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Assessment of Knowledge and Confidence in Basic Clinical Skills Among Healthcare Students and Their Implications for Clinical Competency Development

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Abstract:

Background: To make basic sciences easy and accessible in order to enhance their clinical importance.

Objective: basic sciences in Medical education have a pivotal role in forming foundation of a medical students. However, students have become disinterested due to the inaccessible nature of the stud system and methods. Through this study there has been an attempt made to highlight the problem and find a suitable solution.

Material and Method: Data was collected from students using a sample size of 265. Data collection was achieved by means of a questionnaire which was analyzed using SPSS v.20 (IBM, Chicago, IL). Descriptive statistics were run for categorical and quantitative variables. Total scores on each subscale pertaining to basic science subjects; anatomy, physiology and biochemistry were calculated**.**

Results: Medical students reported mixed responses on clinical significance of subjects of anatomy (moderate) and physiology (low to moderate) while biochemistry was reported as being most useful clinically. More than 50% of the respondents considered the syllabus of the basic medical sciences to be vast, in contrast to their very little clinical usefulness. Traditional teaching of basic medical sciences as individual disciplines, unrelated to each other and other clinical subjects (7), made them very difficult to recall and applicable in clinical years of the students, included in our survey

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Conclusion: Majority of the respondents in our study were of the view that the knowledge of basic medical sciences is very important in order to become a good clinician but the majority also thought that only a working knowledge of these subjects is required in clinical years. Therefore, there is no need for the deeper concepts of structures and functions.

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Introduction:

In 2011, Awatif et al study showed similar results and established that under usual teaching circumstances, students mainly concentrate on ways to gain marks, and focus of information application in clinical settings is lost. (1) This emerging problem is being solved by introducing module based learning in several universities with an aim of instilling better quality of education. Module can be problem or project based. Problem based learning is student-centered using teacher/facilitator instructors to solve challenging questions of blocks with basic knowledge. This provides students an opportunity to be actively involved in problem-solving hence they are motivated in their learning. The problem-based learning could be called project-based learning when the problem is larger and interdisciplinary. Students are divided in groups to solve the project module to reinforce the skill of communication, multitasking, gathering and analysing knowledge from different sources. O'Neill et al conducted a study in Manchester University, to evaluate the PROBLEM BASED LEARNING based integration of basic knowledge in clinical curriculum which showed the increase of initial sciences knowledge in students of senior years. (2) This is called module based reinforcement learning which assimilates concurrent and new information with repetition in each step so as to optimize the performance. (3) Although these methods are effectual, there can also be disadvantages if they are solely used in learning of any subject, because these methods focus only on problems/projects or a combination of lecture and project ignoring various correlating knowledge. The module based learning is weak in teaching students to integrate knowledge in solving real problems. These methods mainly focus on learning skills with less attention paid to teaching abilities. (4) The design of conventional medical education in Pakistan focuses on teaching basic sciences during preliminary years of MBBS with teacher centred system. The least teacher-student interaction highlights a growing

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concern among medical educators that this conservative modes of teaching neither help learners to master the excellence of basic medical education nor impart a life-long memory. Instructive lectures, tutorials and practical classes doesn't benefit senior medical students in integrating their basic sciences understanding into their clinical practices because of inert and inaccessible knowledge. This deficiency in medical students transpire a negative opinion about the teaching standards. Marcel et al conducted a study at University of Saskatchewan which concluded that majority of the students did not remember most of what they studied in initial years and wondered if the hard work of those years was worthwhile, which left the observer doubting if the students retained enough information to assimilate in clinical aspects. (5)

There is a gap between the conventional module based learning and PBML, for which our study was designed with objectives of: 1) exploring the students' attitudes and perception about PBML 2) need and application of basic science subjects in the clinical years of their medical education.

Methods

Total scores on each subscale pertaining to basic science subjects; anatomy, physiology and biochemistry were calculated. Thereafter, these subscales were summed to achieve a total score representing overall attitudes and perceptions of medical students towards the basic science subjects (APBS scale). Bivariate associations between scores on attitude and knowledge scale towards basic science subjects and age and

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year of study were analysed using Pearson correlation statistics. Spearman correlation was utilized to assess the association between perceptions of clinical useful of different basic science subjects (low to high) and total scores on the APBS scale. Multivariate analyses could not be conducted due to fewer variables achieving statistical significance in bivariate analyses.Data was collected from students of first, second,third,fourth, final year an house officers using a sample size of 265 .data collection was achieved by means of a questionnaire which was analysed using SPSS v.20 (IBM, Chicago, IL). Descriptive statistics were run for categorical and quantitative variables.

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Results

Medical students reported mixed responses on clinical significance of subjects of anatomy (moderate) and physiology (low to moderate) while biochemistry was reported as being most useful clinically (Table 1 and Figure 1 to 3). A higher proportion of respondents agreed that syllabus of anatomy is vast, had difficulty recalling anatomy and that the syllabus should just cover the general concepts to give a working knowledge. However, a greater proportion enjoyed learning physiology. A majority agreed that practical integration of basic sciences was not done in a manner that was helpful to inculcate useful clinical skills during their schooling. A majority agreed that problem based learning approach and integration of basic sciences during their medical schooling would have equipped them to become a better doctor (Table 2)

Attitude and perception toward anatomy and physiology were positively associated with age of respondents and year of study. Mean overall scores were associated positively with age of respondents. Point biserial correlation did not reveal association of APBS scores with gender of respondents. Perceived clinical significance of basic science subjects was not associated with APBS scores (Table 3).

There were a total of 153 females (57.7%) and 112 males (42.3%), with a mean age of 23.16 years (1.27). Year wise breakdown of respondents revealed that there were 70 students from final year, 65 (24.50%)

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4th year, 62 (23.40%) third year and rest 68 (25.70%) were house officers. The mean score on APBS scale were 68.63 (10.35) while a subscale wise breakdown revealed following trends: Anatomy 23.03 (4.26); physiology 23.76 (4.04) and biochemistry 21.84 (3.78).

Table 1: Perceived clinical usefulness of basic science subjects

Variables	Frequency (n)	Percentage (%)

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Clinical usefulness of Anatomy	Low	106	40.0%
	Moderate	138	52.1%
	High	21	7.9%
Clinical usefulness of Physiology	Low	145	54.7%
	Moderate	107	40.4%
	High	13	4.9%
Clinical usefulness of Biochemistry	Low	20	7.5%
	Moderate	18	6.8%
	High	227	85.7%

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Table 2: Frequency of responses on individual items of APBS scale

Item	Response	Frequency (n)	Percentage (%)
Syllabus of Anatomy is Vast	Disagree	57	21.5%
	Neutral	26	9.8%
	Agree	182	68.7%
Syllabus of Physiology is Vast	Disagree	58	21.9%
	Neutral	68	25.7%
	Agree	139	52.5%
Syllabus of Biochemistry is Vast	Disagree	55	20.8%

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	Neutral	76	28.7%
	Agree	134	50.6%
To study Anatomy was fun and you really enjoyed learning it	Disagree	104	39.2%
	Neutral	69	26.0%
	Agree	92	34.7%
To study Physiology was fun and you really enjoyed learning it	Disagree	79	29.8%
	Neutral	65	24.5%
	Agree	121	45.7%
To study Biochemistry was fun and you really enjoyed learning	Disagree	117	44.2%
	Neutral	92	34.7%
	Agree	56	21.1%
The knowledge of Anatomy to understand biological structures and mechanisms is very important to be a good clinician	Disagree	30	11.3%
	Neutral	51	19.2%
	Agree	184	69.4%
The knowledge of Physiology to understand biological structures and mechanisms is very important to be a good clinician	Disagree	23	8.7%
	Neutral	62	23.4%
	Agree	180	67.9%
The knowledge of Biochemistry to understand biological structures and mechanisms is very important to be a good clinician	Disagree	48	18.1%
	Neutral	85	32.1%
	Agree	132	49.8%

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The Anatomy should just cover the general concepts to give a working knowledge without going in to detailed mechanisms and facts	Disagree	95	35.8%
	Neutral	46	17.4%
	Agree	124	46.8%
The Physiology should just cover the general concepts to give a working knowledge without going in to detailed mechanisms and facts	Disagree	100	37.7%
	Neutral	42	15.8%
	Agree	123	46.4%
The Biochemistry should just cover the general concepts to give a working knowledge without going in to detailed mechanisms and facts	Disagree	73	27.5%
	Neutral	55	20.8%
	Agree	137	51.7%
You are able to recall Anatomy during relevant discussion in your clinical years	Disagree	150	56.6%
	Neutral	48	18.1%
	Agree	67	25.3%
You are able to recall Physiology during relevant discussion in your clinical years	Disagree	105	39.6%
	Neutral	56	21.1%
	Agree	104	39.2%
You are able to recall Biochemistry during relevant discussion in your clinical years	Disagree	146	55.1%
	Neutral	76	28.7%
	Agree	43	16.2%
The practical integration of Anatomy was	Disagree	96	36.2%

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done in manner that was helpful to inculcate useful clinical skills	Neutral	83	31.3%
	Agree	86	32.5%
The practical integration of Physiology was done in manner that was helpful to inculcate useful clinical skills	Disagree	87	32.8%
	Neutral	90	34.0%
	Agree	88	33.2%
The practical integration of Biochemistry was done in manner that was helpful to inculcate useful clinical skills	Disagree	130	49.1%
	Neutral	91	34.3%
	Agree	44	16.6%
Do you think problem base learning i.e integration of Anatomy with clinical subjects to discuss a topic would have helped you in having better understanding of the subject	Disagree	30	11.3%
	Neutral	27	10.2%
	Agree	208	78.5%
Do you think problem base learning i.e integration of Physiology with clinical subjects to discuss a topic would have helped you in having better understanding of the subject	Disagree	22	8.3%
	Neutral	34	12.8%
	Agree	209	78.9%
Do you think problem base learning i.e integration of Biochemistry with clinical subjects to discuss a topic would have helped you in having better understanding	Disagree	28	10.6%
	Neutral	50	18.9%
	Agree	187	70.6%

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of the subject			

Table 3: Association of demographic characterises and perceived clinical useful of basic science subjects with attitude and perceptions among medial students

Variable	Anatomy	Physiology	Biochemistry	Total
Age of respondents	.2281	.2561	.069	.2331
Gender of respondents	-.005	-.036	.004	-.020
Year of study	.1621	.1981	.025	.162
Clinical usefulness of Anatomy	.009	.083	.027	.047
Clinical usefulness of Physiology	-.024	-.082	-.063	-.068
Clinical usefulness of Biochemistry	-.034	-.054	-.034	-.038

1P< 0.05

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Figure 1: Distribution of respondents according to perceived usefulness of anatomy

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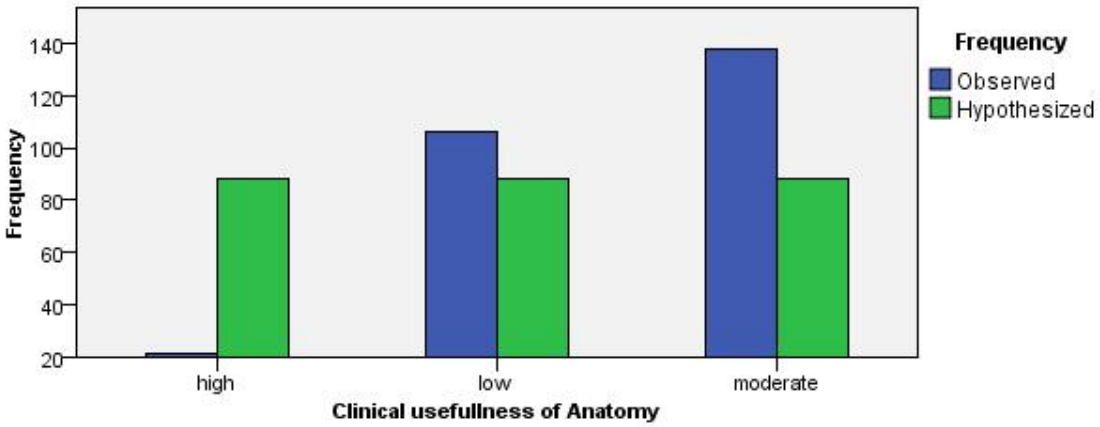
One-Sample Chi-Square Test



Total N	265
Test Statistic	82.785
Degrees of Freedom	2
Asymptotic Sig. (2-sided test)	.000

1. There are 0 cells (0%) with expected values less than 5. The minimum expected value is 88.333.

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Figure 2: Distribution of respondents according to perceived usefulness of physiology

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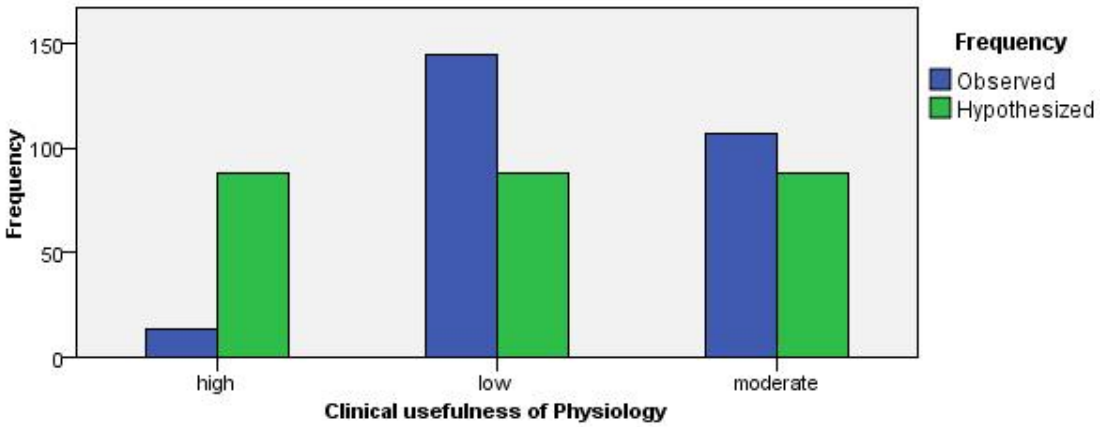
One-Sample Chi-Square Test



Total N	265
Test Statistic	104.543
Degrees of Freedom	2
Asymptotic Sig. (2-sided test)	.000

1. There are 0 cells (0%) with expected values less than 5. The minimum expected value is 88.333.

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Figure 2: Distribution of respondents according to perceived usefulness of biochemistry

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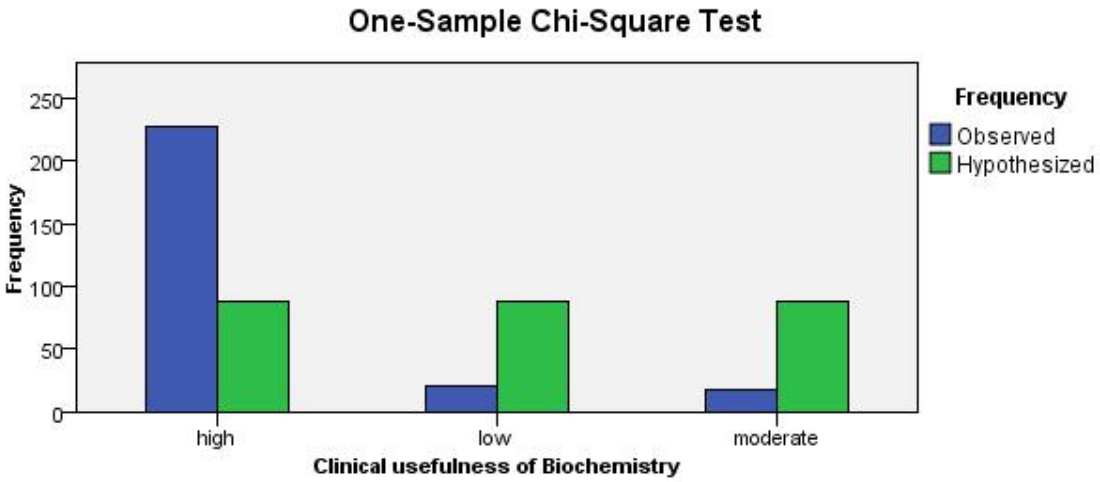

Total N	265
Test Statistic	326.543
Degrees of Freedom	2
Asymptotic Sig. (2-sided test)	.000

1. There are 0 cells (0%) with expected values less than 5. The minimum expected value is 88.333.

Discussion:

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In our study more than 50% of the respondents considered the syllabus of the basic medical sciences to be vast, in contrast to their very little clinical usefulness. Traditional teaching of basic medical sciences as individual disciplines, unrelated to each other and other clinical subjects(6), made them very difficult to recall and applicable in clinical years of the students, included in our survey. Most of the traditional teaching involves direct transfer of knowledge from a teacher to the students, which makes the vast knowledge of basic medical sciences burdensome and over whelming for the students(7).

Majority of the respondents in our study were of the view that the knowledge of basic medical sciences is very important in order to become a good clinician but the majority also thought that only a working knowledge of these subjects is required in clinical years. Therefore, there is no need for the deeper concepts of structures and functions. Similar findings have been suggested by El-Bab et al, in which they showed that most the medical students who didn't answer well to questions asked from basic medical sciences, did answer well to the clinical questions(8). Moreover, these students, were not able to correlate their basic medical sciences knowledge with the clinical subjects(8). This they believed to be due to little basic science knowledge in clinical textbooks and numerous more medical facts to be memorized rather than revising the basic medical knowledge(8).

Recent studies indicate that problem based learning is a better technique as compared to the traditional teaching for basic medical science disciplines(9). This they believe, not only helps students to develop cognitive thinking skills but allows them to integrate knowledge of basic medical sciences with clinical subjects, adding more towards its usefulness(10). More than 70% of the respondents in our study agreed that integration of basic medical science knowledge with clinical subjects through Problem Based Learning would have helped them in better learning and retention of knowledge. Recent studies have also shown that Problem Based Learning neither had any impact on the knowledge acquisition nor it result in

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any enhanced learning by the students rather it caused wastage of faculty time and effort(11). One solution to the overload was suggested by establishing a core curriculum, few topics which shall be taught through Problem Based Learning method while rest of the topics shall be covered in additional/extra modules(2).

Retention of the Basic Medical Sciences knowledge is also a problem due to its vastness (6). Most of the respondents in our study did not enjoy learning basic medical sciences. This has also been supported by other studies, in which a comprehensive, integrated and objective based approach was recommended which shall allow students to inter-relate knowledge and help them in retention of basic medical science knowledge in clinical years(12).

Conclusions:

Use of PROBLEM BASED LEARNING and other modalities in teaching Basic Medical Sciences shall make their learning more fun and help students in comprehensive use of knowledge as a future doctor. The students in our study presented a positive attitude towards basic science subjects and believed that basic sciences had an important role in becoming good clinicians.

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