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Evaluating Sitting Body Proportions: A Gender-Based Anthropometric Study Among Nigerian Igbos

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Abstract

Anthropometry, in the field of ergonomics, is relevant in the assessment of sitting postures between genders during sedimentary work lifestyles. The present study was done to evaluate sitting body proportions using selected anthropometric variables of Nigerian Igbo adults and to analyse where sexual differences exist between them. This cross-sectional descriptive study measured sitting anthropometrics of 500 Nigerian Igbo individuals aged 18-35 years, equally balanced by gender. Participants met the selection criteria such as no musculoskeletal issues, no limb surgeries, and engaged in routine activities, and were recruited via multi-stage random sampling. Standardized anthropometric protocols were used for obtaining measurements including standing height (H), body weight (W), body-mass index (BMI), sitting height (SH), sitting eye height (SEH), shoulder height (SSH), knee height (SKH), and popliteal height (SPH). Data were analysed using SPSS version 25.0, presenting descriptive statistics and comparing sexes via Student's t-test, with significance set at $p<0.05$. Anthropometric outcomes in the current study revealed that the mean height and weight of the males were significantly higher compared to females, while the mean values for sitting height (SH) and knee height (SKH) differed significantly between genders. The other sitting anthropometric variables such as the eye height (SEH), shoulder height (SSH), and the popliteal height (SPH) did not differ significantly between genders ($p < 0.05$). The study concluded that there were selected gender differences observed in the sitting anthropometric parameters and this could be relevant towards the ergonomic design of seats for Nigerian Igbos.

Keywords: *sitting height, eye height, shoulder height, knee height, popliteal height*

Introduction

Anthropometry is the scientific study of measuring the physical dimensions of the human body (Green et al., 2019). It encompasses a variety of measurements, including linear body dimensions such as body height, circumferences of the head, neck, and chest, as well as body angular measurements (Utkualp & Ercan, 2015; Heymsfield et al., 2018). Generally, anthropometry is a way of measuring and collecting data about physical traits of people. This knowledge is not only important for understanding how body shapes and sizes of people differ between ethnic groups, but it is also useful in the fields of ergonomics and human engineering for designing products, workplaces, and systems that fit users well to improve comfort, safety, and performance (Garneau & Parkinson, 2016; Ma & Niu, 2021).

Ergonomics and anthropometry experts usually look at and analyse the body dimensions of people sitting in different posi-

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tions to find the best way to design chairs, workstations, vehicle interiors, and other seating areas that are comfortable, safe, and healthy (Utkualp & Ercan, 2015; Dianat et al., 2018; Almaz & Fawzy, 2022). These sitting postures inform our understanding on how the spine, pelvis, hips, knees, and ankles align when seated (Hey et al., 2017; Léger et al., 2023). When you sit down, you measure certain body parts that are important for sitting, such the height, depth, and breadth of the seat, the height of the backrest, and the lumbar support. These measurements are different than when you stand up since your body changes shape (Baharampour et al., 2013; Igbokwe et al., 2019). Furthermore, these ergonomic proportions make sitting for long periods of time more comfortable, safer, and able to fit a wide range of body types in cars and other public transportation vehicles thereby reducing musculoskeletal disorders among regular users of these means of transportation.

In line with a previous study done among Indonesians, Malaysians and Filipinos, findings revealed significant differences in sitting anthropometric parameters as Indonesian individuals generally exhibited the highest measurements across parameters such as sitting height, sitting eye height, and sitting shoulder height, thus indicating that they had taller and larger body physiques in these dimensions (Abd Rahman et al., 2018). It is evident from several literature that sitting anthropometrics of most ethnic populations are usually gender-specific, as males usually exhibit higher anthropometrics in comparison to females (Darius et al., 2011; Taifa & Desai, 2017; Kibria & Rafiquzzaman, 2019). However, there are dearth in literature on how sitting anthropometrics are sexually dimorphic among Nigerian adult populations. Therefore, the aim of this study was to evaluate sitting body proportions using selected anthropometric variables of Nigerian Igbo adults and to analyse where sexual differences exist between them.

Materials and methods

Ethical Considerations

Before the commencement of the study, an ethical clearance was obtained from the Research Ethics Committee of the University of Port Harcourt (with registration number UPH/CEREMAD/REC/MM/91/005).

Study Population and Selection of Participants

A cross-sectional, descriptive study design was used to obtain the sitting anthropometrics of five hundred (500) indigenous people (within the age interval of 18-35 years) of the Igbo ethnic group of Nigeria between September 2024 to December 2024. All subjects gave their informed consent, and their personal information was kept confidential. The study population includes 250 males and 250 females of Indigenous Igbo with no/any history of surgical operations in both upper and lower limb regions, no history of musculoskeletal disorders, and were either actively employed or regularly carried out routine daily activities to reflect typical postures. The study subjects were recruited using the multi-stage random proportionate sampling technique and the minimum sample size was calculated using the Taro Yamane formula for quantitative studies as shown in previous studies (Asiwe et al. 2024; Fawehinmi et al. 2024).

Procedures for Measurements

In accordance with the study done by Daruis et al. (2011) and Taifa & Desai (2017), the procedures for measuring and recording the sitting anthropometrics were as follows.

i. Standing Height (H) or Stature: Participants were instructed to stand erect with their heels together, touching the back of the measuring device, their feet flat on the ground, legs straight, arms relaxed at their sides, and their heads positioned in the Frankfort horizontal plane. Then the height was measured and recorded in centimetres.

ii. Body Weight (W): With the aid of a calibrated digital weighing scale, participants were asked to stand upright, and barefooted on the scale with feet evenly spaced and arms relaxed at sides while dressed in minimal clothing. Then, the weight was measured and recorded in kilograms. To ensure consistency in the results, each participant was measured two times and the average between both readings were obtained.

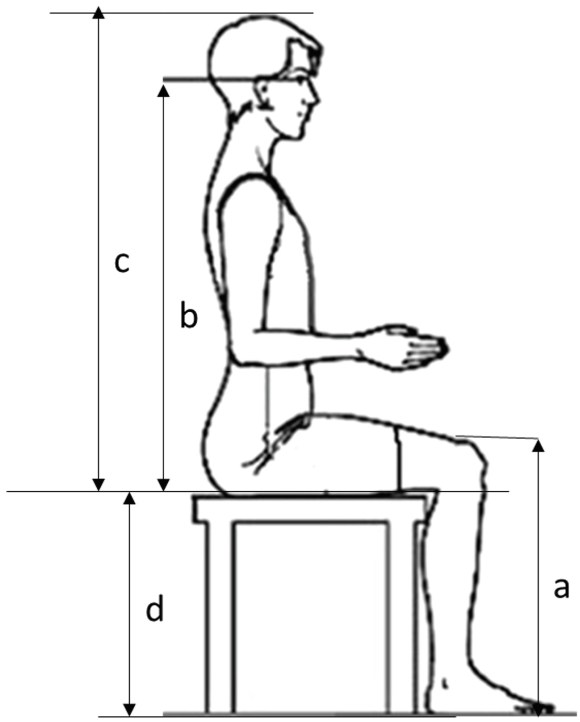

FIGURE 1. Showing the sitting measurements, where a = sitting knee height, b = sitting eye height, c = sitting height, d = sitting popliteal height

iii. Body Mass Index (BMI): Based on the measurements as obtained above (i and ii), the BMI was calculated by dividing the body weight (kilograms) by the square of the standing height (metres).

iv. Sitting Height (SH): Participants were told to sit up straight on an adjustable anthropometric chair, with their feet flat on the floor, thighs parallel to the floor, and heads in a neutral position. The anthropometer was set up so that it was perpendicular to the sitting surface and at the top of the head for each participant. SH was then measured as the vertical distance from the sitting surface to the top of the skull.

v. Sitting Eye Height (SEH): Participants were told to sit up straight with their heads and faces maintaining a natural, forward-looking position. With the anthropometer rod clearly placed and aligning with the eye level, SEH was measured as the vertical distance from the sitting surface to the inferior margin of the eye (usually the line of sight when looking horizontally) and the measurements were recorded.

vi. Sitting Shoulder Height (SSH): Just as in sitting height, the participants were instructed to sit up straight on an adjustable anthropometric chair and SSH was measured as the vertical distance from the sitting surface to the acromion process (the prominent point on the shoulder). To ensure consistency in the measurements, each participant was measured two times and the average between both readings were calculated.

vii. Sitting Knee Height (SKH): Just as in sitting height, the participants were instructed to sit up straight with their knees flexed at approximately 90° on an adjustable anthropometric chair and SKH was measured using the anthropometer as the vertical distance from the sitting surface to the inferior border of the popliteal fossa (the crease behind the knee), and later recorded in centimetres.

viii. Sitting Popliteal Height (SPH): In line with the procedure for measuring sitting knee height, participants were asked to seat upright with thighs horizontal, and their feet flat on the ground. However, SPH was measured as the distance from the surface of the seat to the lowest point of the popliteal fossa (back of the knee) using the anthropometer. Later, the readings were recorded in centimetres.

Reliability of Data

The reliability of the instrument and result was examined using two statistical methods. Firstly, a paired T-test was used to compare the data collected and secondly, we employed the use of the Cronbach alpha to evaluate the consistency of our results, and the outcome presented that the reliability scale was 0.78 which indicates that our results were consistent.

Methods of Data Analyses

The data obtained in this study were subjected to statistical analysis using the International Business Machine of Statistical Package for Social Sciences (IBM SPSS version 25) and results were present descriptively in the form of means, standard errors of means, standard deviation, minimum and maximum values, and the 5th, 50th, and 95th percentiles to understand the variability within the population. A student's t-tests was used to analyse the differences in anthropometrics between sexes and a probability of less than 0.05 was considered statistically significant.

Results

The results from Table 1 show that the mean standing height (H) of Igbo males is 176.12 cm, with a standard deviation (SD) of 6.96 and a range from 160.00 cm to 202.00 cm. The 5th, 50th, and 95th percentiles are 163.77 cm, 176.00 cm, and 186.73 cm, respectively. The mean body weight (W) is 69.02 kg, with an SD of 10.33, ranging from 49.00 kg to 108.00 kg. The BMI has a mean value of 22.24 kg/m², SD of 2.98, and ranges from 16.66 to 34.74, with the 5th percentile at 18.39, 50th percentile at 21.83, and 95th percentile at 28.52. The sitting eye height (SEH) has a mean of 72.63 cm, SD of 3.80 cm, with values ranging from 52.00 cm to 79.60 cm, and corresponding percentiles at 65.77 (5th), 73.00 (50th), and 79.00 (95th). The sitting shoulder height (SSH) has a mean of 57.01 cm, SD of 3.34 cm, with a range from 43.00 cm to 65.00 cm and percentiles at 50.86 (5th), 57.00 (50th), and 62.50 (95th). The sitting knee height (SKH) has a mean of 54.22 cm, SD of 3.61 cm, ranging from 34.00 cm to 63.00 cm, with the 5th percentile at 49.17 cm, the median at 54.05 cm, and the 95th percentile at 60.09 cm. Lastly, the popliteal height (SPH) has a mean of 42.92 cm, SD of 3.62 cm, with values ranging from 28.00 cm to 53.00 cm. The 5th percentile is 36.00 cm, the 50th percentile is 43.00 cm, and the 95th percentile is 49.00 cm.

The results from Table 2 show that the mean standing height (H) of Igbo females is 166.30 cm, with a standard deviation (SD) of 6.02 cm, ranging from 150.50 cm to 189.00 cm. The 5th percentile is 156.78 cm, the median is 166.00 cm, and the 95th percentile is 176.00 cm. The mean body weight (W) is 62.59 kg, with an SD of 10.62 kg and a range from 43.00 kg to 100.00 kg. The body mass index (BMI) has a mean of 22.64 kg/m², an SD of 3.70, and ranges from 15.87 to 36.13. The percentiles for BMI are 17.75 (5th), 21.95 (50th), and 29.33 (95th). In the sitting anthropometric measures, the sitting height (SH) has a mean of 84.35 cm, SD of 3.55 cm, with a minimum of 69.00 cm and a maximum of 89.90 cm. The 5th percentile is 78.00 cm, the median is 84.70 cm, and the 95th percentile is 89.60 cm. For sitting-related measurements, the sitting height (SH) has a mean of 83.32 cm, SD of 4.31, and ranges between 64.00 cm and 89.90 cm. The sitting eye height (SEH) has a mean of 72.30 cm, SD of 3.87, with a minimum of 52.40 cm and maximum of 79.50 cm. The sitting shoulder height (SSH) has a mean of 56.53 cm, SD of 3.55 cm, and ranges from 47.00 cm to 68.00 cm. The sitting knee height (SKH) has a mean of 53.31 cm, SD of 3.20, with values between 43.00 cm and 63.30 cm. The popliteal height (SPH) shows a mean of 42.64 cm, SD of 3.38, and ranges from 33.00 cm to 52.00 cm. Across these sitting anthropometric measures, the 5th, 50th, and 95th, percentiles indicate a relatively tight distribution, with, for example, SH having 5th percentile at 76.00 cm, 50th percentile at 84.00 cm, and 95th percentile at 89.40 cm.

The results presented in Table 3 show sex differences in sitting anthropometric parameters among Igbo subjects, with several statistically significant variations between males and females. Standing height (H) was significantly higher in males than females with a mean difference of -9.82 cm and a highly significant t-value of -16.870 (p = 0.001). Body weight (W) also showed a significant sex difference, with males weighing more than females yielding a mean difference of -6.43 kg (t = -6.867, p = 0.001). However, BMI did not differ significantly between sexes with a t-value of 1.334 (p = 0.183). Among the sitting anthropometric variables, sitting height (SH) was slightly higher in females than males, and the difference was statistically significant (mean difference = 1.03 cm; t = 2.925; p = 0.004). Sitting knee height (SKH) also showed a significant difference, with females having higher values compared to males (t = 2.974, p = 0.003). In contrast, sitting eye height (SEH), sitting shoulder height (SSH), and sitting popliteal height (SPH) did not show statistically significant differences between the sexes, with p-values of 0.346, 0.125, and 0.380 respectively. Significant sexual dimorphism was observed in standing height, body weight, sitting height, and sitting knee height, while BMI and other sitting measures (SEH, SSH, SPH) did not show significant sex-related variation among the Igbo subjects studied.

Table 1. Descriptive Statistics of Anthropometrics for Igbo males

Variables	Mean	SEM	SD	Min	Max	Male Percentile		
						5th	50th	95th
H (cm)	176.12	0.44	6.96	160.00	202.00	163.77	176.00	186.73
W (kg)	69.02	0.65	10.33	49.00	108.00	54.28	68.00	90.23
BMI (kg/m^2)	22.24	0.19	2.98	16.66	34.74	18.39	21.83	28.52
SH (cm)	84.35	0.23	3.55	69.00	89.90	78.00	84.70	89.60
SEH (cm)	72.63	0.24	3.80	52.00	79.60	65.77	73.00	79.00
SSH (cm)	57.01	0.21	3.34	43.00	65.00	50.86	57.00	62.50
SKH (cm)	54.22	0.23	3.61	34.00	63.00	49.17	54.05	60.09
SPH (cm)	42.92	0.23	3.62	28.00	53.00	36.00	43.00	49.00

H=standing height, W=body weight, BMI=body mass index, SH=sitting height, SEH=sitting eye height, SSH=sitting shoulder height, SKH=sitting knee height, SPH=sitting popliteal height

Table 2. Descriptive Statistics of Anthropometrics for Igbo females

Variables	Mean	SEM	SD	Min	Max	Female Percentile		
						5th	50th	95th
H (cm)	166.30	0.38	6.02	150.50	189.00	156.78	166.00	176.00
W (kg)	62.59	0.67	10.62	43.00	100.00	50.00	61.00	82.675
BMI (kg/m^2)	22.64	0.23	3.70	15.87	36.13	17.75	21.95	29.33
SH (cm)	83.32	0.27	4.31	64.00	89.90	76.00	84.00	89.40
SEH (cm)	72.30	0.25	3.87	52.40	79.50	66.59	72.35	78.14
SSH (cm)	56.53	0.22	3.55	47.00	68.00	51.00	56.50	62.78
SKH (cm)	53.31	0.20	3.20	43.00	63.30	48.60	53.00	58.74
SPH (cm)	42.64	0.21	3.38	33.00	52.00	37.25	42.35	48.73

H=standing height, W=body weight, BMI=body mass index, SH=sitting height, SEH=sitting eye height, SSH=sitting shoulder height, SKH=sitting knee height, SPH=sitting popliteal height

Table 3. Gender Differences between Anthropometrics

Variables	Male	Female	Mean Difference	T-test	Significance	Inference
H (cm)	176.11±6.96	166.30±6.01	-9.82	-16.87	0.001	Significant
W (kg)	69.01±10.32	62.58±10.62	-6.43	-6.87	0.001	Significant
BMI (kg/m^2)	22.23±2.98	22.64±3.70	0.40	1.33	0.183	Non-Significant
SH (cm)	84.35±3.55	83.32±0.27	1.03	2.93	0.004	Significant
SEH (cm)	72.62±3.79	72.30±3.89	0.32	0.94	0.346	Non-Significant
SSH (cm)	57.00±3.33	56.53±3.54	0.47	1.54	0.125	Non-Significant
SKH (cm)	54.22±3.60	53.31±6.96	0.91	2.97	0.003	Significant
SPH (cm)	42.91±3.62	69.01±10.32	0.28	0.88	0.380	Non-Significant

H=standing height, W=body weight, BMI=body mass index, SH=sitting height, SEH=sitting eye height, SSH=sitting shoulder height, SKH=sitting knee height, SPH=sitting popliteal height

Discussions

The measurement of the dimensions of the human body is crucial in building work environments that are suited to individual needs irrespective of the gender differences (Garneau & Parkinson, 2016; Wiggermann et al., 2019). When employees sit for lengthy periods of time, discrepancies between their body proportions and the furniture or workstation design might cause pain and health problems. For instance, if a chair does not support the natural curvature of the spine, this imbalance might cause the body to be in awkward postures eventually creating discomfort and in extreme cases, pose a threat on their musculoskeletal health (Reid et al., 2010; Kwon et al., 2018). The present study was done to evaluate the anthropometry of different sitting body proportions of adult Nigerian Igbos and to check where the sexual dimorphism exists between both genders.

Anthropometric outcomes obtained from participants in the current study revealed that the mean height and weight of the males were significantly higher compared to females, only the mean values for sitting height (SH) and sitting knee height (SKH) differed significantly between genders. The other sitting anthropometric variables such as the sitting eye height (SEH), sitting shoulder height (SSH), and the sitting popliteal height (SPH) did not differ significantly between genders ($p < 0.05$). In comparison with a related study done among a Malaysian population by Abd Rahman et al. (2018), gender dimorphism was significant for variables such as SH, SSH, SKH, and SPH, although it was not significant for SEH.

As shown in table 4, the results showed that except for the 5th percentile values for SEH, SSH, and SPH, as well as 95th percentile values for SSH in the current study, percentile values for all sitting anthropometric variables were slightly higher in males than females. With respect to SH, the differences in sitting postures between males and females is usually in relation to the variations in the musculoskeletal architecture of the thoracic and upper spinal regions, as well as the positioning of the head relative to the torso during prolonged sitting. For the 5th percentile of females that showed higher SEH, SSH, and SPH values compared to men, it could be explained that the seat of these females was adjustable to the morphological differences in their cervical spine, shoulder and thigh regions.

Table 4. Comparison of sitting anthropometric variables of the present study with related literature

Study	Study Population	Variables	Gender	Mean	5th Percentile	50th Percentile	95th Percentile
Darius et al. (2011)	Malaysian	SH (cm)	Male	86.89	78.69	N. A	95.08
			Female	82.00	74.21	N. A	89.80
		SEH (cm)	Male	74.94	66.31	N. A	83.58
			Female	69.88	62.48	N. A	77.29
		SSH (cm)	Male	56.66	47.26	N. A	66.07
			Female	53.27	46.01	N. A	60.53
		SKH (cm)	Male	51.94	42.04	N. A	61.85
			Female	48.95	40.51	N. A	57.38
		SPH (cm)	Male	45.40	39.02	N. A	51.77
			Female	43.40	35.87	N. A	50.93
Taifa & Desai (2017)	Indian	SH (cm)	Male	80.50	73.00	80.50	88.00
			Female	77.90	73.00	78.00	82.00
		SEH (cm)	Male	70.80	63.00	71.00	78.00
			Female	67.90	63.00	68.00	72.00
		SSH (cm)	Male	56.90	52.00	57.00	62.00
			Female	54.80	50.00	55.00	58.00
		SKH (cm)	Male	53.20	49.00	53.00	57.00
			Female	47.40	42.00	47.00	53.00
		SPH (cm)	Male	45.00	41.00	45.00	48.70
			Female	42.20	37.50	42.00	47.00
Kibria & Rafiquzzaman (2019)	Bangladeshi	SH (cm)	Male	85.21	79.00	85.05	92.05
			Female	80.35	76.26	79.76	85.40
		SEH (cm)	Male	72.15	58.00	74.00	81.16
			Female	68.70	64.06	68.20	73.32
		SSH (cm)	Male	56.57	44.00	58.00	65.05
			Female	54.22	47.10	54.20	59.08
		SKH (cm)	Male	54.90	47.00	54.00	63.69
			Female	49.47	44.92	49.20	54.24
		SPH (cm)	Male	47.43	43.00	47.00	52.00
			Female	39.71	32.68	39.90	46.18
Current Study	Nigerian Igbos	SH (cm)	Male	84.35	78.00	84.70	89.60
			Female	83.32	76.00	84.00	89.40
		SEH (cm)	Male	72.63	65.77	73.00	79.00
			Female	72.30	66.59	72.35	78.14
		SSH (cm)	Male	57.01	50.86	57.00	62.50
			Female	56.53	51.00	56.50	62.78
		SKH (cm)	Male	54.22	49.17	54.05	60.09
			Female	53.31	48.60	53.00	58.74
		SPH (cm)	Male	42.92	36.00	43.00	49.00
			Female	42.64	37.25	42.35	48.73

SH=sitting height, SEH=sitting eye height, SSH=sitting shoulder height, SKH=sitting knee height, SPH=sitting popliteal height, N. A = Not Available

From an ergonomic perspective, the current study findings seek to suggest the relevance of gender dimorphism in the design of seating arrangements, workplace furniture, and working environments since females and males often differ in body composition variables such as pelvic width, abdomen size, thigh length, and spinal curvature. Such differences could impact preferred sitting postures and the likelihood of developing musculoskeletal disorders. For instance, women generally have a wider pelvis and different lumbar lordosis angles, which can affect lumbar support requirements and seat pan dimensions (Been & Kalichman, 2014).

The intricate interplay between human physiology and environmental design lies at the heart of ergonomics, a discipline fundamentally dedicated to optimizing human well-being and overall body system performance (Punchihewa & Gyi, 2016; Adiga, 2023; Kamijantono et al., 2024). Within this critical domain, the precise application of anthropometric data serves as a foundational blueprint, essential for crafting adaptive and inclusive environments. It is within this vital context that the current investigation into the anthropometry of sitting body proportions among adult Nigerian Igbos assumes significant importance. Through a meticulous examination of sexual dimorphism between genders, this study offers a nuanced and detailed information vital for tailoring work environments to meet specific individual needs, thereby contributing to a more inclusive and efficient ergonomic landscape. Indeed, anthropometric data are indispensable for engineering workplaces that not only mitigate the risk of musculoskeletal disorders (MSDs) and associated health ailments but also foster optimal comfort and productivity (Garneau & Parkinson, 2016; Widana et al., 2021). In addition, the utility of this data extends to resolving a spectrum of bio-ergonomic challenges, which are inherently modulated by factors such as race, occupation, and gender – variables known to profoundly influence individual body composition, proportions, and ergonomic preferences. Anthropometric data can differ significantly among various races due to genetic and environmental factors. For example, the study conducted by Abd Rahman et al. (2018) among a Malaysian population found significant gender dimorphism in sitting anthropometric variables, while the current study among Nigerian Igbos showed differences only in sitting height, sitting knee height, and a few percentile values. These variations in anthropometric data further highlight the importance of collecting race-specific data to design work environments that cater to the specific needs of different populations.

Different occupations may require distinct anthropometric data due to the nature of the tasks performed and the equipment used. For instance, workers in the manufacturing industry may require adjustable chairs and workstations to accommodate their height and reach, while office workers may need ergonomic chairs that support their spinal curvature and promote good posture (Van Niekerk et al., 2012; Kahya, 2021). Moreover, jobs that involve repetitive movements or heavy lifting may necessitate the design of workstations that minimize the risk of MSDs and other injuries. The study findings emphasize the significance of gender dimorphism in the design of seating arrangements, workplace furniture, and working environments. Women and men often differ in body composition variables such as pelvic width, abdomen size, thigh length, and spinal curvature, which can impact preferred sitting postures and the likelihood of developing MSDs. For example, women generally have a wider pelvis and different lumbar lordosis angles, which can affect lumbar support requirements and seat pan dimensions. Therefore, ergonomic designs should consider these gender-specific differences to ensure comfort and minimize health risks.

Based on the results obtained in this present study, the usage of anthropometric data in ergonomics can be seen in various industries and workplaces. Firstly, ergonomic chairs and workstations are designed based on anthropometric data to provide optimal support and comfort for workers. These designs consider factors such as sitting height, sitting shoulder height, and sitting popliteal height to ensure that the chair supports the natural curvature of the spine and promotes good posture. Additionally, adjustable chairs and workstations can cater to individual preferences and body proportions, reducing the risk of MSDs and other health issues. In industries where workers perform repetitive tasks or handle heavy equipment, ergonomic designs can minimize the risk of injuries and MSDs. For example, adjustable workstations can be designed to accommodate different heights and reach distances, reducing the need for workers to bend or stretch excessively. Moreover, ergonomic tools and equipment can be designed to minimize the force and repetitive movements required to perform tasks, reducing the risk of strain and injury (Dianat et al., 2018).

Conclusion

Based on the study results, the anthropometric data for Igbo men and women demonstrated evident and noteworthy patterns of sexual dimorphism, as well as some traits that are shared across the two groups. Igbo males were significantly taller and heavier than Igbo females. Interestingly, while males were taller overall, Igbo females exhibit a significantly greater sitting height (SH) than males suggesting that Igbo males had proportionally longer lower limbs relative to their trunk length compared to Igbo females. Also, sitting knee height (SKH) showed a significant difference, with females having higher values compared to males. In contrast to overall height, weight, and specific lower sitting dimensions (SH, SKH), other key sitting anthropometric measures such as, sitting eye height (SEH), sitting shoulder height (SSH), and sitting popliteal height (SPH) did not demonstrate statistically significant differences between the sexes. This implied that the vertical dimensions of the upper body, when seated, and the popliteal height are remarkably similar between Igbo males and females, despite their overall size differences.

Recommendations

The current study provided basic anthropometric data for the Igbo people. Because the current data does not specify age ranges, future research should investigate how these anthropometric parameters vary by age group (e.g., children, adolescents, young adults, middle-aged, elderly) to better understand growth patterns, peak physical dimensions, and age-related changes. Furthermore, a future study ought to include dynamic anthropometric measures related to specific activities, professional duties, or athletic performance. Finally, longitudinal studies that follow changes in anthropometric characteristics over time within the research sample population are critical for providing information on growth trajectories, aging processes, and the long-term influence of environmental variables.

Because the present study focused solely on men and women of the Nigerian Igbo ethnic extractions, its findings may not be generalizable to other ethnic groups within Nigeria or to other populations globally. Therefore, future research should conduct similar studies on other Nigerian ethnic groups and compare the findings to establish ethnic-specific sexual dimorphisms and traits shared among them. Also, the study does not account for potential confounding factors like nutritional status, health conditions, or lifestyle habits which could possibly impact body composition and measurements. That being noted, prospective research ought to examine holistically how these factors could significantly influence the body measurements.

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