

FINGERPRINT PATTERN AND ITS GENDER DISTRIBUTION AMONG MEDICAL AND DENTAL STUDENTS OF KHYBER MEDICAL COLLEGE AND KHYBER COLLEGE OF DENTISTRY, PESHAWAR

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ABSTRACT

Objective: To assess the relationship between the fingerprint pattern and gender

Materials and Methods: A cross-sectional study conducted having 400 healthy medical and dental students of Khyber Medical College and Khyber College of dentistry, Peshawar. The study was done by categorizing the pattern into arches, loops and whorls. The statistical analysis was done by using frequency distribution and non-parametric test i.e. chi square test. A P value of < 0.05 was considered statistically significant.

Results: The fingerprint pattern prevalence showed that the predominant pattern was 58.55% (loops) followed by 32.65% (whorl) and 8.8% (arch). A significant relationship between the fingerprint patterns and gender ($P < 0.05$) was also observed.

Conclusion: The conclusions drawn from the study is that loops are the most commonly found finger print pattern and arches are the least common in both male and females

Keywords: Dactyloscopy, finger print pattern, gender

INTRODUCTION

Henry–Galton system is use to study fingerprints pattern also known as Dactyloscopy.¹ It is a method where impressions of papillary ridges of the fingers are taken in order to identify a person. This is one of accurate method with no possibility of inaccuracy.^{2,3}

The Identification of individual can be complete/ absolute i.e. one can say with surety that it is that particular person or can be partial/incomplete i.e. the facts are doubtful, individual cannot be identified. For more accurate result research uses more than two methods.⁴ Like recording age, sex, foot prints, any deformities, scars or handwriting which can make the identity of individual more precise. As probability

of two individual having same fingerprints is one in sixty four thousand million people.⁵

The aim of the present study was to assess the finger print patterns and their distribution and to assess its association with the gender amongst the students of Khyber Medical College, Peshawar (KMC) and Khyber College of Dentistry Peshawar (KCD), Pakistan.

MATERIALS AND METHODS

This study was conducted in the department of Anatomy of Khyber Medical College, Peshawar.

Sample size were 400 students, having 200 males and 200 females' medical and dental students. Simple random sampling technique was used, where the roll no of all the students were put in the basket and sample were drawn from it. The duration of the study was from June 2019 to September 2019 after the approval of synopsis from Advanced Studies and Research Board (ASRB).

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All those students who were present on the day of interview and willing to participate in the study were included in the study population. Students having hand injury or had bandage on the hand or had any deformity of hands were excluded. Informed written consent was acquired proceeding to taking the prints. The fingers were numbered according to Henry's classification system.⁶

To begin with hands of the partaker were clean with soap and water and were air dried. Then each finger of the participants was placed on ink pad beginning with right thumb and ending with left little finger. The prints were obtain on page, studied and identified as being loop, whorl or arch with the aid of a magnifying lens and recorded on data sheet.

The data was analyzed using SPSS software, version 22 and the statistical analysis was done by using frequency distribution and non-parametric test i.e. chi square test. A P value of < 0.05 was considered statistically significant.

RESULT

The Chi Square test analysis revealed an increased percentage of loops fingerprint pattern as 58.55% (30.45% female and 28.10% male) followed by whorl 32.65% (17.5% male and 15.12% female) and Arch 8.8% (female 4.42 % and male 4.37%). A significant relationship was observed between the fingerprint patterns distribution and gender, as the P value (0.004) is less than 0.05 i.e. $P < 0.05$.

DISCUSSION

In this study, the loop pattern was found in high prevalence as 58.55% (30.45% female and 28.10% male), which was followed by whorl as 32.65% (17.5% male and 15.12% female) and arch as 8.8% (female 4.42 % and male 4.37%). An association between fingerprint patterns and gender was also found in this study. Our study findings was consistent to a study performed in Andhra Pradesh in India.⁷ In order to strengthen our findings, the loop pattern was reported in females as 75%, whorl as 31% in males and arch as 4.67% in males and 3.6% in females. Yet in another study in India, the authors found no significant association between both sexes in their finger print pattern, which is contrary to our findings.⁸ The reason for this contradiction is the design of study, which was community based, while our study involved only the medical and dental students.

Another study, revealed that ulnar loops were the mainly prevailing digital pattern in the majority sexes, trail by whorls and arches in males and females respectively.^{9,10} Gangadhar and Rajashekara Reddy in their study on 360 unrelated Adikarnataka population of Mysore city of Karnataka State, establish that the occurrence of loops (57.11%) were widespread trail by 27.89% whorls and 15.00% arches. This development was seen in both sex.¹¹

Purkait analysed the finger prints of two tribes Mundas and Lodhas, of Midnapur district, West Ben-

Sequence of fingerprints from both hands (Henry's classification system)

L Little	L Ring	L Middle	L Index	L Thumb	R Thumb	R Index	R Middle	R Ring	R Little Finger
10	9	8	7	6	1	2	3	4	5

(L=left, R= right)

Table 1: Fingerprint patterns distribution with respect to gender

Finger Print patterns	Gender		Total
	Male	Female	
Arch	175 (4.37%)	177 (4.42%)	352 (8.8%)
Loop	1124 (28.1%)	1218 (30.45%)	2342 (58.55%)
Whorl	701 (17.5%)	605 (15.12%)	1306 (32.65%)
Total	2000 (50%)	2000 (50%)	4000 (100%)

$\chi^2 = 10.841$, $df = 2$, $P = 0.004$

gal. Mundas show predominance of whorl and loop patterns while loops were dominant in Lodhas.^{2,12} Jaga and Igbigbi conducted survey on Ijaw population of, Southern Nigerians, establish that the most widespread pattern was ulnar loop trail by whorls, arches and the slightest number was radial loops. Sex differences was not noted in the study.¹³ While a study of Kenyan and Tanzanian revealed that the ulnar loops prevailing digital pattern and the arches were in smallest amount.¹⁴ Ching Cho studied New Zealand Samoan population and found 55.6% whorls and 43.6% loops in males while females show evidence of 65.6% whorls and lesser number 33.7% of ulnar loops.¹⁵

CONCLUSIONS

The conclusions drawn from the study is that loops are the most commonly found finger print pattern and arches are the least common in both male and females.

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