



A Descriptive Analysis of the Epidemiology and Motivations for Laser Tattoo Removal in an Underserved Population

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Abstract

Tattoos of formerly gang-involved and incarcerated individuals can negatively impact their ability to reintegrate into society. Laser tattoo removal is essential to helping individuals obtain employment, re-cultivate positive relationships, and disengage from gangs. The objective of this study is to describe the demographics and motivations for laser tattoo removal at a large nonprofit clinic. This was a single center retrospective study conducted on patients presenting to Ya'stuvo Tattoo Removal between January 2016–December 2018 and had at least three laser tattoo removal sessions. Data was recorded on patient demographics, geographic location of residence (e.g. zipcode), comorbidities, probation/parole status, referral source, transportation mode, and motivations for receiving and removing tattoos. A representative sample of 862 patients was used to conduct our analysis. Average age at first visit was 30. 16% (n = 134) were on probation, 8% (n = 66) were on parole, and 63% (n = 544) did not report their probation/parole status. Reasons for receiving a tattoo included gangs (46%, n = 368), a current or ex-relationship (28%, n = 223), and decoration (20%, n = 159). The most common reasons for tattoo removal were employment (66%, n = 546), readiness to change life (47%, n = 392), maturity (47%, n = 392), family (43%, n = 356), and negative attention from tattoos (37%, n = 303). The current study highlights the importance of laser tattoo removal in reintegration and gang disengagement. Expanding cost efficient laser tattoo removal is paramount to meet the safety and socioeconomic needs of this population.

Keywords Tattoos · Gang affiliation · Incarcerated · Underserved populations · Laser tattoo removal

Introduction

Since the Neolithic era, tattoos have served an important role in society. Largely considered a mark of self-expression emphasizing individuality, tattoos can also be a representation of religious or cultural affiliation [1, 2]. Within the United States, the popularity of tattoos has continued to grow. Reports show that 36% of Americans aged 18–25 and 40% aged 26–40 have at least one tattoo [3]. Furthermore, the appeal of tattoos is ever changing, with more women and younger adults seeking multiple tattoos on visible parts of the body [1, 4].

The wide range of meaning behind tattoos spurs both positive and negative reactions. Some individuals associate tattoos with deviant social behavior, including self-destruction, sexual promiscuity, and poor decision-making [3, 5]. Such an outlook stigmatizes those with tattoos, leading to discrimination that permeates multiple societal realms [6]. Regarding employment opportunities, many employers view those with tattoos as less credible and less competent [3, 7–11]. Additionally, employers may view tattoos as inappropriate and serve as a hindrance when working with customers, such as in the hospitality, beauty, and retail industries [3, 11]. Beyond employment, one study reported that tattooed persons were negatively regarded by healthcare providers, potentially impacting rapport between physicians and patients and instigating implicit biases [11]. Within the legal system, tattoos were found to contribute to stigma and police profiling [6]. Multiple studies have reported that tattooed defendants were perceived as more threatening and those with facial tattoos were more likely to be incarcerated [5, 12]. Tattoos have

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also been associated with victimization by law enforcement, leading to police harassment [13].

Federally funded employment positions have strict tattoo regulations preventing tattooed applicants from entering such fields. In the United States Military, all branches have banned neck and face tattoos as well as tattoos that are considered indecent (e.g. containing racist, sexist, or extremist messaging) [14]. Similarly, the Los Angeles Police Department and Transportation Security Administration (TSA) require all facial and neck tattoos be covered during duty hours [15].

The social ramifications created by tattoos discussed above have a particular impact on the formerly incarcerated and formerly gang-affiliated individuals, a highly underserved population affected largely by poor access to tattoo removal. Gang membership has become an important public health issue, with nearly twenty thousand gangs and one million gang members living in the United States [16]. For former or current gang-affiliated individuals, tattoos can represent commitment, allegiance, and rank within a gang, or reflect committed felonies [17]. Notably, these tattoos are not always obtained voluntarily. Victims of sex trafficking are branded with the names or aliases of their traffickers, barcodes, or gang symbols to signify possession [18]. Thus, gang tattoos propel stigma, are a source of emotional trauma, and pose a threat to safety [13, 19]. Therefore, the opportunity to remove such tattoos for individuals seeking re-entry into society is extremely impactful.

Although there is published data on laser tattoo removal, there exists a paucity of literature pertaining to the significance of this procedure for the formerly incarcerated and formerly gang affiliated. A significant barrier to accessing tattoo removal is its high costs. Estimated to total up to thousands of dollars, laser tattoo removal costs on average \$401 for a single procedure at a private clinic [20], with an average of 7–10 treatments needed to fully remove a tattoo [21]. Additionally laser tattoo removal is typically considered a cosmetic procedure, which is not covered by insurance. As a result, some who desire tattoo removal attempt to do so through harmful methods including abrasive chemicals, fire, or cutting, which put them at significant risk for scarring and infection [6].

Given the value of laser tattoo removal to safe reentry into society, several tattoo removal clinics dedicated to serving the formerly incarcerated and formerly gang-affiliated have been created. In a study by *Foran et al.* they found a majority of patients sought tattoo removal to remove gang affiliation, improve employment and personal safety [19]. Additionally, *Kremer et al.* found Mexican migrants undergoing tattoo removal were less likely to be incarcerated [13]. These studies underscore the value of tattoo removal for vulnerable populations with limited access to this procedure.

Despite current data, existing studies are limited to small sample sizes, with further data needed to describe the complex landscape of laser tattoo removal in this population. Our project is a collaborative effort between the USC Keck School of Medicine and Homeboy Industries, a non-profit organization dedicated to gang rehabilitation and societal re-entry. Homeboy Industries' Ya'Stuvo Tattoo Removal provides over 3000 pro bono tattoo removal treatments each month to their 950 clients [22]. The objectives of this study are to: (1) describe the patient demographics of the laser tattoo removal population at a large nonprofit organization, (2) describe the motives for obtaining and removing tattoos, (3) evaluate the challenges of tattoo removal to the formerly incarcerated and formerly gang affiliated communities, and (4) evaluate the importance of accessibility to this service.

Methods

Homeboy Industries' Ya'Stuvo Tattoo Removal Clinic

Homeboy Industries' Ya'Stuvo Tattoo Removal services are free and open to the community, with no eligibility criteria for new patients, including prior existing health conditions or geographic residence. Patients include participants from other Homeboy Industries programs, referrals from local organizations and law enforcement agencies, and self-referred community members. Patients include former gang members, previously incarcerated individuals, and other community clients referred to Homeboy Industries. Services are provided by a team of 30 volunteer clinicians, including physicians, physician assistants, nurse practitioners, and dentists. Clinicians span a wide range of medical fields, including dermatology, family medicine, plastic surgery, and psychiatry. Because of its well-known history and presence in the community, the clinic provides tattoo removal to over 4000 patients per year.

All patients receiving services at Homeboy Industries have their demographic information, including date of birth, ethnicity, race, and address stored in the clinic's tracking platform, FileMakerPro. Patients complete a detailed intake form which includes multiple choice questions about the patient's tattoos, motivation(s) for removal, how they were referred, probation/parole status, and sociodemographic information. Patient intake forms, along with photographs of the tattoos and laser treatment settings are recorded on paper charts stored onsite.

Patient Selection

A retrospective review of patients who had received laser tattoo removal services at Homeboy Industries' Ya'Stuvo Tattoo Removal clinic between January 2016 to December

2018. Given the large patient volume, a representative sample was chosen from Ya’Stuvo Tattoo Removal’s paper charts to represent the patient population seen during the study period. This study was reviewed by the LA Biomed Research Institute. It was determined by the John F. Wolf Human Subjects Committee (1) that the proposed activity, as it pertains to submission reference #048108, is not human subject research as defined by DHHS and/or FDA regulations.

A total of 8364 patients identified through FileMakerPro had at least one tattoo removal clinic visit from 2016 to May 2018. Medical histories for approximately 1400 randomly selected patient paper charts were entered by the research team into a secure electronic database, and these entered histories were merged with the patient information extracted from the database. Patient charts that were missing date of birth, race, ethnicity, gender, or zip code were excluded from the dataset before merging. Patients with fewer than three total treatments throughout the study period were excluded.

To assess whether our sample was representative of the clinic’s patient population, we compared the demographics of our final sample with those of the comprehensive patient list and found that across racial and ethnic demographics, race, and age there was proportional consistency of our sample the entire patient population between 2016 and 2018.

Data Extraction

Data was collected on the demographics, geographic location of residence (e.g., zip code), comorbidities, probation/parole status, referral source, transportation method to the clinic, motivations for receiving tattoos, and motivations for removing tattoos.

The data was summarized into a series of descriptive tables, with frequencies calculated for patient age at first visit, race, ethnicity, gender, living situation, probation/parole status, referral source, mode of transportation, reason for getting tattoo, and reason for tattoo removal.

Results

A total of 862 individuals met the study inclusion criteria. Our sample represented 17% of the total number of patients with three or more laser tattoo removal treatments, who visited between 2016 and 2018 (Table 1). Compared to all laser tattoo removal patients at Ya’Stuvo Tattoo Removal from 2016 to 2018 with at least three treatments, our sample had a similar racial, ethnic, and gender distribution (Table 2). Compared to the entire population of patients from 2016 to 2018, there was a modest but statistically significant difference in the percentage of males (60% vs. 56%, $p = 0.02$).

The geographic distribution of laser tattoo removal patients presenting to Ya’Stuvo Tattoo Removal is shown in Fig. 1. A total of 269 zip codes were represented by our cohort. The majority of patients (87%, $n = 754$) lived in Los Angeles County, with the most represented cities being Los Angeles, Long Beach, Bell Gardens, Montebello, Pasadena, and Pomona. The remaining came from surrounding counties in southern California, including San Bernardino (4%, $n = 34$), Orange (3%, $n = 26$), Riverside (2%, $n = 21$), San Diego (2%, $n = 13$), Kern ($< 1%$, $n = 4$), and Ventura ($< 1%$, $n = 3$) counties. (Table 3).

Tables 2 and 4 outline the demographic characteristics of our cohort. Among our sample, the majority of patients identified as Latino, Chicano or Hispanic, both racially and ethnically (81 and 80% respectively). 56% ($n = 483$) of patients were male. The average age of patients at their first visit was 30, with 57 (7%) patients under the age of 18 during their first visit (Table 4).

Comorbidities at the time of intake include hepatitis C (3%, $n = 27$), diabetes (2%, $n = 17$), and seizure disorder (1%, $n = 9$) (Table 4). One patient reported Hepatitis B, and 2 patients reported HIV. 6% ($n = 52$) of patients were on prescribed medications, including antidepressants.

Approximately 10% of our sample reported transitional living situations, with 8% ($n = 69$) living in a recovery

Table 1 Total number of patients and study sample for laser tattoo removal patients at Homeboy Industries’ Ya’Stuvo Tattoo Removal, 2016–2018

Year	2016	2017	2018	Total				
Total files from database								
Total number of patients 2016–18 ^a	4254	4599	3653	8364				
Number of patients with 3+ treatments across all years	3211	3286	2497	5037				
Sample (n and % total patients)								
Total number of medical histories entered from 2016-18 (merged files)	767	24%	768	23%	602	24%	1406	28%
Number of patients with 3+ treatments across all years	590	18%	569	17%	414	17%	862	17%

^aTotals are not a sum of the year’s totals but the number of unique individuals across all three years

Table 2 Demographics of study sample in comparison to population of laser tattoo removal patients at Homeboy Industries' Ya'Stuvia Tattoo Removal, 2016–2018

Characteristic	Population – All Treatments 2016-18 (n = 8,364)		Population – 3 + Treatments (n = 5,037)		Study Sample – 3 + Treatments (n = 862)	
	n	%	n	%	n	%
Race						
American Indian or Alaskan Native	81	1	35	1	5	< 1
Asian	128	2	83	2	11	1
Biracial or Multi-racial	218	3	115	2	23	3
Black or African American	752	9	365	7	64	7
Latino/Chicano/Hispanic	6483	78	4032	80	697	81
Native Hawaiian or other Pacific Islander	24	0	12	0	2	< 1
Some Other Race	103	1	76	2	7	1
White or Caucasian	575	7	319	6	53	6
Ethnicity						
Hispanic or Latino	# of patients	% of total	# of patients	% of total	# of patients	% of total
	6551	78	4093	81	699	81
Not Hispanic or Latino	1811	22	942	19	163	19
Gender						
Female	# of patients	% of total	# of patients	% of total	# of patients	% of total
	3341	40	2181	43	379	44
Male	5023	60	2856	57	483	56

home (e.g., rehabilitation center, sober living facility), and 1% (n = 9) living in a halfway house (Table 4. 31% (n = 267) did not respond to the question. Anecdotally, many patients report living with family or friends and do not rent or own their own housing. 16% (n = 134) of patients were on probation, 8% (n = 66) were on parole, 63% (n = 544) selected not applicable, and 14% (n = 123) did not respond. With respect to patient mode of transportation, 50% (n = 398) reported driving themselves, 26% (n = 338) used public transportation (e.g., bus, train), and 25% (n = 201) received a ride from a friend.

An overview of patient referral sources to the Homeboy Industries laser tattoo removal clinic is shown in Table 5. Patients were referred by a work source (8%, n = 57), Father Gregory Boyle (founder of Homeboy Industries) (8%, n = 55), probation or parole officers (6%, n = 41), case workers (3%, n = 27), teachers (3%, n = 25), and social workers (3%, n = 23). The majority (66%, n = 460) of patients selected "Other" for referral source. Most often, these were patients who were already participants or friends of individuals in other Homeboy Industries services.

Reasons for receiving and removing tattoos are shown in Table 6. The most common reasons for receiving tattoos include: gang affiliation (46%, n = 368), current or ex-relationship (28%, n = 223), and decoration (20%, n = 159). Reasons for tattoo removal include employment (66%, n = 546); maturity (47%, n = 392); wanting to change one's life (47%, n = 392); family (43%, n = 356); and tattoo(s) attracting negative attention (37%, n = 303).

On average, patients reported getting their first tattoo at 16 years old, reported having 11 tattoos, and expressed wanting to remove 4 tattoos. Some patients also reported having hundreds of tattoos and wanting to remove up to 30 tattoos, while others did not provide responses to these questions. 8% of patients had received prior tattoo removal treatments at other facilities.

Discussion

For individuals who decide to leave a gang, tattoos remain a stigma and serve as a significant barrier to safety and stability [1]. Tattoos demonstrating past gang affiliation can

Fig. 1 Geographic distribution of laser tattoo removal patients presenting to Homeboy Industries' Ya'Stuvo Tattoo Removal

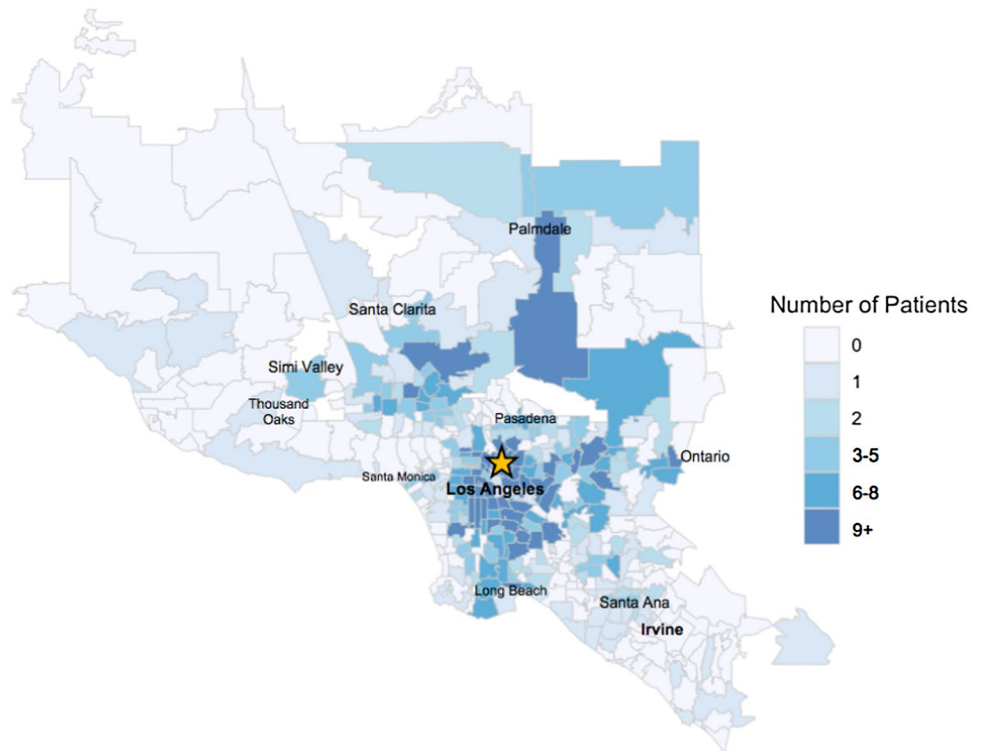


Table 3 Distribution of patient zip codes (n = 862), Homeboy Industries' Ya'Stuvo Tattoo Removal, 2016–2018

County	Most Common Cities	n	%
Los Angeles	Los Angeles (331), Long Beach (35), Bell Gardens (18), Montebello (16), Pasadena (14), Pomona (14), Compton (13), South Gate (13), El Monte (12), Whittier (12)	754	87
San Bernardino	San Bernardino (5), Rancho Cucamonga (5), Ontario (5), Chino (4), Fontana (4)	34	4
Orange	Anaheim (9), Santa Ana (3), Garden Grove (3)	26	3
Riverside	Riverside (6), Corona (3)	21	2
San Diego	San Diego (4), Escondido (3)	13	2
Kern	Bakersfield (3)	4	<1
Ventura	Simi Valley (2)	3	<1
Fresno	Fresno (1)	1	<1
Hopkins (Kentucky)	Earlington (1)	1	<1
Invalid zip code	N/A	5	<1

make finding employment difficult, particularly when they are located on visible areas of the body including the hands, neck, and face. In an attempt to overcome this obstacle, former gang members and inmates resort to unsafe attempts at tattoo removal, including burning or applying acid to the tattooed skin [23]. The role of safe tattoo removal holds increased significance for this population and providers must consider multiple factors when optimizing the tattoo removal process.

There is a paucity of literature reporting on laser tattoo removal in the formerly incarcerated and formerly gang-affiliated. Existing studies are limited to small retrospective

cohorts of less than 200 patients, including multicenter studies [6, 19]. Here we describe a large population of laser tattoo removal patients from Homeboy Industries, a nonprofit organization that serves to rehabilitate and reintegrate former inmates and former gang members into society. Unique to our study is the large sample size of over 800 patients from a program that has been delivering free laser tattoo removal services to this population since 1988. Our patient population spans a wide geographic distribution across the state, suggesting a high demand for and relative inaccessibility to laser tattoo removal services. We postulate this to be due to a lack of low-cost tattoo removal clinics, as laser

Table 4 Age, comorbidities, living situation, probation/parole status, and transportation mode of study sample, (n = 862), Homeboy Industries' Ya' Stuvo Tattoo Removal, 2016–2018

Characteristic	n	%
Age		
< 18	57	7
18–24	237	27
25–34	329	38
35–44	159	18
45–54	65	8
≥ 55	15	2
Comorbidities		
Hepatitis C	27	3
Diabetes	17	2
Seizure disorder	9	1
HIV	2	0.20
Hepatitis B	1	0.10
Housing status		
Recovery home ^a	69	8
Halfway house	9	1
Not applicable	517	60
No response	267	31
Probation/parole status		
Not Applicable	544	63
Probation	134	16
No Response	123	14
Parole	66	8
Method of transportation		
Drove	398	50
A Ride	201	25
Bus	137	17
Train	69	9
Walk	24	3
Other transportation	27	3
No response	64	7

^aRehabilitation center or sober living facility

tattoo removal is a costly procedure traditionally offered in dermatology offices that can add up to thousands of dollars over the course of multiple treatment sessions [24].

To deliver patient centered and culturally sensitive care, it is imperative to understand the motivations behind acquiring and removing tattoos. The reasons for obtaining tattoos described in our cohort highlight a population that varies from the traditional tattoo removal patient population observed in dermatology offices. A survey conducted by Armstrong et al. across four dermatology clinics found a majority of patients sought tattoos to “feel independent” (44%, n = 82) and “make life experiences stand out” (33%, n = 60) [1]. In contrast, our patients largely cited gangs (46%, n = 368) and a current or ex relationship (28%, n = 223) as

Table 5 Referral source for study laser tattoo removal patients in study sample (n = 862), 2016–2018. Intake form instructed patients to “Check all that apply.”

Referred by	n	%
Other referral	460	66
Work source	57	8
Father G	55	8
Probation/parole officer	41	6
Case manager	27	3
Teacher or school official	25	3
Social worker	23	3
Prison	18	3
Placement	15	2
DPSS	9	1
DCFS	9	1
Camp	5	1
Court order	8	1
AB109	4	1
Health rite 360	6	1
District attorney	0	0
Project 180	2	0
No response	162	19

the primary motivators for obtaining a tattoo. Oftentimes, women who seek tattoo removal services at our clinic obtained their tattoos forcibly or through a coercive relationship. Removal of these tattoos is important to patient safety and emotional healing. Reasons for tattoo removal also vary from traditional tattoo removal clinics. In Armstrong's study, the majority of patients sought tattoo removal because they “just decided to remove” them and because they felt embarrassed [1]. In contrast, our cohort cited employment (66%, n = 546), readiness to change (47%, n = 392), family (43%, n = 356), and negative attention (37%, n = 303). These motivations stem more from a need to achieve economic and personal stability.

The role of laser tattoo removal in the formerly incarcerated and formerly gang-affiliated population should not be understated. Gang members are at a higher risk of violent victimization before, during, and after their time in a gang [19, 25]. A study by Rufino et al. found that within a prison cohort, gang members were at higher risk for violent victimization than their non-gang member counterparts [25]. Tattoos are well documented as a marking of gang membership, past or present, and therefore are a constant source of vulnerability to this population [1]. Thus, laser tattoo removal impacts their ability to disengage from gang activity and is vital to the safety of the individual and their family [19, 25].

Accessibility is a major concern for patients seeking laser tattoo removal services in this population. Our patients had high rates of incarceration, with a majority of patients

Table 6 Reasons for getting and removing tattoos in study sample (n=862), 2016–2018. Intake form instructed patients to “Check all that apply.”

Reason for getting tattoo	n	%
Gang	368	46
Current or ex-relationship	223	28
Decoration	159	20
High	141	17
Drunk	131	16
Other	129	16
Peer pressure	107	13
No response	54	6
Reason for removing tattoo	n	%
Employment	546	66
Maturity	392	47
Ready to change life	392	47
Family	356	43
Tattoo(s) attract negative attention	303	37
Embarrassed	262	32
Other explanation given	196	24
Offensive	82	10
Probation/Parole Officer suggested it	30	4
No Response	36	4
Court Orders	16	2

referred through other Homeboy Industry services (e.g., education, employment training). While our patients were largely familiarized with Homeboy Industries, this underscores the importance of community programs dedicated to serving this population and streamlining access to critical services like laser tattoo removal. Further, patients with gang-related tattoos often face multiple competing needs in their pathway to societal re-entry [6]. Patients must address unemployment and unstable housing and are thus not equipped to seek out costly laser tattoo removal services from dermatology offices [6]. In our study, a substantial proportion of patients reported transitional living situations and over half relied on public transportation or rides from others, indicating potential transportation barriers. Laser tattoo removal may rank lower in patient priority due to the costs of the procedure and long treatment periods needed to remove tattoos [6]. Important to consider is the critical need for laser tattoo removal to address these competing needs, specifically safety, employment, and safe housing. Tattoo removal mitigates patient social determinants of health, and extending insurance coverage for tattoo removal may improve accessibility.

In addition to low-cost laser tattoo removal services, access to professionals experienced in working with the formerly incarcerated and formerly gang-affiliated is paramount. The adverse effects of laser tattoo removal

include skin dyspigmentation, scarring, and keloid formation [26]. The consequences of poor scarring outcomes extend beyond the psychosocial sequelae and can serve as an identifying marker of past gang affiliation. Even more problematic is that scars can mark an individual as someone attempting to leave a gang, putting them at higher risk for violent retribution [25]. As noted by Rufino et al., gang members are at risk of violence, violation, and death for both breaking gang rules and leaving a gang [25]. Careful attention to the laser tattoo removal process is essential to the safety of this population and should be done by experienced professionals. At our institution, providers have been serving this population for over 30 years and are well acquainted with the laser settings and post-treatment protocols better suited for these patients. Incumbent upon this care is an understanding of the patients they serve, the traumas they experienced, and the risks these individuals are taking in the tattoo removal process.

The demographic findings of this study demonstrate that the patient population cared for by Homeboy Industries' Ya'Stuvo Tattoo Removal is primarily Latino or Hispanic. These patients possess a wide range of skin colors that has not previously been studied in the literature. Current research is underway assessing laser protocols and complication rates for patients of color (e.g. skin types Fitzpatrick III-V) at the Ya'Stuvo Tattoo Removal Clinic.

Limitations

As a retrospective study, our data was dependent on accurate documentation from patient charts and intake forms. Therefore, it must be noted that our data may under or over represent the demographics and characteristics of the Homeboy Industries population. A significant limitation was the reliance on intake forms that were not specific in delineating an option to specify for answer choices denoted as “other.” The current study may over or underestimate patient data with regards to probation/parole status, referral source, and reasons for obtaining and removing tattoos. However, our study represents a prominent laser tattoo removal clinic that serves the largest cohort of formerly incarcerated and formerly gang-affiliated patients.

Conclusions

The aims of this study included to: (1) describe the patient demographics of the laser tattoo removal population at Homeboy Industries (2) outline the motives for obtaining and removing tattoos (3) evaluate the challenges of tattoo removal to the formerly incarcerated and formerly gang-affiliated communities and (4) highlight the importance of accessibility to this service.

Through a large data set analysis, our findings demonstrate laser tattoo removal services are highly utilized by patients belonging to racial and ethnic minorities, formerly incarcerated individuals, and those with gang affiliations. The current literature that exists on tattoo removal does not reflect the widely varied ethnic/racial populations that seek tattoo removal, their unique needs, or the diverse motivations behind laser tattoo removal. Factors that motivate this population include seeking employment, readiness for change, and safety concerns. Our study highlights the social challenges faced by the gang-affiliated and recently incarcerated communities, including stigmatization, unstable housing, and transportation. We hope this study can help address the immense need for more community based free tattoo removal services and research.

Author Contributions All authors contributed to the conception of the study, data collection, data analysis, and writing of the manuscript.

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Declarations

Conflict of interest The authors have no conflict of interest or financial disclosures related to this manuscript. There are no declarations to disclose.

Ethical Approval Approval was obtained from the LA Biomed Research Institute. This project was determined by the John F. Wolf Human Subjects Committee (1) that the proposed activity, as it pertains to submission reference #048108, is not human subject research as defined by DHHS and/or FDA regulations.

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