Original Article

Fingerprint Examination by Gender in Healthy Turkish Population

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Abstract

Background: Dermatoglyphic forensic institutions provide important information that can also be used in the field of anthropology and medicine. To expand the existing data of the Turkish society and increasing literature data on fingerprint. **Materials and Methods:** This study was conducted with 147 healthy young people. The parameters examined were compared between right and left hands and between genders. The fingerprints were divided into two groups as whorl, loop, arch, and accidental pattern. In addition, "total finger ridge count, absolute finger ridge count, Pattern Intensity Index (PII), Cummins index (CI), Poll index (PI), Dankmeijer index (DI), Volotzkoy index (VI), and Furuhata's index (FI)" of fingerprints on both hands and right-left hands separately were calculated. **Results:** In the joint evaluation of 10 fingers in both genders, the most common type was found to be loop pattern. The index data of the Turkish population are as follows (respectively, female and male): PII – 13.2/12.6, CI – 0.1/0.2, PI – 1/1, DI – 11.9/33.3, VI – 132.3/126.7, and FI – 128/133.7. There was no significant difference in the compared parameters between males and females and both hands ($P > 0.05$). **Conclusions:** According to the data obtained, the Turkish population data correspond to the Mediterranean subgroup of the European races. Moreover, as seen in this study, ulnar loop density is more common in Eastern countries.

Keywords: Dermatoglyphic, fingerprint, gender, index, population, Turkish population

Introduction

Dermatoglyphics is the examination of pattern formed by epidermal folds on the tips of the fingers and toes and on the palms.[1] Fingertip patterns in dermatoglyphics are called fingerprints. Fingerprints as they were written in the literature were first dealt with scientifically in the 17th century. The first important studies on fingerprint started with anthropological studies in the early 19th century.[2] In the middle of the 19th century, with Cummins' realization of fingerprint findings that could help in the diagnosis of chromosomal anomalies, the studies gained momentum and the first study in the literature was done by Penrose.[3] As medical findings for many diseases were obtained, studies gained momentum toward the end of the 19th century and these fingerprints, which could give near-conclusive results in identifying the individual, were also used by forensic units.[4] The realization of the relationship between fingerprint features and genetics has led to the investigation of how these features are in various societies.[2]

Although there are many studies on the status of dermatoglyphic features in various population, very few studies have been done on this subject in Turkish population. Our aim in this study is to contribute to the differences between population studies by conducting an up-to-date and comprehensive study on healthy individuals of Turkish population.

Materials and Methods

Approval for this study was obtained from the Clinical Research Ethics Committee of Cerrahpaşa medical faculty clinical research ethics committee (27661).

One hundred and forty-seven (F: 68 [46%], M: 79 [54%]) medical school students who were healthy, who did not have a known genetic disease in their first- and second-degree

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relatives (information regarding the third-degree relatives of the students could not be obtained), and who did not have any incisions on their fingers participated in the study. After obtaining consent from each student, 10 fingerprints were taken by a researcher (…) with a dry stamp. After the fingerprints were scanned and transferred to the computer, fingerprint typing was done first. Typing was done as arch, ulnar loop, radial loop, whorl, and accidental (respectively, A, UL, RL, W, and Acc).[1] Triradius counts were made in each fingerprint (if any) and noted. The papilla count of the loop and whorl patterns was performed (other patterns cannot be counted). Counts were made from the right and left triradii in the whorl pattern, and the highest number was accepted as the number of papillae. The same researcher (…) re-evaluated 30 fingerprints at different times in typing and papilla count. Strong correlation data were obtained in intraobserver evaluation (type, r= 1.0 and P=0.000; papilla count, r=0.93 P=0.000). In the papilla count, a very strong, in the same direction and valid (r = 0.93 P = 0.000) correlation was found between the two variables [Tables 1 and 2].

With the data obtained, "total finger ridge count (TFRC)," "absolute finger ridge count (aFRC)," "Pattern Intensity Index (PII)," "Cummins index (CI), Poll index (PI), Dankmeijer index (DI), Volotzkoy index (VI), and Furuhata's index (FI)" were calculated.

TFRC: Number of ridge counts between the core of the finger pattern and its corresponding triradius; arch patterns do not have triradius and receive a ridge count of zero.[5]

aFRC: It is the average of the two papilla counts measured between the core and the right and left triradii.[6]

PII: The value of PII may be stated as the number of triradii per individual or as the average number of triradii per finger.

$2 \times W + L/n$ (number of subject/number of fingers)[7]

CI: $(2W-L)/10$

PI: $([W-A]/100) +1$

DI: (A/W) 100

VI: $([L + 2W]/[A + L + W]) \times 100$

FI: $W \times 100/L$ (10).

In the calculations of the indexes defined above, the cases in which the fingerprint pattern of at least one finger could not be determined were not included in the calculation (4 units).

Cases whose papillae could not be counted in at least one finger were not included in the TFRC calculation (14 females, 11 males).

In the biostatistical analysis of the study, the criteria considered were defined with mean, standard deviation, frequency, and percentage values.

Chi-square exact probability tests were used to compare frequencies and percentages between groups.

If necessary (depending on the number of subjects and homogeneity control), nonparametric "Kolmogorov–Smirnov test, Mann–Whitney test, and Wilcoxon test" methods were used in appropriate experimental setups.

Correlation (Pearson and Spearman) and linear regression analyses were performed to determine the relations between the variables and to present the determined relations as mathematical relations.

In interpretations, the limit of significance was taken as $P = 0.05$.

IBM SPSS Statistics 28.0 version, (Armonk, NY: IBM Corporation) package program was used for biostatistical analysis.

Table 1: Correlations 1

Spearman's rho Type_1. Read	Type_2. read
Correlation coefficient	1.000
Significant (two-tailed)	0.000
N	30

Table 2: Correlations 2

Spearman's rho Census_1. Read	Census_2. read
Correlation coefficient	0.931
Significant (two-tailed)	0.000
N	30

Results

A total of 147 participants, 68 females and 79 males participated in the research. The mean age of females is 20 (SD: 0.9) and the mean age of males is 20.2 (SD: 1.6). The ratios of the patterns of fingerprints seen on the fingers of the participants were calculated and compared. When the rates of print patterns were compared according to genders, it was seen that there was no significant difference [Tables 3 and 4].

DI, FI, PI, CI, VI, right and left hand TFRC, both hand TFRC, right and left hand PII, both hand PII, right and left hand absolute TFRC (aTFRC), and both hand aTFRC were calculated for both males and females [Table 5]. There was no significant difference in the evaluation of the data between the genders and in the comparison of the individual right-left hands of male and female individuals ($P > 0.05$).

Discussion

Fingerprint patterns and ratios

It is important to know the population differences in fingerprint, which is thought to have medical benefits as well as its known anthropological benefits and where research is increasing. In our study, we wanted to learn about the fingerprints of healthy Turkish population and to compare them with different

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Table 3: Rates of appearance of fingerprint types according to fingers

Female, *n* (%)	Right					Left				
	1 (*n*=68)	2 (*n*=68)	3 (*n*=67)	4 (*n*=68)	5 (*n*=67)	1 (*n*=67)	2 (*n*=67)	3 (*n*=67)	4 (*n*=66)	5 (*n*=65)
Arch	0	7 (10.29)	2 (2.99)	3 (4.41)	2 (2.99)	1 (1.49)	8 (11.94)	6 (8.96)	3 (4.55)	3 (4.62)
L (ulnar)	25 (36.76)	25 (36.76)	47 (70.15)	33 (48.53)	56 (83.58)	37 (55.22)	19 (28.36)	43 (64.18)	34 (51.52)	53 (81.54)
L (radial)	0	4 (5.88)	2 (2.99)	0	0	0	6 (8.96)	2 (2.99)	0	0
L (total)	31 (45.59)	29 (42.65)	49 (73.13)	33 (48.53)	56 (83.58)	37 (55.22)	25 (37.31)	45 (67.16)	34 (51.52)	53 (81.54)
Whorl	36 (52.94)	32 (47.06)	16 (23.88)	32 (47.06)	9 (13.43)	29 (43.28)	34 (50.75)	16 (23.88)	29 (43.94)	9 (13.85)
Accidental	1 (1.47)	0	0	0	0	0	0	0	0	0
Male, *n* (%)	**Right**					**Left**				
	1 (*n*=79)	2 (*n*=79)	3 (*n*=79)	4 (*n*=79)	5 (*n*=79)	1 (*n*=79)	2 (*n*=79)	3 (*n*=79)	4 (*n*=79)	5 (*n*=79)
Arch	2 (2.53)	14 (17.72)	11 (13.92)	4 (5.06)	4 (5.06)	1 (1.27)	16 (20.25)	14 (17.72)	7 (8.86)	4 (5.06)
L (ulnar)	33 (41.77)	23 (29.11)	50 (63.29)	32 (40.51)	51 (64.56)	44 (55.70)	29 (36.71)	46 (58.23)	36 (45.57)	57 (72.15)
L (radial)	1 (1.27)	11 (13.92)	0	1 (1.27)	0	1 (1.27)	6 (7.59)	0	1 (1.27)	0
L (total)	34 (43.04)	34 (43.04)	50 (63.29)	33 (41.77)	51 (64.56)	45 (56.96)	35 (44.30)	46 (58.23)	37 (46.84)	57 (72.15)
Whorl	43 (54.43)	31 (39.24)	18 (22.78)	42 (53.16)	24 (30.38)	33 (41.77)	27 (34.18)	18 (22.78)	35 (44.30)	18 (22.78)
Accidental	0	0	0	0	0	0	1 (1.27)	1 (1.27)	0	0
Total, *n* (%)	**Right**					**Left**				
	1 (*n*=147)	2 (*n*=147)	3 (*n*=146)	4 (*n*=147)	5 (*n*=146)	1 (*n*=146)	2 (*n*=146)	3 (*n*=146)	4 (*n*=145)	5 (*n*=144)
Arch	2 (1.36)	21 (14.29)	13 (8.90)	7 (4.76)	6 (4.11)	2 (1.37)	24 (16.44)	20 (13.70)	10 (6.90)	7 (4.86)
L (ulnar)	58 (39.46)	48 (32.65)	97 (66.44)	65 (44.22)	107 (73.29)	81 (55.48)	48 (32.88)	89 (60.96)	70 (48.28)	110 (76.39)
L (radial)	1 (0.68)	15 (10.20)	2 (1.37)	1 (0.68)	0	1 (0.68)	12 (8.22)	2 (1.37)	1 (0.69)	0
L (total)	65 (44.22)	63 (42.86)	99 (67.81)	66 (44.90)	107 (73.29)	82 (56.16)	60 (41.10)	91 (62.33)	71 (48.97)	110 (76.39)
Whorl	79 (53.74)	63 (42.86)	34 (23.29)	74 (50.34)	33 (22.60)	62 (42.47)	61 (41.78)	34 (23.29)	64 (44.14)	27 (18.75)
Accidental	0	0	0	0	0	0	1 (0.68)	1 (0.68)	0	0

population. The results will be helpful both for comparison and to better evaluate the results of the fingerprints of the clinical cases we plan to do next.

In our study, the most common fingerprint pattern in males and females was the L (UL > RL), followed by W, A, and Acc. While fingerprint patterns were examined under four headings in our study, they mostly preferred to be divided into three groups. In the study of Kapoor and Badiye,[8] in contrast to other studies, including our study, the Acc pattern rate was found to be much higher than the A.

When we compare this study with studies on fingerprints in Türkiye, The results are seen to be similar to Tunakan's study.[9] In Barutçu and İşcan's study,[4] W was seen more frequently.

The changes seen in fingerprint patterns in studies conducted in Turkey are as follows:

The RL in our study has parallel results with those of Barutçu and İşcan, and it is more common in the left hand in females, whereas it is more common in the right hand in males.[4] Data belonging to different populations of RL could not be reached from the literature.

In the study of Barutçu and İşcan, the Acc pattern was seen only on the left side in both genders, whereas in our study, it was seen on the right in females and on the left in males.[4] Since the number of Acc patterns seen is very few, generalization cannot be made.

In Barutçu and İşcan's study, the frequency of occurrence of the A pattern on both hands is listed as 3rd finger >2 >4 >5 >1. A similar result was obtained in our study and the frequency of occurrence in the fingers of both hands is 2nd finger >3 >4 >5 >1.[4]

The results are similar to previous studies on patterns in Türkiye. Only in the study conducted by Barutçu and İşcan in 2008, the W pattern was evaluated more frequently than the L pattern.[4] However, this difference was not found to be significant either. A comparison of fingerprint types among populations has been made, and it is mostly seen that L is the most common pattern [Table 6].

The frequency of occurrence of the patterns is the same as in the study conducted in Ethiopia; UL>W>A>RL.[12] Since we consider the Acc pattern that contains more than one pattern in the fingerprint typing, there is also an Acc pattern in our ranking, which is the least common pattern of fingerprint (0.2%).

An increase in the RL pattern is seen as one goes west in Europe. We are more similar to the UL pattern, which is characteristic of Eastern Bloc countries.[23,24]

When we look at the population and geographical settlements in Table 6, we can say that the W pattern ratio is higher than the L when going from north to south. We see the biggest contrast to this interpretation in the work of Igbigbi and Msamati.[15] L pattern's superiority over W pattern is inconsistent with the

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Table 4: Comparison of fingerprint types between genders

Hand-pattern	Statistical evaluation
Right-hand whorl	
χ^2	3.424
Df	5
Significant	0.635
Left-hand whorl	
χ^2	5.300
Df	5
Significant	0.380
Whorl-total	
χ^2	9.169
Df	10
Significant	0.516[a]
Right-hand loop	
χ^2	5.318
Df	5
Significant	0.378
Right-hand loop	
χ^2	2.294
Df	5
Significant	0.807
Loop-total	
χ^2	14.825
Df	10
Significant	0.139[a]
Right-hand arc	
χ^2	6,750
Df	3
Significant	0.080[a]
Left-hand arc	
χ^2	8.398
Df	4
Significant	0.078[a,b]
Arc total	
χ^2	11.718
Df	6
Significant	0.069[a,b]

Table 5: Total finger ridge count, absolute total finger ridge count, Pattern Intensity Index, Cummins, Poll, Dankmeijer, VI, and Furuhata's index of the cases by females and males

Gender (0: Female, 1: Male)	*n*	Mean	SD
Age			
0	68	20.04	0.905
1	78	20.23	1.651
DI			
0	53	11.981	33.8944
1	61	33.342	62.0801
FI			
0	64	128.06	184.489
1	72	133.73	236.515
PI			
0	64	1.0323	0.03176
1	78	1.0267	0.04060
CI			
0	64	0.16	0.797
1	78	0.20	0.924
CI			
0	64	132.38	31.748
1	78	126.78	40.676
Right-hand TFRC			
0	64	71.55	23.129
1	78	71.40	25.103
Left-hand TFRC			
0	64	69.23	24.409
1	78	67.85	24.938
Both hand TFRC			
0	64	140.78	45.047
1	78	139.24	48.462
Right-hand PII			
0	64	6.72	1.685
1	78	6.54	2.178
Left-hand PII			
0	64	6.50	1.826
1	78	6.10	2.117
Both hand PII			
0	64	13.22	3.185
1	78	12.64	4.055
Right-hand aTFRC			
0	64	96.03	42.971
1	78	99.58	50.277
Left-hand aTFRC			
0	64	90.61	42.725
1	78	90.51	49.068
Both hands aTFRC			
0	64	186.64	81.927
1	78	190.09	97.339

TFRC: Total finger ridge count, PII: Pattern Intensity Index, CI: Cummins index, PI: Poll index, DI: Dankmeijer index, FI: Furuhata's index, aTFRC: Absolute TFRC, VI: Volotzkoy index

work of Králík *et al*. In the study of Králík *et al*., W pattern is said to be more intense in males.[23] However, when we look at our study with Table 6, we can say that the rate of L pattern is higher in males. More clear data can be obtained by increasing the number of studies and the number of fingers scanned in the studies.

The fact that the 5th fingers have a much higher tendency to L pattern, as stated by Igbigbi and Msamati,[15] is a result similar to our study. According to the study conducted in Bulgaria,[25] the W pattern decreases as one goes from northwest to southeast.

In a study,[26] they conducted with 360 male and female Caucasian Americans, the UL pattern was the highest and the A pattern was the lowest (in our study, Acc pattern is seen the least in the fingerprints divided into four groups. When examined in three groups, A pattern is the least common fingerprint pattern). The second highest pattern is W pattern and it is more common in males, the UL pattern is relatively prominent in females, and this pattern is most intense in the

Table 6: A comparison of the dermatoglyphic patterns of this study with various other populations

Population	Gender	Case/loops (%)	Whorls (%)	Arches (%)	Accidental (%)	Authors
This study (Türkiye)	Male	79/58.62	36	5.22	0.14	Üzel *et al*.
	Female	68/52.73	36.58	9.23	0.25	
Ijaws (Delta State. Nigeria)	Male	100/33.98	21.3	0.47		Anibor *et al*.[10]
	Female	100/17.68	27.26	1.51		
Sinhalese (Sri Lanka)	Male	217/58.52	36.54	4.93		Wijerathne *et al*.[11]
	Female	217/60.92	34.52	4.56		
Rarhi Brahmins (Bengal)	Male	100/53.8	43.9	2.3		Chattopadhyay and Sharma[12]
	Female	38/64.47	31.32	4.21		
Tunisians (Tunisia)	Male	233/61.72	31.31	7.08		Namouchi[13]
	Female	110/63.54	27.74	8.63		
Black Americans (USA)	Male	100/63.1	33.6	3.3		Qazi *et al*.[14]
	Female	100/59.7	31.3	8.2		
Indigenous black Zimbabweans (Zimbabwe)	Male	135/77.77	12.23	10		Igbigbi and Msamati[15]
	Female	135/85	5	10		
Tibetans (Tibet)	Male	156/38.99	60.24	0.76		Tiwari and Chattopadhyay[16]
	Female	150/49.13	48.67	2.2		
Muzziena Bedouin (South Sinai)	Male	170/49.2	49.1	1.7		Karmakar and Kobyliansky[17]
	Female	48/48.2	50.3	1.6		
Samoan (New Zealand)	Male	100/43.6	55.6	0.8		Cho[18]
	Female	93/33.7	65.6	0.7		
Muslims (Central India)	Male	240/52.33	28.17	3.5	16.00	Kapoor and Badiye[8]
	Female	240/48.17	27.83	5.33	18.67	
Ethiopia	Male + female	382/55	37	7.7	5.6	Yohannes and Bekele[19]
	Female	27/44.4	40.7	14.8		
Baganda (Uganda)	Male	111/57.57	34.51	7.3	0.63	Virji[20]
	Female	84/59.82	32.75	6.79	0.71	
Spain	Male + female	200/67.34	27.49	5.15		Gutiérrez-Redomero *et al*.[21]
Apache and Navajo (India)						
Apache	Male	44/45.46	49.09	5.45		Flickinger and Yarbrough[22]
	Female	50/45.40	51	3.6		
Navajo	Male	48/48.75	47.92	3.33		
	Female	54/42.78	51.85	5.37		

fifth and third fingers and lowest in the second finger in both genders. The results are similar to our study.

In the study conducted by Tunakan *et al*.,[9] with the Geipel method, it is stated that Turks join the Mediterranean subgroup from the European races.[23] This result is the same as our study. According to the study of Atasu, the A pattern is common in the first finger, RL pattern on the second finger of the right hand, and UL pattern on the fifth finger. The W pattern has the highest value in the first and fourth fingers of both hands.[26]

The following results obtained in the examinations of 41 male and 40 female American fetuses of Caucasian origin, 11–25 weeks old, are the same as in our study: the UL pattern is highest in the fifth finger. In the second finger, the UL pattern is the least and usually the RL pattern is seen. The A pattern is most intense on the second finger in males and females.[2] A pattern is more common in males (in our study, M/F = 97.4/52.2) and similar results. No matter where we live, we see that the place of our fingerprint in the genetic codes does not change, with these studies and the results of our study being almost exactly the same.

Pattern Intensity Index, Cummins, Poll, Dankmeijer, Volotzkoy, and Furuhata's indexes

In our study, no significant difference was found in the comparison of males and females in PII. Even though it was not significant in our study, the numerical value of female PII was found to be higher than that of males (female PII 13.2, male PII 12.6). With this result, our study supports the information that "PII distributions show a characteristic increasing trend from south to north" for females.[27] The data of the populations whose PII and index data can be accessed, including our study, are given in Table 7. It is seen in the table that there may be different values according to the population. According to Newman,[28] one of the most important criteria for determining the biological difference between populations is PII.[29]

In anthropological studies, various indices have been created that deal with the relationship between fingerprint types. The CI value for this study is F/M, 0.1/0.2. Accordingly, the L pattern is more dominant in both genders.

PI value F/M is 1/1, and delta distribution exhibits a symmetrical structure in almost both hands in both genders.

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Table 7: Comparison of Pattern Intensity Index, Cummins, Poll, Dankmeijer, VI, and Furuhata's indexes of different populations

Population	Gender	PII	DI	FI	CI	VI	PI	Author(s)
Türkiye	Male	12.64	33.34	133.73	0.2	126.78	1.02	Üzel *et al*.
	Female	13.22	11.98	128.06	0.16	132.38	1.03	
Rajputs (India)	Male	14.7	4.08	100				Singh and Mishra[7]
	Female	15	3.41	118				
	Male + female	14.85	3.73	109				
Sinhalese (Sri Lanka)	Male	13.16	13.49	62.44				Wijerathne *et al*.[11]
	Female	12.99	13.22	56.65				
	Male + female	13.08	13.35	59.55				
Samoan New Zealanders	Male	15.18	1.44	127.52				Cho[18]
New Zealand	Female	16.49	1.07	194.66				
	Male + female	15.99	1.32	156.59				
Tibetans (Tibet)	Male	15.95	1.26	154.5				Tiwari and Chattopadhyay[16]
	Female	14.65	4.5	99.06				
	Male + female	15.3	2.88	126.78				
Rengma Nagas of Nagaland (India)	Male	1.54	0.14					Banik *et al*.[29]
	Female	1.56	3.34					
	Male + female	0.47	1.47					
Dhimals of North Bengal (Bengal)	Male	15.24	4.98	130.7				Biswas[30]
	Female	14.86	3.13	104.07				
	Male + female	15.05	4.1	116.49				
Apache and Navajo (India)								Flickinger and Yarbrough[22]
Apache	Male	14.36						
	Female	14.74						
Navajo	Male	14.46						
	Female	14.65						
Türkiye (2008)	Male + female		27.03		7.57	143.19	1.35	Barutçu and İşcan[4]
Ethiopia	Male	13.25						Yohannes and Bekele[19]
	Female	10.66						
Muslims (Central India)	Male	10.87	12.42	53.83				Kapoor and Badiye[8]
	Female	10.38	19.15	57.77				
	Male + female	10.63	15.79	55.72				

TFRC: Total finger ridge count, PII: Pattern Intensity Index, CI: Cummins index, Pl: Poll index, DI: Dankmeijer index, FI: Furuhata's index, VI: Volotzkoy index

The Dankmeijer index value is F/M, 11.9/33.3. The A pattern is seen in very few in both hands, where the W pattern gives the highest values. The A pattern is more common in males [Table 3]. VI value is F/M, 132.3/126.7, and FI is F/M, 128/133.7. In this case, the A and L patterns have quite large values among all models. In our study, the indexes and indices of the societies whose data could be accessed were compared [Table 7]. Since all indices were not examined in other studies, a separate comparison could not be made for each.

Total finger ridge count and absolute total finger ridge count

The data of this study and other studies that performed the TFRC calculation are given in Table 8.[30,31] Since we could not find a study that looked at the aTFRC value, which is more reliable in terms of evaluating the total number of papillae, this parameter could not be compared. According to Table 8, while male TFRC values are higher than females in the previous data obtained in Turkey, TFRC and aTFRC values do not have a significant difference between genders in our study. With this aspect, conducting new studies with a wider audience to investigate this different result will provide access to correct information.

Considering the populations, the general tendency is that the number of papillae is higher in males.[32-34] These data also agree with the data on the higher prevalence of W pattern in males in other articles. However, although W pattern was more common in males in our study (a statistically insignificant excess), L pattern was found to be much more common in both males and females in our study [Table 3]. In addition, the fact that the A pattern is much more common in males than in females and the A pattern is not included in the papilla count may also have contributed to the lack of significant difference between males and females in the papillary count.

When we look at Table 8, we see that the results closest to our study are in the study of Iraq population. The values of the Apache and Navajo natives and the Belgian are similar. Apart from that, German and Hungarian also show similarities among

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Table 8: Total finger ridge count values by populations (table taken from a single source[29] - except reference[31])

	Case	Female TFRC	Male TFRC	Mean TFRC	Female aTFRC	Male aTFRC
This study (Türkiye)	147	140.78	139.24	140.01	186.64	190.09
Serbia[34]	51	147.423	139.160	143.29		
Ethiopia	382			129.5		
Norway	1125			131.5		
Hungary	709			137.2		
Germany	643			138.5		
Apache-Navajo	196			146.5		
Belgium	400			147.1		
India-Apache		147.06	147.83	147.44		
India-Navajo		142.72	148.49	145.60		
North America		120.4	142.9	131.65		
England		127	145	136		
Italy		127.4	135	131.2		
Persian		127.4	152.3	139.85		
Bulgaria		135.6	145.6	140.6		
Iraq		144.6	136.2	140.4		

TFRC: Total finger ridge count, aTFRC: Absolute TFRC

Table 9: Number of papillae of fingers in males and females

	Right hand	Left hand
Male		
Finger 1	20.4	18.1
Finger 2	13.98	14.16
Finger 3	13.57	14.85
Finger 4	16.29	15.97
Finger 5	13.37	14.01
Female		
Finger 1	18.47	16.82
Finger 2	14.1	14.12
Finger 3	13.36	13.74
Finger 4	16.11	16.56
Finger 5	13.04	14.35

themselves, between Italy and North America.

The number of lines in the fingerprint formed on the finger surface is higher in Asia, where the A pattern is common. It is higher than Europe.[8] According to Holt,[34] the number of papillae is highest in the right male thumb and least in the left index finger of female. Our study supports Holt's data [Table 3]. In our study, the order of papillary number was 1 >4 >2 >3 >5 in male right hand, 1 >4 >3 >2 >5 in left hand. In females, right hand is 1 >4 >2 >3 >5, left hand is 1 >4 >5 >2 >3 [Table 9].

Conclusion

According to the data obtained, the Turkish population data correspond to the Mediterranean subgroup of the European races. Moreover, as seen in this study, UL density is more common in Eastern countries.

Fingerprint is an important issue that shows its importance and originality in every new study. Epidermis is derived from ectoderm, and in this regard, we think that more studies should be done with larger masses and to help ectoderm-related diseases in early diagnosis and treatment.

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Conflicts of interest

There are no conflicts of interest.

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