

### The Effect of Theoretical Courses in Apprenticeship on Educational Function of Medical Students in Pediatrics and Gynecology Wards of Educational Hospitals of Birjand University of Medical Sciences

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**Background:** Clinical training is an important part of the training courses of medicine during which students learn how to face the patients, diagnose the diseases and treat the patients. Alongside clinical apprenticeship, related theoretical courses are presented so that the most training possible is covered. In the past the theoretical courses of pediatrics ward of Birjand University of Medical Sciences were presented in the afternoons separately from the clinical part. According to the new strategy of clinical deputy of medical school in the case of merging the theoretical courses with clinical apprenticeship, since past year the theoretical courses of pediatrics ward are presented simultaneously with apprenticeship. The purpose of this study was to examine the effect of merging theoretical courses in apprenticeship of pediatrics and gynecology wards on the scores of pre internship of medical students.

**Methods:** This was a retrospective interventional case study and it was conducted after proper coordination and getting the scores of pre internship exam scores, the scores of students having started in 2005 were considered as the control group and the scores of students of 2006 as case group (training of merging of clinical and theoretical courses), and then the two groups were compared. Data was analyzed through SPSS 1 and descriptive statistics and frequency distribution tables and independent t-test were used for analysis (meaningfulness level  $(p) \geq 0.05$ ).

**Results:** Totally, there were 89 participants in this study. 40 people participated in control group (entrance year of 2005) and 49 (entrance year of 2006) in case group. The mean score of pre internship exam in pediatrics course was higher in the control group but it wasn't statistically meaningful. On the other hand, the score of the students of the case group in gynecology course was significantly higher than the score of control group ( $p=0.001$ ).

**Conclusions:** The results showed that in both merged courses the mean score of pre internship exam in case group was higher than control group which implies the necessity of more planning in this case.

**Keywords:** Merge of Theoretical and Clinical Courses; Medical Education

### تأثیر دمج الدروس النظرية في المرحلة العملية على مستوى الأداء التعليمي عند طلاب الطب في أقسام الأطفال والنسائي في المشافي التعليمية التابعة لجامعه بیرجند للعلوم الطبية

**المقدمة:** إن المرحلة السريرية تعتبر من أهم المراحل في الدورة التعليمية في مجال الطب في هذه المرحلة يتعلم الطلاب كيفية التعامل مع المرضى و تشخيص الامراض و اساليب العلاج و الى جانب الدروس العملية يعطى دروس نظرية حتى يكون التأثير العلمي اكبر. في السابق كان يتم اعطاء الدروس النظرية لقسم الاطفال بعد الظهر في جامعه بیرجند للعلوم الطبية و كانت منفصلة عن القسم السريري.

نظرا للروية الجديدة للادارة الجديدة للمرحلة السريرية تم دمج الدروس النظرية مع الدروس العملية في قسم الاطفال.

إن الهدف من هذه الدراسة هو البحث عن مستوى تأثير دمج الدروس النظرية و العملية في المرحلة السريرية في أقسام الاطفال و النسائي في علامات الاختبار عند طلاب الطب.

**أسلوب العمل:** هذه الدراسة التي هي بأسلوب النظره الى الماضي و التي تمت بعد التنسيقات اللازمه و استخراج علامات الإمتحان تم اجرائها على فریقین هم طلاب سنه ۸۴ و طلاب سنه ۸۵ هـ.ش (الدوره التي تم دمج في تعليمهم). تم معالجة المعلومات عبر برنامج SPSS النسخه ۱۱ و تم استخدام القواعد و المعايير الإحصائية في التحليل ( $p=0.05$ ).

**النتائج:** اشترك في هذه الدراسة ۸۹ من الطلبة ۴۰ منهم من طلاب العام ۸۴ هـ.ش و ۴۹ منهم من طلاب العام ۸۵ هـ.ش. إن علامه الاختبار درس الاطفال عند طلاب عام ۸۵ كانت اعلى و لكن من جبهه احصائيه لم يكن الاختلاف و كان الاختلاف له قيمه احصائيه واضحه ( $p=0.001$ ).

**الاستنتاج:** اشارت النتائج الى أن في أسلوب الدمج كانت العلامات افضل لنا نوصي ذوی الامر الى اجراء البرامج اللازمه في هذا الشأن .

**الكلمات الرئيسية:** دمج الدروس النظرية في المرحلة السريرية . التعليم الطبي.

### تأثير ادغام دروس تئوری در کارآموزی بر عملکرد تحصیلی دانشجویان پزشکی در بخشهای اطفال و زنان بیمارستانهای آموزشی دانشگاه علوم پزشکی بیرجند

**مقدمه:** آموزش بالینی بخش مهمی از دوره آموزشی در رشته پزشکی را تشکیل می دهد که در طی آن دانشجویان مهارت برخورد با بیماران و تشخیص و درمان بیماری را پیدا می کنند. در کنار کارآموزی بالینی دروس مرتبط در قالب تئوری ارائه شده تا حداکثر پوشش آموزشی را فراهم آورند. در گذشته دروس تئوری بخش اطفال در دانشگاه علوم پزشکی بیرجند در بعد از ظهر ها و جدا از بخش بالینی ارائه می شدند. با توجه به رویکرد جدید معاونت بالینی دانشکده پزشکی در جهت ادغام دروس تئوری در کارآموزی بالینی از سال گذشته دروس تئوری بخش اطفال همزمان با کارآموزی بالینی در بخش ارائه می گردد. هدف از اجرا این طرح بررسی تاثیر ادغام دروس تئوری در کارآموزی بخش اطفال و زنان بر نمرات پیش کارورزی دانشجویان پزشکی می باشد.

**روش کار:** این مطالعه مداخله ای مورد شاهد دار با رویکرد گذشته نگر بوده و پس از انجام هماهنگی های مقتضی و استخراج نمرات امتحان جامع پیش کارورزی، نمرات ورودی ۸۴ به عنوان گروه کنترل و نمرات ورودی ۸۵ به عنوان گروه مداخله (آموزش ادغام یافته تئوری در بالینی) مورد مقایسه قرار گرفت. داده ها به نرم افزار SPSS 11 وارد شده و آمارهای توصیفی و جداول توزیع فراوانی و آزمون تی مستقل جهت تجزیه و تحلیل داده ها استفاده گردید (سطح معناداری P بیشتر مساوی ۰/۰۵).

**نتایج:** در مجموع ۸۹ نفر در این مطالعه وارد شدند. ۴۰ نفر در گروه شاهد (ورودی ۸۴) و ۴۹ نفر در مورد (ورودی ۸۵) قرار داشتند. میانگین نمره پیش کارورزی در درس کودکان در گروه مورد بالاتر از شاهد بود ولی این اختلاف از لحاظ آماری معنادار نبود. از سوی دیگر نمره دانشجویان گروه مورد در درس زنان به طور معناداری بالاتر از نمره دانشجویان در گروه شاهد بود است ( $p=0.001$ ).

**نتیجه گیری:** نتایج نشان داد که در هر دو درس ادغام یافته میانگین نمره آزمون پیش کارورزی در گروه مداخله بالاتر از گروه مورد بوده که لزوم برنامه ریزی در این جهت را نشان می دهد.

**کلمات کلیدی:** ادغام دروس تئوری در بالین، آموزش پزشکی

### تھیوری کے دروس کا کلینیکل تعلیم کے ساتھ ضم کرنے کے اثرات کا جائزہ۔ یہ اقدام بیرجند یونیورسٹی آف میڈیکل سائنس کے شعبہ اطفال اور شعبہ امراض النساء میں کیا گیا تھا۔

**بیک گراؤنڈ:** کلینیکل تعلیم، میڈیکل کورس کا نہایت اہم شعبہ ہوتا ہے۔ اس کورس میں میڈیکل طلباء کو سمجھایا جاتا ہے کہ بیمار کے ساتھ کس طرح پیش آیا جاتا ہے اور اس کے مرض کی تشخیص کیسے دی جاتی ہے۔ کلینیکل تعلیم کے ہمراہ کچھ دروس بھی رکھے گئے ہیں تاکہ طلباء کو زیادہ سے زیادہ معلومات فراہم کی جاسکیں۔ ماضی میں بیرجند یونیورسٹی آف میڈیکل سائنس میں دوپہر کے بعد کی کلاسوں میں تھیوری کی کلاسیں لگتی تھیں لیکن اس شعبے نے گذشتہ برس سے کلینیکل تعلیم کے ساتھ ساتھ تھیوری کی تعلیم بھی دینا شروع کی ہے۔ اس تحقیق کا مقصد اطفال اور امراض النساء کے شعبوں میں لکچرز اور کلینیکل تعلیم کو ایک ساتھ رکھنے کے اثرات کا جائزہ لینا ہے۔

**روش:** اس تحقیق میں ماضی کے دروس اور نمبروں کا جائزہ لیا گیا تھا۔ دوہزار پانچ اور دوہزار کے طلباء کے نمبروں کا موازنہ کیا گیا اور یہ دیکھا گیا کہ تھیوری کے ساتھ کلینیکل تعلم کے کیا اثرات مرتب ہوتے ہیں۔ ڈیٹا کا ٹی ٹسٹ سے تجزیہ کیا گیا۔

**نتیجے:** اس تحقیق میں مجموعی طور پر نواسی طلباء نے شرکت کی پہلے گروہ کو شاید کے نام سے موسوم کیا گیا۔ دوسرے گروہ میں انچاس طلباء شامل تھے۔ دوسرے گروہ کے نمبر شعبہ اطفال میں پہلے گروہ سے بہتر تھے لیکن اعداد و شمار کے لحاظ سے ان میں کوئی خاص فرق نہیں تھا۔ دوسری طرف سے شعبہ امراض النساء میں پہلے گروہ کے نمبر زیادہ تھے۔

**سفرات:** اس تحقیق کے نتائج سے معلوم ہوتا ہے کہ کلینیکل دروس کے ساتھ تھیوری کا درس مفید واقع ہوتا ہے اور اس سلسلے میں یونیورسٹی کے عہدیداروں کو منصوبہ بندی کرنی چاہیے۔

**کلیدی کلمات:** تھیوری، لکچرز، کلینیکل تعلیم۔

## INTRODUCTION

In today's world, according to the movement toward professionalism in the training of different sciences; the role of universities in the case of training of specialists has become clear. In this manner the considerable role of training in educating responsible and expert forces in the case of health and maintaining and improving the health of society is related to the medical sciences universities. Meanwhile training general physicians, as one of the most important parts of health system of society which is on the basis of health network system the first place of dealing with patients is of prime importance (1).

Since long ago, medical education has been classified in to four levels which are basic sciences (in which students get familiar with basic courses such as anatomy, biochemistry, histology, and etc.), physiopathology (in which students generally get acquainted with the pathology of occurrence of diseases especially internal ones), apprenticeship (as the first level of facing the clinical environment of hospitals for medical students in which the students deal with all diseases [mostly common ones] clinically and on the other hand they study the common ones) and internship (in which the students independently but supervised by a physician or a resident examines a patient and prescribes medicine (2,3,4)). In recent years, a lot of attention have been paid to the merging of theoretical and clinical courses in a way that Shahid Beheshti University as the first university has merged basic sciences, physiopathology, and internship (5). Emerging methods are normally divided in to two groups of vertical and horizontal, in vertical method in the case of an organ (for example respiratory system) basic sciences, physiopathology, physiology, and its diseases are presented together. In the horizontal method the courses of a level (for example basic sciences, histology, and physiology) in the case of a specific organ are presented simultaneously. In the case of horizontal merging the studies have shown that this kind of training facilitates learning (6). Studies have also shown that simultaneous presentation of theoretical and clinical courses lead to the increase of educational interest and motivation among students (7).

In Birjand University of Medical Sciences after about 20 years of performing the traditional method in the case of presenting the courses of medicine, for the first time with the agreement of clinical deputy of medical school and directors and faculty members of pediatrics and gynecology wards, since last year the theoretical courses of these wards have been presented simultaneously with apprenticeship of the wards mentioned and in a way they were merged horizontally. The present study has been planned according to the change made in the presentation of the courses of these two wards and determination of the effectiveness of this step. In this study the score of pre internship exam is used as the educational function of students. Totally the purpose of the present study is to determine the effect of merging the theoretical courses and apprenticeship of pediatrics and gynecology wards on educational function of medical students.

## METHODS

This is an interventional case study. The location was pediatrics and gynecology wards of Vali-Asr educational hospital of Birjand. The students were counted and the score of pre internship of pediatrics and gynecology courses of the entrance year of 1384 and 1385 were recorded in the study. The students of the entrance years of 1384 (as control group) were 40 and the students of 1385 (as case group) were 49, totally there were 89 participants in this study.

The intervention of this study was merging the theoretical and clinical courses which occurred after 20 years of performing the traditional method which was separate and caused educational problems for students, in a way that a student may have been in ward A but participated in the theory class of ward B in the afternoon), this change happened with the agreement of clinical deputy of medical school and directors and faculty members. After holding several meetings and considering the opinions of students it was intended that at first the theoretical courses of gynecology and pediatrics wards were presented pilot and in case of getting positive results this plan was performed in other clinical groups. The presentation method of theoretical courses in case group (students of 1385) was in a way that after finishing the clinical ward (from 8 a.m. to 12 p.m.) students participated in class for 1 hour and 30 minutes. In this way the theoretical courses of pediatrics were presented three times and the courses of gynecology five times in a year (only for the students who were participating in the clinical course of the related ward). In case group (students of entrance of 1384) the theoretical courses of these two wards were presented only once in a year in the afternoons.

In this study after getting the necessary permission and performing the proper coordination with the Education Office the necessary data in the case of the scores of pre internship scores of pediatrics and gynecology of students of 1384 (as the control group with the traditional teaching method) and students of 1385 (as the case group with the new teaching method of merging theoretical and clinical courses) was taken from Evaluation and Education Office. In the next level the demographic data such as average score, gender, and entrance year alongside with the score of pre internship of pediatrics and gynecology courses (separately) was collected by researcher-made questionnaire. For considering ethics in research the scores of pre internship of all students were nameless and after extracting the necessary information the original file of scores was returned to the authorities.

Data was analyzed through SPSS 11; descriptive statistics, frequency distribution tables, and independent t-test.

## RESULTS

Totally there were 89 participants in this study. There were 40 students in control group (entrance year of 1384) and 49 in case group (entrance year of 1385). 58 participants were female and 31 were male. There was not a significant difference between the pre internship score of pediatrics and

gynecology scores of male and female student .Table number one and two shows the necessary information in the case of pre internship exam scores based on gender. The mean score of pre internship in pediatrics course in students of 1384 (control group) was  $14.60 \pm 3.93$  and in students of entrance of 1385 (case) it was  $15.45 \pm 4.11$ ,but this difference was not statistically significant .The score of students of 1385 (case) in gynecology course was meaningfully higher than control group ( $12.61 \pm 2.57$  and  $10.68 \pm 2.80$  with  $p > 0.001$ ). Tables number three and four show the necessary information in the case of pre internship score of pediatrics and gynecology scores based on entrance year.

**DISCUSSION**

Since the educational year of 91-92, on the basis of the new viewpoint of educational deputy of medical school and department of pediatrics and gynecology the theoretical courses were presented simultaneously with internship .This study was conducted with the purpose of determining the effect of this change on the educational function of medical students through comparison of the scores of pre internship exam.

In this study although the scores of pediatrics course in case group, whose training has been eclectic, were higher but this difference has not been significantly meaningful. This can be

because of the fact that the researchers of this study have studied the results of the scores of just one group of students and in case of studying several groups, clearer results would be achieved. Although factors such as little knowledge of students toward this process cannot be ignored as one of the reasons. As Dehghan et al.'s study in the case of studying the opinions of medical students of Yazd University of Medical Sciences showed that in the field of "knowledge of merging theoretical sciences " most of the repliers have evaluated their familiarity as average (43%) and little (41%).About 60% of the examinees have mentioned that the necessity of the merging process in facilitating learning has been average. A considerable percent have expressed the necessity of merging theoretical sciences with clinical issues as average(44.8%).About half of the students have been familiar with the traditional teaching method of theoretical sciences about average and have evaluated the effect of this program on understanding adjacent as low. The results in the field of availability of facilities for merging was in a way that 27.6% of students evaluated the appropriateness of dissection salon and corpse for organ system plan as average but a few believed that facilities were not proper for this plan at all. A lot of students mentioned that accessibility to appropriate books for this plan was low .63% of the students agreed more than average to merge the mentioned courses.40% of the

**Table 1. The Comparison of the Scores of Pre-internship of Pediatrics Based on Gender**

Sig	Std. Error Mean	Std. Deviation	Mean	Number		
T=-0.193 P=0.847	0.49	3.76	15.05	58	Female	Score of Pediatrics Pre Internship
	0.81	4.56	15.23	31	Male	

**Table 2. The Comparison of the Score of Pre Internship of Gynecology Based on Gender**

Sig	Std. Error Mean	Std. Deviation	Mean	Number		
T=-0.705 P=0.483	0.62	3.93	11.59	58	Female	Score of Gynecology Pre Internship
	0.58	4.11	12.03	31	Male	

**Table 3. The Comparison of Pediatrics Pre Internship Score in Case and Control Groups**

	Std. Error Mean	Std. Deviation	Mean	Number		
T=-0.871 P=0.847	0.62	3.93	14.70	40	84 (Control)	Pediatrics Pre Internship Score
	0.58	4.11	15.45	49	85 (Case)	

**Table 4. The Comparison of Pediatrics Score of Case and Control Groups**

	Std. Error Mean	Std. Deviation	Mean	Number		
T=-3.393 P=0.001	0.62	2.80	10.68	40	84 (Control)	Gynecology Pre Internship Score
	0.58	2.57	12.61	49	85 (Case)	

students expressed that the amount of time allocated to the teaching of anatomy has been relatively proper. Finally this study got to the conclusion that students' impression toward the process of horizontal merging of basic sciences courses has been relatively appropriate (6).

On the other hand, this study showed that the scores of students of case group were higher than control group in gynecology. This can originate from students' enthusiasm toward this teaching methodology in the case of women's diseases, although the effect of simultaneous presentation of these topics on increase of comprehension and learning cannot be ignored. Also teaching in small groups has more efficiency (the number of absent reaches the least). In Khazae's study in the case of the effect of merging physiopathology with clinical and para-clinical achievements on viewpoint and interest of medical students toward physiology it was clarified that in the case of interest in participating in this program and standard deviation of students' score increased from  $15.30 \pm 0.25$  before the program to  $17.38 \pm 0.35$  after the program ( $t = -2.06$ ,  $p < 0.05$ ). Also in the field of viewpoint of students toward physiopathology as one of the courses of basic sciences it was shown that mean and standard deviation of the scores changed from  $16.71 \pm 0.25$  before the exam to  $11.30 \pm 0.33$  (after the program) ( $t = -4.24$ ,  $p < 0.05$ ).

Finally this study got to the conclusion that attending the hospital and facing the patients simultaneously with theoretical training can help a lot in increasing the students' internal motivation and improving students' viewpoint toward basic sciences courses especially physiology (7-9). In a review done by Dick et al. in the case of positive effects of and obstacles of vertical merging in teaching and learning of medicine it was determined that such methods 1) increase the cooperation of students, interns, and general physicians, 2) increase instructors' credit in a way that students may encourage some faculty members to teach, 3)

provide a kind of atmosphere in which the students can transfer their knowledge to their instructor and can get feedback, and 4) improve professionalism and enthusiasm of faculty members through involving them in the process of teaching through steps. Also the most important obstacles of performing such plans are 1) limitation of resources (space and infrastructures of information technology), 2) discouragement and tiredness of instructors who are used to the current method, 3) limitation of financial and human resources for keeping on (10). One of the major limitations of conducting this study has been insufficient number of faculty members of gynecology ward (2 people) which according to the surgical matter of this specialty and involvement of faculty members in treating patients, this study burdened more pressure on their shoulders. Another limitation the researchers faced was the time consuming process of getting the scores of pediatrics and gynecology course from the Medical Education Center. In this manner it is recommended that the Medical Education Center sends the scores of all courses to all medical schools. Certainly with considering these obstacles and trying to eliminate them (through increasing faculty members, improving educational infrastructures in hospitals and also allocating sufficient financial resources for educational matters) can improve medical education level in universities of medical sciences through presenting merged courses.

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