



## Impact of the first year of medical school in the growth and personal development of students

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### ABSTRACT

**Objective:** To study the differences in the development of medical students, when admitted into medical school and observe any statistically important changes that might have taken place during their first year in medical school. Instead of developing various scales to study these changes, we included in the questionnaire various scales that observed student's abilities and aptitudes that many authors studied separately.

**Methods:** This study brings together the following 10 scales: self-esteem, self-knowledge and emotional expression, commitment, creativity, resilience and coping, positive outlook on life, self-confidence, assertiveness and leadership, empathy and teamwork, social and interpersonal skills. It is a comparative study with 891 students. The study involves applying a 10-scale instrument with reliability coefficients between 0.617 and 0.786, at the beginning and at the end of the first year of medical school. The Wilcoxon test for paired samples was applied.

**Results:** There was a decrease in self-esteem, commitment, positive outlook of life, self-confidence, teamwork, and social skills which was observed, and improvement in empathy.

**Conclusions:** The first year affects students, which tends to diminish many of their abilities to confront academic difficulties. On the other hand, we can see an increase in their intentions to adapt through believing in themselves. In addition, if teachers collaborate in this endeavor, students could have a better chance of completing their first year adequately.

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## Introduction

Entering medical school represents important changes for students in their abilities to confront academic challenges. This is associated with situations such as the need to adapt to new environments, and their age among other factors, and then they experience more intensely this transition. Moreover, they have to face changes and the challenge of adapting not only to new situations but also to the need for redefining decisions that can influence the rest of their life. Hence, knowing the attitudes that were present when they entered school and the changes that appeared at the end of

the first year is paramount for the support that the institution must offer.

Deciding on the different areas of the development and growth that students must incorporate, several studies were analyzed which help to understand the results they obtained.

Several authors from different universities' in Mexico found that around 44% of the students did not seem to have made a proper choice of their future profession. However, those with some problems but have the adequate motivation and consider that they have the right expectations of themselves (assertiveness) can continue, especially

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if they get recognition for their effort, which drives them to work every day diligently (commitment). So, various studies agree that career satisfaction is essential for a student to achieve higher school performance and as such, success [1–3].

Toews et al. [4] observed that medical studies are characterized by a constant and growing academic demand that forces the student to develop major efforts to adapt. Arias [5] postulates that the best predictor of an adult adaptation is not the intelligence quotient or school qualifications nor behavior in class but the ability to perform within interpersonal relationships (teamwork and empathy) according to the needs of the academic overload.

Another important factor that influences the performance of the individual and in general, their quality of life, is stress [6] and comparing medical students with students from other careers, the first ones suffer more stress from the start of his career [7,8]. Excessive stress reduces *self-esteem* and affects their academic achievement and personal development. Studies have shown a high prevalence of stress in medical students, ranging from 21% to 56%, particularly in the first year since they face difficult times in the adjustment to the new environment of medical training [9].

The probability of developing associated with a personal vulnerability to stress results in unsatisfactory academic response and is almost 20 times higher than students without a vulnerability to stress are. That led us to explore factors that influence its development. Students use various mechanisms to overcome it, some evade the problem, others idealize the situations, use optimism or tend to social isolation and still others use excessive self-criticism. Those who manage better resources employ coping, (assertiveness) communication, and support from others and the manifestation of their emotions to others (empathy) [10,11].

Within education, resilience plays an important role, and through its promotion, it may favor the development of social, academic and personal skills that allow the student to overcome adversity and move forward [12]. Studies also have found significant correlations between the positive attitude of the student toward the learning and academic performance than when they just go along without self-knowledge of what they are doing [13].

In assessing the changes that might occur during the development of first-year students, we have examined other factors: motivation, aspects of personality, self-esteem, social skills, and emotional intelligence. Some of the safety factors such as

self-esteem are involved in the academic achievement, as well as in easing the student into socializing, inspiring confidence, respecting others, being consistent with themselves, and reflecting on the satisfaction of their choices [14]. According to Díaz, students who have low self-esteem have disinterest in academic work, have no taste in individual or group work, and give up easily, they are not competitive and have, therefore, in general, a poor academic performance [15].

Gordon [16] points out that student's attitudes and self-consciousness vary between the beginning and the end of school, and does not depend only on the acquisition of data or reasoning abilities. This has resulted in a series of studies interested in observing different areas related to the personal development of students; such is the case of a study that found that those who had adequate behavioral attitudes and positive learning aptitudes had greater autonomy in their learning and development [17,18]. Stanford University found that the strategy of collaborative learning favored the development of communication skills, teamwork, professionalism, and application of knowledge, as well as better the commitment of the students [19].

A study in Chile reports that there was a relationship between the commitment of students and their academic performance, this commitment served as a variable in the predictive relationship between positive emotions and the support offered by the teacher to promote their autonomy in the learning process [20].

Toward the end of adolescence, the capacity to coordinate, resolve, and normalize contradictory attributes appears, youngsters with self-esteem problems tend to retain more the external negative information of themselves rather than perceive their positive aspects, this mechanism of detecting only negative information diminishes their capacity to understand the reality through others; people with low self-esteem are more likely to feel bad and perceive the reactions of others as a personal attack although it is not so [21].

It is important to mention that on becoming a competent professional, a doctor requires among others some personal attributes, such as responsibility, discipline, organization, integrity, and psychological maturity. However, during the selection process of students to enter Medicine in this University, only their previous studies average or a faculty assessment of their knowledge are considered [22]. On the other hand, it is a recognized fact that the failing and the abandoning of medical school

during the first cycles may not always be attributed to causes like the lack of dedication, academic quality, or commitment to study; other personal and social factors also play a part [18,23].

Considering the importance implied in the formation of a professional, the Faculty of Medicine of the National Autonomous University of Mexico include in their 2010 Program “Growth and personal development” as one of its eight competencies. This is important because it gives the student the opportunity to develop his/her abilities to help them become better health professionals [24].

Though many studies look for different elements that affect the proper performance of students at different stages of their career, in this study that we seek to understand some of the characteristics of this competency in students when they first start their classes and if there are changes towards the end of the first year.

For this study, “Growth and personal development” is defined as the advancement of the human potential, to able to go beyond its natural moment according to his/her age [25], and to learn through self-awareness to take advantage of their thinking, feeling, and acting capacities to: (1) use free or independent thinking; (2) develop a responsible freedom; (3) have good emotional health; (4) get to know his/her self, recognizing strengths and weaknesses; (5) evaluate what they want to preserve, improve, or change, as well as the tools to achieve this; (6) be who he wants to be, where thinking, feeling, and acting are a unit; (7) use one’s own experience, provided by reflection or by external influences to develop one’s personal growth.

## Methods

This is a comparative study originally intended for 1,278 students during their first year of medicine. In order to evaluate and compare the development and personal growth, at the beginning and at the end of the school year; a Likert-type scale composed of 68 items with four options of response: “Always” (4 points), “almost always” (3 points), “almost never” (2 points), and “never” (1) was applied to students that were present in its group at the time of the application and who agreed to answer it. The use of four possible responses corresponds to the initial validation of this instrument was validated.

After eliminating all incomplete questionnaires or those that students had not answered in both surveys, the population was finally formed by 891

students (70% of the initial population), with an average age of 19 years, 68% women and 32% men.

The instrument integrates 10 scales, designed and validated by Cortés et al. [26], with reliability coefficients between 0.617 and 0.786. The scales are defined as follows:

*Self-esteem* (nine items): The value that one gives oneself.

*Self-knowledge and emotional expression* (four items): Awareness of their own emotions, how they affect a given situation, and the ability to show affection and feelings.

*Commitment* (six items): To have consistency in personal and professional activities and keep improving them. Their attitudes and behaviors are reflected in the achievement of goals.

*Creativity* (five items): Seek new solutions and managed them with practical and useful spontaneity in all situations that arise.

*Resilience and coping* (three items): Confront problems and recover from the emotional conflicts that may arise.

*Positive Outlook on life* (Optimism) (seven items): Ability to show a favorable attitude to diverse situations of life and act accordingly.

*Self-confidence* (eight items): Belief that one is able to perform a task successfully.

*Assertiveness and leadership* (nine items): Expression of feelings, attitudes, desires, opinions, or rights in a way that is direct, firm and honest, respecting the feelings, attitudes, desires, opinions, and rights of other individuals.

*Empathy* (six items): Ability to recognize and understand the needs and desires of others.

*Teamwork, social and interpersonal skills* (11 items): Ability to interact harmoniously with others.

With regard to the internal consistency of the 10 instruments, after their first application in this research at the beginning of the school year, the Cronbach’s alpha obtained for each scale. Self-esteem, 0.675; self-knowledge and emotional expression, 0.735; commitment, 0.741; creativity, 0.640; resilience and coping, 0.790; positive outlook on life, 0.691; self-confidence, 0.733; assertiveness and leadership, 0.690; empathy 0.618; and teamwork, social and interpersonal skills, 0.775.

Only for descriptive purposes, the participants grouped, based on the scores obtained in each scale, at the “low”, “medium,” or “high” level of development. Mean and standard deviation of each scale, in the first and second application, were included.

For the comparison between both applications, the paired samples *t*-test was used. The effect size, Cohen's *d*, was included in the latter analysis.

The research and ethics committees approved the project. Prior commitment to absolute confidentiality of the results was obtained from the students, and the commitment to send individually via e-mail their results, including the interpretation of the results and an offer to supply support(s) in the areas that are considered of risk or in which they request help. All students registered their email address to receive the results.

Based on the scores obtained in each scale, and by grouping them in levels of low, medium, and high, we observed that, except in the case of resilience and coping, 70% or more of the students at the beginning of the school year had a general high score. However, that most of them declined at the end of the first year. The exceptions were resilience and coping, assertiveness and leadership, as well as empathy; which presented a low or medium level at the beginning and increased at the end of the year. (Table 1).

Means and standard deviation of the scores obtained in each scale show the same trend as grouped by levels. When comparing both applications, differences with statistical significance on scales of self-esteem, commitment, positive outlook of life, self-confidence, and social skills decreased and, on the other hand, there was an improvement in empathy (Table 2). According to that of size, it was found that in the case of commitment and positive outlook in life, the effect of size is medium;

while for self-esteem, self-confidence, empathy, as well as teamwork and social skills, the effect of size is low. It is important to clarify that according to Cohen himself [27], this definition of effect size levels is relative in variables of this type, because "when phenomena are studied which cannot be brought into the laboratory, the influence of uncontrollable extraneous variables ("noise") makes the size of the effect small relative to these" [27, p. 25].

## Discussion

The objectives of all medical schools are to have students achieve academic success. However, on many occasions, the environment can be perceived as aggressive, with few possibilities of real institutional support to help with the adaptation to the sudden demands and, there for students can show low academic results that can lead in some cases to abandon or fail in their career choice, with all the implications of emotional, affective, and physical repercussions.

As it occurred in this study, the stressful environment of the career seems to have fostered the growth in the capacity for coping with problems in some students during their studies and they moved forward. While in other areas of their development, they seem to have diminished and according to Díaz [15] and Dyrbye et al. [12], coping is one of the resources necessary to improve psychological well-being, and that together with resilience play an important role in promoting among others the academic development.

**Table 1.** Level of development skills in medical students at the start and at the end of their first year. (*N* = 891).

Scale	Level*											
	Low				Medium				High			
	1st		2nd		1st		2nd		1st		2nd	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Self-esteem	1	0.1	5	0.6	172	19.3	229	25.7	718	80.6	657	73.7
Self-knowledge and emotional expression	17	1.9	18	2.0	240	26.9	263	29.5	634	71.2	610	68.5
Commitment	2	0.2	17	1.9	152	17.1	285	32.0	737	82.7	589	66.1
Creativity	6	0.7	11	1.2	307	34.5	322	36.1	578	64.9	558	62.6
Resilience and coping	48	5.4	46	5.2	426	47.8	400	44.9	417	46.8	445	49.9
Positive perspective on life	4	0.4	8	0.9	114	12.8	211	23.7	773	86.8	672	75.4
Self-confidence	1	0.1	5	0.6	167	18.7	216	24.2	723	81.1	670	75.2
Assertiveness and leadership	3	0.3	4	0.4	265	29.7	254	28.5	623	69.9	633	71.0
Empathy	5	0.6	5	0.6	253	28.4	211	23.7	633	71.0	675	75.8
Teamwork and social abilities	1	0.1	6	0.7	204	22.9	234	26.3	686	77.0	651	73.1

\*Terciles of the range of scores for each scale.

1st and 2nd = application at the beginning and at the end, of the first year of Medicine; *f* = frequency; % = percentage.

**Table 2.** Differences between scores from the first application and the second\*.

Scale (scores)**	Applications for each scale				t	CI <sup>99%</sup>	p	Cohen's d	
	First		Second						
	$\bar{X}$	SD±	$\bar{X}$	SD±					
Self-esteem (9–36)	29.99	3.057	29.64	3.658	3.586	0.099	0.608	0.001	0.104
Self-knowledge and emotional expression (4–16)	13.52	2.093	13.41	2.136	1.450	-0.084	0.300	0.147	0.052
Commitment (6–24)	20.57	2.262	19.47	2.785	13.516	0.886	1.305	0.001	0.434
Creativity (5–20)	16.20	2.120	16.14	2.298	0.952	-0.113	0.246	0.341	0.027
Resilience and coping (3–12)	9.52	1.699	9.61	1.733	-1.529	-0.235	0.060	0.127	-0.052
Positive perspective on life (7–28)	24.29	2.545	23.43	3.085	9.856	0.635	1.085	0.001	0.304
Self-confidence (8–32)	27.04	2.978	26.72	3.452	3.369	0.075	0.567	0.001	0.099
Assertiveness and leadership (9–36)	29.14	3.409	29.28	3.785	-1.393	-0.416	0.124	0.164	-0.039
Empathy (6–24)	19.73	2.353	20.07	2.534	-4.148	-0.554	-0.129	0.001	-0.139
Teamwork and social abilities (11–44)	36.49	3.948	36.04	4.472	3.617	0.129	0.771	0.001	0.107

\*The paired samples t-test.

\*\*The scores of each scale appear in parenthesis.

$\bar{X}$  = mean; SD = standard deviation; CI = confidence interval for the difference; Cohen's d is used as a measure of effect.

Scales of self-esteem, commitment, positive outlook of life, self-confidence, teamwork, and social skills showed significant differences when the two applications (first and last) tended to diminish during the second application. This turned out to be consistent with what Vargas et al. [6] and Reig et al. [7] found among others studies, in that not having a good self-esteem can produce changes in their commitment, teamwork and optimistic outlook on life, and others factors. In addition, as Arias [5] pointed out, to prevent this, it is necessary to foster better interpersonal relationships as observed with the increase of their “empathy”, which precisely in medical school seems to lessen the excessive burden of work and the level of existing competition.

Even if it seems that there is some level of contradiction between an increase in empathy on one hand and on the other the presence of lower self-esteem at the end of the school year. Frequently, most of the students enter medical school with a high academic background but that during the first year they face demands that require personal aptitudes that yet to be developed. Thus, the presence of some confusion among the various areas of their growth and personal development that are still consolidating at this early stage of their adult life. But, it seems that they try to get ahead as best they could understand how difficult it has been for all their generation. While these results give us only a

limited outlook on the problems that our students face, we believe that they should promote support networks within the Faculty, including teachers and authorities to favor a better way to stimulate their growth and personal development.

To have an idea as of where these situations come from, most studies agree that these problems are associated with stress due to academic overload, lack of time to meet academic obligations, and sometimes excessive assessments, as well as lack of direction during these formative years. In addition, to put the emphasis on achieving a sense of belonging to the institution, we recommend addressing the socio-emotional area, to promote meaningful experiences during the induction period and find alternatives to reduce the difficulties faced by the students at the arrival to medical school and permanence in higher education.

### Conflict of interest

The authors declare that they have no conflict of interest.

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