

### Evidence Based Medical Education for Teaching First Aids to Medical Students

**Background:** Teaching of theoretical and practical first aids are important courses for medical sciences students. If these courses are taught with Evidence Based Medicine (EBM), they will be learned better by students. The objective of this study was the determination of the effect of evidence based medical education on learning of first aids.

**Methods:** This study had been performed in the planning of educational course, as a cross-sectional study.

The course was in accordance with the Iran's Ministry of Health Curriculum for teaching first Aids to Medical Students. The study was performed in Mashhad University of Medical Sciences in 2011. Medical students randomly divided to two groups. In group 1 First aids was taught in traditional style. The students' score in final exam was compared between 2 study groups.

**Results:** The mean score of theoretical first aids in group 1 was  $18.83 \pm 1.16$ , the minimum was 16.50 and the maximum was 20, in group 2, it was  $19.28 \pm 0.40$ , the minimum was 18.25 and the maximum was 20 with  $t = -1.563$  and  $P = 0.134$  without any significant differences. The mean theoretical first aids score of two groups were not significantly different (group 1:  $18.25 \pm 1.116$  min 16.5 max: 20 vs. group 2:  $19.28 \pm 0.40$  Min: 18.25 Max: 20,  $t = -4.52$   $P < 0.001$ ). The mean grade of practical first aids in group 1 was  $18.88 \pm 0.94$ , the minimum was 17 and the maximum was 20, in group 2 it was  $19.92 \pm 0.23$ , minimum 19 and maximum 20 with  $t = -4.515$  and  $P = 0.001$  with significant differences.

**Conclusion:** Evidence based medical education might be beneficial for the learning of practical and some subject of theoretical first aids.

**Keywords:** Evidence based Medical Education, Theoretical First Aid education, Practical First Aid education, Occupational Health

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### اثرات التعليم الطبي المبني على شواهد تعلم درس الإسعافات الأولية.

**التمهيد و الهدف:** من المعروف أن تعليم درس الإسعافات الأولية بشكل عملي وشفافي ضروري جدا إذا تم تدريس هذا الدرس على أسس التدريس المبني الشواهد قد يكون ذو تأثير أكبر إن الهدف من هذه الدراسة هو تعيين اثرات التعليم الطبي المبني على شواهد تعلم الإسعافات الأولية عند طلاب كلية الصحة.

**أسلوب العمل:** تم كتابة الطرح على اساس البرنامج التعليمي المكتوبات من قبل وزارة الصحة ونظرات المدرسين وتمت هذه الدراسة عبر المظالمه المقطعية على فريقين من طلاب كلية الصحة. تم التعليم الفريقي الاول عبر البرنامج الاعتيادي والفريق الثاني بواسطة أسلوب التعليم المبني على الشواهد وتم تحليل المعلومات عبر برنامج Spss من حيث المعدل وانحراف المعيار و t-test مع ( $p < 0.05$ ).

**النتائج:** كان معدل علامات درس الإسعافات الأولية التي تم القاؤها بشكل تفاقلي في الفريق الأول  $18.83 \pm 1.16$  في اقل مستوى 16.5 وفي اعلى مستوى 20. وفي الفريق الثاني

$19.28 \pm 0.40$  في اقل مستوى 18.25 وفي اعلى مستوى 20 مع  $t = -1.563$  و  $p = 0.134$  كان معدل علامات درس الإسعافات الأولية التي تم القاؤها بشكل عملي في الفريق الاول  $18.88 \pm 0.94$  في المستوى الأدنى 17 وفي الحد الأعلى 20. وفي الفريق الثاني  $19.92 \pm 0.23$  في المستوى الأدنى 19 وفي الحد الأعلى 20 مع  $t = -4.515$  و  $p = 0.001$ .

**الاستنتاج:** ندل هذه الدراسة على أن تدريس درس الإسعافات الأولية العملية وتفاصيها على أسلوب المبني على الشواهد ذو فائده أكبر مقارنة مع الأساليب السالفه.

**الكلمات الرئيسية:** التعليم الطبي المبني على شواهد الإسعافات الأولية السفافية، الإسعافات الأولية العملية، الصحة الحرفية.

### فرست ایڈ میں علمی مثالوں سے میڈیکل تعلیم پر پڑنے والے مفید اثرات .

**بیک گراؤنڈ:** میڈیکل طلباء کے لئے فرست ایڈ کی تعلیم تھیوری اور عملی طریقے سے نہایت اہمیت رکھتی ہے۔ اگر اس موضوع کو عملی شواہد کے ساتھ پڑھایا جائے تو طلباء بہتر طرح سے تعلیم حاصل کرسکتے ہیں۔ اس تحقیق کا هدف میڈیکل تعلیم میں عملی مثالوں کے مفید اثرات کا جائزہ لینا ہے۔

**روش:** وزارت صحت کے ماہرین اور اکیڈمیک کونسل کے اراکین کے تیار کردہ طبی نصاب میں فرست ایڈ کی تھیوری اور عملی روشیں ترتیب دی گئیں اس کے بعد یہ موضوع طلباء کے دو گروہوں کو پڑھایا گیا یہ آزمائشی تعلیم تھی پہلے گروہ کو روایتی طریقے سے پڑھایا گیا اور دوسرے گروہ کو عملی مثالوں کے ساتھ یہ موضوع پڑھایا گیا۔

اس تحقیق کے نتائج کا 5/11 پی ایس ایس سافٹ ویئر سے تجزیہ کیا گیا اسی طرح اسٹیٹسٹریڈ ڈیوی ایشن اور ٹی ٹسٹ سے بھی تجزیہ کیا گیا۔

**سفارشات:** اس روشوں کے باہمی مقابلے سے ظاہر ہوا ہے کہ عملی مثالوں کے ساتھ فرست ایڈ کی تدريس زياده موثر واقع ہوتی ہے اور اس سے طلباء کو زياده فائدہ ہوتا ہے۔

**کلیدی الفاظ:** عملی شواہد، فرست ایڈ، علم طب

### اثرات آموزش پزشکی مبتنی بر شواهد بر یادگیری بهتر درس کمک های اولیه

**زمینه و هدف:** آموزش درس کمک های اولیه به صورت تئوری و عملی برای دانشجویان رشته های علوم پزشکی بسیار با اهمیت است اگر این درس با استفاده از آموزش پزشکی مبتنی بر شواهد تدریس شود بر یادگیری بهتر دانشجویان موثر خواهد بود. هدف اصلی این مطالعه تعیین اثر آموزش پزشکی مبتنی بر شواهد بر یادگیری درس کمک های اولیه دانشجویان بهداشت حرفه ای بود.

**روش:** با استفاده از کوریکولوم مصوب وزارت بهداشت و نظرات اعضای هیات علمی ابتدا طرح دوره کمک های اولیه تئوری و عملی نوشته شد سپس در قالب یک مطالعه مقطعی در دو گروه دانشجویان بهداشت حرفه ای اجرا شد. تدریس درگروه اول طبق روال مرسوم صورت گرفت و برای گروه دوم دروس به روش آموزش پزشکی مبتنی بر شواهد ارائه شد. داده ها در نرم افزار SPSS ۱۱/۵ از نظر میانگین، انحراف معیار و t test با سطح معنی داری  $P < 0.05$  مورد تجزیه و تحلیل قرار گرفت.

**نتایج:** میانگین نمره کمک های اولیه تئوری در گروه اول  $18.83 \pm 1.16$  حداقل 16.5 و حداکثر 20 و در گروه دوم  $19.28 \pm 0.40$  حداقل 18.25 و حداکثر 20.  $t = -1.563$  و  $P = 0.134$  بود.

میانگین نمره کمک های اولیه عملی در گروه اول  $18.88 \pm 0.94$  حداقل 17 و حداکثر 20 و در گروه دوم  $19.92 \pm 0.23$  حداقل 19 و حداکثر 20.  $t = -4.515$  و  $P < 0.001$  بدست آمد.

**نتیجه گیری:** تدریس به روش آموزش پزشکی مبتنی بر شواهد برای درس کمک های اولیه عملی و بیشتر مباحث کمک های اولیه تئوری مفید واقع شد.

**کلمات کلیدی:** آموزش پزشکی مبتنی بر شواهد، کمک های اولیه تئوری، کمک های اولیه عملی، بهداشت حرفه ای

## INTRODUCTION

The most important task in Medical universities is students' education according to the newest and best references. One of the new and beneficial educational methods in medical sciences is evidence based medical education. This method is planned by searching about the evidences in scientific websites and journals (1,2).

Evidence based medicine (EBM) is very useful in clinical medical education specially for medical students. In some studies, this fact had been demonstrated, for example for having a better educational session such as morning report, they divided this educational session in 4 or 5 sections according to evidence based searching. Solving the problem with this method, was easier than before (3-5). One part of this session was making a question about the medical sciences subject and another part was the presentation of searching the result about previous session subject. These results were presented by medical sciences students. First aids is one of the main courses for medical sciences students. First aids is presented in theory and practice, but the use of a new scientific educational method can make it interesting and more useful. If students have the chance to participate in teaching by answering the questions and searching about the subject, they will have better, more perfect learning, easier memorization and fast reaction in the real places.

Davies P. had introduced the evidence based teaching (5). Wolf F.M. had shown the effectiveness of cumulating of evidence based medicine and evidence based education (8). In another study; Belfield C, Thomas H, Bullock A, Eynon R. had demonstrated measuring the effectiveness for best evidence medical education (9). MacLennan A.H, Sturdee D.W. had determined the usefulness of evidence-based labeling for some medicine (10).

In some studies educational standards had been emphasized, the main items of these standards are curriculum, course plans and educational methods (11,12). In the curriculum of occupational health real places such as work places, factories and industries had been mentioned (13). By reviewing the curriculum and designing new course plans, professors can use evidence based education in methods of teaching in the special part of course plans forms (14-16). In another study, the effect of evidence based medicine in primary care by family physicians had been demonstrated (17).

Teaching of theoretical and practical first aids is important for medical sciences students. If these courses are taught practically and properly, they will be learned better by students. Teaching with new educational methods such as evidence based medical education can help better learning (18).

The objective of this study was determining the effect of evidence based medical education on learning first aids.

## METHODS

This study has been performed as a cross-sectional study from 1389 solar year to 1390 on occupational health students. Group 1 included 18 students and group 2, 24

students. Course plans had been written according to the curriculum of Health Ministry website.

For group 2, the teaching of theoretical and practical first aids was according to EBM but not for group 1. According to these, both groups had theoretical and practical first aids from 8 to 10 and 10 to 12 in a day. Each chapter had three parts theoretical, practical, and evidence based medical education by using the educational and scientific websites and journals. A question was asked from the students about the subject and one or two students searched for the answer for the next session. At the beginning of the next session; the students who had searched about the subject spoke what she or he had found in the related journals and websites, such as Health and Safety Executive, Occupational Safety and Health Administration, International Labor Organization (19-21).

Session one: primary care, Session two: air ways, Session three: artificial breath, Session four: chest compression, Session five: control of bleeding, Session six: fracture, Session seven: foreign body, Session eight: burn with fire, Session nine: burn with chemicals, Session ten: heat and cold. Each session had questions asked from students and discussions held among them during the classes from and also a quiz was taken at the end of the class.

The final Exam of the two groups were at the same level, these tests were prepared by professors opinions for correction and validity and have a pilot study with 0.85 correlation for reliability in a sample of students.

The inclusion criterion was entering university in the educational year of 1389\_90 in the field of occupational health and exclusion criteria were students from other entrance years or other fields.

Data had been gathered in SPSS 11.5 and analyzed for the calculation of means, standard deviation, t-test and  $P < 0.05$ .

In research ethics; author got oral satisfaction from participants and told that cumulative data has been used, without entioning the of the students.

## RESULTS

The total grade of theoretical first aids was  $18.83 \pm 1.16$ , (min: 16.5 Max: 20) in group 1 and  $19.28 \pm 0.40$  (Min: 18.25 Max: 20) in group 2 with no significant difference ( $t < 0.05$ ).

The total grade of practical first aids was  $18.88 \pm 0.94$  (Min: 17 max: 20) in group 1 and  $19.92 \pm 0.23$  (Min: 19 Max: 20) in group 2. They were significantly different ( $t = -4.515$ ,  $P = 0.001$ ).

Table 1 shows the comparison of grades in theoretical first aids between the two groups.

Table 2 shows the comparison of grades in practical first aids between the two groups.

## DISCUSSION

According to the results; the learning levels had been promoted in teaching with evidenced based medical education specially for practical first aids with significant difference.

In group 2 of theoretical First Aids, the grades of Artificial Breath, Fracture, Burn with Chemicals were significantly higher more than group 1.

**Table 1: The comparison of grades in different subjects of theoretical first aids between the two groups (P<0.05)**

subject	group 1	group 2		sig
Primary care	1.86±0.23	1.98±0.10	2.054-t:	P:0.052
Air ways	1.88±0.21	1.97±0.15	t:-1.383	P:0.177
Artificial breath	1.75±0.30	1.97±0.10	t:-2.890	P:0.009*
Chest compression	1.79±0.36	1.97±0.15	1.951- t:	P:0.064
Control of bleeding	1.69±0.38	1.88±0.29	t:-1.696	P:0.100
Fracture	1.79±0.32	1.98±0.10	t:-2.388	P:0.027*
Foreign body	1.83±0.28	1.97±0.10	1.937 - t:	P:0.066
Burn with fire	1.87±0.27	1.94±0.16	t:-1.123	P:0.268
Burn with chemicals	0.96±0.12	1.82±0.25	2.116- t:	P:0.045*
Heat and cold	1.88±0.21	1.97±0.09	t:-1.585	P:0.128
Significant P Value*				

**Table 2 –The comparison of grades in different subjects of practical first aids between the two groups**

subject	group 1	in group 2		Sig
Primary care	1.66±0.38	2.00±0	t:9.220-	P:0.001*
Air ways	1.69±0.51	2.00±0	t:-2.500	P:0.023*
Artificial breath	1.63±0.47	1.98±0.10	t:-2.974	P:0.008*
Chest compression	1.61±0.50	2.00±0	t:3.289-	P:0.004*
Control of bleeding	1.52±0.49	1.94±0.16	t:-3.372	P:0.003*
Fracture	1.62±0.48	2.00±0	t:-3.267	P:0.005*
Foreign body	1.71±0.43	2.00±0	t:2.808-	P:0.012*
Burn with fire	1.72±0.46	1.95±0.17	t:-1.994	P:0.060
Burn with chemicals	1.66±0.45	2.00±0	t:3.117-	P:0.006*
Heat and cold	1.74±0.43	2.00±0	t:2.505-	P:0.023
* Significant P Value				

In group 2 of practical First Aids ,the grades of Primary Care, Air ways, Artificial Breath, Cardiac Compression, Control of Bleeding, Fracture, Foreign Body, Burn with Chemicals, Heat and Cold were significantly higher than group 1.

In group 2 the grades of other sections of theoretical First Aids and the grades of other chapters of practical First Aids were better than group 1 but did not have any significant differences.

According to the results the grade of practical first aids and many sections of theoretical course had been increased with the evidence based medical education, the same as the results of the study on students' learning with the use of this method.(4,17)

Evidence based medicine is useful in clinical medical education specially for medical students. In some studies, EBM have been successfully used in holding educational sessions such as journal clubs and morning reports (1,4,5). Evidence based medicine (17) and evidence based care had positive effects on perfection and updating clinical care . The course of first aids is one of the important courses for medical sciences students. First aids in working place is presented in theory and practice for occupational health students and by the use of evidence based medicine education it can become more beneficial. In this method students participate by searching the subject(6-8), therefore they will have a better comprehension of the subject and learn more perfectly (9,10).

Also there are studies with the same results such as ours ; Bligh J. and Brownell A. had shown the importance of evidence in medical education(6). Mennin S.P and MCGrew M.C. had demonstrated the effectiveness of synergy for teaching and learning with evidence medical education (7). According to educational standards, the main items in these standards are curriculum, course plans and educational methods (11,12).

Innovation in teaching methods is important in medical sciences education. According to the previous studies this work can elevate the learning. Schools may need workshops for introducing these methods to faculty members.

By reviewing the course plans, university professors may supply the evidence based education in methods of teaching (14-16) but it seems that introduction of the new and related references must be and advanced search strategies necessarily introduced to educators (17,18).

In this study, the students were perfectly satisfied with this method. They could participate and be active in classes and had experience in searching in medical sciences websites

and journals. For example first aids in work places from occupational health and medicine sites such as Health and Safety Executive, Occupational Safety and Health Administration , International Labor Organization (19-21).

This study had a few limitations; the number of students and two entrance years of the university, lack of searching in journals and Internet. Another study is recommended with more students , from one entrance exam year, and the use of new educational journals and scientific websites.

### Conclusion

Evidence based care education was good for the learning of practical and many sections of theoretical first aids. In this study was recommended the evidence based medicine was recommended for teaching First Aids.

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