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Correlation of Anthropometric Parameters with Different Neuro Cognitive Style Barriers among Health Care Students-A Preliminary Study

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Abstract

Objective: This preliminary study was done to investigate the relationship between various anthropometric parameters on different cognitive style barriers of the individual.

Methods: This study was conducted in the Department of Physiology, Chennai Medical College Hospital &Research Centre, Trichy, during 2013 to 2014. We have analyzed 41 healthy (M=22, F=19) volunteers aged between 18-25 yrs. of both genders who were selected via stratified random sampling technique.

Results: The results indicated that, the average Boy mass index of the volunteers was 22.53(3.82) and the mean age was 19.17 (0.704). Most of the anthropometric parameters were significantly decreased and barriers of cognitive styles were increased in females than males. Barriers to Systematic analysis and confidence level were negatively correlated with ideal body weight. Hb level was negatively correlated with barriers to confidence level, need for conformity and work pattern. These changes were statistically significant ($p< 0.05$).

Conclusion: Our results shows that, Knowledge regarding barriers of cognitive style may help educators to identify the learning problems promote thinking and improve problem solving and decision-making skills among students.

Keywords: Cognitive style barriers; Anthropometry; Health care students; Academic performance

Introduction

The Inventory of Barriers to Creative Thought and Innovative Action was designed to identify and to measure the degree of inhibitors affecting a person's ability to create and innovate. Its underlying hypothesis is that creative and innovative behavior will increase as a result of feedback obtained from the instrument and the subsequent awareness and understanding of a person's identified inhibitors. Investigations of the factors associated with the creative process and the individual originated with Rogers who attempted to correlate characteristics of the individual and the environment to creative performance. He asserted that a relationship exists between an individual's internal psychological makeup and creativity; for instance, individuals who display creative behaviors generally are open to experience, lack rigidity in thinking, have the ability to deal with conflicting information, and are not unduly influenced by criticism or praise [1]. The Cognitive-Style Inventory provides a basis for identifying the patterns of thinking, learning, problem solving, and decision making behavior. The cognitive style barriers can be categorized into the following three major groups: Perceptual blocks, or the way a person sees things; Cultural blocks, or the way a person ought to do things; and Emotional blocks [2] or the way a person feels about things In another way, barriers were classified in to Structural barriers, which include psychological, cultural, and environmental blocks; Process barriers, which include elements related to cognitive style [3,4]. Early identification of cognitive style barriers in health care students and their relationship among them needs to be investigated. With this background, the present study was planned.

Aims and Objectives

To assess and correlate the various anthropometric parameters on different cognitive style barriers of the individual.

Material and Methods

This study was conducted in the Department of Physiology, Chennai Medical College Hospital and Research Centre, Trichy, Tamilnadu, India, during 2013 to 2014. The study was commenced after obtaining approval from the institute's scientific advisory committee and human ethics committee.

Study design

The analytical Cross sectional study was conducted among the students studying in a medical college was selected by using random number tables. The subjects involved in the recording of the parameters and the analysis of data were blind to the experimental conditions. Out of the three medical colleges at Trichy, one was taken using simple random technique. Primary sampling unit in the study were the MBBS students studying in a medical college. The MBBS students enrolled in the students register was taken as the sampling frame. On the day

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of assessment, participants reported to the Department of Physiology, Chennai Medical College Hospital & Research Centre between 3 and 4 PM, at least two hours after eating the lunch. Then, the below -mentioned parameters were recorded. We administered these tests in the same order as are given here, to all the participants.

Inclusion criteria

Students studying MBBS (First year to Final year) who are present responded and gave informed consent.

Students in the age group 18 – 25 yrs.

Exclusion criteria

Students who didn't respond and cooperate

Any history of chronic illness, known Psychiatric illness

Students currently on anti- Psychotic drugs

Procedure

This study was conducted in the Department of Physiology, Chennai Medical College Hospital &Research Centre, Trichy, during 2013 to 2014. We have analyzed 41 healthy (M=22, F=19) volunteers aged between 18-25 yrs. of both genders. After obtaining ethical clearance from the institutional Human Ethics Committee, the volunteers were explained in detail about the study protocol and informed consent was obtained from them. Various anthropometric parameters and the inventory of barriers to creative thought and innovative action.

Tools for data collection

A pretested structured questionnaire will be used to collect the necessary information: The Inventory of Barriers to Creative Thought and Innovative Action [5].

The instruments consists of thirty-six items, set up in a six point Likert-scale format & identify and measure barriers in the following six categories

A. **Barriers related to concept of self.** These examine the variables most oftenassociated with an individual's self-esteem, self-confidence, handling of rejection, and ability to confront differing opinions.

B. **Barriers related to need for conformity**. These examine the variables most oftenassociated with Inclinations to break away from tried and true patterns, to take risks, to express one's ideas, and to scrutinize traditional views and standard practices and policies.

C. **Barriers related to ability to abstract.** These examine the variables most oftenassociated with tendencies to use the unconscious mind, to abstract, to view things in visual ways, and to rely on intuition.

D. **Barriers related to ability to use systematic analysis.** These examine the variables most oftenassociated withtendencies to use the conscious mind, to apply logic, to think in linear or sequential ways, to organize oneself and one's ideas, and to rely on facts or data.

E. **Barriers related to task achievement.** These examine the variables most oftenassociated with work patterns, persistence, attitudes toward others, and resourcefulness.

F. **Barriers related to physical environment.** These examine the variables most oftenassociated withPreferences as to physical surroundings, dealing with distractions, use of personal space, and need for privacy.

Validity and reliability: The instrument has undergone statistical scrutiny and has been widely used in a variety of organizational settings with diverse populations. The instrument has a test-retest reliability of 0.89; it appears to have construct validity as demonstrated by factor analysis and content validity as demonstrated by expert ratings of the items as they pertain to the literature.

Administration: The following suggestions will be helpful to the facilitator who administers the instrument:

1. Distribute the instrument and read the instructions aloud as the participants follow on their copies.
2. Point out to the participants that the instrument is not a test that has right or wrong answers, but a device designed to indicate one's barriers to creative thought and innovative action.

Scoring: Each participant should be given a copy of the Barriers to Creative Thought and Innovative Action Scoring Sheet. The Scoring Sheet identifies six categories in columns labeled A through F. Each column contains the numbers of the items directly related to that column. Each participant should transfer his or her scores to the scoring sheet and add all values in each column to obtain totals for each column. Each participant should be given a copy of the Barriers to Creative Thought and Innovative Action Profile Sheet. The participants will plot their scores on the graph. The vertical axis represents the numerical scores; the horizontal axis, the categories of barriers. The participants then should draw lines connecting the plotted points. The final version will appear as a line graph; for example: The high scores are the barriers or hurdles to overcome in order to increase one's creative thought and innovative action. For instance, in the example shown previously, Columns B and E are the two highest points on the graph and represent the barriers this individual needs to overcome.

Anthropometric measurements [6]: Height – Measured using standard measuring stand, Weight – measure using adult bench scale, Body circumferences – measured using inch tape.

Estimation of haemoglobin- Shalis Acid-Haematin Method [7]: Sahli's method of haemoglobin estimation is relatively inexpensive, simple to use, does not require electricity & requires only small sample of blood. In developing country like India most common method used for haemoglobin estimation is the Sahli's method Collection of Blood: Two trained laboratory technicians were instructed thoroughly according to the standard operating procedure provided to them. The subject was called at screening laboratory and with all aseptic precautions 20 µl of capillary blood was collected by finger prick from ring finger of left hand for Sahli's method. The haemoglobin tube (STD 14.5gm = 100% concentration) was filled with N/10 hydrochloric acid (HCL) up to 2 gm. marking. This graduated tube was placed in Sahli's Hemoglobinometer (Comparator with Brown glass). The blood and acid are mixed with glass stirrer and allowed to stand for 5 minutes for acid haematin formation. Drop by drop distilled water was added to dilute the acid haematin compound colour till it matches with the standard colour plates of the comparator. Results were read as gms/dl present on the haemoglobin tube.

Data analysis

Data entry was done by using Microsoft Excel 2007 and analyzed by using IBM SPSS Statistics version 21 Descriptive statistics using mean and standard deviation for continuous variables, and frequency and percentage for categorical variables were used. Nonparametric Spearman's rho test was used for correlation anthropometric parameters with barriers to Creative Thought and Innovative Action.

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Parameters	M=1 , F=2	N	Mean	SD	P value	95% CI	
						Lower	Upper
BMI	1	22	23.11	4.42	0.284	-1.09149	3.62203
	2	19	21.85	2.95			
IBW	1	22	65.86	3.87	0***	10.8999	16.29527
	2	19	52.27	4.68			
WHR	1	22	0.8285	0.0563	0.009**	0.0141859	0.09232011
	2	19	0.7753	0.0673			
HB	1	22	13.9	1.01	0***	0.7056	2.1862
	2	19	12.46	1.32			
BCL	1	22	13.68	2.95	0.002**	-5.263	-1.268
	2	19	16.95	3.37			
BNFC	1	22	12.86	3.18	0.006**	-5.239	-0.928
	2	19	15.95	3.64			
BUA	1	22	14.27	3.15	0.11	-3.51	0.372
	2	19	15.84	2.98			
BSA	1	22	14	2.777	0.047*	-3.237	-0.026
	2	19	15.63	2.216			
BWP	1	22	14.23	2.429	0.031*	-3.58	-0.176
	2	19	16.11	2.961			
BPD	1	22	14.23	1.744	0.145	-2.694	0.411
	2	19	15.37	3.077			

Values are expressed as Mean and SD. Unpaired t test was applied to compare the parameters between genders. *P≤0.05., **P≤0.01, ***P≤0.001, M=1(Males), F=2 (Females)

Table 1: Gender difference between anthropometric parameters and barriers of cognitive style inventory.

Parameters	BMI	IBW	W/H Ratio	BCL	BNFC	BUA	BSA	BWP	PD	HB
BMI	1.0									
IBW	0.082	1.0								
W/H Ratio	0.364*	0.260	1.0							
BCL	-0.097	-0.462**	-0.236	1.0						
BNFC	0.076	-0.388*	-0.104	0.608**	1.0					
BUA	0.164	-0.194	0.029	0.436**	0.592**	1.0				
BSA	-0.239	-0.360	-0.457**	0.458**	0.420**	0.393*	1.0			
BWP	-0.078	-0.171	-0.299	0.324*	0.265	0.348*	0.287	1.0		
PD	0.102	-0.318	-0.075	0.322*	0.395*	0.524**	0.496**	0.231	1.0	
HB	-0.133	0.410	0.021	-0.317*	-0.424**	-0.080	-0.023	-0.308*	-0.119	1.0

BMI- Body mass Index; IBW- Ideal Body Weight; WC- Waist Circumference in cm; HC- Hip Circumference in cm; WHR- Waist Hip Ratio; HB- Hemoglobin conc (g/dl); BCL- Barrier to confidence level; BNF- Barrier to Need for Conformity; BUA- Barrier to Use of abstract; BSA- Barrier to Systematic analysis; BWP- Barrier to Work Pattern; PD- Physical distraction. Nonparametric Spearman's rho test was used for correlation anthropometric parameters with barriers to Creative Thought and Innovative Action. *P≤0.05., **P≤0.01, ***P≤0.001.

Table 2: Correlation between anthropometric parameters and barriers of cognitive styles.

Results

The average BMI of the volunteers was 22.53(3.82) and the mean age was 19.17 (0.704) years. Table 1 shows that, Gender difference between anthropometric parameters and barriers of cognitive style inventory. Most of the anthropometric parameters were significantly decreased and barriers of cognitive styles were increased in females than females. These changes were being statistically significant ($p< 0.05$). Table 2 depicts that, Nonparametric Spearman's rho test was used for correlation anthropometric parameters with barriers to Creative Thought and Innovative Action. Barriers to Systematic analysis and confidence levels were negatively correlated with ideal body weight. Hb level was negatively correlated with barriers to Confidence Level (CL), Need for Conformity (NFC) and Work Pattern (WP). These changes were being statistically significant ($p<0.05$).

Discussion

Our results shows that, Knowledge regarding barriers of cognitive style may help educators to identify the learning problems promote thinking and improve problem solving and decision-making skills among students [8]. We found a negative correlation between Hb and barriers of cognitive styles. This finding was consistent with previous studies, that Iron Deficiency Anemia (IDA) negatively affects academic and cognitive performance. This instrument also identifies variables related to intuitive right-brain thinking, as well as elements typically associated with systematic or logical left-brain thinking. Waist circumference may be a better predictor of healthcare costs than the widely used BMI [9]. Ideal body weight was one of the independent prognostic factors for assessing barriers to cognitive styles in young individuals. The possible physiological mechanism is that, larger body mass individual is requires more blood flow for optimal functioning, so the brain is deprived of adequate blood flow [10-12].

Conclusion

In recent years there has been a resurgence of interest in the nature of cognitive style as a potentially significant variable for better understanding and predicting differences in behavior in organizations

at both the individual and group levels of analysis. This activity offers an opportunity for further individual and group insight into the ways in which members stifle or cultivate their own or the group's creativity.

Lacunae

1. Small sample size was analyzed for this preliminary study.
2. We need to correlate between cognitive style barrier with type of nutrient, Pscycho social and sleep pattern etc.
3. Though Sahli's method was performed with all precautions trying to minimize error, suggestions as per WHO guidelines are needed to be followed for Improving test performance by improving its accuracy and reducing variability of the results.

Recommendation

1. Early screening and identification of cognitive styles barriers at different education level needs to be investigated.
2. Link between low self-esteem and high body-image disturbance exhibit patterns of neuropsychological functioning. has to be demonstrated in future.

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