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Original Research

The Effects of Social Accountability in Medical Education on the Knowledge of Occupational Health Personnel working in the Cement Industry in Iran

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Abstract

Introduction: Social accountability in medical education is an essential part of the health education process. According to the current needs in health education, social accountability in medical education is useful for increasing the overall knowledge of students, helping them to reach their maximum competency. The objective of this study was to determine the effects of social accountability medical sciences education on the knowledge of occupational health personnel working in the cement field.

Methods: This study was a semi-experimental study that was conducted by using the curriculum of the Ministry of Health. The occupational health course was taught as a social accountability in medical education course in order to increase knowledge in occupational health personnel of the cement industries, and then the grades of those personnel were analyzed by SPSS 11.5. Mean, standard deviation, and a t-test with $P<0.05$ were calculated. The test incorporated aspects of students' knowledge, attitude and practice.

Results: The total grade of the occupational health workers at the pre-test (before the accompanying workshops) was 4.39±2.10, and at the post-test (after the workshops), it was 17.52±3.28 with $t = -14.274$ and $P<0.001$ had significant differences. The grades in all of the educational items were statistically significant after the workshops.

Conclusion: According to the grades, the social accountability in medical education course had a positive effect on the knowledge of the occupational health personnel of cement industries.

Introduction

Educational methods have importance in creating innovative practices in medical education. The educational institute has recommended the use of new methods for the education of students, including a Social accountability in medical educationcourse.[1-3] According to scientific studies in the health fields, Social accountability in medical educationneeds to be added to a modified curriculum, because it is an important subject of medical sciences education.[1-3]

This educational approach that includes Social accountability in medical educationis useful for increasing the knowledge and competency of students working in the health industries.[4] According to the occupational hygiene curriculum, occupational health is one of the most important elements of education for related personnel in those industries.[5,6] The main concerns for occupational health care workers are overall health, physical hazards, chemical factors, safety, ergonomy and the demands of shift work.

Educational plans for occupational healthcare workers must be written according to social accountability standards. For example, in the cement industries, chemicals are an essential part of the field, and important information about ways of controlling exposure is necessary. There were some studies completed which discussed the effects of social accountability on medical education and increasing the knowledge and competency of students in medical sciences.

N. Rostamigooran et al. showed the health system vision of Iran in 2025 with a special significance tied to social accountability.[7] This study demonstrated the importance of social accountability in education. C. Boelen et al. studied the social accountability of medical schools and its measurable indicators.[8] Miles et al. demonstrated the importance of physician professionalism and accountability, and the role of collaborative improvement networks.[9] These studies emphasized the accountability of the educational program on creating better-educated

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workers ready for the health field.

Magar et al. demonstrated the healthcare system benefits through partnership with academic institutions for social accountability.[10] Mitchell et al. showed that global health training and postgraduate medical education were important for greater educational integration.[11] Strasser et al. studied about how it is possible to transform professional health education through social accountability[12] and showed the effect of this item on increasing the knowledge of healthcare workers. Kruse showed what social accountability in medical education looks like[13] and its benefits. Biggs demonstrated the social responsibilities of medical colleges in Pakistan.[14]

In this study, the author researched in order to find out the effects of social accountability in medical education on the knowledge of occupational health personnel, with the objective to measure the effects of that education.

Materials and Methods

This study was performed as a semi-experimental study from 2010-2012 on 120 occupational health workers of cement industries. The course plan for the social accountability workshops was written according to the curriculum.

Occupational health courses were taught with lectures and Powerpoint presentations, group work and discussion. The lessons were taught using aspects of social accountability in medical education, with weighted significance on the knowledge and competency of the occupational health personnel.

The main occupational health items were overall health, physical hazards, chemical factors, safety, ergonomy and the demands of shift work. The health aspects included health of the person, health definitions, health hazards, occupational health center personnel, and occupational health center tasks. Physical hazards were control of noise, control of vibrations, heat disorders and coldness disorders. Chemical hazards included the entrance of chemicals, which chemicals were most prevalent, least prevalent, control of chemicals (especially cement) and personal protective devices. Safety included occupational accidents, prevalence of accidents, firing protection and injuries in the cement industry.

The category of ergonomy included the definition, muscle function, lifting index and way of lifting. Shift work included the definition, related factors, related diseases to shift work and high-risk persons. The tests for these categories were six sections over knowledge, attitude and practice aspects for each person.

Questions on the tests were essay, multiple choice, interview and objective structured practical examinations. These questions were tested for validity by professors and for reliability with an 85% correlation coefficient.

These tests were taken by the subjects two times, before and after the workshops. The inclusion and exclusion criteria were the occupational health personnel who had not participated in previous classes and workshops, and those who were not previously studying occupational health.

Data were gathered in SPSS 11.5 and analyzed for calculation of mean, standard deviation, t-test and $p<0.05$. In order to uphold research ethics, the researcher got oral consent from participants and told them that cumulative data were used and the names of the personnel were kept confidential.

Results

The total grade of occupational health in pretest (before the workshops) was 4.39±2.10, and in the posttest (after the workshops), it was 17.52±3.28with $t = -14.274$ and $p<0.001$ had significant differences. The grades of educational items were significant after the workshops.

Table 1 showed the comparison of grades in health, physical and chemical hazards chapters between the two groups.

Table 2 showed the comparison of grades in safety, ergonomy and shift work chapters between the two groups.

Discussion

The total grade of the occupational healthcare workers in the pretest (before the workshops) was much higher in the posttest (after the workshops) and had significant differences. All of the educational items showed improvement on the tests after the workshops.

Because of the necessity of the educational items on our tests to occupational health workers in cement industry, the teacher has tried to promote overall knowledge and competency with the use of social accountability in medical education.

After the workshops, all of the items tested higher by the participants than on the pretest; these items were: health, physical hazards, chemical hazards, safety, ergonomy and shift work.

In recent years, health ministry curriculums have emphasized on social accountability in medical education, and on the education of personnel who work in an occupational health center on various aspects of health. Many of these workers were educated in a university, but the social accountability coursework of each industry might be different. This education must be done in an industry setting.

Yardley et al. completed research about early experience in medical education;[15] This study demonstrated the effects of social accountability items on basic medical sciences education.

Galukande et al. studied how social accountability could be useful for bettering the education of students.[16] Yore et al. showed the necessity of socially accountable medical education,[17] which confirmed the results of this article.

Gorry researched socially-accountable medical education and found that it can make a difference in education.[18] Kumar demonstrated the necessity of integrating medical education with social needs.[19] Murray RB et al. showed that medical schools were as agents of change in socially accountable medical education.[20] In the present paper, the author demonstrated the usefulness of socially accountable medical education in industry.

Table 1. The comparison of grades in health, physical and chemical hazards chapters between the two groups. (p<0.05)

Subject	pretest μ±SD	posttest μ±SD	Paired t-test	P value
Healthy person	0.386±0.34	0.97±0.07	-6.094	<0.001
Health	0.363±0.32	0.931±0.16	-6.829	<0.001
Occupational hazards	0.363±0.323	0.840±0.25	-5.573	<0.001
Occupational health center personnel	0.318±0.297	0.886±0.23	-7.470	<0.001
Occupational health center tasks	0.340±0.32	0.886±0.233	-6.708	<0.001
Control of noise	0.250±0.32	0.857±0.19	-5.050	0.002
Control of vibration	0.250±0.322	0.857±0.196	-5.050	0.002
Heat disorders	0.285±0.30	0.785±0.36	-3.464	0.013
Coldness disorders	0.250±0.32	0.785±0.365	-3.603	0.011
Entering way of chemicals	0.166±0.325	0.979±0.07	-7.916	<0.001
Way more prevalent	0.041±0.14	0.979±0.072	-15.000	<0.001
Way less prevalent	0.125±0.31	0.979±0.072	-8.583	<0.001
Control of chemicals	0.041±0.14	0.854±0.31	-7.916	<0.001
Personal protective equipment	0.083±0.194	0.666±0.430	-4.690	0.001

Table 2. The comparison of grades in safety, ergonomy and shift work chapters between the two groups. (p<0.05)

Subject	pretest μ±SD	posttest μ±SD	Paired t-test	P value
Occupational accident	0.437±0.33	1.00±0	-5.745	<0.001
Prevalence of accident	0.250±0.45	0.916±0.28	-4.690	0.001
Firing protection	0.291±0.20	0.895±0.24	-5800	<0.001
Occupational injuries	0.208±0.27	1.00±0	-9.841	<0.001
Ergonomy	0.104±0.24	0.95±0.09	-11.881	<0.001
Muscle function	0.020±0.07	0.833±0.28	-9.892	<0.001
Lifting index	0.125±0.31	1.00±0	-9.753	<0.001
Way of lifting	0.125±0.31	0.958±0.09	-9.381	<0.001
Shift work	0.00±0	0.888±0.13	-20.239	<0.001
Factors of shift work	0.00±0	0.861±0.33	-7.750	<0.001
Related diseases	0.00±0	0.527±0.36	-4.359	0.002
High risk persons	0.00±0	0.416±0.33	-3.780	0.005

Overall, social accountability in medical education had an important effect on personnel, students' knowledge and learning within an occupational health course.

This study had some limitations; for one, the number of personnel who were invited to participate in the workshops was low. Another study is recommended with more personnel.

This study recommends that social accountability in medical educationis effective, and should be part of students' learning processes.

Conclusion

According to the subjects' grades on the posttests, the social accountability in medical educationhad a positive effect on increasing the knowledge of occupational health personnel in the cement industries.

Competing interests

The author declares no conflict of interest.

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