

# Peculiarities of Dermatoglyphics in Minors with Suicidal Behavior

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**Abstract**— *The article presents the data from their research on the study of the peculiarities of dermatoglyphics in minors with suicidal behaviour. The authors analyzed the data of fingerprints of 26 persons who died (according to the investigation data) from suicides. The structure of the scallop skin of the suicides was studied in depth. When calculating the comb papillaries of fingers, the study was conducted on the basis of the developed software product "Analysis of combing palms, fingers and soles papillaries by the method of Iskandarov-Kuziev". Preliminary analysis of the distribution of victims by sex showed that the majority of those killed by suicide were male.*

**Keywords**— *dermatoglyphics, suicide, skin pattern, comb papillaries, loops, forensic medicine, identification, colorless method, signs.*

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## I. INTRODUCTION

In recent years, dermatoglyphics has become widely used as an informative method of assessing individual and group properties of the human body. The main directions of its practical application are medical genetics, sports and forensic medicine, forensics. This method is somewhat less frequently used in clinical medicine and historical and archaeological research [3, 5].

In forensics, dermatoglyphics play an extremely important role in identity identification. Papillar patterns have properties such as individuality, stability and recovery, which is precisely what makes it possible to identify fingerprints with high accuracy and probability [7, 9, 12]. Therefore, experts pay great attention to the detection, identification and storage of fingerprints; this situation is well illustrated by a large number of studies [11, 13].

The primary task for forensic investigators is to identify individuals. In this regard, there is a natural increase in interest in the use of accessible and effective research methods. Dermatoglyphics has become one of the most convenient "complexes of appearance" of a person [1, 2].

For more than a century, dermatoglyphics has been an informative source and a subject of study in forensics. Thus, the works of several authors consider issues of diagnosing human properties by hand [10].

In addition, methods have been developed to diagnose constitutional (sex, types of body proportions), external (skin color, hair shape, facial profile, etc.), and anthropometric (body length, chest circumference, etc.) parameters that allow us to model a person's appearance based on signs of dermatoglyphics [6].

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Features of finger patterns closely correlate with own psychodynamic and neurodynamic constitutions. This amazing, not yet fully studied relationship is explained by the common origin of the skin and nervous system of man from the same embryonic leaf - ectodermis. For example, a study of the dermatoglyphics of serial killers revealed a rare type of asymmetry in the distribution of patterns of varying complexity; people with drug addiction are more likely to have simple forms of skin patterns, a decrease in the total comb count, a pronounced asymmetry of the signs; suicides have a decrease in the frequency of fibular loops, a higher comb count on all the fingers of the left foot compared to the right one. Thus, when describing the dermatoglyphic picture there is a possibility of early detection of various forms of deviant behaviour [4].

The analysis of modern scientific literature has shown that the successful application of the method of dermatoglyphics in medical and criminalistic identification, along with other methods of identification, allows us to speak about a system of methods that effectively complement each other. Besides, insufficient development, practical need and morphogenetic nature (taking into account simplicity and noninvasiveness of the methods) determine the choice of the finger (FD) and palm dermatoglyphics (PD) when searching for diagnostic criteria and markers of definitive manifestations in the light of the general integrity of the organism. The use of dermatoglyphic traits as the main model of manifestation of constitutional, physical and external cognitive features determines the objectivity of scientific search [10].

In practical forensic examinations, the signs of fingers and toes are rarely examined at present. The possibility of the joint use of dermatoglyphic features of the fingers and toes in the literature are found only isolated, contradictory and not reasoned assumptions. The nature of correlations between associations of dermatoglyphic features of arms and legs is still unclear [10].

Thus, dermatoglyphics is a scientific direction that comprehensively investigates human papillary patterns [8]. Meanwhile, the substantial diagnostic potential of dermatoglyphics has not yet been fully realized. The results of scallop skin resecurveh make a huge contribution to solving the problem of human cognition, so the need for deeper study of dermatoglyphics continues to be urgent.

**The aim of the study.** To study the peculiarities of sex, constitutional, physical and external-cognitive parameters in minors with suicidal behaviour based on palm-finger indicators of dermatoglyphics.

## II. MATERIALS AND METHODS OF RESEARCH

Fingerprints of skin patterns of fingers of persons who died (according to the investigation data) from suicides were studied. The study included 26 unidentified corpses of minors aged 13 to 17 years at the National Specialized Scientific and Practical Medical Centre for Forensic Medicine. The monitoring group consisted of 50 students of the Tashkent Pediatric Medical Institute. Of these, 25 are men and 25 are women aged 19-23. Fingerprints were obtained using colourless methods.

The colourless method developed provided an opportunity to obtain fingerprints from volunteers (i.e. living persons) at the next stage. The process of obtaining prints of the colourless method was carried out with the use of an ordinary scanner EPSON perfection - 200, with the quality of 600 dpi, in bmp format. Scanning took place in 3 stages: 1) Scanning of both hands - distal and proximal phalanges of the 2nd, 3rd, 4th and 5th fingers; 2) scanning of

thumbs of both hands; 3) scanning of inner surface of both hands. Both descriptive and quantitative signs of dermatoglyphics were examined. All the data were statistically processed.

### III. RESULTS

The study of descriptive signs of finger dermatoglyphics showed a significant difference between the structure of the scallop skin of suicides and the control group. When calculating the comb papillaries of fingers, the study was carried out on the basis of the developed software product "Analysis of comb palm, finger and plantar papillaries by the method of Iskandarov-Kuziev". Preliminary analysis of the distribution of victims by sex showed that 20 (76.9%) belonged to males and only 6 (23.1%) to females (Table 1).

**Table 1** Frequency of pattern types among victims depending on gender

Pattern type	Right hand				Left hand			
	Men (n=20)		Women (n=6)		Men (n=20)		Women (n=6)	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
A	0	0	2	33,3*	0	0	1	16,7*
A1	0	0	3	12*	0	0	3	12*
A2	0	0	2	33,3*	0	0	2	33,3*
A3	0	0	3	12*	0	0	0	0
A4	0	0	2	33,3*	0	0	2	33,3*
L3	2	10*	0	0	3	20*	0	0
LR	17	85	2	33,3	17	85	2	33,3*
LR1	2	10	3	50*	2	10	2	33,3*
LU	6	30*	0	0	4	20*	0	0
LU2	2	10*	0	0	0	0	0	0
WR3	63	44,4	9	32,1	0	0	3	12*
WU4	0	0	0	0	5	20	9	32,1
W1	2	10	2	33,3	0	0	0	0
W2	11	55	1	16,7*	6	30	1	16,7*
W5	3	12	0	0	5	20	0	0
W6	0	0	2	33,3*	0	0	1	16,7*

Note: \* - reliability of data by sex

As can be seen from the data of this table, only women on distal phalanges and right and left hands had the most frequent curve patterns (A) - 2 (33.3%) on the right hand and 1 (16.7%) on the left hand, the most common were false loop curves (A2) - 2 (33,3%) on both hands and single-looped curves of A4 - also 2 (33.3%) on both hands, as well as loop-deep curls - W6 - 2 (33.3%) on the right hand and 1 (16.7%) on the left hand, in men these patterns were not found.

Curved L3 loops, simple ulnar LU loops and two-loop W5 curls were found on distal phalanges and right and left hands only in men - L3 - 2 (10%) on the right hand and 4 (20%) on the left hand, LU - 6 (30%) on the right

hand and 4 (20%) on the left hand, W5 - 2 (10%) on the right hand and 4 (20%) on the left hand, and the racket-shaped ulnar loops LU2 were also found only in men, but only on distal phalanges of the right hand - 2 (10%).

As for simple radial loops - LR, radial racquet-shaped loops - LR1 and oval scrolls - W2, they were found in both men and women, but simple radial loops LR (right hand - 17 (85%) in men and 2 (33.3%) in women, left hand - 17 (85%) in men and 2 (33.3%) for women, as well as W2 oval curls - right hand - 11 (55%) for men and 1 (16.7%) for women, left hand - 6 (30%) for men and 1 (16.7%) for women) prevailed for men, and radial racket-like loops LR1 - right hand - 2 (10%) for men and 3 (50%) for women, left hand - 2 (10%) for men and 2 (33.3%) - for women. Simple W1 - 2 (10%) in men and 2 (33.3%) in women) were also found in both men and women, but only on distal phalanges of the right hand and prevailed in women.

Thus, the results of the analysis of the frequency of occurrence of pattern types depending on gender shows that the presence of curve patterns, pseudo-loop curves, one-loop curves and loop-like curls in the prints under study testifies to the fact that they belong to the female face, and the presence of curved loops, ulnar loops, two-loop loop-type curls and racquet-shaped ulnar loops indicates that they belong to the male face.

#### IV. CONCLUSIONS

The study of the peculiarities of finger and palm dermatoglyphics, in conjunction with the constitutional, physical and external characteristics of the representatives of male and female groups revealed the preservation of sexual dimorphism, inherent in the general population. As a result of the research, the interrelation between dermatoglyphics of a brush and constitutional, physical and external cognitive signs at male and female persons is established. The relationship identified demonstrated the diagnostic identification capabilities of the individual. This, in turn, expands the marking prospects of dermatoglyphics of both fingers and palms, which became the basis for the possibility of building diagnostic models for identification.

Besides, it should be noted that, with the introduction of new signage systems, the resolution of the dermatoglyphic method, along with basic identification methods, can become more effective and meaningful in terms of identification.

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