

# Effects of Hand Orientation on the Performance in the Presence of Systemic Disease in a College Student

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## Abstract

**Background:** Hand preferences is the natural or biological preferences for using one hand over the other in performing special tasks depending on which hemisphere dominant for the tasks (rice 1998), so it has various effects on one's abilities and behaviors .

**Objective:** Is to compare the final score of sixth year students in faculty of medicine in Basra University between left handed and right handed group.

**Method:** I invite all sixth year students at Basra college of medicine, university of Basra, Southern Iraq, in the academic year (2010-2011) to participate in this study and questioner sheets distributed for them to answer question prepared by researcher(attached).Ninety two participate able to fill the sheet presented. Fifty (54.3%) were female and Forty two (45.7%) were male. Thirteen (14.1%) students were left and Ninety seven (58.9%) students were right handed.

**Results:** Left Handed group in comparison with right hand group showed higher scoring in cumulative result of the final result in academic performance which is statically significant with p. value (0.013).Systemic disease that run in group again is more in left handed group in comparison with right handed group, P.Value ( 0.01).

**Conclusion:** left handedness is associated with more performance regarding the cumulative score of final result in medical students in spite of their relatively increase incidence of systemic disease.

## I. INTRODUCTION

Handedness does it problem? The literature addressing that simple question is massive and provides mixed evidence regarding the relationship between handedness and various measures such as health outcomes, accident rates, and cognitive skills.<sup>(1)</sup> plentiful studies have shown that left-handed individuals have different health outcomes. Some studies find they have a higher rate of high blood pressure (Bryden, Bruyn, & Fletcher, 2005) and irritable bowel syndrome (Dancey, Attree, Ba`rdos, & Kovacs, 2005), but a lower rate of arthritis and ulcer (McManus & Wysocki, 2005). Meta-analyses did not find convincing evidence that left-handedness was correlated with immune disorders (Bryden, McManus, & Bulman-Fleming1994), but did find a positive correlation with schizophrenia (Dragovic & Hammond, 2005).

Handedness is natural of biological and environmental factors (rice 1998), historically left hander form stigmata to individual and in some nation may link this to devil hence the ring in finger held in the left side to throw out the devil from the newly married couple, in addition a family may force child borne left handed to encourage the use of his right hand in his activity. According to De young et al (1998) 40% of population should be left handed. Historical investigations revealed that there were more left handed people in population at one time. By studying the cave drawing of tools from stone age, researchers found that during this time period equal proportions of population were left or right handed. (coates 1996,Deyoung et al 1998). Researchers suggest that changes in the amount of left handed people happened in the bronze age due religious ceremonies centered on the sun also developing the believe that the left handed was evil and the right was lucky.(coates 1996,De young et al 1998,howell 1978). The book of judges in bible associate left handedness with warlike tendency (trotter 1974). In conjunction with religious beliefs, hunting technique play role in right hand dominance. primitive hunters needed to protect their most vital organ of the body (Heart), so their left hand was used to hold a shield. The right hand was used to hold the sword or knife. Therefore the right hand acquired greater agility which was pass down through generations (coates 1996: hollingh worth 1923).The age at which the children shown their preferred hand have been debated. Gesell and Ames(1947) indicated that there is no clear cut handedness until the about age of 10 . Lewis et al (1986) argue that children under 5 years are likely to switch hand preference or show evidence of ambidexterity. Whereas after 5 years of ages hand preference becomes a more reliable indicters of handedness .There are many things used every day that have a right handed bias. bottles caps, vegetable peelers', serrated knives, scissor, musical instruments, gum wrapper tabs, chairdesk, computer keyboard and many power tools to name just a few, cause difficulty for the left handed user. The act of witting poses a variety of difficulties for left handed person to overcome. because the English writing take place from left to right, the left handed person cannot see what they have been just written because their hand cover the writing. many left handed may accommodate by using a bowed position, which can cause problem because the arm does not have the full range of motion (Hackney, 1997). not only not seeing what is being Written cause a problem, but left hand dragged

across freshly written letters and smear the writing(bloods worth ,1993 :) .If the left handed writer using a pen, the nub of the pen is pushed rather than pulled across the paper the way the pen was designed to perform, this action can cause erratic ink flow and allows the writing to be smeared easier (Milsom 1995). Writing letters in acceptable way causes the left handed person to go against their natural indistinct of moving away from body midline, consequently this cause left handed to be slower, more awkward and uncomfortable in their hand and body positions. In addition left handed experience more fatigue when engaged in prolonged periods of witting (Harrisons,1981)<sup>2</sup> .The aim of this study is to found whether there is any relation between handedness and the cumulative result of final year medical students and its relation to family history and associated systemic disease.

## II. PATIENTS AND METHOD:

Ninety tow participants from one hundred twenty four sixth year medical student from Basra faculty of medicine, university of Basra, fifty (54.3%) participants were female and (45.7%) participants were male. All invited after informed consent to fill a questioners sheet containing general personal information including name ,age, gender, residency, smoking, hopes, habit, social history including parents relation, systemic disease run in family, parents and brother sister hand preference. The other part of the sheet is in the form of table used the Edinburgh Handedness Inventory for hand preference done by Oldfield in 1971 that still applicable for hand preference, which modified by the researcher for ten tasks including hand preference in writing, eating, holding a cup of water, washing, greeting, throwing hand ball ,firing the match, foot preference in throw foot ball and eye preference in looking to target.(3,4) Each ten task above given a degree, 1; for predominantly left, 2: for occasionally left , 3: for using both side,4: for occasionally right and 5: for predominately right user of the task .and according to the revised scoring for handedness. Participants with higher scoring 30-50 are right handed and those with lower scoring from 1-20 are left handedness', from 20-30 are in between .the grouping are labeled either righted or lefted and tested for final score of result in the final examination and plotted for gender, presence of systemic disease, hand preference in family, parents state (relative or note).hopes, history of psychological trauma and smoking.

**Table 1: General Characteristics of Study Sample.**

Hand Preference	L	R	P value
NO.&%	13(14.1%)	79(58.9%)	
Male\ female	8(8.7%)\ 5(5.4%)	34(37%)\ 45(48.9%)	Ns Ns
FH +VE	4(4.3%)	27(29.3%)	Ns
FH_ VE	9(9.8%)	52(56.5%)	Ns
Systemic disease+ve	5(5.4%)	7 (7.6%)	0.01
Systemic disease-ve	8(8.7%)	72( 78.3%)	0.01
Smoking+ve	2(2.2%)	6 (6.7%)	Ns
Smoking-ve	11(11.2%)	71( 78.9%)	Ns
Suborient+ve	8(8.7%)	14(15.2%)	0.001
Suborient-ve	5(5.4%)	65(70.7%)	0.001
Results+ve	13(14.1%)	61(66.3%)	0.013
Results-ve	0(.0%)	18(19.6%)	0.013
Social; stigma +ve	11(11.2%)	21 (23.1%)	0.012
Social stigma-ve	2 (2.2%)	58 (63.5%)	0.012

## III. DISCUSSION:

In this study, the aim is to prove whether handedness is a concern effect on the final cumulative results of medical student and whether it is affected by factors such as social, systemic disease, gender, total leftness and family history of handedness. We choice the final year students in this study for their proved effects as parameter for inelegancy of students, though it is not actually reflects it. And to study how this exaggerated by social, family and systemic disease factors. No study in our area deal with this interested subject regarding the actual outcome of results and the difference between lefted and righted individual regarding their marks in examination. Although the marks not reflect the actual state of one intelligent level, however the final score of students during their six year study in college may reflect the intelligent level, as the chance factors and other environmental and organic factors (disease) may ruled out by this long cumulative summation of score .this may gave to the study some significant on one hand and on the other hand may satisfy statistical results. This study reflect the usual distribution of left and right hand as in population as in other study ( 5). No gender factor is significant between two group and it is similar to other study in reflecting the sex distribution.( 6) The main results was obtained significant regarding the presence or absence of systemic diseases that runs in the studied group, which showed increased occurrence of disease in left hand group in comparison to right handed. This may goes with many previous study that showed close association with many systemic diseases like hypertension, asthma, myasthenia graves.(7,8 ) But one of the main pitfall in this study regarding the systemic disease is the occurrence of hematological disease in left handed group and most of this disease is common in the area of study and this may not reflect the actual result of the associations. The second parameter which appear in this study is the occurrence of footedness' and eyetedeness in left handed group in comparison with right handed group, which indicate that the participants

with full leftedness are more lateralized and got more final score than right hand participants. The presence of systemic diseases in the target group not negatively affect the success rate in them and this may be not more than just associations. Smoking habit obtained in this study showed no significant difference between groups. The fact that study group are from the same academic level gave the study more confidence regarding the significance of the results than if they come from different academic achievements as the intelligent question ( IQ ) may vary if the sample of the study are from different college.( 9,10,11) In conclusion left handed students achieve good academic score in spite of the presence of increased occurrence of systemic disease and the social embarrassments or social stigma that accompany the condition in early years of life in comparison with right hand students, furthermore the significant association of total leftedness in left hand group and its significant with the success rate increasingly give confidents to the results in this study.

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