Clinical Research and Methods

Behavioral Risks Associated With Tattooing

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Background and Objectives: Tattoos are an increasingly prevalent form of self-expression, especially for adolescents. This study was conducted to determine health-risk behaviors associated with tattoos in young men and women entering military service. Methods: We surveyed a cohort of 550 military recruits using a modification of the Youth Risk Behavioral Survey (YRBS), a validated instrument used to assess health risk behaviors in adolescents. All individuals entering basic training in the US Marine Corps or the US Air Force from June through September 1999 were eligible to participate. The primary outcome variables of interest were tobacco use, alcohol use, seatbelt use, suicidal behaviors, depression, and physical violence. Results: The survey response rate was 91% (n=499 of 550). Overall, 27% of respondents had tattoos (n=125) when entering military service. Women entering military service were more likely to have a tattoo than men. Controlling for age and gender, individuals with tattoos were more likely to smoke, drink heavily, use smokeless tobacco, and ride in a vehicle with someone who had been drinking than non-tattooed individuals. Conclusions: In a population of military recruits, tattoos were associated with predictable adverse health-risk behaviors. This represents an important opportunity for targeted preventive counseling.

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Tattooing is an increasingly common form of self-expression, especially in the young adult population. Convenience samples of general adolescent populations indicate that between 10% and 30% of adolescents or young adults currently have a tattoo\(^1\) and that up to half of non-tattooed young adults are considering getting a tattoo.\(^2\) Historically, tattooed individuals have often been stereotyped as being part of a particular group and the act of tattooing itself viewed as a form of deviant behavior. While alcohol has often been anecdotally implicated with the act of tattooing, a study of more than 1,800 tattooed individuals indicates that only 15% were under the influence of alcohol when they obtained their tattoo.\(^3\) This suggests that young individuals who are serious about tattooing are more than likely to get one regardless of cost, risk, or the opinion of others.\(^4\) Tattoos are an important means of self-expression and self-identity\(^5\) for adolescent and young adult populations.

Within this context, the current study was designed to determine the prevalence of tattooing in a population of young, healthy adults and the extent to which tattooing is associated with high-risk health behaviors.

Methods

Subjects

This study was conducted in a cohort of healthy young men and women entering military service. Following institutional and local site approval, subjects were recruited from Lackland Air Force Base, Tex, and Parris Island, SC, from June 1999 to September 1999. All men and women who were entering military basic training at these sites were eligible for participation. During the study period, individual classes of recruits were selected at random to participate. The average class size was 75-100 individuals. An independent party not associated with either the study or the recruit training program distributed the anonymous survey instrument to each class. Individuals were then given the option of completing the survey instrument. Those who did complete a survey returned it to a central collection site where the surveys were then mailed back to the primary investigator for data entry and analysis. There were no specific exclusion criteria.

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Survey Instrument

The Youth Risk Behavior Survey (YRBS)\textsuperscript{6} was modified for use in our study. This survey has been previously validated as a means of assessing risk behaviors in adolescents. The YRBS is used to examine health risk behaviors, such as tobacco use, alcohol use, seat belt use, helmet use (bicycle and motorcycle), and suicide attempts. To determine the extent to which tattooing is associated with individual risk behaviors, a question about tattooing was added to the standard YRBS instrument. Specifically, individuals were asked to report whether or not they had any tattoos prior to enlisting for military service.

Data Analysis

Basic descriptive statistics were used for categorical variables. Proportions were compared using the chi-square test of contingency. Fisher’s exact test was used for rare responses. Continuous variables were compared using Student’s \( t \) test for independent samples. Adjusted odds ratios were calculated using a multivariate logistic regression analysis controlling for gender and age.

Results

Of 550 individuals recruited for participation, 499 completed the survey (91\% response rate). Data on tattooing were available for 444 participants (81\% of the study sample). The study sample was 88\% male (n=390) and 12\% female (n=54). The mean respondent age was 21 years, with a range of 18–35.

Tattoo Rates

There were 125 individuals who reported having one or more tattoos when entering military service (28\% of the study sample). Twenty-five of 54 female respondents were tattooed (46\%), as were 100 of 390 male respondents (26\%). Women entering the military were almost twice as likely to have a tattoo than were men (adjusted odds ratio [AOR]=1.8, 95\% confidence interval [CI]=1.3–2.6, \( P<.01 \)).

Controlling for age and gender, individuals with tattoos were more likely to smoke (AOR=3.0, 95\% CI=1.9–4.7), drink heavily, defined as five or more drinks in one sitting (AOR=2.0, 95\% CI=1.3–3.0), use smokeless tobacco (AOR=1.8, 95\% CI=1.1–3.1), and ride in a vehicle with someone who had been drinking (AOR=1.5, 95\% CI=1.0–2.3) than were non-tattooed individuals. There were no differences in the incidence of reported suicide attempts, depression, seatbelt use, or physical violence between tattooed and non-tattooed individuals. Table 1 shows the AORs for health-risk behaviors and tattooing.

Discussion

Historically, tattooing has been associated with male gender,\textsuperscript{2} gang-related activities,\textsuperscript{7} drug use,\textsuperscript{8} and underlying psychopathology.\textsuperscript{9} Military service has also been associated with tattooing. The demographics of tattooing, however, appear to be changing, and many of these associations may no longer be valid. Indeed, in our study, a significantly greater number of women entered military service with tattoos compared to their male counterparts. While tempting to speculate that the military might “attract” women who are predisposed to tattooing, the increased prevalence of tattooing among women in professional roles (physicians, lawyers, businesswomen)\textsuperscript{10} argues against this. Tattooing appears to be increasingly associated with popular culture\textsuperscript{11} and as such, more and more women are being tattooed.

Tattooing has also been associated with a presumption of underlying psychopathology. Adults often view tattooing as a form of deviant behavior.\textsuperscript{1} While some studies have shown an increased prevalence of tattoos in young individuals attempting suicide,\textsuperscript{2} other studies have shown no such relationship. In one study of patients presenting for emergency care, no association was noted between tattooing and the nature of the presenting complaint.\textsuperscript{1} In this particular study, almost as many providers as patients were tattooed. In our study, no differences in depression, suicidal attempts, or a personal history of physical violence were noted between individuals with and without tattoos.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tr>
<td><strong>AORs for Health-risk Behaviors and Tattooing</strong></td>
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<tr>
<td><strong>Factor</strong></td>
</tr>
<tr>
<td>Female gender</td>
</tr>
<tr>
<td>Use of smokeless tobacco</td>
</tr>
<tr>
<td>Smoke cigarettes</td>
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<tr>
<td>Drink alcohol</td>
</tr>
<tr>
<td>Drink alcohol heavily*</td>
</tr>
<tr>
<td>Ride as a passenger with someone who had been drinking</td>
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<tr>
<td>History of depression</td>
</tr>
<tr>
<td>History of suicide attempt</td>
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<tr>
<td>Drink and drive</td>
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<tr>
<td>Wear a helmet when riding a bicycle or motorcycle</td>
</tr>
<tr>
<td>Have been in a physical fight requiring medical attention</td>
</tr>
<tr>
<td>Wear a seatbelt regularly</td>
</tr>
<tr>
<td>Carry a personal weapon</td>
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AOR—adjusted odds ratio  
CI—confidence interval  
NS—nonsignificant  
* defined as five or more drinks in one sitting
Another important finding from this study is the strong association of tattooing with tobacco and alcohol use. While previous work supports the association of tobacco use with tattooing, the association of tattooing and binge drinking has not been previously reported. These results are independent of age and gender. Tattoos, therefore, represent an important surrogate marker for potential alcohol and tobacco abuse that clinicians can use to provide targeted preventive counseling advice. When a tattoo is encountered during a routine clinical examination, physicians should specifically explore potential patterns of tobacco and alcohol use.

Limitations

Before the results of this study can be broadly generalized, the study’s limitations must be recognized. The most important limitation is that all participants in this study were active duty military recruits. Historically, military service has been associated with tattooing. Based on studies examining those with prior military experience, it is possible to speculate that the military attracts individuals predisposed to tattooing. The present study, however, examined individuals just entering military service. This limits any specific effects of sustained military service or group identification relative to military units as confounding variables. Further, prior studies have shown high prevalence (64%) of tattooing among individuals entering military service, but the proportion of tattooed individuals in this study is similar to the prevalence of tattooing in the general population.

Conclusions

The data from the study indicate that a significant number of young people are tattooed. In a population of young, healthy military subjects, one in four individuals had at least one tattoo. The data also indicated that the demographics of tattooing also appear to be changing, in that women were more likely than men to have a tattoo when entering military service.

Finally, tattooing was significantly associated with tobacco and alcohol use. This finding has important implications for clinical preventive counseling strategies. Specifically, clinicians should routinely ask about tattoos when working with adolescents and young adults since tattoos represent a potentially important marker for underlying health risk behaviors that can be used to target specific preventive advice.

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References