

Aesthetic Aspects and Morphotypes of the Forefeet in a Congolese Population, Democratic Republic of Congo

Anatole Kibadi-Kapay^{1,2}, Dina Babala-Bulaba², Joyce-Euphrasie Kibadi-Kisita²

¹Department of Plastic Reconstructive and Aesthetic Surgery & Hand Surgery, University Hospital of Kinshasa, Kinshasa, Democratic Republic of Congo

²Faculty of Medicine, University of Kinshasa, Kinshasa, Democratic Republic of Congo
Email: akibadi@yahoo.fr

How to cite this paper: Kibadi-Kapay, A. and Babala-Bulaba, D. and Kibadi-Kisita, J.-E. (2025) Aesthetic Aspects and Morphotypes of the Forefeet in a Congolese Population, Democratic Republic of Congo. *Modern Plastic Surgery*, 15, 53-62.
<https://doi.org/10.4236/mps.2025.152005>

Received: October 30, 2024

Accepted: March 10, 2025

Published: March 13, 2025

Copyright © 2025 by author(s) and Scientific Research Publishing Inc.
This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Objectives: This work aimed to determine the aesthetic aspects and morphotypes of the forefeet in a Congolese population (Democratic Republic of Congo) by comparing the length of the toes. **Methods:** This was a prospective study to compare toe length in a Congolese population (Democratic Republic of Congo). Through simple random sampling, we recruited 72 students from the University of Kinshasa. This study was carried out over a period of 3 months, from July 1 to September 30, 2024. **Results:** By simple random sampling, this prospective study recruited 72 Congolese including 36 women and 36 men. The average age was 25.58 ± 3.21 years with a maximum of 36 years and a minimum of 18 years. Concerning the morphotypes of the forefoot, we observed 50 Egyptian feet (type A) or 69.4% of the cases, 13 Roman feet (type B) or 18% of the cases and 9 Greek feet (type C) or 12.5% of the cases. The Egyptian foot (type A, pyramidal shape or curved shape of the toes) was therefore widely represented with 69% of the cases observed. In our study population, concerning the shoe sizes, we observed that type A forefoot (Egyptian foot) was much more the preserve of size 37; those of type B (Roman foot) were divided equally (50%) between sizes 36 and 43. The forefoot of type C (Greek foot) wore more size 39. We noted that the Greek foot (type C, triangular shape of the toes) was more likely to cause pain when putting on shoes (55,5%). Concerning aesthetic aspects, 63 respondents (87.5%) considered the Egyptian type the most beautiful, 6 (8.3%) the Greek type and 3 (4.1%) the Roman type. **Conclusion:** Beyond the susceptibility to developing a certain number of deformations and pathologies, the choice of shoes should be adapted to the morphotype of the forefoot to ensure walking comfort both when walking and when standing. In this Congolese population surveyed, the Egyptian foot is the most observed and also considered the most beautiful.

Keywords

Aesthetic Aspects, Morphotypes, Forefoot, Democratic Republic of Congo

1. Introduction

In ancient times, the shape of the feet could tell us about the personality type, the aesthetic form of beauty and especially the ancestral origin of a person [1]. The obvious existential relationship between the alignment of the toes and genealogy is not limited to what is abstract, because the latter can be exposed to a certain number of pathologies [2]. Note that each shape of feet does not always offer the same stability, the same shoeing capacities or the same support for walking. The morphology of the feet is an essential element for a judicious choice of shoes [3]. We did not find in the literature any published studies on the aesthetic aspects and morphotypes of the forefoot from the Democratic Republic of Congo.

This pilot work aimed to determine the aesthetic aspects and morphotypes of the forefoot in a Congolese population (Democratic Republic of Congo) by comparing the length of the toes.

2. Materials and Methods

This was a prospective study to compare toe length in a Congolese population (Democratic Republic of Congo). Through simple random sampling, we recruited 72 students from the University of Kinshasa. This study was carried out over a period of 3 months, from July 1 to September 30, 2024.

The study variables were: age, sex, weight, height, shoe sizes (shoes), aesthetic aspects (foot beauty), forefoot morphotypes, and respondents' knowledge of forefoot morphotypes. These variables were the inclusion criteria for the study. The absence of one of these variables is an exclusion criterion.

In this study, the criteria for assessing the aesthetics of the foot depend on the subjectivity of each respondent. The latter answered the question whether, for him, the foot was beautiful or not.

The data were entered, encoded and processed on Excel 2019 software. Means and standard deviation were sought for quantitative data with Gaussian distribution, relative proportions (%) and absolute proportions (n) for categorical data.

Free and informed consent was obtained from all respondents before their inclusion in the study. Respect for human life was observed through confidentiality of the results. Anonymity was maintained and the information collected was not used for other purposes. Compliance with the Declaration of Helsinki alone is sufficient and has been scrupulously respected.

3. Results

3.1. General Characteristics of the Study Population

Our sample of 72 students consisted of 36 women and 36 men. We had an equal

representation of women and men at the end of our study. The average age was 25.58 ± 3.21 years with a maximum of 36 years and a minimum of 18 years. Students aged 27 were the most represented at 27% of cases, illustrated in **Figure 1**.

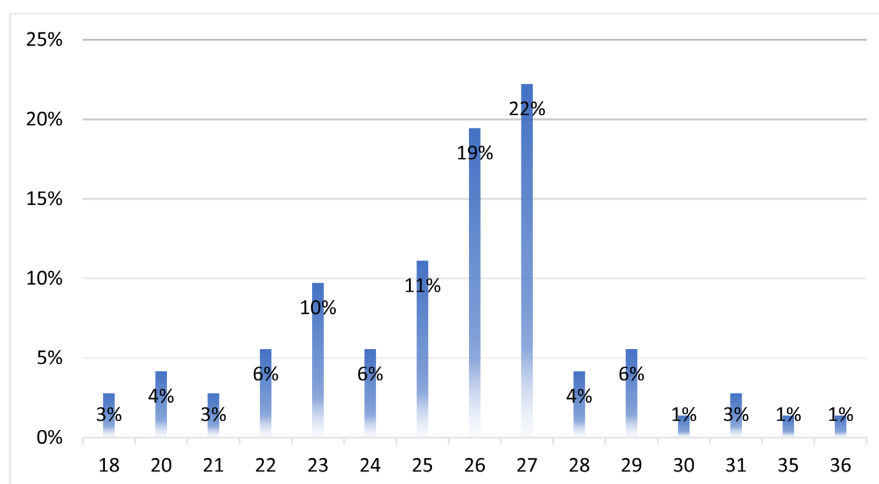


Figure 1. Distribution of respondents by age.

However, we noted an average age of 26.02 ± 3.09 years among female respondents with a maximum of 36 years and a minimum of 20 years unlike male respondents who had an average age of 25 ± 3 years with a maximum of 35 years and a minimum of 18 years. **Table 1** gives the weight, height and body mass index (BMI) of the population studied.

Table 1. Height-weight-BMI characteristics of the population studied.

Measures \ Variables	Weight	Height	BMI
Minimum	46	132	17,3010381
Average	66,6111111	169,763889	23,1758138
Maximum	105	198	37,202381
Standard deviation	11,8244859	11,9015836	3,76223164

The average weight of the respondents was 66.61 ± 11.82 kg with a maximum of 105 kg and a minimum of 46 kg. On the other hand, the average height was 169.76 ± 11.90 cm with a maximum of 198 cm and a minimum of 132 cm and the calculated body mass index was 23.17 ± 3.76 kg per m² with a maximum of 37 kg per m² and a minimum of 17 kg per m².

3.2. Morphotypes of the Forefoot or Foot Shapes

Concerning the morphotypes of the forefoot, we observed 50 Egyptian feet (type A) or 69.4% of the cases; 13 Roman feet (type B) or 18% of the cases and 9 Greek feet (type C) or 12.5% of the cases. The Egyptian foot (type A, pyramidal shape or curved shape of the toes) was therefore widely represented with 69% of the cases

observed.

In our study population, concerning the shoe sizes, the average shoe size was 40.75 ± 2.54 cm with a minimum of 36 cm and a maximum of 46 cm (Figure 2).

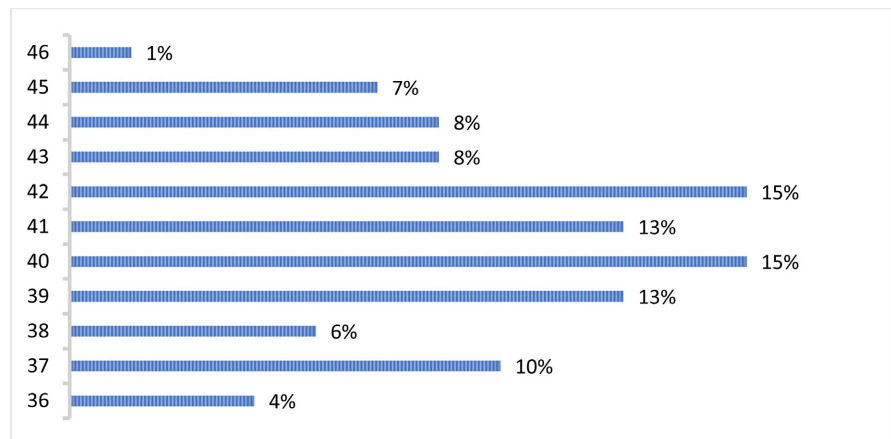


Figure 2. Distribution according to the shoe sizes of the respondents.

In our study population, concerning the shoe sizes, we noted that type A forefoot (Egyptian foot) was much more the preserve of size 37, while type B (square toe shape or Roman foot) was equally shared (50%) between sizes 36 and 43. Type C forefoot (triangular toe shape or Greek foot) was strongly represented among respondents with size 39.

3.3. Aesthetic Aspects and Knowledge of Respondents

Concerning aesthetic aspects, 63 respondents (87.5%) considered the Egyptian type the most beautiful, 6 (8.3%) the Greek type and 3 (4.1%) the Roman type.

We noted that the majority of respondents (68%) acknowledged that they were aware of the existence of forefoot morphotypes, compared to only 31% who said they did not have the information. It should also be noted that of the 68% who claimed to know the different forefoot morphotypes, only 82% claimed that these morphotypes had a genetic origin compared to 14% who did not recognize it. The complaints present among the respondents according to forefoot morphotypes are listed in Table 2.

Table 2. Forefoot morphotype and complaints of the respondents

Difficulties encountered	Forefoot morphotypes		
	A (n = 50)	B (n = 13)	C (n = 9)
Others not specified	4/50 (8%)	1/13 (7.6%)	1/9 (11.1%)
Pain when putting on shoes	14/50 (28%)	2/15 (15%)	5/9 (55.5%)

We noted that the Greek foot (type C, triangular shape of the toes) was more likely to cause pain when putting on shoes (55.5%).

3.4. Illustration of the Morphotypes of the Forefeet Observed in a Congolese Population, Democratic Republic of Congo

Figures 3-5 illustrate the observed foot shapes

3.4.1. Type A (Egyptian Foot, Pyramidal Foot)



Figure 3. Egyptian foot in a Congolese people.

3.4.2. Type B (Roman Foot, Square Toe Shape)

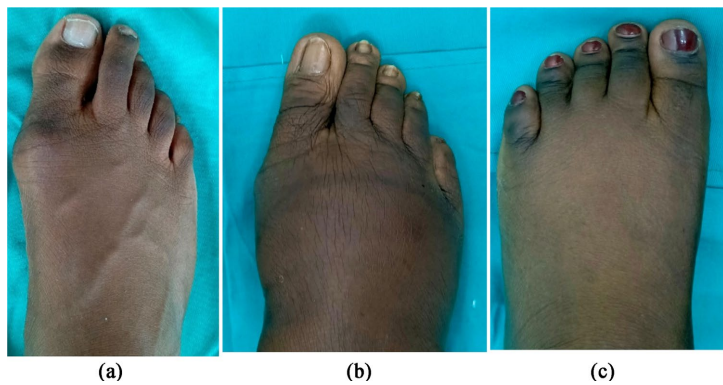


Figure 4. Roman foot in a Congolese people.

3.4.3. Type C (Greek Foot, Triangular Toe Shape)

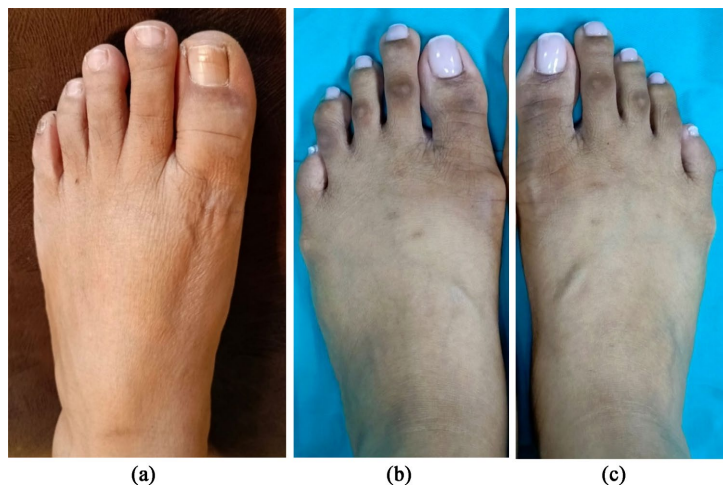


Figure 5. Greek foot in a Congolese people.

4. Discussion

4.1. Shape of the Forefoot

According to the length of the toes, five types of feet are distinguished: the Egyptian foot, the square foot or Roman foot, the Greek foot, the Germanic foot and the Celtic foot [4] (Figure 6).



Figure 6. Five types of the forefoot [4].

However, feet are generally classified into 3 major categories: the Egyptian foot, the Roman foot and the Greek foot.

Egyptian feet are the most widespread: more than half of the population has this type of foot. As such, the majority of shoes are designed to fit feet of this type. An Egyptian foot is characterized by toes forming a downward slope. The big toe is notably longer than the others. A square foot is recognized by the first two or three toes that are aligned at the same level. In some cases, the fourth toe is also added. Greek feet are the rarest and easiest to recognize types of feet. These are characterized by a second toe longer than the first and the other toes.

In our series, concerning the morphotypes of the forefoot, we observed 50 Egyptian feet (type A) or 69.4% of the cases; 13 Roman feet (type B) or 18% of the cases and 9 Greek feet (type C) or 12.5% of the cases. The Egyptian foot (type A, pyramidal shape or curved shape of the toes) was therefore widely represented with 69% of the cases observed. In Ivory Coast, Dao *et al.* [5], in a study carried out on a population of 1041 people including 540 men and 501 women, noted that the Egyptian foot was the dominant morphotype (58.6%) regardless of sex and ethnic group.

The same observation was made by Vernois [2] who also noted three clinical morphotypes: the Egyptian foot whose first toe is longer than the second and the latter longer than the third (50% of cases); the Greek foot which has the second toe longer than the first (25% of cases); the Roman foot which has the first and second toes are the same length (25% of cases.)

Some authors [6] report that it is not the toe that is longer but the bone of it (metatarsal bone), with 10% to 20% of the population having the Greek foot. It should also be noted that functional analyses of the morphotype of the forefoot by the biplanar imaging system are also carried out [6].

4.2. Aesthetic Aspects

In this study, the criteria for assessing the aesthetics of the foot depend on the subjectivity of each respondent. The latter answered the question of whether, for

him, the foot was beautiful or not.

In our series, regarding aesthetic aspects, 63 respondents (87.5%) considered the Egyptian type the most beautiful, 6 (8.3%) the Greek type and 3 (4.1%) the Roman type.

Since ancient times, the shape of the alignment of the toes has been the subject of particular attention. In addition to the shape of the Roman foot, with a big toe as long as the second, and the shape of the Egyptian foot, with a big toe longer than the second, the shape of the Greek foot has long been considered an ideal of beauty. Indeed, Greek goddesses were often represented with a second toe longer than the big toe [4].

The Egyptian foot is the most common with an incidence of 70% of the world's population and then comes the Roman foot which is found in 25% of people. The Greek foot is the rarest. It is observed in only 5% of the world population. However, in Europe and Greece, it is more common. The representation of Celtic and Germanic foot types is not known. But they would also be much rarer [4]. Can we know the origin of our ancestors based on our foot type? The claim that the length of the toes can be used to trace your ethnic origin is not proven. However, a study conducted by the University of Thessaloniki and made public at an orthopedic congress in 2015 showed striking results [4]. Indeed, while only 5% of the world population has a Greek foot shape, this incidence is quite different within the Greek population itself. According to figures reported by the research director, Periklis Vounotripidis, almost half of Greeks (46%) had a second toe longer than the others [4]. In addition, the study showed that 62% of men had such a foot shape compared to 32% of women. This indicates a probable heredity linked to the X chromosome. The researchers therefore concluded that the Greek feet therefore had a phylogenetic origin (kinship relationship between species) [4].

In our series, we also observed a Greek foot near a lady who also had one of these Greek ancestors (**Figure 7**)



Figure 7. Greek foot in a Congolese people with Greek ancestors.

4.3. Foot Shapes and Shoe Types

In our series, the average shoe size was 40.75 ± 2.54 cm with a minimum of 36 cm and a maximum of 46 cm. Regarding shoe sizes, we noted that type A forefoot (Egyptian foot) was much more prevalent in size 37, type B forefoot (square toe shape or Roman foot) was equally distributed (50%) between sizes 36 and 43 and type C forefoot (triangular toe shape or Greek foot) was strongly represented among respondents with size 39. Shoes must adapt to the shape of the feet [8].

- Shoes for Egyptian feet.

Egyptian feet have the advantage of being easier to put on. Indeed, most of the shoe models on the market are suitable for these types of feet. In any case, it would be best to choose shoes that offer enough space for the big toe to optimize comfort.

- Shoes for square feet

Finding shoe models that are adapted to the morphology of square feet is not an easy task. They require more space at the forefoot. As such, shoes that are too narrow or too pointed at the front are not recommended. Instead, opt for shoes with a square or round toe.

- Shoes for Greek feet

For a Greek foot, again, it is preferable to choose shoes with a round and elongated toe to be comfortable. This type of shoe helps to avoid problems such as claw toes.

In our series, we noted that the Greek foot morphotype (type C or triangular shape of the toes) was the main cause of pain when putting on shoes (55.5%).

Indeed, the shoe size is generally proportional to the height, which is why it is used in many size prediction formulas. However, the results are generally far from reliable. In addition, the shoe size must be adapted to the shape of the feet and oriented for a better fit, because in the event of a discrepancy, this can be the basis of several pathologies of the forefoot (hallux valgus, claw toes, etc.). Indeed, certain pathologies are often aggravated by wearing orthotics, which reduce the volume of available footwear and lead to painful feet. They are the cause of complications that are sometimes disproportionate to the calceological etiology. Pathologies such as, canal syndromes, osteoarticular lesions, diabetic neuropathy are often victims. In the event of superficial sensory neuropathy, a diabetic no longer has the possibility of knowing whether his shoe is traumatic or not. An old but still current survey [9] showed that 50% of foot ulcers are the result of wearing unsuitable shoes due to their narrowness (21%), the addition of a foot orthosis (12%) or an alteration of the statics of the foot (17%). Every diabetic patient should know their actual shoe size, length, and width and be advised to choose the models best suited to their foot morphology.

4.4. Strengths and Weaknesses of the Study

Strengths

The strength of this study is that it presents, for the very first time, the aesthetic aspects and morphotypes of the forefoot in a Congolese population. It is intended

to be a preliminary database that is useful for the population and health professionals in the prevention of diseases related to forefoot morphotypes and unsuitable shoes.

Weaknesses

Like any scientific study, this one also has weaknesses. This is a prospective study with a descriptive aim that sought to determine the aesthetic aspects and morphotypes of the forefoot in a Congolese population made up of students. This is a non-representative sample of the entire student population of the University of Kinshasa and the Congolese population. Extrapolation of our results to the entire student population or to the general population of the Democratic Republic of Congo therefore remains difficult.

5. Conclusion

In this Congolese population surveyed, the Egyptian foot was the most observed and considered the most beautiful. Beyond the susceptibility to developing a certain number of deformations and pathologies, the choice of shoes should be adapted to the morphotype of the forefoot to ensure walking comfort both when walking and when standing.

Acknowledgements

We are deeply grateful to the students of the University of Kinshasa for their acceptance and inclusion in this study. Our thanks also go to the staff of the Plastic Surgery Department (CUK) for their contribution in writing this work.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] La Rédaction (2023) La forme de votre pied donne de précieux indices sur votre origine. <https://www.linternaute.com/actualite/magazine/3223789->
- [2] Vernois, J. (2013) Morphotype de l'avant-pied. Classifications et scores en chirurgie orthopédique et en traumatologie, Springer Paris, 207-208. https://doi.org/10.1007/978-2-287-79848-1_16
- [3] Simon, B. (1986) La douleur, le pied et la chaussure. *Revue de l'Institut de calcéologie*, **3**, 18-24.
- [4] PassionSanté.be. (2023) Grec, romain, égyptien...: quel est votre type de pied? <https://www.passionsante.be/>
- [5] Dao, A., Dosh, I., Gogoua, D. and Guedegbe, F. (1993) Morphotypes du pied de l'Ivoirien et incidence sur certaines affections des orteils. *Publications Médicales Africaines*, **26**, 5-11.
- [6] Besse, J.-L., Maestro, M. and Ragusa, M. (2003) Morphotypes radiologiques de l'avant-pied: conséquences chirurgicales. <https://www.em-consulte.com/article/147703/morphotypes-radiologiques-de-l-avant-pied-conseque>

- [7] Dagneaux, L., Gaillard, F., Bissuel, T. *et al.* (2016) Analyse fonctionnelle du morphotype de l'avant pied par le système d'imagerie biplanaire EOS. *Revue de Chirurgie Orthopédique et Traumatologique*, **102**, S127.
- [8] Goldcher, M. (2016) Pied et chaussure: un couple à risque médical méconnu. *Bulletin de l'Académie nationale de médecine*, **200**, 1167-1177
- [9] Magnan, C., Pantel, A., Dubois, A., *et al.* (2022) Pathophysiology, Ecology and Microbiological Diagnosis of Patients Living with Diabetic Foot Osteomyelitis. *Revue Francophone des Laboratoires*, **2022**, 36-44.
[https://doi.org/10.1016/S1773-035X\(22\)00311-2](https://doi.org/10.1016/S1773-035X(22)00311-2)