RELATIONSHIP OF FINGERPRINTS WITH INTELLIGENCE QUOTIENT AND EMOTIONAL QUOTIENT AMONG MEDICAL STUDENTS OF HITEC–IMS

Sehar Rizvi[1], Maria Sattar[1], Muhammad Bin Aslam[1], Romana Malik[1], Shehr Bano Batool[2], Jawaria Sattar[2]

[1] Department of Forensic Medicine and Toxicology, HITEC-IMS, Taxila, Pakistan
[2] Rawalpindi Medical University, Rawalpindi, Pakistan

ABSTRACT

Objective: *To determine the relationship of the pattern of fingerprints with Intelligence Quotient (IQ) and Emotional Quotient (EQ).*

Study design: *Cross-sectional study*

Study place: *HITEC Institute of Medical Sciences, Taxila Pakistan.*

Duration of study: *5 months*

Methods: *Study was conducted at department of forensic medicine, HITEC-IMS, Heavy Industries Taxila from November 2021 to March 2022. Students enrolled in this project were given a pre-validated IQ and EQ questionnaire. The IQ questionnaire by Philip carter and Ken Russell and EQ questionnaire by Emily were used. Students were asked to fill it. Following which impression of their right middle finger was taken using plain or dab impression.*

Results: *The Loop is the commonest type of fingerprint seen in 100 students followed by whorls and arches pattern. EQ was then checked and divided as EQ more than 120 and EQ less than 120. IQ of individuals was divided under the headings of excellent, very good, good and average. Those individuals with arches type of pattern constitute 21% of people and majority had EQ >120, similarly whorls type of pattern which constitute 28% of people also mainly had an EQ of more than 120. While majority of individuals with loops and mixed pattern have an EQ of less than 120. Similarly, most individuals with arches and whorls fall in the category of very good IQ levels as compared to loops and mixed pattern where most individuals fall in good and average IQ levels.*

Conclusion: *This study concluded that despite loops being the most common fingerprint pattern, it is associated mostly with EQ <120 and average IQ levels.*

Keywords: *Fingerprints, Intelligence Quotient, Emotional Quotient*

INTRODUCTION

One of the most effective methods for identifying a person is fingerprint system (dactylography). Although DNA fingerprinting is thought to be more distinctive than dactylography, it is the fingerprint, not the DNA pattern, that is different in monozygotic (identical) twins. Therefore, dactylography continues to be a crucial identification tool in forensic analysis.[1,2]

Finger print system (Galton System) or Dermatoglyphics is based on the principle that the skin of the balls of the fingers and thumbs is covered with ridges and grooves, the pattern of which varies between individuals and makes absolute identification possible. This was first studied in 1892 by Francis Galton. These ridges on dermis of skin are formed early in the fetal life, approximately in the third month after fertilization and this process completes at birth.[3,4,5] The development of these ridges is not affected by environmental factors or age. There are 4 types of finger print patterns mainly Loops, Arches, Whorls and Mixed.[6]

Emotional quotient (EQ) is the ability to understand, use and manage your own emotions to relieve stress,

communicate effectively, empathize with others, overcome challenges and defuse conflict.[7]

Intelligence quotient (IQ) is explained as a total score derived from a set of standardized tests or subsets designed to assess human intelligence.[8] It is measured by calculating mental age/ chronological age x 100. This mental age is calculated or assessed by various standardized tests.[9] IQ is considered as a typical value reflecting the thinking ability of an individual at the best of his/her ability. It has been long regarded as an indication of intellectual classification.[10]

OBJECTIVES

To determine the most common type of fingerprint in students of HITEC-IMS and to evaluate the relationship between the type of fingerprint and EQ/ IQ among students of HITEC-IMS.

METHODOLOGY

This cross-sectional study was conducted among the students of HITEC-IMS, Taxila Pakistan. The study duration was from November 2021 to March 2022. Sample size was calculated using OpenEpi software and it came out to be 100. So total of 100 students enrolled in MBBS at HITEC-IMS were included in this study. The technique used for sampling was the random sampling technique. Random number tables were generated using Open Epi software and lists of students were taken from student affairs department. Ethical approval was given by college committee and consent from students was also taken. Numbers were then assigned to students and they were selected using a random number table. All selected students who fulfilled the inclusion and exclusion criteria were included.

Inclusion criteria:

1. Students of all years of MBBS at HITEC-IMS

Exclusion criteria:

1. Those students who had skin condition affecting fingerprints.

2. Those students who didn't give consent.

Students included in the study were then given a pre-validated questionnaire for determining their IQ and EQ. EQ questionnaire used in this study was formulated by Emily A Sterrett[11] which assessed the six fields of Emotional Intelligence. IQ questionnaire used was by Philip Carter and Ken Russell.[12,13] In addition to these questionnaires, their right middle finger prints were collected using the plain and dab method.

DATA ANALYSIS

Data were analyzed using SPSS Version 28. Graphs and bar diagrams were also constructed on the basis of results received and finger print type. Chi square test was applied and p-values were calculated for each digit.

RESULTS

In our study we tried to find out the association between the finger print pattern and IQ/ EQ quotient among students of HITEC-IMS Taxila. We included a total of 100 students with mean age of 21 years. Out of these 100 students 60 were females and 40 male students.

Most common type of fingerprint seen in students was loop pattern, however, most of the students with this pattern showed EQ<120 and average IQ levels. After loop pattern, whorls and then arches were frequently seen and were linked with good EQ and IQ levels.

Table I: Association of different types of finger prints with EQ level

	Frequency of students with different fingerprints n=100	EQ >120	EQ <120	p-value
ARCH	21 (21%)	16 (76%)	05 (24%)	**0.00**
WHORL	28 (28%)	18 (64%)	10 (36%)	**0.06**
LOOP	38 (38%)	16 (42%)	22 (58%)	0.17
MIXED	13 (13%)	06 (46%)	07 (54%)	0.70

Individuals with arches and whorls type of fingerprints mostly had EQ of more than 120 while people with loop and mixed pattern mostly had an EQ of less than 120.

Similarly, an association of different types of finger prints with IQ levels of student are shown in Table II.

Table II: Association of different types of fingerprints with IQ levels

	Count n=100	Excellent IQ	V. good IQ	Good IQ	Average IQ	p-value
ARCH	21(21%)	04(19%)	10(48%)	05(24%)	02(9%)	**0.03**
WHORL	28(28%)	03(11%)	10(36%)	08(28%)	07(25%)	0.15
LOOP	38(38%)	02(5%)	11(29%)	07(19%)	18(47%)	**0.00**
MIXED	13(13%)	01(8%)	04(31%)	05(38%)	03(23%)	0.32

Students with arches and whorls type of finger print mostly had very good IQ levels as compared to loop and mixed type of patterns where most individuals had average and good IQ levels respectively.

DISCUSSION

Our study showed that 21 out of the 100 (i.e. 21%) students had arches as the type of fingerprint. Out of which 16 students had EQ of more than 120 and the remaining 5 students had EQ less than 120. This data showed that most of the students with arch type of fingerprints had a significantly good EQ level and p-value showed that its statistically significant. After arches fingerprints, we had whorls type of fingerprints. Twenty eight (28) students had this finger print type. Out of which, 18 students had EQ more than 120 and only 10 students having less than 120. This also indicated that most people with whorl type had a good EQ. However, after analysis of data using SPSS software, *p*-value was more than 0.05 and thus statistically insignificant.

The third type of finger print out of the four that we had used as fingerprint types, is Loop. In our sample of 100, 38 students of respective finger print were found, out of which 16 students had an EQ of more than 120 while 22 students had EQ of less than 120, this was one finger print where we saw the opposite of what we had observed in arches and whorls. Thus, most students with Loop fingerprint had less EQ as compared to students with the other two types. Mixed finger print was the 4th type of fingerprint. This pattern was seen in only 13 students and it was one of the rare types of fingerprint. We had 6 students with EQ more than 120 and 7 students with EQ less than 120. The p-values for these fingerprints were more than 0.05, thus making the data insignificant.

Emotional intelligence and finger print has been studied over years by multiple researchers. Multiple studies have shown strong relationship between dermatoglyphics and EQ because neocortex development time coincides with the formation of finger prints in intrauterine life.[3]

A study conducted in 2019 showed that ulnar loop pattern is commonly seen in medical students, which is comparable to our study. However, in the above mentioned study students had been classified according to EQ levels as EQ>120 and EQ<120. In either of the categories ulnar loop pattern was most recurring one while our study showed high EQ in arches and whorls type of finger prints. This difference is probably because of small sample size.[3]

Another study conducted in India in 2016 showed that there are multiple intelligences and their correlation with dermatoglyphic pattern was seen. Multiple intelligences (i.e logical, spatial, linguistic, kinaesthetic, musical, interpersonal and intrapersonal) when correlated with finger print patterns, showed a weak correlation and it was concluded that every individual has different type of intelligence with different level.[14] Studies have also been conducted in which finger print patterns of young children are seen, which helps them find their inborn potentials and thus enhance these potentials with time.[15]

To check the correlation of fingerprint patterns with intelligence; intelligence was categorized into different categories. When the statistical analysis was done on the students (18 to 26 years of age) regarding their intelligence type and fingerprint patterns, it was seen that the loop fingerprint was commonest among the students that possessed intrapersonal and musical intelligence. The whorl fingerprint was common among students possessing spatial and kinesthetic intelligences, whereas, in the case of Naturalistic and Linguistic intelligences, the arch fingerprint was a common occurrence.[16]

CONCLUSION

The Loop pattern was the most commonest type of fingerprint found among the students of HITEC-IMS. This pattern had no significant association with EQ levels. The majority of the students having loop patterns of fingerprints had average IQ. Students having Arches and Whorls types of fingerprints had an EQ of more than 120. Moreover, participants having Arches and Whorls had very good IQ levels.

LIMITATIONS OF STUDY

All the data collected in this research is taken from a very small sample of 100 students; generalizing it and applying it to the whole population is not recommended. For a better understanding of findings, we need a larger sample size with various age groups and genders to be taken from people of all walks of life.

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