. At times, these issues would have been better informed by the review of the past and the observations made on the past interactions of health and the environmental social and economic conditions that are relevant today. Nevertheless the issue of increasing emphasis on healthy survival, the continuing risk of communicable disease (much less than in the past but not entirely defeated) and the roles of statistics and social sciences summarized the contribution of the University of Edinburgh in these areas.

The three chapters on the future of public health include the role of genomics, legislation and public health practice. As "looks into the future", these were necessarily less evidence based.

As a light read, especially for graduates of the University of Edinburgh and particularly the Department of Public Health and the Usher Institute, this book could be worthwhile. Generally speaking I cannot recommend this book for the average reader unless there is a strong interest in history and/or in the University of Edinburgh.

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