International Journal of Community Medicine and Public Health
Oinam J et al. Int J Community Med Public Health. 2019 Feb;6(2):774-779
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20190205

Original Research Article

Prevalence of tattooing and knowledge about health risk associated with it among adolescent school students in Manipur, North-eastern India: a cross-sectional study

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Received: 29 November 2018
Accepted: 04 January 2019

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ABSTRACT

Background: Tattooing has emerged as common activity among adolescents. Therefore, it is important to informed adolescents about possible health hazards associated with it. The objective of the study was to determine the prevalence of tattooing and knowledge of health risks associated with it among higher secondary students and association between knowledge on risk factors with selected socio-demographic variables.
Methods: A cross-sectional study was conducted from September to October 2015 among 1325 students studying in class XI and XII in Thoubal district of Manipur in Northeast India. A self-administered questionnaire was used for data collection. Based on the obtained score, knowledge was divided into adequate and inadequate. Descriptive statistics like mean (SD) and percentages were used. Chi-square test was used for testing the significance and $p<0.05$ was considered as statistically significant.
Results: Total of 1378 students participated in the study. Almost all the students (99.5%) have heard of tattoo but only 75 of them (5.5%) had ever tattooed. Majority (87%) of the students had inadequate knowledge. Ever tattooed was more among male students compared to female. There was significant association between adequate knowledge and male students, parents who had secondary and above education. Significant association was found among those who had adequate knowledge and risk of transmission of disease through tattooing.
Conclusions: Prevalence of ever tattooed was 5.5%. Though majority of the participants had heard of tattoo but most of them had inadequate knowledge about health risk associated with tattooing.

Keywords: Prevalence, Tattoo, Adolescents, Students, Knowledge, India

INTRODUCTION

Recently, tattooing has gained increasing popularity worldwide especially among adolescents. Although the literatures differ on the basis of area and population studied, it indicates that body art is increasingly accepted by all social classes and age groups, but especially by adolescents and youths. In Western society, tattooing have become mainstream activities among adolescents and young adults.[1-3] Prevalence of tattooing in these age groups vary by country and setting, ranging from 1to 24%.[4-16] Unfortunately, with this higher demand, the number of unprofessional tattooists has increased creating more complications due to frequent procedures carried out without any knowledge of health and hygiene rules.[12,13] Evidence showed that tattooed individuals have a higher risk of being infected by blood-borne viruses, including hepatitis B and C, HIV.[14,15]

With the modernization and urbanization of North-Eastern India over the decades, the tattoo culture has shifted significantly among adolescent and young adults even in Manipur. In recent years, tattooing has increased in popularity among adolescents as a fashion statement or improvement of body image. This maybe probably due to the growing use of body modification by media celebrities, sports icons, and peers. However, this trend is accompanied by an increase in reported health complications, which are often overlooked.

Therefore, it is important to inform adolescents and young adults about possible health hazards associated with tattooing. Most of the data on body art practices (BAP) among adolescents and young adults are available from developed countries. However, due to the cross-culture and learning from the western society, BAP such as tattooing is likely to be highly prevalent also in the developing countries. Only few studies on tattoo have been conducted in India so far. However, we could not find any such study so far documented in Manipur or Northeast India regarding prevalence of tattooing and its associated health risk among adolescent. Therefore, the objectives of this study are to determine the prevalence of tattooing and knowledge of health risks associated with tattooing and association between knowledge on risk factors with important socio-demographic variables.

METHODS

A cross-sectional study was carried out from September to October 2015 among schools providing higher secondary education in Thoubal district, Manipur in Northeast India. All the students in class XI and XII who were present on the day of data collection and who were willing to participate in the study were included. Sample size was calculated based on the formula: $4PQ/L^2$, where, prevalence of tattoo was 8%, absolute allowable error taken as 2% at 95% confidence level and a design effect of 1.5 and a non-response rate of 20%, the final estimated sample size come to 1325.[16] Stratified two - stage cluster sampling with probability proportionate to size was used to select a representative sample. For this study, clusters identified were institutions providing higher secondary education. Details of schools and students enrolled in each school were collected from Council of Higher Secondary Education, Manipur. The schools were first stratified into government and private schools. Four government schools and six private schools were selected randomly by lottery method based on probability proportionate to size. In the second stage 60% of students were selected from six private schools and 40% from four government schools by population proportion to size within each cluster.

A pre-designed and pre-tested self-administered questionnaire having four sections was used, (I) socio-demographic characteristics, (II) knowledge on health risk associated with tattooing, (III) practice on tattooing and (IV) attitude towards tattooing.

Written permission from all the participating school authorities were taken at the time of survey. Participants were requested to consent orally before receiving the questionnaires and were informed of voluntary participation and assured of confidentiality. They were reassured about their anonymity and the importance of honest answer. Instructions were given how to fill the questionnaire: section I-compulsory for all, II and III- for those who have heard about tattoo and IV- for those who have tattoo. Operational definition: Tattooing: Person who put an indelible mark or figure fixed upon the body by insertion of pigment under the skin by using any instrument. Amateur tattoos: Tattoos made by untrained person, friends or self. Maximum obtainable knowledge score was 18 and minimum was 0. Based on the obtained score, knowledge was divided into two groups: Adequate (>mean+2SD) and Inadequate (≤mean+2SD). Data were analyzed using SPSS (IBM) version 21. Descriptive statistics like mean (SD) and percentages were used to summarize the data. Chi-square test was used for testing the significance and $p<0.05$ was considered as statistically significant. Approval was obtained from the Institutional Ethics Committee RIMS, Imphal.

RESULTS

Table 1: Background characteristics of the study participants (n=1378).

Characteristics	Number	Percentage (%)
Sex		
Male	651	44.6
Female	763	55.4
Residence		
Urban	390	28.3
Rural	988	71.7
Stream		
Science	1288	93.5
Arts	90	6.5
Class		
XI	560	40.6
XII	818	59.4
Religion		
Hindu	586	42.5
Meitei	568	41.3
Muslim	181	13.1
Christian	43	3.1
Father's education		
Illiterate	160	11.6
Upto Middle	388	28.2
Secondary	467	33.9
Graduate & above	363	26.3
Mother's education		
Illiterate	388	28.2
Upto Middle	484	35.1
Secondary	318	23.1
Graduate & above	188	13.6

A total of 1378 students participated in the study. Around three-fifth (55.4%) were female and majority belonged to rural area (71.7%). Three-fifth of the students studied in class XII and majority (93.5%) belonged to science stream. Almost all the students (99.5%) have heard of tattoo and friends (58.4%) followed by mass media (53.2%) were the most common source of information. Around three-fourth of the respondents (71%) knew someone with tattoo and half of them were their friends (Table 1).

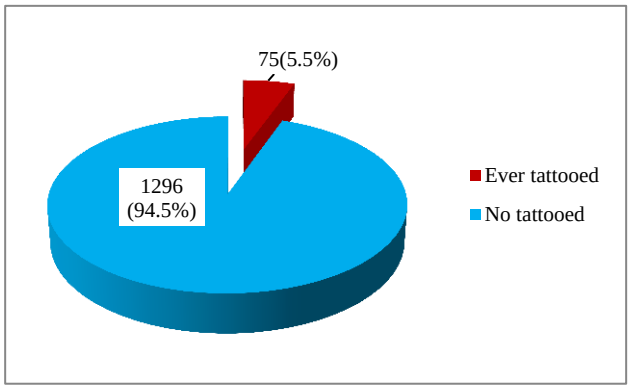

Figure 1: Prevalence of ever tattooed.

In the present study, the prevalence of ever tattooed was found to be 5.5%.

In majority of them (65.3%) tattoo was made by their friends and most of them (66.6%) have tattoo on their arm and hand. Fashion (62.7%) was the most common reason followed by peer pressure (34.7%) for tattooing.

Majority of the students (64.5%) gave HIV/AIDS followed by hepatitis B and C (13.6%) as the most common diseases which can be transmitted through tattooing. Around three-fifths of the participants (56.3%) were not aware of the difficulties involved in removing tattoo. Among those participants who ever had tattooed, around one-fourth (21.3%) of them had more than three tattoos on their body and half of them had symbol (49.3%) followed by words (26%) as tattoos. Among ever tattooed 34.7% of them experienced complications following tattooing. Common complications were scarring (37.6%), allergic skin reactions (26.9%), bleeding (23.1%) and localized infection (15.4%). More than one-third (69.3%) are planning to removed their tattoo. Common reasons for tattoo removal are to be eligible for job placement in military service in future (36.5%) followed by scolding from parents/teachers (30.8%), dissatisfied with the design of tattoo (23%) and side-effects (10.7%).

Table 2: Practice questions of tattooing among ever tattooed (n=75).

Questions	Frequency	Percentage (%)
Gender		
Male	54	72.0
Female	21	28.0
Age at first tattooing (years)		
>16	4	5.3
15-16	15	20.0
13-14	50	66.7
<13	6	8.0
Who made tattoo		
Friends	49	65.3
Mela	14	16.6
Tattoo studio/parlour	8	10.8
Self	4	5.3
Body part(s) having tattoo(s)*		
Arm/hand	50	66.6
Back/shoulder	8	10.6
Head/neck	6	8.0
Leg	5	6.6
Others	7	8.2
Reason for tattooing		
Fashion	47	62.7
Peer pressure	17	22.7
For love	9	12.0
Religious beliefs	2	2.6
Money for tattooing		
Free	31	41.3
Pocket money	30	40.0
Borrow from friends	14	18.7

Continued.

Questions	Frequency	Percentage (%)
Number of tattoo(s)		
1	47	62.7
2	11	14.7
≥3	17	33.6
Colour of the tattoo		
Black	39	52.0
Other colour	36	48.0
Design of the tattoo(s)*		
Symbols	38	49.4
Words	26	34.6
Pictures	12	16.0
Any precautions taken while tattooing by tattoo maker		
Yes	41	54.7
No	34	45.3
Any side-effects after tattooing		
Yes	26	34.7
No	49	65.3
Whom do you consulted for those side-effects (n=26)		
Friend	10	38.5
Doctor	9	34.6
Self	7	26.9
Planning to remove tattoo(s)		
Yes	52	69.3
No	23	30.7
Aware of difficulties involved in tattoo removal		
Yes	28	37.3
No	47	62.7

*multiple answer allowed.

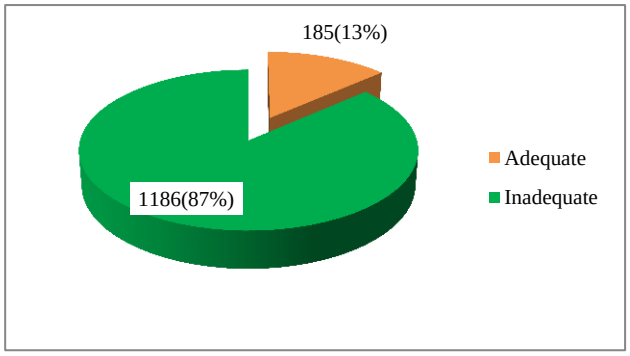

Figure 2: Distribution of respondents by knowledge level regarding health risks associated with tattooing.

Majority (87%) of the students had inadequate knowledge and only 13% of them had adequate knowledge.

Ever tattooed was more among male students compared to female and it was found to be significant. Significantly male students took precautions before/after tattooing as compared to female and also they were planning for more tattooing in future. There was significant association between adequate knowledge and male students, parents who had secondary and above education and those who followed Christianity. Those who had adequate knowledge they were aware of the risk of transmission of disease through tattooing and it was found to be statistically significant.

Table 3: Association of gender with practice of tattooing.

Questions	Male N (%)	Female N (%)	P value*
Ever tattooed	54 (8.9)	21 (2.8)	0.01
Precautions taken during/after tattooing	34 (63.0)	7 (33.3)	0.02
Plan for tattooing more in future	66 (10.2)	18 (2.4)	0.01

*χ^2 test.

DISCUSSION

In the present study, the prevalence of tattooing was 5.5% which was higher than a study conducted among high school students in Southern Taiwan in 2004 where they reported only 1%.[4] This difference could be because of huge gaps in the study timings as well as difference in background characteristics of the study participants between these two settings. Most of the previous studies are predominantly among adolescents and young adults of western countries and the prevalence of tattooing ranges from 3-24%.[5-16] From the study result, it shows

that developing country like India also showed an increased trend of tattooing among the adolescents which is comparable with the western countries.

Table 4: Association of knowledge about health risk associated with tattooing with selected variables of interest.

Variables	Knowledge N (%)		P value*
	Adequate	Inadequate	
Sex			
Male	109 (17.9)	501 (82.1)	0.02
Female	76 (10.0)	685 (90.0)	
Father's education			
Upto middle	50 (9.2)	495 (90.8)	0.02
Secondary & above	135 (16.3)	691 (83.7)	
Mother's education			
Upto Middle	94 (10.9)	772 (89.1)	0.01
Secondary & above	91 (18.0)	414 (82.0)	
Religion			
Hindu	79 (13.5)	506 (86.5)	0.01
Meitei	74 (13.1)	490 (86.9)	
Christian	19 (44.2)	24 (55.8)	
Muslim	13 (7.3)	166 (92.7)	
Risk associated with tattooing			
Yes	31 (7.7)	374 (92.3)	0.02
No	41 (4.2)	925 (95.8)	

*χ^2 test

In our study more than three-fifths of the participants (66.7%) had put their tattoo when they were below 15 years which was comparable to study by Galle et al and Thakur et al.[17,18] This shows that there is an increasing trend of starting tattooing in younger age group which is a matter of concern with regards to health risks associated with tattooing.

In our study majority favoured upper limbs for tattooing (66.7%) which was consistent to study by Thakur et al (76.4%) and Moorthy et al (49.5%).[18,19] In the present study, 89.2% placed their tattoos outside a tattoo studio/parlour which is comparable to the study.[18] We are looking into this because usually commercial tattoo studios are preferable because the likelihood is greater that the tattoo will be applied by trained person using sanitary techniques. However, based on our findings most of the adolescents obtained amateur tattoos maybe because they could not find a tattoo studio or they were not allowed because of age factor or they cannot afford studio tattoo rates which are usually high. This area need to be further studied in future. In their study[18] tattoo was done mostly by their friends (61.3%) which was comparable with our study (65.3%).

In the present study the most common motivation for tattooing was fashion (62.7%) which was consistent to other studies.[17-19] However in our study 34.7% participants gave peer pressure as one of the main reason for tattooing, but in their study only 4.7% participants have done tattooing because of peer pressure.[18] This difference could be because their study was a hospital based study among tattooed. This also shows the role of peer pressure in today's young generation as their tattooing might be a reflection of their peer group. In order to become an accepted member of the group, adolescents may be tempted to model the behavior of their peer's members who might be having a common identity or difference from other groups by having a tattoo.

In the present study among ever tattooed 34.7% of them experienced complications following tattooing which was much higher as compared to a study conducted by Quaranta et al where they reported only 13.2% developed complications.[20] This could be because majority (71.9%) in their study reported tattooing in an authorized centre. Regarding adolescents' knowledge of infectious risks, majority (64.5%) gave HIV/AIDS as a possible infection risk, but not many of them were aware of the risks associated with hepatitis B/C (13.6%) and tetanus (7%). Our finding is comparable to the study.[20] This suggests that while HIV/AIDS-related risks are better known, other risks which are equally important need to be better specified and highlighted to the adolescents, through awareness campaigns in schools, mass media. In the present study, common reasons for tattoo removal was to be eligible for job placement in military service in future (36.5%) followed by scolding from parents/teachers (30.8%) which was comparable to a study where they also reported similar reasons such as to be eligible for armed force jobs (49.5%), regret (21.7%) and family or parent pressure (14.2%).[18] Therefore, we would like to recommend increasing awareness and educating the youngsters and school-going children about safe tattooing and the consequences of tattooing. As a long-term measure, we would like to suggest the regulation of tattooing by government legislation so that it is done with strict hygiene, not allowing tattoo stalls in mela and minors should be prevented from tattooing. The present study finds a significant association between adolescent tattooing and male gender which was consistent with a study conducted by Makkai et al.[21]

CONCLUSION

The prevalence of tattooing was 5.5% and majority of them have inadequate knowledge about the health risk associated with tattooing. This information about their knowledge and practices regarding tattooing could help in effective planning for health promotion strategies and appropriate preventive measures should be adopted by professionals such as teachers, health care providers and parents who are in contact with adolescents to help them make informed choices. Furthermore, it could be interesting to develop collaborative educational programs between health care providers and schools, sharing information about body art in general, including the

inherent risks associated with it, and encouraging adolescents to contemplate their decisions carefully in advance.

ACKNOWLEDGEMENTS

The authors would like to thank the interns posted during that period in Community Medicine department for their help during data collection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Oinam J, Singh AB, Singh YN. Prevalence of tattooing and knowledge about health risk associated with it among adolescent school students in Manipur, North-eastern India: a cross-sectional study. Int J Community Med Public Health 2019;6:774-9.