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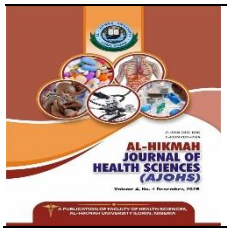

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Original Article

Enhancing Health and Safety for Beauty Professionals in Ijebu-Jesa and Ede, Osun State, Nigeria

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ABSTRACT

Introduction: Body modification practices such as tattooing and piercing are increasingly popular worldwide, including among Nigerian youth. However, inadequate hygiene practices among practitioners pose significant public health risks. This study assessed the baseline knowledge, attitudes, and practices related to hygiene among tattoo and piercing practitioners in Osun State, Nigeria, and evaluated the effectiveness of a targeted educational intervention.

Methods: A quasi-experimental design was employed, involving pre- and post-intervention assessments. The intervention comprised structured lectures and hands-on demonstrations on infection control and hygiene standards.

Results: This study observed a critical effect size in knowledge (d = 2.31) and medium effect sizes for practice (d = 0.71), highlighting the training's effectiveness. A striking 83.9% of the intervention group agreed that tattoo artists should cover exposed skin, a stark contrast to only 17.2% in the control group. Furthermore, nearly all intervention group participants, 93.5%, recognized the importance of cleaning clients' skin with antiseptics, whereas only 17.2% of the control group shared this view. In a positive shift, 67.7% of the intervention group disagreed that wearing gloves is more important than washing hands, suggesting a more comprehensive understanding of both practices' importance, unlike the 79.3% in the control group who prioritized gloves.

Conclusion: The study observed that baseline assessments revealed limited knowledge and suboptimal adherence to health and safety protocols among participants. Post-intervention findings demonstrated significant improvements in both knowledge and reported hygiene practices. These findings suggest the implementation of standardized, structured training programs to enhance safety and reduce health risks in the industry among body modification practitioners.

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Introduction

Body modification practices, particularly tattooing and body piercing, have witnessed significant global growth, with prevalence rates in developed nations ranging from 10% to 20% for tattoos, especially among youths, transcending socioeconomic

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boundaries and cultural divisions (Kluger, 2015). Historically, these practices date back to prehistoric times, serving diverse cultural, spiritual, and social functions across civilizations. In contemporary society, their appeal is shaped by a multitude of motivations, including aesthetic expression, identity construction, emotional coping, and even sexual enhancement (Meltzer, 2005; Wohlrab *et al*., 2007; Bailey, 2011; Grogan, 2021). In Nigeria, several studies reveal increasing tattooing and body piercing among university students, with motivations ranging from fashion to peer influence (Daramola *et al*., 2017; Akaa *et al*., 2017; Abimbola *et al*., 2022).

Despite their growing popularity, the medical and public health implications of tattoos and piercings are substantial. The classification of tattooing as a surgical procedure by the International Classification of Procedures in Medicine (ICPM) highlights potential complications, including localized skin infections from bacteria such as *Staphylococcus aureus* and atypical mycobacteria (Roberts *et al*., 2004; CDC, 2006; Drage *et al*., 2010). More concerning are the risks of blood-borne diseases like hepatitis and HIV/AIDS due to unsterile equipment (Frings, 2021) and severe bacterial infections that can lead to abscesses and sepsis (Agbezuge *et al*., 2022). Furthermore, allergic reactions to tattoo inks, often containing industrial-grade pigments with heavy metals and carcinogenic compounds, as well as scarring and exacerbation of pre-existing skin conditions, present significant health challenges (Neri *et al*., 2002; Armstrong, 2005; Dron *et al.*, 2007; Wohlrab *et al*., 2007; Engel *et al*., 2008; Lehner *et al*., 2011; Bonadonna, 2015). Oral piercings also pose specific risks to dental and oral health (Passos *et al*., 2022).

Given these health implications, adherence to professional standards is paramount. This includes rigorous hand hygiene, use of sterile and disposable instruments, proper needle disposal, and comprehensive client screening and consultation regarding medical history and contraindications (Brooks *et al*., 2003; Hellard *et al.*, 2007). Regulatory frameworks, such as the Local Government (Miscellaneous Provisions) Act 1982 in England and Wales, underscore the necessity of registered premises and trained practitioners in safeguarding public health and ensuring ethical standards within the body modification industry. With increasing global acceptance, negative perceptions, often rooted in cultural, religious, and sociocultural beliefs, continue to pose challenges in some regions, such as Nigeria (Abimbola *et al*., 2022; Ezeibekwe *et al*., 2016; Adisa *et al*., 2021).

Reports of complications and infections among youths in higher institutions in Ede and Ijebu-Jesa prompted the selection of these locations for this study. Despite the rising popularity of body modification practices, there is a notable absence of public health surveillance and scientific quantification of the infectious risks associated with tattooing and body piercing in Nigeria. This study, therefore, evaluated the impact of an educational intervention on improving health and safety practices among tattoo and body piercing artists in the towns of Ijebu-Jesa and Ede, Osun State, Nigeria.

Materials and Methods

Study Design

The study utilized a quasi-experimental design (Rogers & Revesz, 2019) that included baseline and end-line assessments for both intervention and control groups, with the intervention implemented solely for the intervention group (Table 1).

Table 1: Research Design

Group	Time		
	Baseline Assessment	Intervention (3 months)	End-of-Line Assessment
Intervention group (IG)	O_1	Training of tattoo artists and body piercers	O_3
Control group (CG)	O_2	No Intervention	O_4

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Study Location
Ijebu-Jesa and Ede, two ancient Yoruba towns tracing their lineage to Oduduwa, share similar socio-cultural traditions, including the use of facial marks for identity. While such traditional markings are waning, now often limited to firstborns, modern forms of body modification, such as tattoos and piercings, are increasingly being embraced by the youth, particularly in higher education institutions. In both towns, body art practices have evolved with contemporary fashion trends, incorporating elements like name tattoos, ear piercings, body beads, and dyeing of hands and feet. These modifications not only reflect changing cultural aesthetics but also serve as income-generating activities for many residents.

Study Population
The study population included tattoo artists and body piercers in the selected towns of Ijebu-Jesa and Ede in Osun State. There were a total of 49 and 35 registered body beauticians offering tattoo and body piercing services in Ijebu-Jesa and Ede, respectively
Inclusion criteria: Eligible participants were registered tattoo artists and body piercers who had established shops they operated in, had been living in the study area for more than 3 months, and were present at the time of the study.
Exclusion criteria: Tattoo artists who did not consent to this study were not eligible.

Sample Size
The sample size was determined by the total number of registered body beauticians in the selected towns. Given the study's aim to include all registered practitioners in these towns, the sample size was comprehensive and representative of the population in the chosen localities (Figure 1).

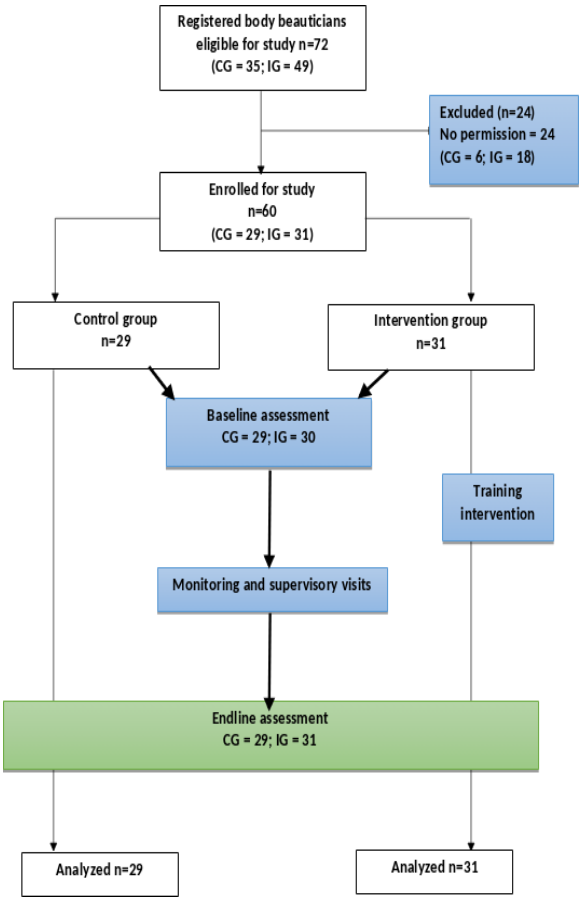

Figure 1: Flowchart of the study
Source: Author

Theoretical Model: Social Learning Model.

Participants
Registered tattoo artists and body piercers in Ijebu-Jesa and Ede. A total of 59 participants were in the study (29 in the control group and 30 in the intervention group at baseline; 31 in the intervention group at end-line).
Intervention
One-month training followed by two months of monitoring, using lectures and demonstrations covering safety hygiene practices, professional procedures, and ethical guidelines.

Data Collection
The questionnaire was designed by the researcher and has a reliability value of 0.70 to 0.80 (Cronbach's alpha).

Data Analysis
Data analysis was conducted using IBM SPSS version 24, which was employed to code, input, and analyze the quantitative data collected. Both descriptive

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statistics (such as means and standard deviations) and inferential statistics, including ANOVA, independent sample t-tests, Chi-square tests (with Fisher's exact test applied for variables with small sample sizes), correlation, and regression analyses, were utilized. A significance level of 0.05 was adopted, guided by the study objectives and corresponding null hypotheses. Data comparisons were made across four levels: baseline and end-line data within the intervention group, baseline and end-line data within the control group, and comparisons of baseline and end-line data between the intervention and control groups.

Ethical considerations

The study rigorously protected participant privacy and confidentiality by not collecting personal identifiers like names or addresses. Researchers ensured ethical conduct, avoiding coercion and fully explaining the study's goals, including data anonymity. To facilitate understanding, interviews were conducted in Yoruba, and each participant received a code number to safeguard their responses. Informed consent was obtained from all respondents before data collection.

Result

Table 1: Socio-demographic Characteristics of the Study Participants

Socio-demographic Characteristics	Study Site		Total
	Ede N (%)	Ijebu-Jesa N (%)	N (%)
Age	25.97 ± 5.03	30.57 ± 7.43	28.31± 6.72
Gender			
Male	14 (48.3)	11 (36.7)	25 (42.4)
Female	15 (51.7)	19 (63.3)	34 (57.6)
Ever had any training	22 (75.9)	21 (70.0)	43 (72.9)
Yes	7 (24.1)	9 (30.0)	16 (27.1)
No			
Educational Level	0 (0.0)	2 (6.7)	2 (3.4)
None	10 (34.5)	4 (13.3)	14 (23.7)
Primary	17 (58.6)	19 (63.3)	36 (61.0)
Secondary	2 (6.9)	5 (16.7)	7 (11.9)
Tertiary			
Years of experience	5.76 ± 3.33	7.77 ± 6.49	6.78 ± 5.24
Number of trainings attended	23 (100)	16 (80.0)	39 (90.7)
	-	3 (15.0)	3 (7.0)
One	-	1 (5.0)	1 (2.3)
Two			
Three			
Services rendered	1 (3.4)	3 (10.0)	4 (6.8)
Tattoo	25 (86.2)	23 (76.7)	48 (81.4)
Body Piercing	3 (10.3)	4 (13.3)	7 (11.9)
Both			

This study involved 59 participants with an average age of 28.31 ± 6.72 years, with 57.6% being female. Most participants (72.9%) had no prior training, though 90.7% had attended at least one training session. Secondary education was the highest for 61% of respondents, compared to 23.7% with primary education. Participants had an average of 6.78 ± 5.24 years of experience. The majority (81.4%) offered only body piercing, while 11.9% offered both, and 6.8% offered only tattooing services.

Knowledge of Health Safety Practices of the Study Participants

The study revealed a generally low level of knowledge of health safety practices among participants. A significant majority were unaware of key hygiene protocols, such as autoclave sterility (71.2%), the need to cover exposed skin (64.4%), and proper skin antisepsis before procedures (66.1%). Most participants (84.7%) mistakenly prioritized glove use over handwashing, and 89.8% lacked knowledge about the Hepatitis B virus's survival outside the body. Additionally, 61% did not know that tattoo ink should be single-use. The average knowledge score was 2.07 ± 2.56 out of 11, with 67.8% classified as having poor knowledge and only 27.1% with average knowledge.

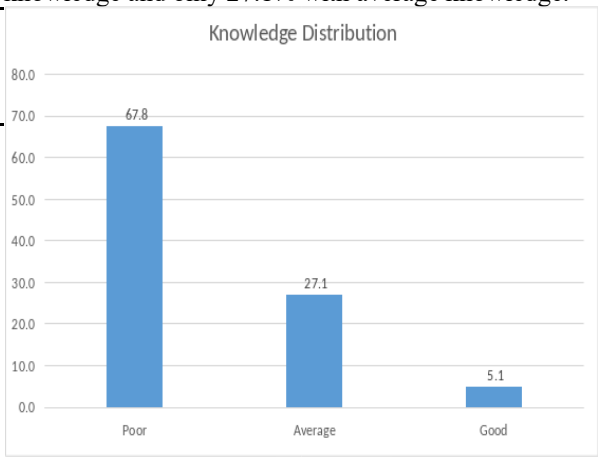

Figure 1: Knowledge Distribution of Participants

Attitudinal Disposition of the Study Participants

The findings show that while a majority of participants (64.4%) acknowledged the risk of spreading blood-borne diseases between clients, 39% believed such infections would be mild. Many viewed strict health safety protocols as burdensome (55.9%) and costly (74.6%), yet 61% strongly agreed these measures could prevent legal issues. Additionally, 83.1% recognized that disease precautions could be life-saving. Overall, participants demonstrated a generally positive attitude towards health safety, with a mean

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attitude score of 16.34 ± 3.47 out of 30; 59.3% had a positive attitude, while 40.7% had a negative one.

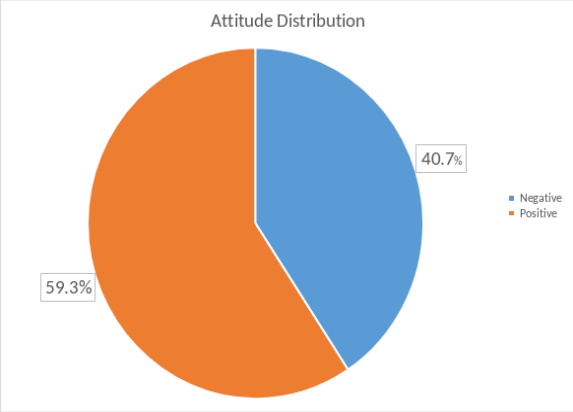

Figure 2: Attitude Distribution of ParticipantsHealth Safety Practices of the Study Participants

Participant self-assessments revealed low adherence to hygiene practices, with nearly half (40.7%) rarely performing hand hygiene before procedures and 32.2% never doing so. While glove use was high (47.5% always), over half (54.2%) never autoclaved equipment in sealed bags, and a majority (49.2%) never reused needles. Overall, the average practice score was 18.44 ± 7.03 out of 40, indicating a low level of health safety practice among participants, with 66.1% demonstrating low practice levels compared to 33.9% who had a high level.

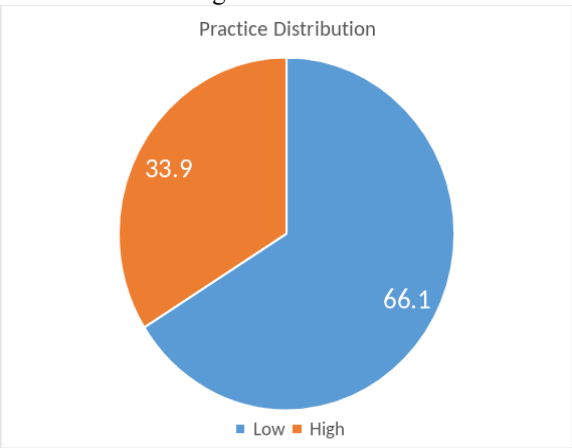

Figure 3: Practice Distribution of Participants

Table 2: Knowledge Relationship of the Study Participants between Variables

Variable	Mean	SD	F	df	P-value
Gender					
Male	2.76	2.758	3.301	1	0.075
Female	1.56	2.312			
Ever had training	2.42	2.629	3.088	1	0.084
Yes	1.13	2.156			
No					
Educational Level	0.00	0.000	11.541	3	0.000*
None	0.43	1.089			
Primary	2.08	2.383			
Secondary	5.86	1.773			
Tertiary					
Training attended	2.15	2.466	4.380	2	0.019*
1	5.00	2.646			
2	8.00				
3					
Services Rendered	5.25	2.217	16.146	2	0.000*
Tattoo	1.33	1.971			
Body piercing	5.29	2.690			
Both					
Age					
Less than 21 years	0.38	0.518	3.201	2	0.048*
21 – 35 years	2.14	2.629			
More than 35 years	3.57	2.637			
Years of experience	1.92	2.746	2.750	2	0.073
Less than 3 years	1.64	1.988			
3 – 10 years	3.64	3.529			
More than 10 years					

The analysis of variance (ANOVA) revealed no significant differences in knowledge based on respondents' gender ($F = 3.301$, $df = 1$; $p = 0.075$), years of experience ($F = 2.750$, $df = 2$, $p = 0.073$), or training attendance ($F = 3.088$, $df = 1$, $p = 0.084$). However, there was a significant difference in knowledge among respondents based on their educational level ($F = 11.541$, $df = 3$, $p < 0.05$), number of training sessions attended ($F = 4.380$, $df = 2$, $p < 0.05$), age ($F = 3.201$, $df = 2$, $p < 0.05$), and services rendered ($F = 16.146$, $df = 2$, $p < 0.05$).

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Table 3: Study Participants' Attitude Relationship with Variables

Variable	Mean	SD	F	df	P-value
Gender					
Male	17.12	3.468	2.249	1	0.139
Female	15.77	3.403			
Ever had training	16.77	3.365	2.483	1	0.121
Yes	15.19	3.582			
No					
Educational level	13.50	2.121	3.093	3	0.034*
None	15.21	3.577			
Primary	16.33	3.329			
Secondary	19.43	2.507			
Tertiary					
Training attended	16.95	3.387	0.784	2	0.463
1	16.33	2.082			
2	21.00				
3					
Services rendered	18.75	2.217	3.197	2	0.048*
Tattoo	15.81	3.431			
Body piercing	18.57	3.102			
Both					
Age					
Less than 21 years	16.13	1.458	1.467	2	0.239
21 – 35 years	16.05	3.634			
More than 35 years	18.43	3.645			
Years of experience	16.75	4.026	0.131	2	0.878
Less than 3 years	16.17	3.265			
3 – 10 years	16.46	3.778			
More than 10 years					

ANOVA revealed no significant difference in attitude across respondent gender ($F = 2.249$, $df = 1$; $p = 0.139$), years of experience ($F = 0.131$, $df = 2$, $p = 0.878$), training attendance ($F = 2.483$, $df = 1$, $p = 0.121$), number of training attended ($F = 0.784$, $df = 2$, $p = 0.463$), and age ($F = 1.467$, $df = 2$, $p = 0.239$). However, there was a significant difference in attitudes among respondents based on their educational level ($F = 3.093$, $df = 3$, $p < 0.05$) and services rendered ($F = 3.197$, $df = 2$, $p < 0.05$) (Table 3).

Table 4: Analysis of Practice across Study Participants' Variables

Variable	Mean	SD	F	df	P-value
Gender					
Male	18.64	7.794	0.03	1	0.854
Female	18.29	6.521	4		
Ever had training	19.39	7.024	3.03	1	0.087
Yes	15.88	6.561	1		
No					
Educational Level	22.00	2.828	9.03	3	0.000*
None	14.86	4.167	7		
Primary	17.67	6.137			
Secondary	28.57	7.807			
Tertiary					
Training attended	18.54	6.168	6.69	2	0.003*
1	29.00	6.928	9		
2	34.00				
3					
Services Rendered	26.25	9.569	8.81	2	0.000*
Tattoo	16.81	6.330	9		
Body piercing	25.14	1.773			
Both					
Age					
Less than 21 years	15.13	3.182	1.50	2	0.232
21 – 35 years	18.59	7.235	1		
More than 35 years	21.29	8.118			
Years of experience	17.58	8.073	1.68	2	0.194
Less than 3 years	17.67	5.787	8		
3 – 10 years	21.91	9.005			
More than 10 years					

ANOVA indicated no significant difference in practice across gender of respondents ($F = 0.034$, $df = 1$, $p = 0.854$), training attendance ($F = 3.031$, $df = 1$, $p = 0.087$), age ($F = 1.501$, $df = 2$, $p = 0.232$), and years of experience ($F = 1.688$, $df = 2$, $p = 0.194$). However, there was a significant difference in practice across the educational level of respondents ($F = 9.037$, $df = 3$, $p < 0.05$), number of training sessions attended ($F = 6.699$, $df = 2$, $p < 0.000$) and services rendered ($F = 8.819$, $df = 2$, $p < 0.05$).

The Relationship between Practice, Knowledge, and Attitude among Study Participants

Table 5: Correlation Between Practice, Knowledge, And Attitude

Variables	1	2	3
Practice	-		
Attitude	0.654**	-	
Knowledge	0.639**	0.547**	-

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Table 6: Regression Analysis Containing Significant Predictors of Practice

	Unstandardized Coefficients		Standardized Coefficients	Rank	t	Sig.
	B	Std. Error	Beta			
Model 1						
Knowledge	1.101	0.297	0.401	2nd	3.707	0.000
Attitude	0.881	0.219	0.435	1st	4.016	0.000

There was a positive correlation between attitude (r = 0.654, p < p<0.001) and knowledge (r = 0.639, p < 0.001). Linear regression revealed that attitude (b = 0.435, p < 0.001) and knowledge (b = 0.401, p < 0.001) were significant predictors of variation in practices. This suggests that improving knowledge and attitude can lead to more effective practices.

Table 7: Impact Evaluation of Variables in the Study at End-Line

Variables	Max point	Intervention N = 31	Control N = 29	*ES(95%CI)	p-value
		$\bar{x} \pm SD$	$\bar{x} \pm SD$		
Knowledge	11	6.42 ± 2.06	1.35 ± 2.33	2.31 (1.63 – 2.93)	0.00*
Attitude	30	17.45 ± 4.70	15.66 ± 3.18	0.44 (-0.07 – 0.95)	0.09
Practice	40	20.13 ± 5.87	16.31 ± 4.74	0.71 (0.18 – 1.23)	0.01*

The intervention group (IG) exhibited substantial improvements in knowledge and practices compared to the control group (CG). Large effect sizes were observed for knowledge (d = 2.31) and medium effect sizes for practice (d = 0.71), highlighting the training's effectiveness. A striking 83.9% of the IG agreed that tattoo artists should cover exposed skin, a stark contrast to only 17.2% in the CG. Furthermore, nearly all IG participants, 93.5%, recognized the importance of cleaning clients' skin with antiseptics, whereas only 17.2% of the CG shared this view. In a positive shift, 67.7% of the IG disagreed that wearing gloves is more important than washing hands, suggesting a more comprehensive understanding of both practices' importance, unlike the 79.3% in the CG who prioritized gloves.

Discussion

This study observed a remarkably low level of knowledge regarding health safety practices and hygiene protocols among participants, aligning with previous research indicating a lack of awareness among artists regarding professional training topics and universal precautions for blood and bodily fluids (Hellard, 2003; Vozza *et al*., 2014; Covello *et al*., 2020). This is particularly concerning given the importance of scientific knowledge in promoting safe behaviors (John *et al*., 2016). Surprisingly, attending training did not significantly increase knowledge for all participants, suggesting that rudimentary aseptic procedure awareness and the absence of federal regulations might contribute to insufficient new and refresher training.

While some studies link experience to increased knowledge (Gyekye, 2010; Tamene & Yemane, 2022), this study, similar to Oberdorfer *et al.* (2003) and Raymond *et al*. (2001), found no significant change in knowledge with years of experience. This implies that changing long-standing habits requires more than just teaching; it necessitates regular reinforcement, live examples, and practice observation. Conversely, older and more experienced respondents demonstrated greater knowledge. A significant finding was that increased training attendance correlated with higher knowledge levels, consistent with Raymond *et al*. (2001), who found that instruction from health officials improved knowledge and practice.

Furthermore, higher education significantly predisposed participants to a higher level of knowledge, with those having lower educational levels exhibiting significantly less knowledge. This highlights the need for monitoring agencies to develop targeted strategies to improve general knowledge, especially among less educated operators.

Attitude, defined as a cognitive style manifested in observable behaviors and influenced by intrinsic and extrinsic factors (Schwarz, 2007), was also explored. Research across various professions shows that educational and training interventions positively influence attitudes towards infection prevention and control (Khanghahi *et al*., 2013; Ogoina *et al*., 2015; Ibrahim & Elshafe, 2016). Similarly, this study found a significant positive correlation between respondents' educational levels and their attitudes towards health safety practices, suggesting that targeted education can mitigate attitudes that hinder safe practices.

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However, the study's intervention did not effectively impact attitudes as anticipated. This discrepancy can be attributed to several factors. Attitudes are complex and often deeply ingrained, making them resistant to change, even with educational efforts. The Theory of Planned Behaviour emphasizes that altering attitudes requires sustained effort and reinforcement, and the intervention period might have been too short (De Pretto *et al*., 2015). Additionally, participants' perceptions of the intervention's credibility or relevance, along with strong cultural or organizational norms within the tattooing and body piercing community, might have outweighed the intervention's effects. Lastly, the study's methodology or measurement tools might not have been sensitive enough to capture subtle shifts in attitude over time, potentially masking any impacts. Future interventions should consider these complexities, including duration, intensity, individual perceptions, cultural factors, and measurement sensitivity, to enhance effectiveness in attitude change.

The study revealed a low level of adherence to health safety practices, including hand washing, glove use, and proper sterilization techniques. These findings align with other research (Raymond *et al*., 2001) and indicate a need for strategies to increase compliance. Notably, artists with lower educational levels, those without training, and body piercers showed significantly lower compliance rates. This suggests that practice enhancement tactics should initially focus on these specific groups.

These concerning results imply that for regulations to be effective, more intensive detection (inspection) efforts and sufficient enforcement and penalties are necessary. This aligns with other research suggesting that operators and environmental health officers would support such improvements, especially when combined with better feedback or information (Oberdorfer & Wiggers, 2002; Oberdorfer *et al*., 2003).

A significant correlation was found between respondents' knowledge and their health safety practices, suggesting that the low level of adherence to protocols may stem from a lack of information. This is a serious issue, as tattoo artists and body piercers must understand the concept of universal precautions for blood and bodily fluids to recognize the risk of infection from HIV, hepatitis B, hepatitis C, and other blood-borne pathogens (CDC, 1988). This underscores the need for instruction on the concept and application of general safeguards.

At the end-line, respondents' level of health safety practices knowledge significantly increased, which can be attributed to the training intervention. This supports the dynamic and reciprocal relationship between behavior and knowledge (Ajzen & Fishbein, 1977), where knowledge can influence feelings, and feelings can influence behavior (Fishbein, 1967). The improved knowledge among the intervention group at the study's conclusion suggests a robust predictor for the implementation of health safety practices strategies.

The study's findings collectively highlight the critical significance of specialized training programs in promoting health and safety among tattoo artists and body piercers. By demonstrating the close relationship between increased knowledge levels and adherence to safety regulations, this study emphasizes the importance of comprehensive training in raising professional standards and lowering potential health risks. Well-designed training programs not only equip practitioners with technical skills but also enhance their understanding of best practices, regulatory requirements, and risk mitigation. This focused education enables informed decisions regarding sanitation, sterilization, and client care, ultimately elevating service delivery standards and safeguarding both clients' and artists' health. This study also emphasizes the necessity of upholding high practice standards through ongoing training and skill improvement in the evolving body piercing and tattoo industries. Continuous education and knowledge exchange ensure practitioners remain current with technological advancements, emerging trends, and changes in health and safety regulations, enabling them to provide ethical, competent, and secure services.

Conclusion

This study observed higher rates of agreement in the intervention group regarding the use of sharps containers and autoclaving equipment. However, no significant increase in attitude level in the intervention group from baseline to end-line, nor a significant difference in attitude between the control and intervention groups at end-line, was observed in this study. Thus, this study suggests that the intervention had a direct impact on knowledge and practice, rather than significantly shifting underlying attitudes during the study's timeframe.

Contribution to Public Health Knowledge

The findings from this study demonstrate the effectiveness of tailored training programs in promoting positive attitudes and improving safety outcomes. In addition, this study emphasizes the importance of continuous education and skill development among body beauticians to maintain high standards and safeguard the health of both clients and practitioners. Ultimately, it reinforces the broader value of education in preventing infections and mitigating health risks in this specialized field.

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Recommendations

Based on the findings from this study, the following recommendations are made:

i. Development of tailored training programs that address deep-rooted behaviors and are accessible to practitioners of all educational levels.

ii. Targeted educational strategies should be implemented for untrained or less-educated practitioners, using interactive methods to bridge knowledge gaps.

iii. Strengthening regulatory oversight and enforcing federal guidelines are essential to ensure compliance with health safety standards.

iv. Continuous professional development through training, workshops, and conferences is encouraged to keep practitioners updated.

v. Public awareness campaigns should educate clients on choosing certified professionals who follow proper safety protocols.

vi. Partnerships with public health organizations are vital for creating and distributing educational materials to reduce health risks and promote safer practices.

Declarations

Conflict of interest

The authors declare no conflict of interest

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References

Abimbola, E. O., Itohan, O. R., Ehizokhale, E. S., Chuwuma, O. N., Godswill, O. O., & Enatewe, A. E. (2022). Tattoos and body piercings among young adults in Nigeria. *International Journal of Human and Health Sciences (IJHHS)*, *6*(1), 24.

Adisa, T. A., Adekoya, O. D., & Sani, K. F. (2021). Stigma hurts: exploring employer and employee perceptions of tattoos and body piercings in Nigeria. *Career Development International*, *26*(2), 217-237.

Agbezuge, M. A.,Danso, D. K., & Adom, D. (2022). General Attitudes, Cultural Significance and Health Risks Associated with Body Arts among Ewe Youth in the Volta Region of Ghana. Art and Design Review, 10, 1-17.https://doi.org/10.4236/adr.2022.101001

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological bulletin*, *84*(5), 888.

Akaa, P., Ahachi, C., & Babarinde, O. (2017). Attitude and Perception to Tattoos and Scarified Skin Marks in Makurdi, North Central Nigeria. *British Journal of Medicine and Medical Research*, *21*(6), 1-8.

Armstrong, M. L. (2005). Tattooing, body piercing, and permanent cosmetics: a historical and current view of state regulations, with continuing concerns. *Journal of Environmental Health*, *67*(8), 38.

Bailey, D. (2011). *Tattoo art around the world*. The Rosen Publishing Group, Inc.

Bonadonna, L. (2015). Survey of studies on microbial contamination of marketed tattoo inks. *Curr Probl Dermatol*, *48*, 190-195.

Brooks, TL, Woods, ER, & Knight, JR et al. (2003). Body modification and substance use in adolescents: is there a link? *Journal of Adolescent Health* 32: 44–9.

Centers for Disease Control (US). (1988). *Update: universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health-care settings*. Centers for Disease Control

Centers for Disease Control and Prevention (CDC) (2006). Methicillin-resistant *Staphylococcus aureus* skin infections among tattoo recipients--Ohio, Kentucky, and Vermont, 2004-2005. *MMWR: Morbidity & Mortality Weekly Report*, *55*(24).

Covello, F., Salerno, C., Giovannini, V., Corridore, D., Ottolenghi, L., & Vozza, I. (2020). Piercing and oral health: a study on the knowledge of risks and complications. *International journal of environmental research and public health*, *17*(2), 613.

Daramola, G. O., Oluyege, A. O., Edogun, H. A., Ajayi, A. O., Esan, C. O., Ojerinde, A. O., ... & Egbebi, A. (2017). The Prevalence of Skin-tattooing and HIV among Students of Three Tertiary Institutions in Ondo State, Southwest, Nigeria.

De Pretto, L., Acreman, S., Ashfold, M. J., Mohankumar, S. K., & Campos-Arceiz, A. (2015). The link between knowledge, attitudes and practices in relation to atmospheric haze pollution in Peninsular Malaysia. *PloS one*, *10*(12), e0143655.

Drage, L. A., Ecker, P. M., Orenstein, R., Phillips, P. K., & Edson, R. S. (2010). An outbreak of Mycobacterium chelonae infections in tattoos. *Journal of the American Academy of Dermatology*, *62*(3), 501-506.

Dron, P., Lafourcade, M. P., Leprince, F., Nonotte-Varly, C., Van Der Brempt, X., Banoun, L., ... & Moneret-Vautrin, D. A. (2007). Allergies associated with body piercing and tattoos: a report of the Allergy Vigilance Network.

P-ISSN: 2811-1516
E-ISSN: 2811-1524

European Annals of Allergy and Clinical Immunology, *39*(6), 189-192.

Engel, E., Santarelli, F., Vasold, R., Maisch, T., Ulrich, H., Prantl, L., ... & Bäumler, W. (2008). Modern tattoos cause high concentrations of hazardous pigments in the skin. *Contact dermatitis*, *58*(4), 228-233.

Ezeibekwe, U. P., Ojedokun, U. A., & Aderinto, A. A. (2016). Love for artwork": Tattooing and body piercing among undergraduate students of the University of Ibadan, Nigeria. *African Journal for the Psychological Studies of Social Issues*, *19*(3), 87-95.

Fishbein, M. (1967). Attitude and the prediction of behavior. *Readings in attitude theory and measurement*.

Frings, V. G., Roth, S., Rosenwald, A., Goebeler, M., Geissinger, E., & Wobser, M. (2021). EBER in situ hybridization in subcutaneous aluminum granulomas/lymphoid hyperplasia: A diagnostic clue to differentiate injection-associated lymphoid hyperplasia from other forms of pseudolymphomas and cutaneous lymphomas. *Journal of Cutaneous Pathology*, *48*(5), 625-631.

Grogan, S. (2021). *Body image: Understanding body dissatisfaction in men, women and children*. Routledge.

Gyekye, S. A. (2010). Occupational safety management: The role of causal attribution. *International Journal of Psychology*, *45*(6), 405-416.

Hellard, M., Aitken, C., Mackintosh, A., Ridge, A., & Bowden, S. (2003). Investigation of health safety practices and knowledge of hepatitis C among body-piercing practitioners. *American Journal of Health Safety Practices*, *31*(4), 215-220.

Hellard, ME, Aitken, CK, & Hocking, JS (2007). Tattooing in prisons – not such a pretty picture. *American Journal of Health Safety Practices* 35: 477–80.

Ibrahim, A. A., & Elshafie, S. S. (2016). Knowledge, awareness, and attitude regarding infection prevention and control among medical students: a call for educational intervention. *Advances in medical education and practice*, 505-510.

John, A., Tomas, M. E., Cadnum, J. L., Mana, T. S., Jencson, A., Shaikh, A., ... & Donskey, C. J. (2016). Are health care personnel trained in the correct use of personal protective equipment?. *American Journal of Health Safety Practices*, *44*(7), 840-842.

Khanghahi, B. M., Jamali, Z., Azar, F. P., Behzad, M. N., & Azami-Aghdash, S. (2013). Knowledge, attitude, practice, and status of health safety practices among Iranian dentists and dental students: a systematic review. *Journal of dental research, dental clinics, dental prospects*, *7*(2), 55.

Kluger N. (2015). Epidemiology of tattoos in industrialized countries. *Current problems in dermatology*, *48*, 6–20. https://doi.org/10.1159/000369175

Lehner, K., Santarelli, F., Vasold, R., König, B., Landthaler, M., & Bäumler, W. (2011). Black tattoo inks are a source of problematic substances such as dibutyl phthalate. *Contact dermatitis*, *65*(4), 231-238.

Meltzer, D. I. (2005). Complications of body piercing. *American family physician*, *72*(10), 2029-2034.

Neri, I., Guareschi, E., Savoia, F., & Patrizi, A. (2002). Childhood allergic contact dermatitis from henna tattoo. *Pediatric dermatology*, *19*(6), 503-505.

Oberdorfer, A., & Wiggers, J. H. (2002). Environmental Health Officers' Knowledge and Attitudes towards Health safety practices. *Environmental Health*, *2*(2), 35-44.

Oberdorfer, A., Wiggers, J. H., Bowman, J., & Lecathelinais, C. (2003). Health safety practices among tattooists and body piercers in Sydney, Australia. *American journal of health safety practices*, *31*(8), 447-456

Ogoina, D., Pondei, K., Adetunji, B., Chima, G., Isichei, C., & Gidado, S. (2015). Knowledge, attitude and practice of standard precautions of health safety practices by hospital workers in two tertiary hospitals in Nigeria. *Journal of Infection Prevention*, *16*(1), 16-22.

Passos, P. F., Pintor, A. V. B., Marañón-Vásquez, G. A., Campos, T., Abrahão, A. C., Ferreira, D. M. T. P., ... & Visconti, M. A. (2022). Oral manifestations arising from oral piercings: A systematic review and meta-analyses. *Oral surgery, oral medicine, oral pathology and oral radiology*, *134*(3), 327-341

Raymond, M. J., Pirie, P. L., & Halcón, L. L. (2001). Health safety practices among professional tattooists in Minneapolis and St. Paul, MN. *Public Health Reports*, *116*(3), 249.

Roberts, T. A., Auinger, P., & Ryan, S. A. (2004). Body piercing and high-risk behavior in adolescents. *Journal of Adolescent Health*, *34*(3), 224-229.

Rogers, J., & Revesz, A. (2019). Experimental and quasi-experimental designs. In *The Routledge Handbook of Research Methods in Applied Linguistics* (pp. 133-143). Routledge.

P-ISSN: 2811-1516
E-ISSN: 2811-1524

Schwarz, N. (2007). Attitude construction: Evaluation in context. *Social cognition*, *25*(5), 638-656.

Tamene, A., & Yemane, B. (2022). A Study of Body Modification Artists' Knowledge, Attitudes, and Practices Toward Health Safety Practices: A Questionnaire-Based Cross-Sectional Study. *Risk Management and Healthcare Policy*, 713-725.

Vozza, I., Fusco, F., Bove, E., Ripari, F., Corridore, D., & Ottolenghi, L. (2014). Awareness of risks related to oral piercing in Italian piercers. Pilot study in Lazio Region. *Annali di stomatologia*, *5*(4), 128.

Wohlrab, S., Stahl, J., & Kappeler, P. M. (2007). Modifying the body: Motivations for getting tattooed and pierced. *Body image*, *4*(1), 87-95.

Wohlrab, S., Stahl, J., Rammsayer, T., & Kappeler, P. M. (2007). Differences in personality characteristics between body-modified and non-modified individuals: associations with individual personality traits and their possible evolutionary implications. *European Journal of Personality: Published for the European Association of Personality Psychology*, *21*(7), 931-951.