

Medical Students' Attitude and Perception towards Basic Medical Sciences in the Faculty of Medicine for Girls, Al-Azhar University: A Study Prior to the Integrated Program

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ABSTRACT

Background: Assessment of the students' opinion throughout their teaching course is a crucial part to achieve the intended learning outcome. **Objectives:** Were to assess and compare the students' attitude and perception towards basic medical sciences during the preclinical and clinical academic years, to recognize their opinion to early integration of both basic and clinical sciences, their preferred basic subjects and related causes.

Subjects and Methods: A cross sectional study was conducted on 344 female medical students. They were randomly selected through the academic year 2015-2016, at the Faculty of Medicine for Girls, Al-Azhar University in Cairo. Data were collected using a valid and reliable (nine items) questionnaire. The first five items measured the perceived importance and relevance of basic medical sciences to clinical medicine, and the last four items measured students' attitudes towards, and perceived effectiveness of their education in basic medical sciences. Necessity of integration from the first year and the preferred basic medical subjects were also asked about. All opinions were rated using a three points Likert scale. **Results:** A significant difference between the two groups was obtained as regards that "physician can effectively treat most medical patients without knowing the details of the biological processes (72.4% versus 75.9%). While, disagreement perception was significantly higher among clinical group students (62.8%) compared to preclinical students (47.8%) as regards less value of basic medical sciences in clinical practice. Modest agreement attitude was the dominant towards the further statements with no significant difference ($p > 0.005$). How best to integrate both clinical and basic medical sciences was not significant and represented 67.5% and 71.0% among preclinical and clinical students respectively. The top preferred basic medical sciences were; anatomy, physiology and pathology. Understandable curriculum, good professor and clear method of teaching were the main causes for preference. **Conclusion and Recommendation:** Overall positive attitude and perception towards basic medical sciences are found, mainly among students in clinical years. Refocusing the basic/clinical medical sciences is essential to cross the gap between knowledge and medical practice. Opinion of the students is necessary to be considered to provide the educational planners with valuable guidelines in order to maximize the benefits of medical curricula and prepare medical students efficiently for clinical work. Further studies prior to the application of the integrated program are required.

Keywords: Medical students, basic medical sciences, attitude, perception, integration discipline.

INTRODUCTION

The national movement toward redesign of medical collage's curricula nowadays necessitates re examination of all aspects of medical education program, including the role of the basic medical sciences for the practice of medicine. Medical students build their clinical knowledge on the grounds of previously obtained basic knowledge⁽¹⁾. Moreover, most scientific knowledge learned in preclinical academic years play a role through progress of the student from understanding into action⁽²⁾. It has been observed that basic science knowledge learned in a clinical context is better comprehended and more easily applied by the students⁽³⁾. Therefore, several elements need to be

considered in medical education to cross the gap between knowledge and practice such as; quality of learning process, curriculum content, methods of teaching and continuous evaluation⁽⁴⁾. In addition, in the last two decades, integration curriculum in medical education is a challenging approach to remove distinction between basic and clinical subjects⁽⁵⁾. Little is known about opinion and response of medical students about curriculum provided to them, either a collection of separate subjects or an integrated and effective one topic (i.e. medicine). Monitoring the attitudes and perception of medical students throughout their teaching course play a vital role in their learning process, better achievements and future practice⁽⁴⁾. It may provide

educational planners with optimal guidelines for operating the application of a successful integration process. Thus; objectives of the study are:

- 1- To assess and compare the students' attitude and perception towards basic medical sciences among the preclinical and clinical academic years students.
- 2- To recognize the students' opinion towards; learning both basic and clinical medical sciences from the first year and the underlying causes of the most preferable basic sciences.

SUBJECTS AND METHODS

Study design and sample size: A cross sectional study was conducted in the Faculty of Medicine for Girls, Al-Azhar University in Cairo, during the academic year 2015–2016 and the data were collected over a period of one month. Sample size was taken with 5% margin of error and 95% confidence level⁽⁶⁾. Calculated sample size was 342 students, it was increased to be 360 (12.4% of the total students 2900). Students from grade one to grade six were selected by randomized stratified sampling method and drawn by the sum of proportional allocation from every stratum. Those who completed and returned the questionnaires back were 344. So, the response rate was 95.5%.

Study tool and data collection

A nine scale questionnaire designed by West and coworkers⁽⁷⁾ was used. It was a valid and reliable^(8, 9) self-administered questionnaire. Data was collected individually by distributing the questionnaires namelessly to participants at the end of lectures. The completed forms were collected at the end of the session at the same day. The students were asked to denote their opinions using a three point "Likert scale" which ranges from "agree, neutral and disagree".

The first five items (from number 1-5) measured the perceived importance and relevance of basic sciences to clinical medicine.

- 1- A physician can effectively treat most patients without knowing the details of the biological processes involved.
- 2- Most basic medical science study is so far removed from clinical medicine that its usefulness to the practicing doctor is slight.
- 3- Psychological factors are just as important as physical factors in the healing process.
- 4- Of the facets of a good physician, his/her knowledge of biological mechanisms is most important.

5- Applying the basic science of medicine to clinical practice is a skill which should be reinforced early in medical education.

- Disagreement with items 1 and 2 and agreement with items 3, 4 and 5 reflect acknowledged relevance of the basic sciences to clinicians.

The next four items (from no. 6-9) measured students' attitudes and perceived effectiveness of their education in basic sciences.

6- It is first necessary to learn as many facts as possible in the basic medical sciences and then learn to apply them later on in the clinical years.

7- What students should learn in the basic medical sciences are the general concepts, in order that they might have a good working knowledge without having to know all the facts.

8- The information and knowledge I have gained to date are fundamental to my future role as a physician.

9- Faculty members excite students' curiosity through the teaching of the medical basic sciences.

- Item 6 states the emphasis in basic science learning in the conventional curriculum, while items no. 8 and 9 measures the perceived value of students' medical education experiences to date and for future.

- Also, demographic and personal characteristics of students, preferred subjects among students and underlying causes of their preferences were reported. Students' opinions about integration of both theoretical and clinical sciences were reported.

Ethical considerations

This study was approved by the Ethics Committee of both; the Community Medicine Department and of the Faculty of Medicine for Girls, Al-Azhar University. Informal consent for students' participation was taken after explanation of study objectives. The distributed questionnaires were namelessly and the students were assured that their information would be confidential.

Statistical analysis

Data of the studied students were included for statistical analysis by using the (SPSS) program version 17.0 (SPSS Inc.; Chicago, USA). Descriptive analysis was done for each item and the results were expressed as mean \pm SD for quantitative continuous variables, and as frequencies and percentages for qualitative (categorical and nominal) variables. Chi-square (X^2) and independent t-test were used to compare between groups. Values of $p \leq 0.05$ (with a confidence limit at 95%) were

considered significant. Results were presented by tables and figures.

RESULTS

Three hundred and forty four medical students were participated in this study. Their response rate to the administered questionnaire was 95.5 %.

Characteristics of the studied sample were demonstrated (**Table 1**). The preclinical academic grades constituted 203 (59%) and the clinical grades students were 141 (41%). The mean age of the preclinical students (19.4± 1.03 years) was significantly lower ($p \leq 0.05$) than those of clinical grades (22.4± 1.1 years).

Table (2) revealed the statements that measured the perceived importance and relevance of the basic medical sciences and/versus clinical medicine. Most students had a positive perception as they were disagreed with the 1st statement; the preclinical years students were 72.4% compared to 75.9 % of clinical grades students with no significant difference. While, a significantly ($p < 0.05$) higher disagreement with the 2nd statement was recorded among students of clinical grades (61.0%) versus preclinical students (43.3%). However, students who agreed with the 3rd statement were 88.7% of clinical students versus 79.3% of preclinical years students ($p > 0.05$). Students of the clinical grades reported a significantly higher positive perception, their agreement was (83.0%) of the 4th statement than those of preclinical grades (70.4%). Regarding the 5th statement preclinical students reported a higher percentage of agreement (72.4%) than students of clinical grades (69.5%) with insignificant difference ($p > 0.05$).

Table (3) demonstrated items that measured the students' attitude towards and perceived effectiveness

of their education in basic medical sciences. Students who agreed to the 6th statement from clinical years showed a significantly higher positive opinion, their agreement was 52.5% versus 44.3% of preclinical years. The disagreement to the 7th statement was 28.1% versus 23.4% in both preclinical and clinical grades respectively ($p > 0.05$). Nearly similar agreement to perceived value of basic medical sciences among students of both preclinical (65.1%) and clinical grades (63.1%) were detected towards the 8th statement. Statistically significant ($P < 0.05$) poor agreement about the role of faculty staff member (the 9th statement) was reported by 21.7% of preclinical years students versus 17% of clinical years group.

Figure (1) demonstrates opinion of students regarding learning of both theoretical basic and clinical subjects from the first year according to the academic years. Students of clinical grades showed a higher rate of agreement (69.5%) than those of preclinical grades (64.5%) with insignificant difference ($P > 0.05$).

Figure (2) demonstrates distribution of sciences preferred among the studied students. Anatomy was the highest preferred science among students (28.7%) followed by Physiology (20.6%). Pathology and histology reported by 9.7% for each, Pharmacology preferred by 8.3%, Biochemistry by 5.9%, Parasitology by 4.1% and Microbiology preference reported by only 1.2% of the students.

Figure (3) demonstrates distribution of underlying causes of medical subjects' preferences among the studied students. Understandable/interesting curriculum was the highest reported cause among 44.2% of students for subjects' preferences followed by good professors (25.1%) and clear teaching methods (20.7%). While, more than one underlying cause were reported by 10 % of the studied groups.

Table (1): Characteristics of the studied sample

Items	Total number of studied students (No.= 344)					
	Preclinical grades 203 (59.0%)			Clinical grades 141 (41.0%)		
Academic Grades	1st grade	72	20.9 %	4th grade	57	16.6 %
	2nd grade	68	19.8 %	5th grade	40	11.6 %
	3rd grade	63	18.3 %	6th grade	44	12.8 %
Age (years)- Mean ± SD	19.4 ± 1.03			22.4 ± 1.1		
Sig. test & p-value	t-test = 25.7			p-value = < 0.001*		

*Significant p-value (≤ 0.05)

Table (2): Students' perception of the importance and relevance of basic sciences to clinical medicine

Students' Groups Numbered Statements	Preclinical grades No.= 203			Clinical grades No.= 141			Sig. test & P-value
	Agree	Disagree	Neutral	Agree	Disagree	Neutral	
1 st - A physician can effectively treat most patients without knowing the details of the biological processes involved.	15 (7.4%)	147 (72.4%)	41 (20.2%)	7 (5.0%)	107 (75.9%)	27 (19.1%)	X ² = 0.94 P= 0.62
2 nd - Most basic science study is so far removed from clinical medicine because its usefulness to the practicing doctor is slight	51 (25.1%)	88 (43.3%)	64 (31.5%)	28 (19.9%)	86 (61.0%)	27 (19.1%)	X ² =10.9 P= 0.004*
3 rd - Psychological factors are just as important as physical factors in the healing process.	161 (79.3%)	6 (3.0)	36 (17.7%)	125 (88.7%)	2 (1.4)	14 (9.9%)	X ² = 5.2 P= 0.07
4 th - Of the facets of a good physician, his/her knowledge of biological mechanisms is most important.	143 (70.4%)	13 (6.4%)	47 (23.2%)	117 (83.0%)	5 (3.5%)	19 (13.5%)	X ² = 7.1 P= 0.029*
5 th - Applying the basic medical science to clinical practice is a skill which should be reinforced early on in medical education.	147 (72.4%)	13 (6.4%)	41 (21.2%)	98 (69.5%)	6 (4.3 %)	37 (26.2%)	X ² = 6.2 P=0.42

*Significant p-value (≤ 0.05)

Table (3): Students' attitudes toward, and perceived effectiveness of their education in basic sciences

Students' Groups Numbered Statements	Preclinical grades (No.= 203)			Clinical grades (No.= 141)			Sig. test & P-value
	Agree	Disagree	Neutral	Agree	Disagree	Neutral	
6 th - It is first necessary to learn as many facts as possible in the basic sciences and then learn to apply them later on in the clinical years.	90 (44.3%)	63 (31.1%)	50 (24.6%)	74 (52.5%)	25 (17.7%)	42 (29.8%)	X ² = 7.7 P= 0.02*
7 th - What students should learn in the basic medical sciences are the general concepts, in order that they might have a good working knowledge without having to know all the facts.	57 (28.1%)	86 (42.4%)	60 (29.6%)	33 (23.4%)	59 (41.8%)	49 (34.8%)	X ² = 1.4 P= 0.49
8 th - The information I have gained are essential to my future role as a physician	132 (65.1%)	22 (10.8%)	49 (24.1%)	89 (63.1%)	20 (14.2%)	32 (22.7%)	X ² = 0.88 P=0.64
9 th - Faculty members motivate students' interest through teaching of the basic medical sciences.	44 (21.7%)	64 (31.5%)	95 (46.8%)	24 (17.0%)	63 (44.7%)	54 (38.3%)	X ² = 6.2 P=0.045*

*Significant p-value (≤ 0.05)

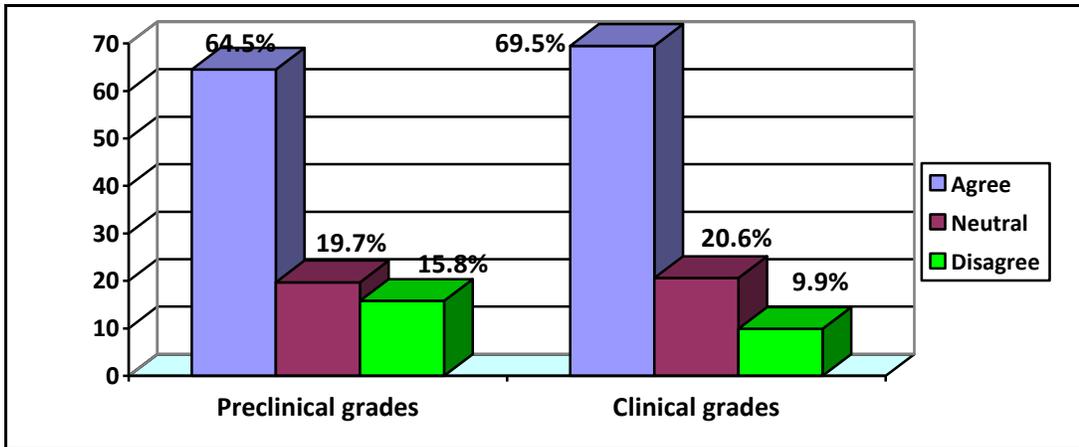


Figure (1): Opinion of students regarding learning of both basic and clinical subjects from the first year according to academic grades. No significant difference between the studied groups ($p > 0.05$).

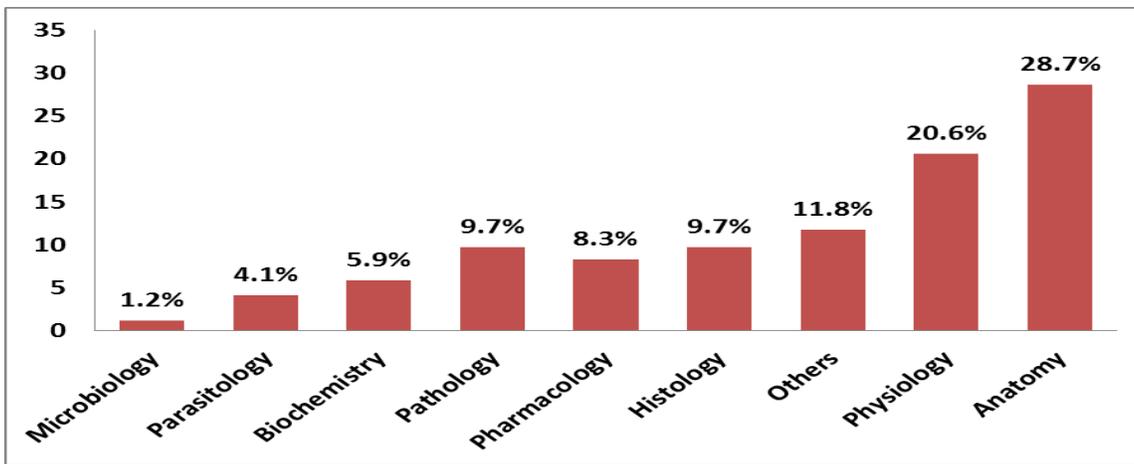


Figure (2): Basic Sciences preferred among the studied students

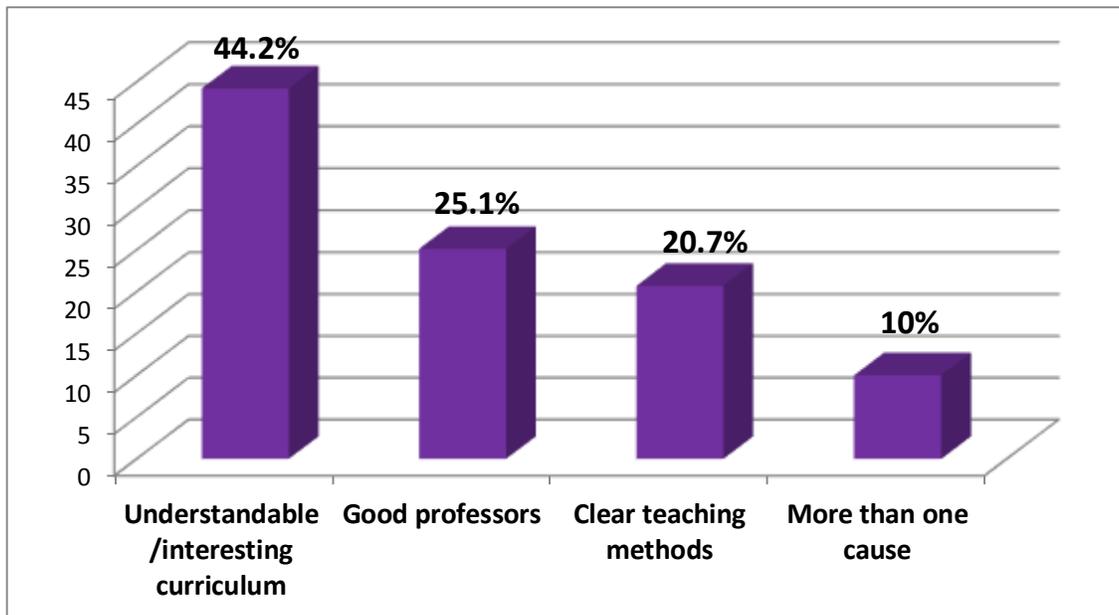


Figure (3): Causes of medical subjects' preferences among the studied students

DISCUSSION

This study was carried out in the Faculty of Medicine for Girls, Al-Azhar University; wherever, the curriculum offers three years of basic medical sciences based on conventional teaching in preparation to subsequent separate three years of clinical part.

As regards the assessment of perceived importance and relevance of the basic sciences to clinical medicine; a higher percentage of preclinical and clinical academic years' students acknowledged relevance of the basic sciences to clinical medicine. They disagree with the first statement, that "physician can effectively treat most medical patients without knowing the details of the biological process". In accordance, a study pointed that medical students should build their clinical knowledge on a ground of the previously obtained basic medical sciences knowledge ⁽¹⁾. In this context, the teaching course of basic sciences in preclinical years is a preparation for what will be applied later ⁽²⁾. Moreover, this positive perception of fundamental sciences importance can be supported by emphasizing the general definition of physician's competence that is "physicians must have access to a wide framework of basic sciences available from molecular biology, physiology and organ histology, to behavioral psychology, epidemiology and biostatistics for perfect counseling, diagnosis and therapy" ⁽¹⁰⁾.

Additionally, importance of the basic medical sciences was more perceived among clinical group students compared to preclinical grades students with a higher significant disagreement regarding the statement 2, that "most basic sciences can be removed because it is less valuable in clinical practicing". In this outline, students in preclinical years may be faced by many basic sciences which are based on conventional teaching, limited research, presence of relatively non relevant topics, dissociation between basic and clinical sciences, and repetition of lectures ⁽¹¹⁾.

Nearly, in a comparative study ⁽¹²⁾, despite of the opinion of the students in the conventional curriculum appear to assign a slightly important role of the basic sciences, those in advanced clinical years and enrolled in clinical innovative curriculum; hold more favorable opinion towards the essential role of basic sciences to the clinicians and might experience sorry feelings that having not paid more attention to basic science knowledge in their preclinical years.

Positive perception was predominant among the studied clinical group which reflects good appreciation of the important role of basic sciences from the

beginning of the teaching course as regards the statements 3, 4, 5. As well, similar findings were obtained by a study among Nepal medical students ⁽⁹⁾.

Unfortunately, 26.5% of both groups were of neutral opinion which revealed that many students still have genuine doubts about the value of basic sciences to which they had been exposed and do not perceive the relevance of basic science education to clinical practice.

Furthermore, measuring the students' attitude toward and perceived effectiveness of their education in basic science was done; the clinical group students had a more positive opinion regarding the last four items, it was significantly a little higher towards the statement "It is first necessary to learn as many facts as possible in the basic sciences and then learn to apply them later on in the clinical years". While, both groups had a modest positive attitude towards the statement that "What students should learn in the basic sciences are the general concepts in order that they might have a good working knowledge without having to know all the facts". Though, in a similar study ⁽¹³⁾, the medical students in their clinical years accounted that curriculum is overloaded and basic sciences being taught in too much details. They suggested that only a working knowledge of these subjects should be given.

Moreover, another study ⁽¹⁴⁾ reported loss of major knowledge among students when the questions asked to them in 1st year then asked again during 2nd year. Furthermore, primary concepts of the basic sciences in pre clinical years are generally not required in the exams, so they are gradually forgotten.

In this circumstances, our finding emphasized general agreement about "The information and knowledge I have gained to date are fundamental to my future role as a physician". In accordance, medical students showed that good knowledge of basic sciences were important to be a good clinician ⁽⁸⁾. Although, there is a common belief among physicians and medical educators that a considerable part of the basic science information learned in the traditional preclinical years in medical school is lost during the clinical years ⁽¹⁵⁾. While, some authors considered retained memory and quality of learning as central for medical education, others argue that knowledge which cannot be of use becomes inert and inaccessible as in previous research ⁽¹⁶⁾. In the current study, students in the preclinical years had a higher significant attitude regarding the statement "Faculty members motivate students' interest through teaching the basic science".

Even so, among preclinical students in another study ⁽⁹⁾, motivation of the students by faculty member showed a decreasing manner as enthusiasm in the second year was less than in the first year. Actually, professionalism of the staff members for teaching process broadly and basic sciences in particular; is based upon communication skills utilization, responsibility and honored role models ⁽³⁾.

On the other hand, the current study aimed at exploring opinion of students regarding learning of both basic and clinical medical subjects from the first year (early integration). It was found that both clinical and preclinical groups study did not signify how best to integrate both clinical and basic sciences from the first year. In a harmony, a previous research had shown that, medical students in the first three years, which based on conventional system, frequently suffer from curricula overloading and overemphasis on some topics. So, they mainly concentrate on ways to gain marks, rather than focusing on how the information could be applied in clinical years ⁽¹³⁾. While, in a recent study ⁽⁵⁾, the integrated course concept was positively accepted by the studied groups with participants suggesting that it promotes retention of basic science knowledge. It appears to be a feasible strategy to improve medical students' understanding of basic science concepts in medical education and to increase their motivation and engagement. However, there is still an ongoing debate about the integration of basic sciences.

So, addressing how basic science is incorporated into the practice of medicine is a challenge and depends upon required assumption about what medical practice is, and this argue was tackled before ⁽¹⁷⁾.

In fact, the students in the current study cannot realize the definition and levels of integrated courses as a novel approach except when applied. So, this new approach does not simply left to the students' opinion themselves theoretically but it should be supported by practical integrated teaching groups.

On the other hand, the top preferred basic sciences for the studied groups were; anatomy, physiology and pathology. While students in both preclinical and clinical grades ranked microbiology and parasitology the lowest preferred sciences. This may have been caused by the complex interplay among factors, which necessitates understanding the cognitive processes regulating how students think and learn ⁽¹⁸⁾.

As the medical students preferred to learn the biological mechanisms in the different basic medical sciences (e.g. anatomy, physiology, biochemistry,

pathology); these results imply that clinically-oriented basic sciences were the best choice of the studied medical students. That supports students' interest of the existing scientific knowledge, concepts and explaining clinical findings for applying science to the health of people and practice of medicine ⁽¹⁹⁾.

Furthermore, the findings regarding student's opinion about the underlying causes of their preference showed that; understandable and interesting curriculum was the highest reported cause followed by good professors and then clear, attractive teaching methods. In more detailed assessment, clinically-oriented teaching methods were preferred by second-year medical students while, lecture-based instruction was dominant among first-year students ⁽²⁰⁾. So, the learning climate is a multifactorial environment which does not aimed solely at students' achievement, but at their motivation, satisfaction and success ⁽²¹⁾. These findings should be considered and well administered in the current trends in medical education and in the novel integrated curricula.

CONCLUSION

In conclusion, the students' attitude and perception toward basic medical sciences is generally positive particularly among students in the clinical grades. Faculty staff member's role should be more prominent in basic medical sciences hold up. For better achievement, the medical curriculum should be interested, related (integrated) to clinical practice and learned in an attractive teaching method.

RECOMMENDATIONS

Continues assessment of student's opinion throughout their teaching course is a vital part for achieving the better learning outcome. Learning process must be updated continuously. Refocusing the basic/clinical medical sciences is essential. Further studies are needed prior to the integrating program to provide the educational planners with valuable guidelines.

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