Research Article

Correlation of IQ and academic performance in first-year medical students

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Abstract

Intellectual quotient (IQ) is an indicator of non-verbal reasoning ability which results from a series of standardized tests that allow observing the cognitive abilities of people in relation to their age. School performance is to reach an education level understood by a grade point average.

General objective: To determine the correlation between IQ and academic performance in first-year medical students

Method: This is an analytical cross-sectional study, where students of the 2018 generation were selected with a total of 150 students, of whom only 115 decided to participate. The Raven Test was applied to them to measure the IQ that later will be registered in the SPSS program and located according to their scores in the scale table.

Results: Of the 115 subjects who participated, the students with a grade point average of 7 and 8 have higher IQs, and the students with a 9-grade point average have lower IQs. When comparing between sexes, only a homogenous correlation was found.

Conclusion: There is a correlation between grade point average, IQ, and age of the population studied; in this population the older the age, the lower the IQ. There was no correlation between IQ and sex found since according to this variable the population is homogeneous.

Introduction

The Intelligence Quotient (CI or IQ) is a number that results from a series of standardized tests that allow measuring the cognitive abilities of people in relation to their age. As a standard, the IQ in an age group is 100, that is, if a person has an IQ of 110, then they're above the average among people of their age. The term intelligence is difficult to define, as it carries different meanings for different people and different contexts. According to Alfred Binet, intelligence is a general capacity for judgment, understanding, and reasoning, which can manifest itself in many ways.

IQ has long been considered the main factor in academic success and achievement, but some critics claim that intellectual abilities are overemphasized in the different points of view of IQ. [1, 2,]

Academic performance was defined by Jiménez (2000) as "the level of knowledge demonstrated in an area or subject with the age and level standard"; Alves and Acevedo defined it as "the result of the learning process, through which the teacher and student can determine in what quantity and quality, the learning facilitated, has been internalized by the latter". Finally, academic performance is multicausal since it can evaluate the educational quality of higher education. Other authors mention that it is the result of learning motivated by the didactic activity of the teacher and produced in the student, likewise, it is undeniable that for a student to maintain academic performance, intrinsic and extrinsic factors intervene, among which we can mention the personality of the student, study habits and the teacher-student relationship itself. These factors are important in the development of the student since academic failure seriously threatens the mental health of the students while lowering their motivation and self-confidence.

Considering the concept of learning, Gagné (1965) defines learning as "a change in the disposition or capacity of people that can be retained and is not simply attributable to the growth process", and that "learning is not a concept reserved for teachers, pedagogues or any education professional, since everyone, at some point in their organizational life must teach and learn from others." However, recent studies show that IQ and learning ability (CA) are related to the teaching-learning process. [5]

In addition to these concepts, emotional intelligence is also an important factor in some research, in which it has been concluded that there is a high significance between emotional intelligence and academic performance, which does not occur with IQ, nor with emotional intelligence.

There is another parameter that is not related to IQ and it is the executive functions (EF) which are related to attention, emotion, behavior, and self-regulation that allows for establishing defined goals, and articles mention that these dimensions are related to the learning of university students; there are also anatomical differences between EF and IQ; in a comparative study, they showed that in high-achieving students, most of the EF measurements were of significant difference compared to the low-achieving group. [7]

At the end of the last decade, the first steps in the empirical verification of the effects that good emotional intelligence can have on people were taken. In general, the first works were aimed at examining the construct of emotional intelligence and focused on the theoretical development of models and the creation of rigorous assessment instruments (Mayer, Caruso, and Salovey in the early 1990s). [8]

At present, there is sufficient theoretical basis and the necessary tools have been developed to reliably examine the relationship of this concept with other relevant variables, both in laboratory experiments and in field studies to demonstrate how emotional intelligence determines some behaviors and which areas of life it significantly influences.

Concerning research linked to academic and professional achievement, there has been a considerable increase in the number of works that have as their specific objective the analysis of how emotional intelligence, general intelligence, and academic performance relate to each other. In such studies, emotional intelligence was reported to have twice the power of cognitive intelligence in predicting academic achievement.

The term self-efficacy is defined as the domain or personal belief of one's abilities in the face of one or more stressors. Some factors influence both emotional intelligence and self-efficacy, including socioeconomic and geographic factors.[9,10,12]

In a study with medical students, a Domino test was applied, it is a nonverbal intelligence test that measures the G factor of intelligence, the TMMS-24 emotional intelligence test, and academic performance from the average; the results denote no correlations between emotional intelligence or IQ with academic performance, age presented an inverse correlation with academic performance.[11]

Some authors such as Diseth, Chamorro-Premuzic, Caprara, Furnham, and Cupani have studied personality as a determining factor in academic performance. The Model of the Five Factors of Personality (Five Factor Model) is one of the most accepted personality tests. It serves as a universal template for understanding the five-dimensional structure of personality:

1. **Neuroticism.** Tendency to chronically experience negative emotions such as depression, anxiety, and anger.
2. **Extroversion.** Predisposition to have positive emotions and traits related to activity and energy with a tendency to be sociable, active, talkative, and positive.
3. **Openness to experience.** Related to scientific and artistic creativity, divergent thinking, political liberalism, and proactive search and appreciation of new experiences.
4. **Kindness.** Prosocial orientation with a tendency to be compassionate, cooperative, friendly, considerate, generous, trusting, forgiving, and willing to compromise their interests with others.
5. **Responsibility.** Tendency to organization, self-control, perseverance, and motivation in goal-directed behaviors.

Through personality research, it has been possible to identify factors that are frequently correlated with academic performance. Most authors agree that the responsibility factor is the most robust predictor of academic performance in university students, explaining up to 16% of the variance. The other four factors were not consistently correlated with the overall average.[13]

The medical degree has been described by several authors as a stressful experience for students, among other reasons, due to the never-ceasing study work, the frequency, and content of exams, and the continuous communication with patients and other colleagues. On the other hand, other reasons can cause stress in the medical student derived from the subjects of study.

One of the priorities of medical schools is to ensure that the students of this career acquire sufficient skills to perform efficiently in clinical practice. However, it must be acknowledged that certain characteristics of the student are fundamental in the educational process, to achieve the purpose of training in Medicine.

The factors associated with academic performance in university students are varied, among which the study of personality variables (personality and coping styles) and cognitive variables (intelligence) stand out.

In this way, this research aims to know the IQ of new students and correlate it with their academic performance in the first periods.

Objective

To determine the correlation between IQ and academic performance in first-year medical students.

Methodology

Analytical cross-sectional study.

Population: students of the 2018 generation, (150); 3 casualties; 18 who refused to participate; 14 were not at the time. Total of 115 participating students

Once the students agreed to participate in the research, the Raven Test was applied. This test measures intellectual capacity, comparing shapes and reasoning by analogies, regardless of the knowledge acquired, so it provides information on the capacity and clarity of thought of the examinee for intellectual activity, it lasts approximately 30 to 60 minutes: it consists of finding the missing piece in a series of figures that will be shown, you must analyze the series that is presented and following the horizontal and vertical sequence, choose one of the six suggested pieces, the one that fits perfectly in both directions, both horizontally as in vertical. This test forces you to activate your analogical reasoning, perception, and abstraction skills. The matrices are evaluated, and it is because individuals will have a certain ability to organize "chaos" by finding logic in confusing and complex situations, it is about evaluating the success or error in the solution proposed by the subject in each problem. posted by the test, the total number of correct answers is added vertically, then the score is inputted in the corresponding scale table according to age.

Personal data such as age, gender, occupation, school, and state of origin will be requested. To evaluate the academic performance, the grades obtained in the periods July 2018 - January 2019 and February - June 2019 were requested from the Academic Secretary of the faculty, with which the correlation analysis will be carried out.

Results

Intelligence Index*grade point average

Count

		Average			
		7	8	9	Total
Intelligence Index	Upper	23	27	2	52
	Middle	13	15	3	31
	Lower	7	20	5	32
Total		43	62	10	115

The table shows the intelligence indices obtained in the students and the averages that they present, when applying Xi^2, a p of .1 is obtained, demonstrating no correlation between these two variables.

Intelligence Index *Age

Count

		AGE			
		18-22	23-27	28-32	Total
Intelligence index	Upper	50	2	0	52
	Middle	27	4	0	31
	Lower	29	2	1	32
Total		106	8	1	115

It is observed that 18-year-old students have a higher IQ, and it is higher than that of those over 28 years of age whose IQ is lower, however there is no correlation between the variables.

Conclusions

There is no significant correlation between the IQ and the grade point average of the students, with this result the null hypothesis is accepted.

When analyzing the age and sex of the student population, no correlation with IQ is found either, which tells us of a homogeneous population.

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