TRNC

NEAR EAST UNIVERSITY

HEALTH SCIENCES INSTITUTE

EXPECTATIONS AND PERCEPTIONS OF PHARMACY STUDENTS ON TEACHING-LEARNING METHODOLOGY IN PHARMACOLOGY LECTURES IN FACULTY OF PHARMACY, AT THE NEAR EAST UNIVERSITY: A QUESTIONNAIRE-BASED STUDY

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PHARMACOLOGY Programme

MASTER'S DEGREE THESIS

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APPROVAL

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ABSTRACT

ASHFAQ, R. Expectations and Perceptions of Pharmacy students on Teaching–Learning Methodology in Pharmacology lectures in the Faculty of Pharmacyat the Near East University (TRNC): A questionnaire-based study. Near East University, Health Sciences Institute, Pharmacology Programme, Master's Thesis, Nicosia, 2014.

Background:Feedback of the students is an indicator of the success of teaching methodologyand it may contribute to improvement in teaching/learning.

Aim:The present study was designed to obtain information about the attitude of pharmacy students in the Faculty of Pharmacy at the NEU about teaching/learning methods in pharmacology education by using students feedback.

Materials and Methods: 40students from the 2nd, 3rd, 4th and 5th years each were enrolled, they were given a questionnaire consisting of 20 questions and with 5 choices, strongly disagree (1 score), disagree (2 scores), do not know (3 scores), agree (4 scores) and strongly agree (5 scores). The responses were expressed as percentage and scores. The statistical analysis was performed by ANOVA and Tukey HSD post hoc test.

Results: Most of the students(60%) agreed that pharmacology is an interesting and important subject.Majority of the students (65%) agreed and strongly agreed that power point presentation is an effective method in teaching/learning pharmacology, 1/3rd of the students preferred one midterm and a final examination. Most students favoured seminars and revision classes before the final examinations.The scores of the 2nd, 3rd, and 4th year students are similar. The 5th year students scored significantly (p:0.03) greater than the 4thyear students (54.4±7.1 and 49.7±9.1, respectively).

Conclusion: This study revealed that the pharmacy students have a favourable attitude and perceptions about the pharmacology courses held in their institute. They favoured the opinion that seminars and revision classes before the examinations will improve their pharmacology education.

Key Words:Pharmacy students, Pharmacology, Teaching–learning methodology

ÖZET

Eşfak R, Yakın Doğu Üniversitesi Eczacılık Fakültesinde Farmakoloji Derslerinde Öğretme-Öğrenme Metodolojisiile İlgili Beklentiler ve Eczacılık Öğrencilerinin Algısı: Bir anket-tabanlı çalışma. Yakın Doğu Üniversitesi, Sağlık Bilimleri Enstitüsü, Farmakoloji Programı, Yüksek Lisans Tezi', Lefkoşa, 2014 .

Gerekçe:Öğrencigeribildirimleri öğretim metodolojisinin başarısının bir göstergesidir ve bir eğitim/öğretim kurumunda eğitimin iyileştirilmesine katkıda bulunabilir.

Amaç: Bu çalışmada YDÜ, Eczacılık Fakültesi öğrencilerinin farmakoloji eğitimleri ile ilgili geri bildirimleri alınarak uygulanan farmakoloji eğitiminin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Bu çalışmaya her sınıftan 40 öğrenci olmak üzere 2, 3, 4ve 5 sınıflardan 160 öğrencikatılmıştır. Öğrencilere 20 soruluk anket formları verilmiştir. Cevaplar 5 seçenekli olup, kesinlikle katılmıyorum (1 puan), katılmıyorum (2 puan), bilmiyorum (3 puan), katılıyorum (4 puan) ve kesinlikle katılıyorum (5 puan) şeklindedir. Verilen cevaplar yüzde olarak ifade edilmiş ve puanları hesaplanmıştır. Cevaplar ve puanlar ANOVA ve Tukey HSD post hoc testi ile değerlendirilmiştir.

Bulgular:Bütün öğrencilerin % 60'ıeczacılık eğitim programı içinde farmakolojinin ilginç ve önemli olduğunu ifade etmektedir. Öğrencilerin çoğunluğu (% 65) farmakoloji eğitimi sırasında kullanılan "power point" sunumların öğretim yöntemi bakımından etkili olduğunu bildirmektedir. Öğrencilerin 1/3'ü bir ara sınav ve bir final sınavını tercih etmektedirler. Öğrencilerin çoğu farmakoloji eğitimi sırasında seminerler düzenlenmesini ve final sınavlarından önce derslerin tekrar gözden geçirilmesini teklif etmektedir. Verilen cevaplar bakımından 2, 3 ve 4 sınıflar arasında fark bulunmamıştır. 5Sınıföğrencileri4 sınıftaki öğrencilere göre daha yüksek puanla cevap vermişlerdir (sırasıyla 54.4±7.1 ve 49.7±9.1). Bu fark istatistiksel olarak anlamlıdır (p:0.03).

Sonuç:Bu çalışma, YDÜ, Eczacılık Fakültesi öğrencilerininfarmakoloji eğitimleri hakkında genelde olumlu tutum içinde olduklarını saptamıştır. Öğrenciler seminerler ve finallerden önce tekrar yapılması ile daha etkili bir farmakoloji eğitimi sağlanabileceğini düşünmektedirler.

Anahtar sözcükler: Eczacılık Fakültesi öğrencileri, Farmakoloji, Öğretim/öğrenim metodolojisi

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SYMBOLS AND ABBREVIATIONS

TRNC	Turkish Republic of Northern Cyprus
ANOVA	Analysis of Variance
SPSS	Statistical Package for the Social Science
HSD	Honestly Significant Difference
NEU	Near East University
MCQs	Multiple choice questions
ANS	Autonomic Nervous System
CNS	Central Nervous System

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1.INTRODUCTION

Pharmacology is a biomedical discipline taught in basic sciences and professional degree programs[1]. It is an essential component in the study of pharmacy and is included as one of the six major areas of instruction in the pharmacy degree curriculum.Pharmacology provides the scientific basis and principles for a variety of special applications, such as the study of drug actions in the health sciences, the use of drugs as therapeutic agents in medicine or as tools in scientific research, and the development and regulation of pharmaceuticals.Pharmacology is a multi-disciplinary science with many subspecialties including clinical pharmacology, cardiovascular pharmacology, behavioural pharmacology, neuropsychopharmacology, pharmacogenetics, and pharmacoeconomics.

Pharmacology at the Near East University Turkish Republic of Northern Cyprus (TRNC) in the Faculty of Pharmacy is taught one and half year, i.e., three semesters. The pharmacology courses begin from the second year andthey are taught over the third and the fourth semesters of the second year and the fifth semester of the third year. Each semester comprises of 12 weeks of teaching and 3 weeks of assessment.

Student's perceptions and attitude regarding the different teaching-learning methods are important for further development and improving the education in future.For thatevaluation is an important aspect. Student's evaluation is also important for an instructor.

Evaluation is a systematic process to assess how much of a predetermined objective of a course of a study has been achieved. Evaluation = Measurement +Value judgment Measurement indicates a qualitative or quantitative description about the change of behavior of the learner. Value judgment is assessment about the desirability of the change of behavior. Evaluation can be of various types such as outcome evaluation, impact evaluation and performance evaluation [3].

In the case of teaching-learning pharmacology, impact evaluation is important for the evaluation of student's attitude and perception regarding teaching-learning methods of pharmacology.

2.GENERAL INFORMATION

In general terms, pharmacology is the science of drug action on biological systems. In its entirety, it embraces knowledge of the sources, chemical properties, biological effects and therapeutic uses of drugs. It is a science that is basic not only to medicine, but also to pharmacy, nursing, dentistry and veterinary medicine. Pharmacological studies range from those that determine the effects of chemical agents upon subcellular mechanisms, to those that deal with the potential hazards of pesticides and herbicides, to those that focus on the treatment and prevention of major diseases by drug therapy[4].

Integrating a depth of knowledge in many related scientific disciplines, pharmacologists offer a unique perspective to solving drug, hormone, and chemical-related problems which impinge on human health. As they unlock the mysteries of drug actions, discover new therapies, and develop new medicinal products, they inevitably touch upon all our lives [4].

While remarkable progress has been made in developing new drugs and in understanding how they act, the challenges that remain are endless. New discoveries regarding fundamental life processes always raise new and intriguing questions that stimulate further research and evoke the need for fresh insight.Hence, not only concepts but also the teaching methodologies and evaluation methods need to be kept under continuous review[4].

Applied pharmacology is the knowledge for rational and judicious use of right drug, in the right form, right dosage, right interdose interval, right duration and for the right cause. Consequently reforms in pharmacology are the need of the hour [5,6].

The pharmacology courses should prepare the students to acquire all the informations regarding to a drug such as indications, pharmacodynamic and pharmacokinetic properties, mechanism of action, adverse effects, contraindications, safety and its clinical efficay. In addition, the study of pharmacology may serve as an additional means by which the student is exposed to give information to their customers and public as well, about the drugs and their safety.

Basic concepts are taught before any consideration of pharmacotherapeutics [7].Basic principles of pharmacodynamics are universal, not specific to a body system; therefore, they are taught at the beginning of the 2nd year, through a series of lectures on cell-signaling/drug-receptor interactions. Subsequently, students are exposed to understand how drugs may target cells to produce their effects. Pharmacodynamics of specific agents are considered as those drugs which are introduced in relation to their actions on different body systems[8]. Foundational concepts are presented with sufficient emphasis in student's self-directed learning to allow them to develop a knowledge base that can serve as a resource when they engage in a drug-related problem with their customers.

Adopting up-to-date methods is more urgent for pharmacology instructors. It embraces rich contents involving too many drugs and related knowledge including mechanisms of drug action, numerous detailed facts about drug classes and individual compounds, and even the diseases for which the various drugs are used.Students avoid pharmacology, and perceive it as a more "difficult" learning area than other subjects in the undergraduate curriculum. So, teaching pharmacology to students has been a challenge [9,10]. Also, a variety of new drugs are emerging with information about their mechanisms and their therapeutic uses. Education of pharmacology needs to be radically reformed to contribute to better professional pharmaceutical services and new drug development [11]. The information about new drugs is usually insufficiently imparted. On the other hand, as healthcare professionals, pharmacists who are often decision makers in settings ranging from patient care to managed care often consult the literature to determine, for example, current practice guidelines or drug interactions or dosing [12]. Thus, pharmaceutical students should also be capable of conducting systematic searches using the medical and pharmaceutical references to formulate responses to queries on drug information. Hence, the curriculum of pharmacology should also aim to instill students with the ability to critically analyze information and apply this knowledge to novel scenarios [13].

Many reforms have been made in undergraduate teaching of pharmacology in different settings. Clinical pharmacology, group discussions and practical classes on therapeutic problems are being introduced. Pharmacology is at crossroads. The place and status of pharmacology in the curriculum is hazy. Students-decry the way it is taught, its examinations, its usefulness when they involve in a healthcare setting. Considering all

these facts it would be appropriate to get a general feedback from the students of Faculty of Pharmacy about the current methodology of pharmacology education in their institute.

Formative feedback is knownto improve student's learning [14]. Early formative feedback also provides information to teaching staff about the areas in which students have developed expertise and the teachers can tailor their teaching to address any problems before they can impact on future sessions[15]. The provision of early formative feedback also allows students to reflect upon their knowledge and identify their own learning needs, thus promoting self-directed study and independence. Additionally, the early formative feedback will allow teaching staff to detect areas of student weakness immediately and thus allow these problem areas to be addressed in more detail within the appropriate session before they can impact on future sessions [16].

The primary objective of teaching pharmacology to undergraduate students can be fulfilled only if they are well acquainted with the subject with respect to innovations in this field. This needs continuous review and modifications in teaching methodology, evaluation methods and lectures in pharmacology.

It is accepted that the feedback from students serves as an effective tool in developing teaching methodology and evaluation methods in undergraduate teaching [17]. There is a growing awareness that learner's view of their educational experiences are valuable in assessing the effectiveness of courses and teaching methods.Furthermore, reviewing the teaching program at regular intervals and modifications in the methodologies of imparting knowledge is mandatory.Thus the present study is an effort to obtain and analyze critical appraisal on:

- The students attitude towards teaching and learning pharmacology in the Faculty of Pharmacy at the Near East University.
- Assessment of pharmacology teaching using student's feedback.

3. MATERIALS AND METHODS

3.1. Participants

This study involved 160 students studying at the Near East University, Turkish Republic of Northern Cyprus (TRNC) in the Faculty of Pharmacy. Students were informed that participation was voluntry. Participants were explained the aims and objectives of the study. All of the participants completed the questionnaire.

3.2. Questionnaire development

A structured questionnaire was developed consisting of 20 questions through reviewing various literatures (Appendix 1). Most of the questions were selected from the Indian original latest articles [18,19].

The questionnaire was consisted of three main categories, i.e., teaching–learning methodology, evaluationmethods and general questions related to pharmacology training in the Faculty of Pharmacy at the Near East University, Turkish Republic of Northern Cyprus (TRNC). In addition to the questions, age and gender were also asked in the questionnaire.

Out of total 20 questions, 11 questions were based on the internationally accepted 'Liekert Scale' (Strongly disagree, Disagree, Do not know, Agree, Strongly agree), 2 questions were based on five options, 3 questions were based on three options i.e., yes, no or somewhat and the last 4 questions were based only on two options like yes or no.

3.3. Questions

Q.No. 1: Pharmacology is useful, practically important and interesting subject in the pharmacy curriculum.

Q.No. 2: Pharmacology is the best of all subjects in pharmacy curriculum as compared to other subjects.

Q.No. 3: Power point presentation is the most commonly used teaching-learning method inpharmacology at this faculty.

Q.No.4: The teacher explained the slides during the lecture class rather than just read out.

Q.No.5: The teacher explained the use of pharmacology in clinical practice.

Q.No.6: The teacher solved the problem when asked.

Q.No. 7: There should be more detailed coverage of A.N.S., C.N.S., and chemotherapeutic agents, followed by general pharmacology.

Q.No. 8: Number of lecture classes should be increased.

Q.No. 9: Duration of lecture classes should not be more than 1 hour.

Q.No. 10: For studying the pharmacology, and preparation for the examinations, lecture notes and test books were beneficial and useful.

Q.No.11. Topics covered during normal lectures are interesting.

Q.No.12: Pattern of studying pharmacology.

Q.No.13: The most suitable method for the evaluation of knowledge in pharmacology.

Q.No.14: Pharmacology knowledge would help me to give instructions to patients regarding the use of drugs.

Q.No.15: Do you think that basic changes are necessary to the present curriculum in the faculty to meet the challenges of pharmacology in the future?

Q.No.16: Does the present teaching methods stimulate learning of pharmacology in the curriculum?

Q.No. 17:Are the students encouraged to present seminars as a part of their pharmacology curriculum?

Q.No.18:Pharmacology revision classes should be offered before the final examination.

Q.No.19: Does the pharmacology lectures provide all the knowledges needed to pass the examinations?

Q.No.20: Current duration of the pharmacology course is sufficient.

3.4. Questionnaire validation

Questionnaire validation was done in 5 students to review the questionnaire to determine whether the questionnaire measured what it was designed to measure. The following validation criteria were used:

• Time requirement for completion of the questionnaire (5 mintue)

• Appropriateness of questionnaire for collecting data

• Repetition or inappropriate questions

• Clear, concise and unambiguous questions

• Easy and meaningful instructions

3.5. Questionnaire approval

The questionnaire was approved by the Faculty of Pharmacy at the Near East University.

3.6. Questionnaire distribution

The questionnaire was distributed to all second, third, fourth and fifth year undergraduate pharmacy students (n=160). The questionnaire was distributed personally by the investigator at the end of each class and in the presence of the concerned instructor. The students were asked to fill up the questionnaire. Subjects were asked to tick only one of the options. The filled questionnaires were collected immediately once they were filled up, on the same day by the investigator.

3.7. Response Scale used

Likert Scale, a psychometric response scale primarily usedin questionnaires to obtain participants preferences or degree of agreement with astatement or set of statements [20]. Likert scales are a non-comparative scaling technique andare uni-dimensional (only measure a single trait) in nature. Respondents are asked to indicatetheir level of agreement with a given statement by way of an ordinal scale. Likert scale is aresponder scale. In this study Five–point Likert Scale was used for the first 11 questions based as 1 = strongly disagree; 2 = disagree; 3 do not know; 4 = agree; and 5 = strongly agree.

For question numbers14 to 17 the following analysis creteria were used. Yes = 3; somewhat = 2 and no = 1. For question numbers 18 to 20 the following analysis creteria were used. Yes = 2; and no = 1.

3.8. Statistical analysis

For all the study variables, descriptive statistics were calculated and shown as arithmetic mean±standard deviation. Frequency and percentage calculations were also provided.To test the differences among the classes, One Way Analysis of Variance (ANOVA) method was performed. For pairwise comparisons of the classes, Tukey HSD post hoc test was applied. All statistical calculations were performed with Statistical Package for the Social Science (SPSS Version 18.0)andMicrosoft OfficeMsExcel (Version 2010) was also used for data management. A value of $p< 0.05$ was consideredstatistically significant. The scores were obtained from the ANOVA and Tukey HSD post foc test.

4. RESULTS

In this study a total of 160 students were evaluated, 95 were females and 65 were males, and the mean age of the students was 22 years. The responder rate in the females (59.4%) was greater than that of the male students (40.6%).

When the responses obtained from the total students were evaluated about their attitude towards learning/teaching methodology of pharmacology education in the pharmacy curriculum, it was observed that about half of the students considered

pharmacology education is useful, practically important and interesting. However, their point of views displayed alterations when their responses were evaluated as they spend more time during their pharmacology training in the school of pharmacy. In order to be able to make such an analysis, the students who were taught pharmacology were analysed separately according to their exposure to the courses.

The first group of students were 2nd year students and they scored 52.7±5.9 (n=40). This score indicates that the majority of the 2nd year students "agree" with the questionaires. As the value of the score increases, the students attitude towards "strongly agree" increases. The maximum theoretical score is calculated to be 73. Contrary to this condition, as the value of the score decreases, the subjects attitude towards "strongly disagree" increases. The minimum theoretical score is calculated to be 18.

The 3rd year students displayed a score of 50.9±7.8, which is not significantly different from that of 2nd year students (p:0.732). The 4th year students scored 49.7±9.1 which is also not significantly different from that of the 2nd and 3rd year students (p:0.294 and p:0749, respectively). The 5th year students displayed a score of 54.4±7.1. This value is significantly (p:0.032) greater than that of the 4th year students, but it is not significantly different from the 2nd and 3rd year students scores.

When the students were asked about the comparison of pharmacology with other subjects, 37.5% of the 5th year students agreed and 25% of the students strongly agreed that pharmacology is the best of all subjects in pharmacy curriculum as compared to other subjects. The response of the 4th year students to the same question was 22.5% agreed and17.5% strongly agreed.

Responding to the questionnaires in relation to the teaching modes and methodologies 45% of the 5th year students agreed and 20% strongly agreed that power point presentation is the most commonly used teaching-learning method in pharmacology at this faculty while 4th year students 32.5% agreed and 22.5% strongly agreed with this fact.

In response to the question that the teacher explained the slides during the lecture class rather than just read out, 37.5% of the 5th year students agreed and 30% of the respondents strongly agreed while the response of the 4th year students was 40% agreed and 22.5% strongly agreed. 50% of the 5th year students agreed and 25% strongly agreed

to the fact that the teacher explained the use of pharmacology in clinical practice while the response of the 4th year students to the same question was 30% agreed and 20% strongly agreed. When the students were asked that the teacher solved the problem, 45% of the 5th year students agreed and 30% strongly agreed to the fact while the 4th year students response were 32.5% agreed and 17.5% strongly agreed to the same question.

It was found that 45% of the5th year class students agreed and 20% strongly agreed that there should be more detailed coverage of autonomic nervous system, central nervous system and chemotherapeutic agents, followed by general pharmacology, while the response of the 4th year students to the same question were 17.5% agreed and 22.5% of the students kept themselves away from the decision by putting tick mark over the undecided or neutral column (Do not know).

When the participants were asked that the number of lecture classes should be increased, 20% of the 5th year class students agreed and 7.5% strongly agreed to the fact, while the 4th year class 27.5 % agreed and 20% strongly agreed to the same question.

When the students were asked about the duration of lectures, 30% of the 5th year class students agreed and 45% strongly agreed that the duration of lectures should not be more than 1 hourwhile 40% of the 4th year class agreed, 17.5% strongly agreed and 22.5% of the students kept themselves away from the decision by putting tick mark over the undecided or neutral column (Do not know).

Most of the 5th year class students (47.5%) agreed and 25% strongly agreed to the fact that the lecture notes and test books were beneficial and useful for studying the pharmacology and preparation for the examinations. The response of the 4th year students to the same question were 30% agreed, 22.5% strongly agreed and 32.5% of the students kept themselves away from the decision by putting tick mark over the undecided or neutral column (Do not know).

It was found that 50% of the 5th year students agreed and 20% strongly agreed to the fact that topics covered during normal lectures are interesting. The response of the 4th year students to the same question were 22.5% agreed,12.5% strongly agreed and 25% disagreed. The details of the responses collected from the 4th and 5th classes to the questionnaires are shown in thetable 4.1.

		Response %			
		4th year class students		5th year class students	
No.	**Questions**	**Agree (%)**	**Strongly agree (%)**	**Agree (%)**	**Strongly agree (%)**
1	Pharmacology is useful, practically important and interesting subject in the pharmacy curriculum.	40%	25%	25%	37.5%
2	Pharmacology is the best of all subjects in pharmacy curriculum as compared to other subjects.	22.5%	17.5%	37.5%	25%
3	Power point presentation is the most common teaching-learning method in pharmacology at this faculty.	32.5%	22.5%	45%	20%
4	The teacher explained the slides during the lecture class rather than just read out.	40%	22.5%	37.5%	30%
5	The teacher explained the use of pharmacology in clinical				

	practice.	30%	20%	50%	25%
6	The teacher solved the problem when asked.	32.5%	17.5%	45%	30%
7	There should be more detailed coverage of A.N.S., C.N.S., and chemotherapeutic agents, followed by general pharmacology.	17.5%	10%	45%	20%
8	Number of lecture classes should be increased.	27.5%	20%	20%	7.5%
9	Duration of lecture classes should not be more than 1 hour.	40%	17.5%	30%	45%
10	For studying the pharmacology, and preparation for the examinations, lecture notes and test books were beneficial and useful.	30%	22.5%	47.5%	25%
11	Topics covered during normal lectures are interesting.	22.5%	12.5%	50%	20%

Table 4.1Comparsion of the Responses of the 4th and 5th year Pharmacy Students in the Faculty of Pharmacy at the Near East University, TRNCto the Questionnaire.

When the students were asked about the pattern of studying pharmacology, 37.5% of the 5th year students suggested that they study pharmacology for gaining more knowledge. 25% of the same class students favoured that they study pharmacology regular because of interest.35% of the 4th year students favoured that they study pharmacology for gaining more knowledge and 27.5% opined that they study pharmacology regular because of tests and oral exam. The details of the responses collected from the 4th and 5th classes to the question are shown in the figure 4.1.

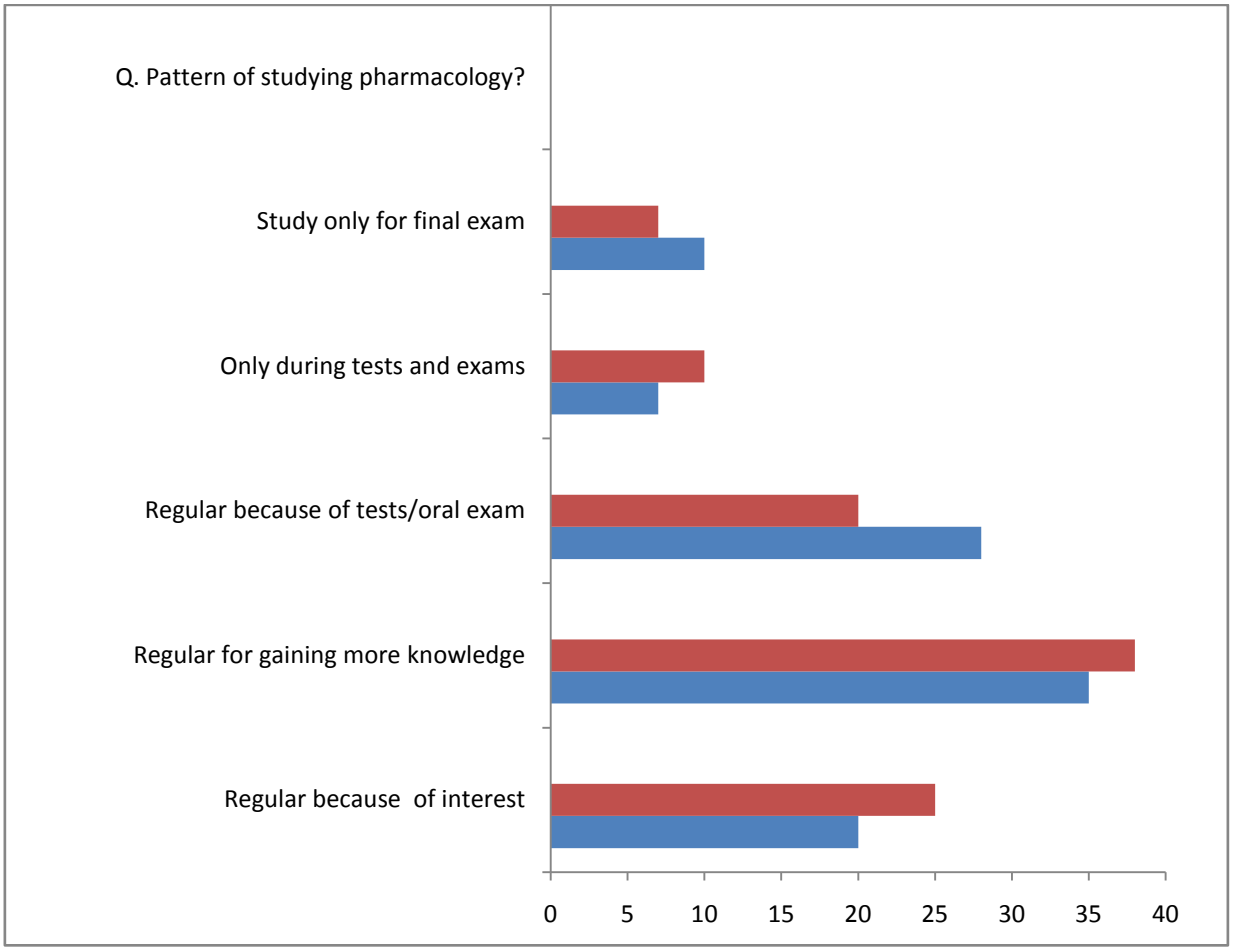

Figure 4.1 Responses of the 4th and 5th year Students Related to the Pattern of Studying Pharmacology

4th year studentsare indicated with blue

5th year students are indicated with red

When the students were asked about the most preferred method for the evaluation of knowledge in pharmacology, 35% of the 5th year students preferred that one midterm and final examination is sufficient. The second highest preference was given by the same class students (27%) to multiple choice questions.

When the 4th year students were asked about the most preferred method for the evaluation of knowledge in pharmacology,33% of the students preferred that one midterm and final examination is sufficient. The second highest preference was given by the same class students (25%) to multiple choice questions. The details of the responses collected from the 4th and 5th classes to the question are shown in the figure 4.2.

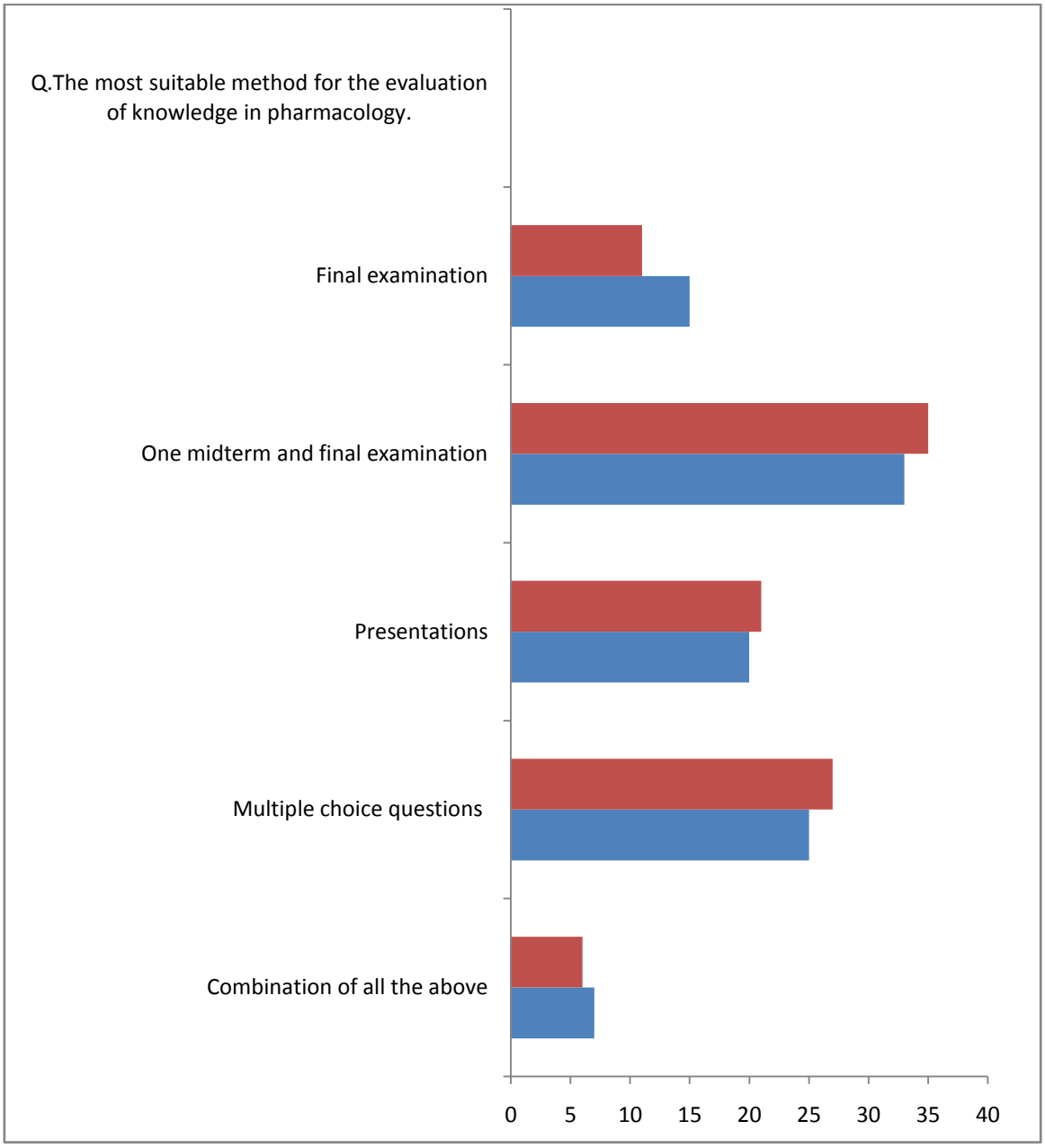

Figure 4.2 Responses of the 4th and 5th year Students Related to the most Preferred Method for the Evaluation of Knowledge in Pharmacology.

4th year studentsare indicated with blue.
5th year students are indicated with red.,

Most of the 5th year students (57.5%)favoured that pharmacology knowledge would help them to give instructions to patients regarding the use of drugs. 62.5% of the participants suggested that basic changes are necessary to the present curriculum in the

faculty to meet the challenges of pharmacology in the future. 55% of the participants stated the present teaching methods stimulate learning of pharmacology in the curriculum. 57.5% of the participants suggested that the students should be encouraged to present seminars as a part of their pharmacology curriculum.

Majority of the 4th year students (47.5%) favoured that pharmacology knowledge would help them to give instructions to patients regarding the use of drugs. 52.5% of the participants suggested that basic changes are necessary to the present curriculum in the faculty to meet the challenges of pharmacology in the future. 51% of the participants stated the present teaching methods stimulate learning of pharmacology in the curriculum. 47.5% of the participants suggested that the students should be encouraged to present seminars as a part of their pharmacology curriculum. The details of the responses collected from the 4th and 5th classes to the questions are shown in the table 4.2.

	Response%					
Questions	**Yes**		**No**		**Somewhat**	
	4th year	5th year	4th year	5th year	4th year	5th year

1	Pharmacology knowledge would help me to give instructions to patients regarding the use of drugs.	47.5%	57.5%	15%	17.5%	37.5%	25%
2	Do you think that basic changes are necessary to the present curriculum in the faculty to meet the challenges of pharmacology in the future?	52.5%	62.5%	17.5%	17.5%	30%	20%
3	Does the present teaching methods stimulate learning of pharmacology in the curriculum?	51%	55%	29%	21%	20%	24%
4	Are the students encouraged to present seminars as a part of their pharmacology curriculum?	47.5%	57.5%	22.5%	17.5%	30%	25%

Table 4.2Comparsion of Responses of the 4th and 5th year Pharmacy Students to the Questionnaire.

When the students were asked about pharmacology revision classes, 68% of 5th year students agreed to the suggestion that pharmacology revision classes should be arranged before the final exam. 62 % of the students opined that pharmacology lectures provide all the knowledges needed to pass the examinations.75%of the students suggested that current duration of the pharmacology course is sufficient.

When the students were asked about pharmacology revision classes, 70% of 4th year students agreed to the suggestion that pharmacology revision classes should be arranged before the final exam. 63 % of the students opined that pharmacology lectures provide all the knowledges needed to pass the examinations. 38% of the students suggested that current duration of the pharmacology course is sufficient.The details of the responses collected from the 4th and 5th classes to the questions are shown in the figure 4.3.

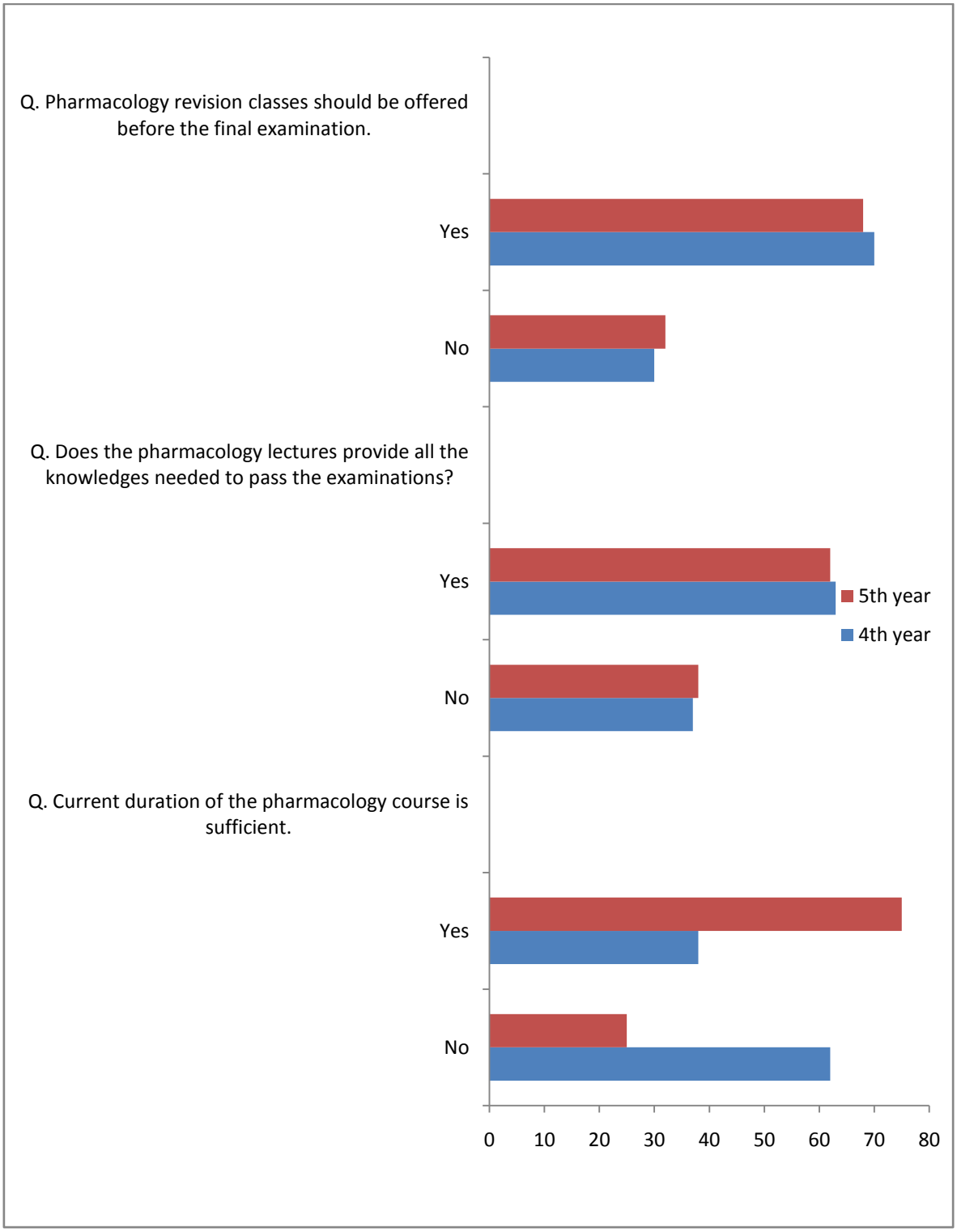

Figure 4.3 Responses of the 4th and 5th year Students Related to the Questions.

5. DISCUSSION

This study aimed to compare the learning and evaluation attitudes of pharmacy students at different grades in the Faculty of Pharmacyat the Near East University Turkish Republic of Northern Cyprus (TRNC), for pharmacology education. It was found that for most of the students pharmacology is an interesting and practically important subject in the curriculum of pharmacy education. As the grades of the students progressed, they displayed a stronger agreement about the subject questions which are related to the evaluation of phramacology education in their institute.

In this study, twenty pointed questionnaires were distributed to the 2nd, 3rd, 4th and 5th year students. Each class of the students were analysed separately. It was found that there is no statistical difference between, 2nd, 3rd and 4th year students about their responses to the statements presented in the questionaires. About one third of the students agreed and one third of the students strongly agreed that pharmacology is a useful, practically important and interesting subject. The rest of the students did not agree.Most of the students favoured and preferred power point presentations, seminars, and revison classes before the examinations and statistical difference was observed only between the 4th and 5th year students.

The difference between the 4th and 5th year students implies that 5th year pharmacy students have a better perception and expectation of the pharmacology training/learning in the pharmacy curriculum. It could be speculated that the 5th year students are about to graduate and they realise that they are going to practice their profession following their graduation. So it should be quite logical to expect these students to appreciate the value of pharmacology training in their professional career. This study did not reveal a statistically significant difference between the 5th year students and the 2nd year and the 3rd year students. This might be due to relatively lower sample size of the students utilized in this study. Another explanation could be that the students in the 2nd and 3rd years are not sufficiently prepared to acknowledge the importance of pharmacology in their professional curriculum. The pharmacology instructors may not be emphasizing the importance of pharmacology during their courses. The students disclosed that, they did not had regular pharmacology instructors and with each semester their pharmacology instructors have changed and the students did not have a chance to appreciate a robust pharmacology education with these type of inconsistencies.

In the TRNC and Turkey, power point presentation is the most commonly used method of teaching followed in a large number of educational institutions. So, in this study the majority of the students gave their favourable opinion regarding the power point presentation. The major topics in the curriculum were taught through power point presentations and lecturing. Most of the students reported that they liked and were satisfied with the power point presentations during the pharmacolgy courses.

This study revealed that most of the students appreciated and were satisfied with their pharmacoloy instructors. The students opinioned that all of the instructors explained the slides during the lectures rather than just reading out and they fully explained the details of the problems when they were asked.These are the positive responses from the students of pharmacy about their pharmacology instructors that were observed in this study.

A large number of students stated that drugs related to the autonomic nervous system, central nervous system and chemotherapeutic agents need more coverage after general pharmacology. So, these topics need to be emphasized more to draw attention of the students. Involvement of students improves learning, and thereby their performance in the examinations. This approach towards teaching pharmacology would be appreciated by the students.

Students of the 4th year class agreed that the number of lecture classes should be increased while the 5th year students disagreed with the increasing number of lecture classes. This study also revealed thatthe majority of students favoured that duration of lecture classes should not be more than 1 hour. Duration of a lecture seems a relevent factor in a student's choice to attend a lecture. Lectures which last longer than 45 minutes result in a sharp decline of student attendance. The students generally want the shortest duration possible for lecture hours. Full and proper attention of the audience could be guaranteed if the teaching process is excellent and entertaining and principles of active learning process are applied.

A good number of students suggested that for studying the pharmacology, and preparation for the examinations, lecture notes and test books were beneficial and useful and the topics covered during normal lectures are interesting. It is observed that the majority of the students liked to study pharmacology for gaining more knowledge. This is

a positive response from the students about pharmacology lectures. So by this way the students understand the subjects properly.

For evalation point of view students feel that one midterm and final examination is sufficient for the evaluation of knowledge in pharmacology. During the period of pharmacology education in years, revelant modifications in the curriculum of pharmacology were made. Most of the students were satisfied that the present teaching methods stimulate learning of pharmacology in the curriculum with the present teaching methods.

The students suggested that seminars should be added as a part of pharmacology curriculum.This suggestion showed that the students will be interested in seminars. Seminars and presentations turn about to be the most important tools in improving the quality of education in an institution. It is very important for a student to be skilled in making presentations and giving a seminar on a particular topic. Seminars should be given especially on the topics which are of current importance and recently under research. Seminars should be made compulsory. Seminars would improve the understanding of the subject, develop the researching attitudes of the students and improve the presentation, listening and reading skills of the students.

The results of this study have revealed that the majority of the students have suggested that the revision classes should be offered.This is a good suggestion pointed by the studens and it should be brought underconsideration by the faculty. The revision classes will make the students to understand the topics, to absorb what they have learnt and understand to memorize, to practice planning and writing answers to questions.

It was found that most of the students accepted that lectures in the pharmacology provide all the knowledge needed to pass the examinations. This showed that the students were taking their pharmacology lectures regularly and interestingly. It was also found that the students are satisfied with the current duration of the pharmacology courses.

6. Conclusions

In conclusion, this study revealed that the pharmacy students have a favourable attitude and perceptions about the pharmacology courses held in the Faculty of Pharmacy,

NEU.Seminars and revisions of pharmacology courses were also suggested by the students.Suggestions for future curriculum modifications were also given to meet the challenges of pharmacology training.

REFERENCES

1.Hilary Lloyd, Tina Hinton, Shane Bullock, Anna-Marie Babey, Elizabeth Davis, Lynette Fernandes,Joanne Hart, Ian Musgrave and James Ziogas.An evaluation of pharmacology curricula in Australian science and health-related degreeprograms.

BMC Medical Education 2013, **13**:153 DOI:10.1186/1472-6920-13-153.

2. http://www.pharmcas.org/advisors/pharmacypharmacology.htm

3.Snell L, Tallett S, Haist S, Hays R, Narcini J, Prince K, et.al. A review of the evaluation of clinical teaching: new perspectives and challenges. Med Educ 2000; 34: 862-70.

4. http://www.aspet.org/knowledge/what-is-pharmacology/.

5. Rao K. Y.Undergraduate Pharmacology: Student's view – A Questionnaire Study J. Phys Pharm Adv 2013, 3(2): 27-32 DOI: 10.5455/jppa.20130228064842 ISSN: 2251-7693

6.http://www.grjournals.com/portals/grjournal/JPPA-2013-32-151-27-32.

7. Woodman OL, Dodds AE, Frauman AG, Mosepele M. Teaching pharmacology to medical students in an integrated problem-based learning curriculum: an Australian perspective.Acta Pharmacol Sin 2004;25(9):1195–203.

8. Karen Gregson, Ph.D.; Laura M. Romito, D.D.S., M.S.; Lawrence P. Garetto, Ph.D. Student's Attitudes Towards Integrating Problem-Based Learning into a D.D.S. Pharmacology Curriculum.Submitted for publication 11/30/09; accepted 1/6/10.

9.Halliday AC, Devonshire IM, Greenfield SA, Dommett EJ. Teaching medical students basic neurotransmitter pharmacology using primary research resources. Adv Physiol Educ. 2010;34:205-12.

10. Badyal DK, Bala S, Kathuria P. Student evaluation of teaching and assessment methods in pharmacology. Indian J Pharmacol. 2010;42:87-9

11. Tanaka M, Misawa M. Proposals for innovative pharmacology education from the perspective of several fields-in response to rapidly changing times. Nihon Yakurigaku Zasshi. 2000;116:163-70.

12. Earl GL. Using cooperative learning for a drug information assignment. Am J Pharm Educ. 2009;73:132

13. Jun Wang, Xiamin Hu andJinglei Xi. Cooperative learning with role play in Chinese pharmacology education. Indian J Pharmacol.2012 Mar-Apr; 44(2): 253–256. DOI:10.4103/0253-7613.93862

14. Black P, Wiliam D. Assessment and Classroom Learning. Assessment in Education: Principles,Policy & Practice 1998, 5(1):7-74

15. Nicol DJ, Macfarlane-Dick D: Formative assessmnet and self-regulated learning: a model and seven principles of feedback practice. Studies in Higher Education

2006,31(2):199-218.
16. Joanne S Lymn, Alison Mostyn. Audience response technology: Engaging and empowering non-medical prescribing students in pharmacology learning. Lymn and Mostyn BMC Medical Education 2010, 10:73
17. Chavda N, Yadav P, Chaudhari M, Kantharia ND. Second year student's feedback on teaching methodology and evaluation methods in Pharmacology. Natl J Physio Pharm Pharmacol. 2011,1:23-31.
18. Uma A. Bhosale, Radha Yegnanarayan and Gauri E. Yadav. Attitude, perception and feedback of second year medical students on teaching–learning methodology and evaluation methods in pharmacology: A questionnaire based study
Nigerian Medical Education 2013. DOI: 10.4103/0300-1652.108891 PMID: 2366189.
19. Bandyopadhyay Dr Debasısa study on the evaluation of perception of teaching-learning methods of pharmacology among the 2nd M.B.B.S students in burdwan medical college, west bengal, india. July 17 2013. ISSN:-2321-3485
20. Likert Scale. Available in: poincare.matf.bg.ac.rs/~kristina/topic-dane-likert.pdf.

Appendix 1:

Questionnaire used in the study

Expectations and perceptions of pharmacy students on teaching–learning methodology in Pharmacology in the Faculty of Pharmacy at the Near East University: A questionnaire-based study

Age group :

☐ 19 -20 years ☐ 21-22years ☐ 24-25years

Gender:
☐ Male ☐ Female

Q.No. 1:Pharmacology is useful, practically important and interesting subject in the pharmacy curriculum.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 2: Pharmacology is the best of all subjects in pharmacy curriculum as compared to othersubjects.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 3:Power point presentation is the most commonly used teaching-learning method inpharmacology at this faculty.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 4: The teacher explained the slides during the lecture class rather than just read out.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 5: The teacher explained the use of pharmacology in clinical practice.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 6:The teacher solved the problem when asked.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 7: There should be more detailed coverage of A.N.S., C.N.S., and chemotherapeutic agents followed by general pharmacology.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 8: Number of lecture classes should be increased.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 9:Duration of lecture classes should not be more than 1 hour.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No. 10: For studying the pharmacology, and preparation for the examinations, lecture notes and test books were beneficial and useful.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree
Q.No.11: Topics covered during normal lectures are interesting.
☐Strongly Disagree ☐Disagree ☐Do not know ☐Agree ☐Strongly Agree

Q.No.12: Pattern of studying pharmacology?
☐ Regular because of interest
☐ Regular for gaining more knowledge
☐Regular because of tests/viva and interview classes
☐Only during tests and exams
☐Study only for final exam

Q.No.13: The most suitable method for the evaluation of knowledge in pharmacology.
☐Final examination
☐One midterm and final examination
☐ Presentations
☐ Multiple choice questions

☐ Combination of allthe above

Q.No.14: Pharmacology knowledge would help me to give instructions to patients regarding the use of drugs.
☐ Yes☐ No ☐Somewhat

Q.No.15: Do you think that basic changes are necessary to the present curriculum in the faculty to meet the challenges of pharmacology in the future?
☐ Yes☐ No ☐Somewhat

Q.No.16: Does the present teaching methods stimulate learning of pharmacology in the curriculum?
☐ Yes☐ No ☐Somewhat

Q.No. 17: Are the students encouraged to present seminars as a part of their pharmacology curriculum?
☐ Yes☐ No ☐ Somewhat

Q.No.18. Pharmacology revision classes should be offered before the final examination.
☐ Yes☐ No

Q.No.19: Does the pharmacology lectures provide all the knowledges needed to pass the examinations.
☐Yes☐ No

Q.No.20: Current duration of the pharmacology course is sufficient.
☐ Yes☐ No

Thank you for your cooperation!