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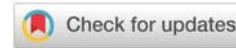
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Research Article

Massive use of tattoos and psychopathological clinical evidence

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Abstract

Purpose: This research aims to identify any recurrent psychopathological profiles in individuals who abuse tattoos and that, for this reason, the tattoo itself could be the manifestation of a specific symptom.

Methods: Clinical interview and administration of the MMPI-II and PICI-1.

Results: The research on a population sample of 444 people has shown a strong psychopathological tendency in the MMPI-II that is confirmed in the PICI-1 (TA version); in fact, the data are even more significant and expressive a precise psychopathological diagnosis of personality. In the male group with a percentage of less than 25%, at least three dysfunctional traits of anxiety, phobic, obsessive, somatic, borderline and antisocial disorder emerged individually. In the male group with a percentage between 26% and 50%, at least four dysfunctional traits of borderline, narcissistic, sadistic and masochistic disorder emerged individually. In the male group with a percentage between 51% and 75%, at least 5 dysfunctional traits of bipolar, borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. In the male group with a percentage between 76% and 100%, at least 6 dysfunctional traits of borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. In the female group with a percentage of less than 25%, at least three dysfunctional traits of anxiety, phobic, obsessive, somatic, borderline and bipolar disorder emerged individually. In the female group with a percentage between 26% and 50%, at least four dysfunctional traits of borderline, borderline, anxiety, phobic, obsessive, somatic, sadistic and masochistic disorder emerged individually. In the female group with a percentage between 51% and 75%, at least five dysfunctional traits of bipolar, borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. In the female group with a percentage between 76% and 100%, at least 6 dysfunctional traits of bipolar, borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually.

Conclusions: On the basis of these data, it is reasonable to argue that as the percentage of body surface area covered by tattoos increases, so do the dysfunctional traits of a specific main disorder. In particular, the recurrent dysfunctional traits are anxious, phobic, obsessive, somatic and bipolar in subjects with less than 25% of the body surface covered by tattoos, while borderline, narcissistic, antisocial, sadistic and masochistic traits are more frequent in subjects with more than 26% of the body surface covered by tattoos. Comparing the data with the control group we reasonably come to the conclusion that the use of tattoos is not directly related to the presence of one or more psychopathologies, but if the use is massive this is a fairly robust indicator of the likely presence of a significant number of psychopathological traits of the same morbid condition.

Contents of the manuscript

Introduction and background

Tattooing is considered to be a technique of human bodily decoration, while the product of this technique is famously called "tattoo" and consists (in its traditional form) of incising the skin by delaying healing with special substances or of puncturing it by introducing dyes into the wounds. Therapeutic tattoos have been found on the mummy of the 'Pazyryk man'

in Central Asia with intricate animal tattoos, or that of the Ukok princess (Altai Mummy) dating from around 500 B.C. depicting an imaginary animal (deer and griffin) of a high artistic level. Among the ancient civilisations where tattooing developed was Egypt, but also ancient Rome, where it was banned by Emperor Constantine, following his conversion to Christianity. It should also be noted that, before Christianity became a licit religion and later the state religion, many Christians tattooed religious symbols on their skin to mark their spiritual identity. Tattooing re-emerged from the shadows in the second half of the 19th



century, with the publication in 1876 of Cesare Lombroso's essay 'L'uomo delinquente' (Criminal Man). Lombroso closely correlates tattoos with the criminal's innate moral degeneration: the tattooed sign is one of those anatomical anomalies capable of recognising the anthropological type of the criminal. The born criminal shows specific anthropological characteristics that bring him closer to primitive animals and humans, and the act of tattooing by repeat offenders is a sign of regression to the primitive, wild state. Following the spread of Cesare Lombroso's theories, tattoos were further censored and this is why, unlike in other Western countries, no professional studios or workshops were set up until the end of the 1970s. From the end of the sixties and the beginning of the seventies of the last century, tattoo culture gradually spread, first in young hippy subcultures, in prisons and among motorcyclists, and then slowly conquered every social stratum and age group. Between the end of the 1990s and the early 2000s, tattoos became increasingly popular, driven by the popularity of the public figures who had them on their bodies, and from a simple phenomenon of custom it became a fashion for people of all ages, although there is still a percentage of risk of contraindications, especially if already suffering from skin diseases, predisposition to allergies, photosensitivity, vulnerability to bacterial and viral infections, coagulation disorders, immunosuppressive conditions, serious cardiac abnormalities treated with drugs and pregnancy [1-5]. Tattoo removal has been carried out using different tools throughout the history of tattoos. While tattoos were once considered permanent, it is now possible to remove them with treatments in whole or in part. Prior to the development of the laser tattoo removal method, the most common removal techniques included dermabrasion, TCA (trichloroacetic acid, an acid that removes the upper layers of the skin, reaching the layers where the ink resides), salabrasion (rubbing the skin with salt), cryosurgery, and incisions, which are sometimes still used in conjunction with skin grafting for larger tattoos. Some earlier forms of tattoo removal included the injection or application of wine, lemon, vinegar or pigeon droppings. Laser tattoo removal was initially performed with continuous wave lasers, and later with Q-switched lasers, which were commercially available from 1990. Today the words "laser tattoo removal" refer to the non-invasive removal of tattoo pigments using Q-switched lasers and typically black and darker inks are removed more easily [6-10].

Research objectives and Methods

This research aims to identify any recurrent psychopathological profiles in individuals who abuse tattoos and that, for this reason, the tattoo itself could be the manifestation of a specific symptom.

The phases of the research were divided as follows:

- 1) Selection of the population sample.
- 2) Individual clinical interview.
- 3) Administration of the MMPI-II and PICI-1 [11], to each population group.

4) Data processing following administration, in relation to data obtained from clinical interviews and the administration of the MMPI-II and PICI-1 [12,13].

All participants were guaranteed anonymity and respects the ethical, moral and clinical content of the 1964 Declaration of Helsinki.

Setting and participants

The requirements decided for the selection of the sample population are:

- 1) Age between 18 years and 75 years.
- 2) Residence or domicile on Italian territory for at least 5 year, regardless of nationality and/or citizenship.
- 3) Male and female gender.
- 4) Absence of psychopathological diagnosis before tattooing.

- 5) Percentage of soiling of the body surface greater than 5%. To calculate the %, the body should be divided into the following districts (including front and back): head and neck [I], shoulders and chest [II], arms and hands [III], abdomen, groin and buttocks [IV] legs and feet [V]. Each district is equivalent to 20%. The percentage per district is calculated based on the extent of the tattoo, assigning the value of 1%, 2% 5%, 7%, 10%, 15% or 20% based on how much skin is not tattooed. Extensive tattoos greater than 200 square centimetres in volume or those present in the following anatomical parts automatically equal 20% even if there are (in that district) parts of skin that are not tattooed: face, neck, hands, wrists and areas that the person tends to keep uncovered more frequently. Extensive tattoos exceeding 180 square centimetres in volume, if present in the legs and arms but only on one side, are worth 10%. To calculate the volume of the tattoo, multiply its base by its height (in square centimetres). Let's take an example. Let's take a 36 year old adult with 7 tattoos in the following areas: a) Right chest, 25 square centimetres in volume; b) Left deltoid, 9 square centimetres in volume; c) High back, 49 square centimetres in volume; d) Left forearm, 14 square centimetres in volume; e) Right thigh, 225 square centimetres in volume; f) Left foot, 12 square centimetres in volume; g) Right malleolus, 1 square centimetre in volume. By dividing the body into districts it is possible to assign percentages to each tattoo: a) Right chest, 25 square centimeters in volume = II district, 5%; b) Left deltoid, 9 square centimeters of volume = II district, 2%; c) High back, 49 square centimeters of volume = II district, 5%; d) Left forearm, 14 square centimeters of volume = III district, 2%; e) Right thigh, 225 square centimeters of volume = V district, 10%; f) Left foot, 12 square centimetres in volume = V district, 2%; g) Right malleolus, 1 square centimetre of volume = V district, 1%; Summarising by districts: the first is 0/20, the second is 12/20, the third is 2/20, the fourth is 0/20 and the fifth is 13/20, giving an overall total of 27/100 (27%).

The selected setting, taking into account the protracted

pandemic period (already in progress since the beginning of the present research), is the online platform via Skype and Videocall Whatsapp, both for the clinical interview and for the administration.

The present research work was carried out from June 2020 to December 2020.

The selected population sample is 444 participants, divided into four groups:

Sex	% Of body surface area affected by tattoos	Population sample		Total
		Male	Female	
	6% - 25%	144	78	222
	26% - 50%	102	42	144
	51% - 75%	34	22	56
	76% - 100%	16	6	22
Total		296	148	444

The same reasoning was applied to the selected control group, consisting of 444 participants with the following participation requirements:

- 1) Age between 18 years and 75 years.
- 2) Residence or domicile on Italian territory for at least 5 years, regardless of nationality and/or citizenship.
- 3) Male and female gender.
- 4) Absence of psychopathological diagnosis.
- 5) Absence of tattoos on the body and declaration by the participant in the control group not to want the application of a tattoo on his body.

The control group was not subdivided into groups because of the necessity and priority of a comparison with respect to the possible presence of one or more psychopathological disorders; therefore, were subjected exclusively to PICI-1(TA).

Results, limits and possible conflicts of interest

Once the sample of the population that met the requirements had been selected (first stage), the participants were subjected individually to a clinical interview (second stage), aimed at obtaining as complete a personal and family history as possible. The following relevant data emerged from the *clinical interview*:

The main recurrent reasons for getting tattoos are: personal emotional meaning or overcoming a traumatic event (45.5%, 202/444), aesthetic beauty (40%, 178/444), fashion and social trend (10%, 44/444), mirroring a partner or a familiar or friendly person (4.5%, 20/444). The relationships between the male and female samples are substantially equal and preserved.

17.1% (76/444) regretted having tattooed their body, with a greater tendency among women (55.3%, 42/76).

As the frequency of the percentage of tattoos on the body increases, the borderline, narcissistic and antisocial symptoms worsen.

The clinical interview and anamnestic reconstruction reveal very clear and sharp personality profiles [14-47].

The male gender of the selected sample of the population (296/444) exhibits mood instability, marked instinctiveness and aggression, obsessive and paranoid thoughts, listlessness, boredom and humour decline, marked narcissistic tendency and a strong inclination towards sadistic/ masochistic traits.

The female gender of the selected sample of the population (148/444) exhibits obsessive and paranoid thoughts about their physical appearance, somatic and body dysmorphic symptoms (in some cases even leading to the need for surgery), listlessness, boredom, bipolar, borderline, narcissistic symptoms and a strong inclination towards sadistic/ masochistic traits.

4) The population sample selected denies having a previous psychopathological diagnosis and/or need for therapeutic intervention, despite the symptoms found and described in the anamnesis.

The third phase is dedicated to the administration of the *MMPI-II* and the *PICI-1 (TA version)*. [45-47] In the first case, the data emerged confirm what had already been noted during the clinical interview (presence of at least 65 correct points in the following scales, with at least 50% frequency):

The data from the *PICI-1 (TA version)* [2,3] were administered and analysed, as listed below: The control group, subjected in the last phase to the administration of *PICI-1(TA)* reported the following values:

The main limitations of the research is one: the *PICI-1* is not yet standardised psychometric instruments but are proposed, despite the excellent results obtained and already published in international scientific journals [11-13].

This research has no financial backer, it's independent and does not present any conflicts of interest.

Conclusions

The research on a population sample of 444 people demonstrated

Very contrasting values emerge from the *MMPI-II*. Among the clinical scales, the values above the 50% frequency are: for the male gender, 63.2% of the hypomania scale, 67.9% of the schizophrenia scale, 75.3% of the paranoia scale and 82% of the psychopathic deviation scale; for the female gender, 65.5% of the schizophrenia scale, 68.9% of the anxiety scale, 70.9% of the hypomania scale, 73.6% of the depression scale, 80.4% of the hysteria scale, 85.8% of the psychopathic deviance scale and 86.5% of the paranoia scale. On the other hand, in relation to the content scales, if in the male group the anxiety and depression scales are below the threshold, in contrast to the female group, the remaining scales are extremely high: 70.1% of the social discomfort scale, 81.4% of the antisocial behaviour scale, 82.7% of the anger scale and 92.7% of the family problems scale. In particular, in the groups with more than



Clinical Scale

SCALE	Hs	D	Hy	Pd	Pa	Sc	Ma
Significance	Hypochondria	Depression	Hysteria	Psychopathic deviation	Paranoia	Schizophrenia	Hypomania
Frequency (m)	< 50%	< 50%	< 50%	243/296 (82%)	223/296 (75.3%)	201/296 (67.9%)	187/296 (63.2%)
Frequency (f)	102/148 (68.9%)	109/148 (73.6%)	119/148 (80.4%)	127/148 (85.8%)	128/148 (86.5%)	97/148 (65.5%)	105/148 (70.9%)

Content Scales

Scale	ANX	DEP	ANG	CYN	ASP	SOD	FAM
Significance	Anxiety	Depression	Anger	Cynicism	Antisocial behaviour	Social discomfort	Family problems
Frequency (m)	< 50%	< 50%	254/296 (85.8%)	234/296 (79%)	227/296 (76.7%)	211/296 (71.3%)	271/296 (91.5%)
Frequency (f)	103/148 (69.6%)	110/148 (74.3.3%)	118/148 (79.7%)	128/148 (86.5%)	127/148 (85.8%)	103/148 (69.6%)	139/148 (93.9%)

Sex	Population sample	
	Male	Female
	List of main personality disorders identified by PICI-1 data from PICI-1 data	
% of body surface area affected by tattoos	6% - 25%	They individually present at least 3 dysfunctional traits of the disorder anxious, phobic, obsessive, somatic, borderline and antisocial disorder
	26% - 50%	They individually present at least 4 dysfunctional traits of bipolar disorder, borderline, narcissistic, sadistic and masochistic
	51% - 75%	They individually present at least 5 dysfunctional traits of bipolar disorder, borderline, narcissistic, antisocial, sadistic and masochistic
	76% - 100%	They individually present at least 6 dysfunctional traits of bipolar disorder, borderline, narcissistic, antisocial, sadistic and masochistic

Sex	Control group						
	Male			Female			
		296/444			148/444		
		1)	Anxious	10/296	1)	Anxious	20/148
		2)	Phobic	3/296	2)	Phobic	7/148
		3)	Avoidant	1/296	3)	Avoidant	3/148
		4)	Obsessive	10/296	4)	Obsessive	6/148
Pathological traits	4 pathological traits	5)	Somatic	8/296	5)	Somatic	6/148
	M = (159/296)	6)	Manic	8/296	6)	Manic	1/148
	F = (100/148)	7)	Bipolar	5/296	7)	Bipolar	4/148
		8)	Emo-Behav.	10/296	8)	Emo-Behav.	3/148
		9)	Dependent	4/296	9)	Dependent	1/148
		10)	Depressive	20/296	10)	Depressive	12/148
		11)	Borderline	20/296	11)	Borderline	16/148
		12)	Histrionic	5/296	12)	Histrionic	1/148
		13a)	Narciss. Overt	3/296	13a)	Narciss. Overt	2/148
		13b)	Narcis. Covert	5/296	13b)	Narcis. Covert	4/148
		14)	Antisocial	15/296	14)	Antisocial	4/148
		15)	Sadistic	3/296	15)	Sadistic	1/148
		16)	Masochistic	4/296	16)	Masochistic	5/148



		17)	<i>Psychopathic</i>	1/296	17)	<i>Psychopathic</i>	1/148
		18)	<i>Schizophrenic</i>	0/296	18)	<i>Schizophrenic</i>	0/148
		19)	<i>Schizoid</i>	0/296	19)	<i>Schizoid</i>	0/148
		20)	<i>Schizotypal</i>	0/296	20)	<i>Schizotypal</i>	0/148
		21)	<i>Schizoaffective</i>	0/296	21)	<i>Schizoaffective</i>	1/148
		22)	<i>Delusional</i>	7/296	22)	<i>Delusional</i>	2/148
		23)	<i>Paranoid</i>	11/296	23)	<i>Paranoid</i>	3/148
		24)	<i>Dissociative</i>	2/296	24)	<i>Dissociative</i>	1/148
		1)	<i>Anxious</i>	2/296	1)	<i>Anxious</i>	3/148
		2)	<i>Phobic</i>	1/296	2)	<i>Phobic</i>	1/148
		3)	<i>Avoidant</i>	1/296	3)	<i>Avoidant</i>	1/148
		4)	<i>Obsessive</i>	3/296	4)	<i>Obsessive</i>	1/148
		5)	<i>Somatic</i>	0/296	5)	<i>Somatic</i>	1/148
	5 pathological traits	6)	<i>Manic</i>	1/296	6)	<i>Manic</i>	1/148
	M = (19/296)	7)	<i>Bipolar</i>	3/296	7)	<i>Bipolar</i>	2/148
	F = (11/148)	8)	<i>Emo-Behav.</i>	0/296	8)	<i>Emo-Behav.</i>	0/148
		9)	<i>Dependent</i>	0/296	9)	<i>Dependent</i>	0/148
		10)	<i>Depressive</i>	2/296	10)	<i>Depressive</i>	0/148
		11)	<i>Borderline</i>	3/296	11)	<i>Borderline</i>	0/148
		12)	<i>Histrionic</i>	0/296	12)	<i>Histrionic</i>	0/148
		13a)	<i>Narciss. Overt</i>	1/296	13a)	<i>Narciss. Overt</i>	0/148
		13b)	<i>Narcis. Covert</i>	0/296	13b)	<i>Narcis. Covert</i>	0/148
		14)	<i>Antisocial</i>	1/296	14)	<i>Antisocial</i>	0/148
		15)	<i>Sadistic</i>	0/296	15)	<i>Sadistic</i>	0/148
		16)	<i>Masochistic</i>	0/296	16)	<i>Masochistic</i>	0/148
		17)	<i>Psychopathic</i>	0/296	17)	<i>Psychopathic</i>	0/148
		18)	<i>Schizophrenic</i>	0/296	18)	<i>Schizophrenic</i>	0/148
		19)	<i>Schizoid</i>	0/296	19)	<i>Schizoid</i>	0/148
		20)	<i>Schizotypal</i>	0/296	20)	<i>Schizotypal</i>	0/148
		21)	<i>Schizoaffective</i>	0/296	21)	<i>Schizoaffective</i>	0/148
		22)	<i>Delusional</i>	0/296	22)	<i>Delusional</i>	0/148
		23)	<i>Paranoid</i>	1/296	23)	<i>Paranoid</i>	1/148
		24)	<i>Dissociative</i>	0/296	24)	<i>Dissociative</i>	0/148
		1)	<i>Anxious</i>	1/296	1)	<i>Anxious</i>	1/148
		2)	<i>Phobic</i>	0/296	2)	<i>Phobic</i>	0/148
		3)	<i>Avoidant</i>	0/296	3)	<i>Avoidant</i>	0/148
		4)	<i>Obsessive</i>	0/296	4)	<i>Obsessive</i>	1/148
		5)	<i>Somatic</i>	0/296	5)	<i>Somatic</i>	0/148
		6)	<i>Manic</i>	0/296	6)	<i>Manic</i>	0/148
	6/+ pathological traits	7)	<i>Bipolar</i>	0/296	7)	<i>Bipolar</i>	0/148
	M = (3/296)	8)	<i>Emo-Behav.</i>	0/296	8)	<i>Emo-Behav.</i>	0/148
	F = (4/148)	9)	<i>Dependent</i>	0/296	9)	<i>Dependent</i>	0/148
		10)	<i>Depressive</i>	0/296	10)	<i>Depressive</i>	0/148
		11)	<i>Borderline</i>	1/296	11)	<i>Borderline</i>	1/148
		12)	<i>Histrionic</i>	0/296	12)	<i>Histrionic</i>	0/148
		13a)	<i>Narciss. Overt</i>	0/296	13a)	<i>Narciss. Overt</i>	0/148
		13b)	<i>Narcis. Covert</i>	0/296	13b)	<i>Narcis. Covert</i>	0/148
		14)	<i>Antisocial</i>	0/296	14)	<i>Antisocial</i>	0/148



	15)	<i>Sadistic</i>	0/296	15)	<i>Sadistic</i>	0/148
	16)	<i>Masochistic</i>	1/296	16)	<i>Masochistic</i>	1/148
	17)	<i>Psychopathic</i>	0/296	17)	<i>Psychopathic</i>	0/148
	18)	<i>Schizophrenic</i>	0/296	18)	<i>Schizophrenic</i>	0/148
	19)	<i>Schizoid</i>	0/296	19)	<i>Schizoid</i>	0/148
	20)	<i>Schizotypal</i>	0/296	20)	<i>Schizotypal</i>	0/148
	21)	<i>Schizoaffective</i>	0/296	21)	<i>Schizoaffective</i>	0/148
	22)	<i>Delusional</i>	0/296	22)	<i>Delusional</i>	0/148
	23)	<i>Paranoid</i>	0/296	23)	<i>Paranoid</i>	0/148
	24)	<i>Dissociative</i>	0/296	24)	<i>Dissociative</i>	0/148

50% of the body surface tattooed, we find the highest values of the clinical scales of paranoia and psychopathic deviance, as well as the highest values of the content scales of cynicism, antisocial behaviour and family problems.

From PICI-1 (TA version), the data are even more significant and expressive a precise psychopathological diagnosis of personality. In the male group with a percentage of less than 25%, at least three dysfunctional traits of anxiety, phobic, obsessive, somatic, borderline and antisocial disorder emerged individually. In the male group with a percentage between 26% and 50%, at least four dysfunctional traits of borderline, narcissistic, sadistic and masochistic disorder emerged individually. In the male group with a percentage between 51% and 75%, at least 5 dysfunctional traits of bipolar, borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. In the male group with a percentage between 76% and 100%, at least 6 dysfunctional traits of borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. In the female group with a percentage of less than 25%, at least three dysfunctional traits of anxiety, phobic, obsessive, somatic, borderline and bipolar disorder emerged individually. In the female group with a percentage between 26% and 50%, at least four dysfunctional traits of borderline, borderline, anxiety, phobic, obsessive, somatic, sadistic and masochistic disorder emerged individually. In the female group with a percentage between 51% and 75%, at least five dysfunctional traits of bipolar, borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. In the female group with a percentage between 76% and 100%, at least 6 dysfunctional traits of bipolar, borderline, narcissistic, antisocial, sadistic and masochistic disorder emerged individually. On the other hand, the control group scored, with regard to 4 dysfunctional traits, 159/296 for the male group and 100/148 for the female group; with regard to 5 dysfunctional traits, 19/296 for the male group and 11/148 for the female group; with regard to 6 or more dysfunctional traits, 3/296 for the male group and 4/148 for the female group. Overall, in the control group, the following results were obtained: 61.15% of the male group presented at least 4 psychopathological traits, while 77.7% of the female group presented at least 4 psychopathological traits.

Based on these data, recurrent dysfunctional traits are anxious, phobic, obsessive, somatic and bipolar in subjects with less than 25% of body surface covered by tattoos, while borderline, narcissistic, antisocial, sadistic and masochistic traits are more frequent in subjects with more than 26% of

body surface covered by tattoos. Comparing the data with the control group we reasonably come to the conclusion that the use of tattoos is not directly related to the presence of one or more psychopathologies, but if the use is massive this is a fairly robust indicator of the likely presence of a significant number of psychopathological traits of the same morbid condition.

In the light of the significant results of this research, it seems consequential to suggest to provide psychological support [48,49] to all subjects presenting at least 3 dysfunctional traits of a specific disorder, starting from the meaning of tattoos on the patient's body in order to tap into all those unconscious information about the patient and the deep reasons of his discomfort.

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