

The Prevalence of Left-Handedness among Medical and Dental Students in the University of Lagos-Nigeria

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Abstract: Handedness has been extensively studied in the past century, but its exact cause remains debatable. The inclination to use one hand over the other for certain tasks has been found to be more common in certain professions. To determine the prevalence of left handedness among medical and dental students of the University of Lagos, Nigeria. Methodology: The survey was carried out among 512 medical and dental students of the University of Lagos through a self-administered questionnaire which was distributed to them through their classes. Names were not required to be written on the questionnaire to ensure confidentiality and to prevent likely bias in their response to the questions. The result of this study revealed a decrease in prevalence of left handedness with increasing age and level of study. The percentage of students who were found to be left-handed in this survey was higher in males than females. The prevalence of left handedness among medical and dental students was within normal proportion.

Key words: Left handedness • Handedness • MBBS • BDS • Students

INTRODUCTION

Left-handedness is the preference for the left hand over the right for everyday activities such as writing and throwing. It is relatively uncommon; about 8-15% of people are left-handed [1]. Reports from social and psychological literature show that handedness may be either genetically determined or psychologically perceived. According to Dada [2], pure right-handers are assumed to be dominant homozygotes, while pure left-handers have recessive homozygotes but mixed handers are heterozygotes.

Typically 10% of the population would be classified as left-handed with a somewhat higher incidence amongst males as females [3]. There is a lower incidence in eastern cultures which may reflect greater cultural resistance to left-handers.

The environmental factors believed to provide structural brain substrate for left-handedness include birth difficulties, prenatal ultrasound, maternal smoking

during pregnancy, low birth weight, diffuse brain damage and testosterone level during early development. Another factor that has occasionally been considered as "trigger" for atypical lateralization of hand preferences is season of birth [4].

However, Left-handedness frequencies in interactive sports (such as fencing, boxing, tennis, baseball, cricket) offering a strategic advantage to the rarer left-hander appear to be very high [5]. Typically, left handed people are seen to be more creative, more likely to notice the size, shape and form of things, more likely to see the whole picture or concept. All these in amalgamated form show that left-handers have more power of perception as compared to right-handers [6].

Neuropsychological explanations of the advantage of being left-handed in some spatial or putatively spatially related abilities are still fairly speculative. Some suggest that the structure of the brain of sinistral and dextral persons might differ, with a larger corpus callosum in those who are left-handed [6]. The increased mass of

connective material could allow more rapid communication between the hemispheres and hence more rapid and efficient processing of certain information.

Despite scientific causes of handedness, in many cultures of the world, different other causes have been attributed to left-handedness. In a research carried out in the Northern part of Nigeria, it was found that almost half of the respondents agreed with the idea that left-handedness is genetically determined [7]. Most of the men in the Southern part of Nigeria believed that left-handedness occurs as a result of parents' laziness or carelessness in their child rearing practices, while women believed that left-handedness occurs as a result of some medical problems during pregnancy [7].

The present survey is therefore designed to assess the prevalence of left-handedness among medical students in the University of Lagos using a questionnaire survey which is manifestly concerned with left-handedness in relation to age, sex and ethnicity.

MATERIALS AND METHODS

Study Population: The survey was carried out in June, 2010 among 512 medical (MBBS) and dental (BDS) students of the University of Lagos.

Survey Instrument: The questionnaire sought information on their socio-demographic characteristics and hand preference for different activities.

This was done in the form of a self-administered questionnaire which was distributed to them through their classes. Names were not required to be written on the questionnaire to ensure confidentiality and to prevent likely bias in their response to the questions.

Statistical Analysis: Questionnaires were coded and statistical analysis was done using Statistical Package for Social Sciences software programme (SPSS) Version 10 to calculate frequencies and chi-square analysis to test for associations between categorical variables.

RESULTS

Socio-Demographic Characteristics: A total of 512 students participated in this survey and the age by sex of the participants are shown in Table 1.

The majority of the students who took part in this survey were males with their number at 290 when compared to females who were 222. Their ages ranged from 17 to over 27 years with a median age of 21. The highest number of respondents belonged to the 21 -22 age range with a total of 215 out of 512.

The majority of the students who took part in this survey were males with their number at 290 when compared to females who were 222. Their ages ranged from 17 to over 27 years with a median age of 21. The highest number of respondents belonged to the 21 -22 age range with a total of 215 out of 512.

According to figure 1, the highest percentage of left-handed students were of the 19-20 age range with 25.9%, followed 23.8% for those in the 17-18 age range, 19.5% for those in the 21-22 age range, 18.1% for those in the 23-24 age range, 18.8% for those in the 25-26 age range and the least coming from those in the ≥ 27 age range (8.7%).

Comparing the difference in handedness for each age group, those in the age range 19-20 had the highest percentage with 25.9% who were left-handed and 74.1% who were right handed, followed by 17-18 age range having 23.8% left handed and 76.2% right handed while those aged 21-22 had 19.5% left handed and 80.5% were right handed; the students in the age range 25-26 had

Table 1: Age by Sex Distribution of Students

		Frequency (%)			Students' T-statistic
		Male (n=290)	Female (n=222)	Total (n=512)	
AGE	17-18	18 (6.2)	24 (10.8)	42 (8.2)	5.24, $P > 0.00^*$
	19-20	48 (16.6)	64 (28.8)	112 (21.9)	
	21-22	120 (41.4)	95 (42.8)	215 (42.0)	
	23-24	49 (16.9)	23 (10.4)	72 (14.1)	
	25-26	37 (12.8)	11 (5.0)	48 (9.4)	
	≥ 27	18 (6.2)	5 (2.3)	23 (4.5)	
	Total	290 (100)	222 (100)	512 (100)	
	Mean Age	22.2 \pm 2.9	20.9 \pm 2.3	21.6 \pm 2.7	
	Median Age	21	21	21	

*Significant

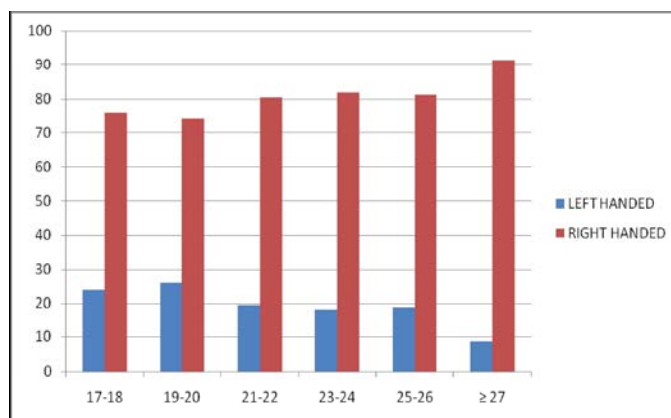


Fig. 1: Percentage of Left Handed Students in Relation to Age

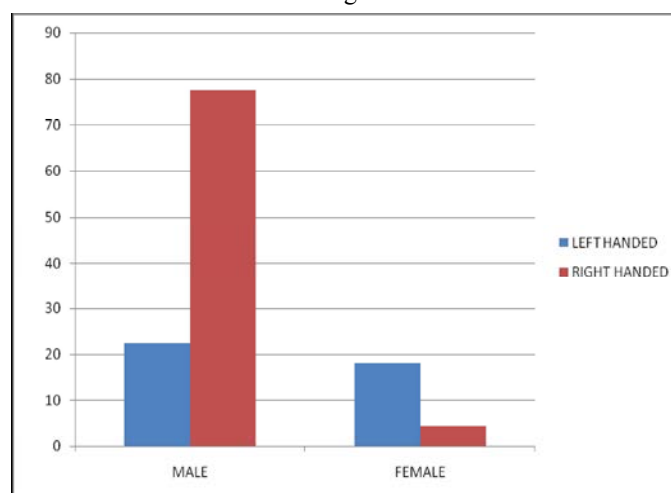


Fig. 2: Percentage of Left-handed Students According to Sex

Table 2: Distribution of Students by Course and Level

		Frequency	Percent
Course	MBBS	398	77.7
	BDS	114	22.3
Level	200	190	37.1
	300	101	19.7
	400	84	16.4
	500	53	10.4
	600	84	16.4
	Total	512	100

18.8% who were left-handed and 81.3% who were right handed. The students aged 23-24 had 18.1% who were left-handed and 81.9% who were right handed. Those in the age range ≥ 27 had the least with 8.7% left-handlers and 91.3% right handed students.

According to figure 2, the highest percentage of students who were left-handed in this survey were males with 22.4% (65) being left handed and 77.6% (225) right handed; while only 18.8% (40) of the females were left-handed and the highest percentage of students who were right handed were females at 82% (182).

In Table 2, 77% (398) of the respondents were medical (MBBS) while 22.3% (114) were dental (BDS) students. The respondents from the different levels varied: the highest being 37.1% (190) from the 200 level, 19.7% (109) from 300 level, 16.4% (84) from 400 and 600 levels and the least being 10.4% (53) from 500 level as shown in Table 2.

According to Table 3, there were 78% left handed MBBS students and 21.9% BDS students with an odd ratio showing that MBBS students were 3 percent more likely to be left handed than BDS students.

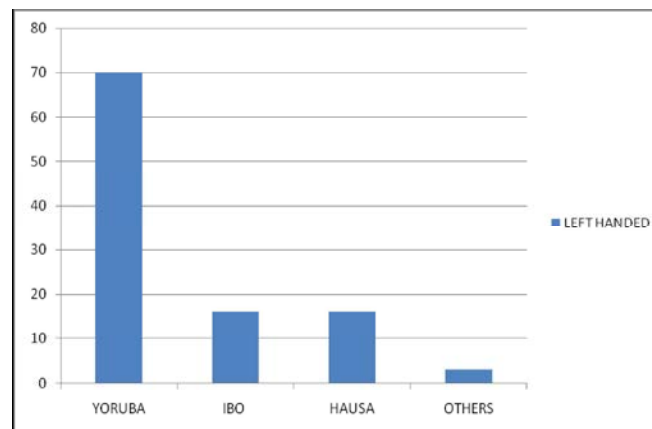


Fig. 3: Frequency of Left Handed Students in Relation to Ethnicity

Table 3: Distribution of Courses and Levels of Respondents by Whether They Are Left Handed

	Left Handed (%)		Total (N=512)	Odd Ratio	95% CI	
	Left-handed (N=105)	Right-handed (N=407)			Lower	Upper
Course						
MBBS	82 (78.1)	316 (77.6)	398 (77.7)	1.03	0.59	1.78
BDS	23 (21.9)	91 (22.4)	114 (22.3)	0.97	0.56	1.68
Level						
200	38 (36.2)	152 (37.3)	190 (37.1)	0.95	0.59	1.52
300	30 (28.6)	71 (17.4)	101 (17.4)	1.89*	1.12	3.19
400	10 (9.5)	74 (18.2)	84 (18.2)	0.47*	0.22	0.99
500	9 (8.6)	44 (10.8)	53 (10.4)	0.77	0.34	1.72
600	18 (17.1)	66 (16.2)	84 (16.4)	1.07	0.58	1.96

•*Significant

Table 4: Prevalence of Left Handedness for Various Activities According to Sex

Activities	Frequency (%)		Total	ODD Ratio	95% CI	
	Male	Female			Lower	Upper
Writing	23 (7.9)	9 (4.1)	32 (6.3)	2.04	0.08	4.86
Drawing	21 (7.2)	9 (4.1)	30 (5.6)	1.85	0.79	4.45
Throwing	30 (10.3)	11 (5.0)	41 (8.0)	2.21*	1.04	4.82
Using Scissors	23 (7.9)	9 (4.1)	32 (6.3)	2.04	0.88	4.86
Using Toothbrush	27 (9.3)	12 (5.4)	39 (7.6)	1.80	0.85	3.86
Using Knife	28 (7.9)	15 (6.8)	43 (8.4)	1.47	0.74	2.98
Using Spoon	10 (10.3)	11 (5.0)	41 (8.0)	0.67	0.26	1.77
Using Broom	31 (10.7)	17 (7.7)	48 (9.4)	1.44	0.75	2.81
Striking Match	28 (9.7)	11 (5.0)	39 (7.6)	2.05	0.95	4.49
Opening Box	30 (10.3)	18 (8.1)	48 (9.4)	1.31	0.68	2.52
Holding Mouse	20 (6.9)	13 (5.9)	33 (6.4)	1.19	0.55	2.60
Using Key	27 (9.8)	12 (5.4)	39 (7.6)	1.80	0.85	3.86
Holding Hammer	25 (8.6)	11 (5.0)	36 (7.0)	1.81	0.83	4.02
Holding Brush/comb	32 (11.0)	13 (5.9)	45 (8.8)	1.99	0.98	4.12
Holding Cup	34 (11.7)	18 (8.1)	52 (10.2)	1.51	0.80	2.87

*Significant

The highest percentage of left handed students were from 200 level (36.2%), followed by those from 400 level (18.2%), then 300 level (17.4%), 600 level (16.2%); the least was from 500 level.

From the odd ratio, 300 and 600 level students were more likely to be left handed than right handed; unlike the other levels in which the students were more likely to be right handed than left handed. The likelihood was however, significant in the 300 and 400 level students.

According to figure 3, the frequency of left-handed was higher among Yoruba (70), followed by Ibo and Hausa which showed the same frequency (16); while Others showed the least frequency in left handedness with only 3 students.

Prevalence of Left Handedness: The activities used to determine handedness was adapted from Oldfield [8]: “The assessment and analysis of handedness: the Edinburgh inventory”. Each activity was designed to assess the hand preference of each student by using every day activities.

Table 4 shows the frequency in which each sex performed the various activities with their left hand. This was seen to be higher in males than in females.

From the odd ratio, the males were twice likely to use their left hand in writing, throwing which is significant; using toothbrush and striking match than the females. The males were also more likely, though by a smaller percentage, to use their left hand in drawing, using toothbrush, knife and broom, opening box, holding mouse, using key, holding hammer, brush/ comb and cup.

The females were however, more likely to use their left hand to use a spoon than males.

DISCUSSION

In this paper, we investigate the prevalence of left handedness among medical and dental students of the University of Lagos.

The result of this study revealed a decrease in prevalence of left handedness with increasing age and level of study. The increase of right hand writing with age suggested that left handed subjects had switched hand preference [9], most likely because of society pressure. There however appears to be a diminishing tendency, in recent years for left handed children to be forced to write with their right hand.

The percentage of students who were found to be left-handed in this survey was higher in males than

females. This is also consistent with previous studies. The difference could also have been influenced by the higher number of males who participated in this survey.

Most of the left-handed students were Yoruba and this could be due to the fact that about 71% of the students who participated in this survey are Yoruba; and so no conclusions can be drawn on the prevalence of left handedness in relation to ethnicity. Also, while hand preference can be affected by social environment, it is unlikely that it is determined entirely by culture. If handedness is socially constructed, one might expect at least one culture where left-handedness predominates and there do not appear to be such a case.

The assessment and analysis of handedness was done using the Edinburgh inventory by Oldfield, [8]. People do differ in the extent to which their right or left hand dominates in manual activities, however and there is an increasing tendency to classify individuals along a continuous dimension of hand preference for various tasks such as writing, throwing, drawing, sewing, tooth brushing or opening a lid [10]. The males had a higher tendency of using their left hands to perform these activities than the females.

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