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Community Oriented Medical Education for Learning of Pathobiology

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Abstract

Background: According to the needs of health education, community oriented medical education was recommended. Health students must learn more about prevalent diseases in their communities.
Objectives: To introduce community oriented medical sciences education to students learning pathobiology and its effects.
Materials and Methods: This study was a quasi-experimental study conducted using the revised curriculum. The pathobiology course was taught with attention to community oriented medical education in group A. The teacher focused on more prominent and prevalent infectious diseases in Khorasan Razavi province, but regular subjects were taught in group B. Student grades or data was then compared and analyzed by SPSS 16, mean, standard deviation, and a t-test with $P<0.05$ for comparison, and significant levels were determined.
Results: The total grade of pathobiology in group A (with community oriented medical education) was 17.58 ± 1.28. In group B (regular education), the total grade was 17.02 ± 1.75 with $t = 1.292$ and $P = 0.202$. There were no significant differences. The specific lessons, such as infection of mycobacterium tuberculosis and gastro intestinal infections, were promoted. Mean grades were higher in group A than B.
Conclusions: According to the grades, community oriented medical education was helpful in teaching some specific chapters of pathobiology, such as more prominent and prevalent infectious diseases.

Keywords: Community Oriented Medical Education, Pathobiology, Medical Education, Pathobiology, Medical Education, Occupational Health

1. Background

New educational strategies are an important part of improving education, especially in medical science fields. Teachers recommended new strategies for student education, such as community oriented medical education or community based medical education (1-3).

According to previous studies about community oriented medical education, the main subject of education was necessity of having the modified curriculum. In recent years, this was being done in some educational fields. This educational approach is useful for demonstrating the social responsibility of the medical sciences. Some of the disorders and disease are more prominent in the specific area.

According to the curriculum of health ministry, occupational health has general and specific courses. Pathobiology is one of the specific courses (4, 5).

In this course, the students were taught some general and some specific items in that area. The general items included definition, immunology, bacteria, viruses, parasites, fungal, and others.

The special items included pulmonary infections and immunology, mycobacterium tuberculosis, other pulmonary infections, dermal infections, fungal infections, gastrointestinal infections, blood infections, and vaccination.

According to community oriented medical education, educational plans must be written according to community health needs. Some infections, such as mycobacterium tuberculosis and gastrointestinal infections, were more prevalent in certain areas. Thus, the promotion of medical sciences team knowledge is necessary (6-8). Some studies focused on the use of community oriented medical education for important educational objectives. For example, Helmich et al. demonstrated the early clinical experience that had a positive effect on medical students' emotional development (9).

Shimizu et al. showed the effect of a hospital educational environment on the performance of residents in medicine education (10). There was some research about the curriculum and educational sessions, but this must be studied according to the community needs, such as vaccination (11-13). McCaffrey et al. concentrated on educating the community to diagnosis and treat Alzheimer's disease (14). Another study emphasized the network of medical

sciences education (15, 16), and others focused on designing a suitable curriculum for community oriented medical education(17, 18).

Eftekhari et al. demonstrated the advantages of community based health programs in medical education (19). Henschen et al. showed the effect of a patient-centered medical home in medical education (20).

These studies showed the effectiveness of community oriented medical education in medical student training, but there were only a few studies that targeted education.

In this study, the author tries to introduce community oriented medical sciences education in occupational health to students learning pathobiology and its effects.

2. Objectives

The objective is to introduce community oriented medical sciences education to students learning pathobiology and its effects.

3. Materials and Methods

Research was conducted as a quasi-experimental study from 2013 - 2014 on occupational health students. Group A and group B each included 25 students. Course plans of pathobiology were written according to the curriculum. This was revised with a focus on community oriented medical education in the educational department. Group A and group B were allocated according to their entrance years.

A pathobiology course was taught with community oriented medical education in group A, focusing on more prevalent and important infectious diseases in Khorasan Razavi. Regular subjects were taught in group B.

The pathobiology course was taught with lectures and PowerPoint presentations. In group A, lessons were taught with a focus on community oriented medical education and discussed prevalent and more prominent cases of infectious diseases in Khorasan Razavi province. Regular subjects were taught in group B.

The pathobiology curriculum had some general and some specific chapters. The general chapters covered definitions, immunology, bacteria, viruses, parasites, fungal, and others.

Specific chapters discussed pulmonary infections and immunology, mycobacterium tuberculosis, other respiratory infections, dermal infections, fungal infections, gastrointestinal infections, blood infections, and vaccination. Community oriented medical education emphasized prevalent infections in the society, such as gastrointestinal infections, respiratory infections, and more important items like lung tuberculosis.

The two groups were examined at the same level and prepared by similar teachers to ensure accuracy, and there was a pilot study with a correlation coefficient of 0.89 to verify reliability in a sample of occupational health students.

The inclusion criteria required occupational health students enroll between 2013 and 2014. Students studying another field and those who entered the university with a different entrance year were excluded.

Data was gathered in SPSS 16 and analyzed for calculation. Standard deviation, Kruskal-Wallis tests to examine normality, pair t-tests for before and after results, and statistical significance t-tests were determined for comparison.

For research ethics, the researcher got verbal approval from participants and announced that cumulative data was used. The names of the students were kept confidential.

4. Results

The total grade of pathobiology in group A (with community oriented medical education) was 17.58 $\pm$ 1.28, and in group B (regular education), the total grade was 17.02 $\pm$ 1.75 with t = 1.292 and P = 0.202. There were no significant differences. The specific lessons, such as infection of mycobacterium tuberculosis and gastro intestinal infections, were promoted, and mean grades were higher in group A than B. Before the tests, was zero in both of them. With pair t-tests, there were significant differences between the two groups.

Table 1 shows the comparison of grades in general chapters of pathobiology between the two groups.

Table 2 shows the comparison of grades in specific chapters of pathobiology between the two groups.

Table 3 shows the odds ratio of wrong answers in pathobiology chapters between the two groups.

5. Discussion

According to the results, the total grade was better in group A with community oriented medical education, but it was not significant. Some chapters, such as mycobacterium tuberculosis and gastrointestinal infections, were better in group A and had significant differences.

Because mycobacterium tuberculosis and gastrointestinal infections were more prominent than the other infectious diseases in that area, health students must thoroughly learn these items. In this study, they received higher grades in these specific chapters of pathobiology.

In group A, the risks of giving the wrong answers in general and specific chapters of pathobiology were less

Table 1. The Comparison of Grades in General Chapters of Pathobiology Between the Two Groups ($P < 0.05$)[a]

Number	Subject	Group A	Group B	T Statistics	P Value
1	Definitions	0.87 ± 0.11	0.96 ± 0.07	-3.515	0.001
2	Immunology	0.96 ± 0.10	0.97 ± 0.06	-0.559	0.579
3	Bacteria	0.94 ± 0.12	0.99 ± 0.04	-1.786	0.08
4	Viruses	0.98 ± 0.06	1.00 ± 0	-1.281	0.206
5	Parasites	1.00 ± 0	0.99 ± 0.04	1.000	0.322
6	Fungal	1.00 ± 0	0.99 ± 0.04	1.000	0.322
7	Others	1.00 ± 0	0.99 ± 0.04	1.000	0.322
8	Total	4.72 ± 0.23	4.80 ± 0.31	-1.040	0.304

[a]Values are expressed as $\mu \pm SD$.

Table 2. The Comparison of Grades in Specific Chapters of Pathobiology Between the Two Groups ($P < 0.05$)[a]

Number	Subject	Group A	Group B	T Statistics	P Value
1	Pulmonary infections	0.40 ± 0.50	0.56 ± 0.50	-1.124	0.267
2	TB	0.96 ± 0.20	0.76 ± 0.43	2.085	0.042
3	Other pulmonary infections	1.00 ± 0	1.00 ± 0	-	-
4	Dermal infections	0.92±0.27	1.00±0	-1.445	0.155
5	Fungal infections	0.96 ± 0.20	1.00 ± 0	-1.000	0.322
6	GI infections	0.30 ± 0.45	0.06 ± 0.21	2.369	0.022
7	Blood infections	0.64 ± 0.48	0.48 ± 0.50	1.131	0.264
8	Vaccination	0.46 ± 0.49	0.60 ± 0.50	-0.992	0.326
9	Total	12.86 ± 1.28	12.34 ± 1.60	1.264	0.212

[a]Values are expressed as $\mu \pm SD$.

than group B. The odds ratios were protective in some specific chapters, such as gastrointestinal and tuberculosis. This means the risk of giving a wrong answer in group A for specific lessons was low. This might be related to new educational strategies.

In group B, this fact had not harmony, but there was a higher occurrence of wrong answers. The specific chapters included pulmonary infections and immunology, mycobacterium tuberculosis, other pulmonary infections, dermal infections, fungal infections, gastrointestinal infections, blood infections, and vaccination. Infections with mycobacterium tuberculosis are prominent, and gastrointestinal infections are prevalent in this area.

In this study, the researcher conducted a pair t-test to assess participant knowledge before and after classes. These were significant for both groups. Both educational methods were useful, but community oriented medical education was more effective than regular education.

Health ministry curriculums have emphasized community oriented medical education in recent years. Many studies have shown the positive effects of community oriented medical education on medical student learning, but few have analyzed health students (2, 3).

One study demonstrated that professional health education was related to social accountability of education. In this study, the author attempted to prove the effectiveness of community oriented medical education in health fields and demonstrate its effects.

Scientists in another study evaluated student emotional response in early clinical experiences. It showed that community oriented education could be affected on their minds (9). In this study, the researcher demonstrated the effect of this method on the ability to learn related lessons. They will need to know about these diseases in the future.

Researchers showed that, according to the educational culture, community oriented health programs had advantages (19). Some studies demonstrated the applications of community oriented medical education (21). In this study,

Table 3. The Odds Ratio of Wrong Answer in Pathobiology Chapters Between the Two Groups ($P < 0.05$)

Number	Wrong Answers	Group A OR(CI)	Group B OR(CI)
1	Definitions	4.84 (0.94 - 12.08)	0.23 (0.10 - 1.51)
2	Immunology	1.31 (0.70 - 2.44)	0.71 (0.28 - 1.83)
3	Bacteria	1.94 (0.23 - 3.04)	0.25 (0.04 - 1.60)
4	Viruses	2.07 (0.55 - 2.80)	-
5	Parasite	-	2.05 (1.53 - 2.71)
6	Fungal	-	2.04 (1.53 - 2.71)
7	Others	-	2.03 (1.53 - 2.71)
8	Pulmonary infection	1.38 (0.77 - 2.46)	0.72 (0.41 - 1.27)
9	TB	0.25 (0.17 - 0.60)	1.94 (1.23 - 3.04)
10	Other respiratory infections	-	-
11	Skin infections	0.32 (0.20 - 1.51)	-
12	Fungal infections	2.04 (0.53 - 2.71)	-
13	GI infections	0.49 (0.31 - 0.75)	4.57 (1.71 - 29.13)
14	Blood infections	0.71 (0.39 - 1.29)	1.37 (0.79 - 2.39)
15	Vaccination	1.37 (0.78 - 2.41)	0.72 (0.40 - 1.28)

the author showed the same benefits.

In another study, the researcher demonstrated the effect of curriculum revision on teaching and learning (2, 3). In this study, the curriculum was revised by the educational department, positively effecting student learning.

Overall, community based medical education had an important effect on students learning pathobiology. This study had some limitations; for example, the number of students in the two entrance years was low. Another study is recommended with more students in the same entrance year, and random allocation should be done.

This study recommends that community based medical education may be useful and effective for students in health fields.

5.1. Conclusions

According to the grades, community oriented medical education was helpful in learning some specific chapters of pathobiology, such as more prominent and prevalent infectious diseases. Curriculum revision with attention to community oriented medical education could be useful.

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