

## Original Research Article

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# Strengthening public health education of undergraduate medical students through early primary healthcare services' association

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## ABSTRACT

**Background:** The World Health Organization consultation paper on the teaching of community medicine 2010 highlighted the need to change the focus from didactic lectures to more interactive teaching learning methods. The objective of this study was detection of difference between didactic and early training at primary healthcare centers at different levels of knowledge, acquired skills, and attitudes of undergraduate medical students.

**Methods:** This interventional study included students of academic year 2017-18 had summer training course in public health department as a part of the Faculty aim of early clinical exposure of preclinical students (i.e., first three grades) (n=25). The public health training course focuses mainly on raising students' skills of basic primary health care services. Comparable group of 75 students from the regular system were randomly selected. This intervention aimed to design new educational process and determine its outcomes evaluating Learner's knowledge, their attitudes, and gained skilled.

**Results:** The interventional group had positive attitudes ranging from 59-93% for different topics given. The conventional methods group had statistically insignificant higher scores in the summative assessment  $20.5 \pm 2.2$  versus  $19.6 \pm 3.1$  of the interventional group (p value 0.11). The acquired skills of the interventional group ranged from  $9.3 \pm 2.1$  to  $14.9 \pm 1.5$ .

**Conclusions:** Early field contact gained higher positive attitude among medical students and it showed high skill acquisition. It is recommended to be used more frequently in public health practical teaching for undergraduate students.

**Keywords:** Public health education, Medical students, Early clinical exposure, Integrated teaching

## INTRODUCTION

Undergraduate teaching in community medicine is conducted through mixing both large groups teaching as in conduction of lectures and small group teaching in practical field work.<sup>1</sup>

The World Health Organization consultation paper on the teaching of community medicine highlighted the need to change the focus from didactic lectures to more interactive teaching learning methods that are student centered, integration, community-based, and problem

based learning.<sup>2,3</sup> Most of the teaching in public health uses standard lectures within the academic institution with limited exploration to their communities. Public health education should be a progressive process, student-centered, problem-based, and evidence-based and it should be focusing on the needs of the community.<sup>3</sup> The role of the public health professional should be to help the student to raise the skills through community based experiential learning of public health competencies involving allocated time for practice, feedback and projections in their future role as primary care physicians. Both the formal and informal ways should be encouraged. Innovative learning modalities should be employed,

depending upon the latest technologies in both education and communication. Both the clinicians and public health professionals have limited interaction and collaboration in teaching of public health contents in the current curricula. The community medicine departments of medical schools must be proactive in integrated teaching with clinical fields.<sup>5</sup> The community medicine and public health departments should also integrate themselves in delivering the services in their teaching hospitals and also in the primary health care settings.<sup>5,6</sup>

Isolation of medical school's function without any health service responsibility is now considered a point of weakness of medical education. And it is highly recommended that all medical schools must have a close collaboration with district health systems in order to provide exposure to public health practices to the students and faculty.<sup>7</sup> Medical schools can involve public health specialists working with the health system in the teaching and training of undergraduate medical students, both in school and in the field.<sup>8,9</sup>

#### **Rational of the study**

Undergraduate medical students have limited knowledge about their community needs in addition they gain limited skills during didactic teaching so early association with the community services mainly primary healthcare will improve their knowledge, skills and attitude.

#### **Study question**

Does early association, of undergraduate medical students, with primary healthcare services affect their knowledge and public health practical skills?

#### **Study objectives**

The present study aimed to detect the difference between didactic and integrated teaching methods of learning on undergraduate medical students of Ksar Alainy medical school on both the knowledge gained and the acquired skills. In addition, assessing the student's attitudes towards the integrated module of teaching.

#### **METHODS**

##### **Study setting**

At the Cairo University Faculty of Medicine, the undergraduate medical program is of a 6 years duration wherein the first three years, pre-clinical, are spent on classroom learning and the last three years, clinical, are spent gaining practical experience in the clinical setting. Public health and community medicine are currently delivered during the fourth academic year. The course is conducted through-out eight weeks. The field visits were for a primary health care center and rural community one visit for each.

The Faculty of Medicine currently administers summer training course for the pre-clinical students including either surgical outpatient clinic, emergency care, specialized internal or medicine outpatient clinics.

The academic year 2017-18 we presented a summer training course which was approved by the faculty administration after approval, the training course was circulated by emails for all the preclinical medical students. 25 students chose our course. The study was done by interventional method in Ksar-Al Ainy medical students.

**Table 1: Outlines the course topics which was conducted.**

Topics	Interventional group	Didactic group
Primary health care services	Pre visit session	Grand lecture covering the key elements of PHC
	Brain storming about expected health problems in the rural community and what are the expected services going to be provided there	Pre visit session reviewing the PHC evaluation check list
	Field visit to a rural unit exploring all services provided and detecting the most prevalent health related problems	Field visit to an urban health care center Post visit check list evaluation
Health education and communication	Tutorial session and team work formulating health education messages	Tutorial and role play
	Practical field visit to the rural health unit delivering these messages	
Medical records	Tutorial session	Tutorial session
	Field visit to Ksar Alainy hospital medical records department	
Infection control	Tutorial session	Tutorial session
	Field visit to one surgical and internal medicine department	

### Sample size and technique

Intervention group (group A) included all students who chose the public health course (n=25). While systematic random sampling was applied to select 75 students representing the main stream students as a control group (group B).

### Course details

Differences between the course details of the interventional group in comparison with the regular (didactic group), were illustrated in Table 1.

### Sessions plans

For the didactic students the tutorial sessions were presented by a staff member using power point presentation. The field visit was conducted guided by the check list presented in the students' practical book.

For the interventional group the tutorial sessions started by brain storming concerning the presented topic then group discussion of scientific references distributed in the form of hard copies related to the same topic, then they discuss it with the session facilitator. In addition, during their field visits students had the opportunity to practice related skills after training by the PHC member practicing these skills.

### Data collection tool

For assessing the scientific knowledge gained by the student's summative assessment was conducted after the tutorial classes it evaluated each topic with maximum score of 8 marks per each. While attitude was evaluated through self-administered questionnaire assessing their attitude towards individual topics each had 5 questions with Likert scale from (0-5) scores of 20 and more were considered positive attitudes. Skills conducted by each participant in the interventional group were evaluated against predetermined criteria checked by the instructor summed score per each was 15.

### Statistical analysis

Statistical analysis was done using SPSS for Windows, Version 21.0. Chicago, SPSS Inc. Independent samples student's t-test was used in compare mean scores of both the knowledge gained- second level in evaluation and performance skills acquired.  $P \leq 0.05$  are considered of statistical significance.

Students' performance of each skill in the course was evaluated each has maximum score of 25. Students attitude towards the introduced course was scaled in a Likert scale ranged from zero totally against to five totally agree with the introduced course. Scales of three and more were considered positive attitude ones.

### Ethics approval

This program was part of the faculty plan for strengthening the medical education through summer training programs, it was approved by the faculty administration prior to implementation. All participants gave consent before joining the study.

## RESULTS

A total of 100 students were included in the study. Of the one hundred students, twenty-five and seventy-five had undergone integrated teaching method (group A) and conventional teaching methods (group B), respectively. Sixty-seven students were females. There was statistically significant difference between two groups in terms of mean age  $18.9 \pm 2.1$  years for the modular teaching group and  $21.7 \pm 1.1$  years for the conventional teaching method  $p < 0.0001$ .

Overall summative assessment score among was insignificantly higher in group B students ( $p$  value 0.11) (Table 2). Summative assessment of individual topics showed that Health information system, medical records and ICD-10 classification had significantly higher scores among the intervention group ( $p=0.003$ ).

**Table 2: Summative assessment of course topics in both main stream students and intervention group.**

Item	Group A	Group B	P value
<b>Elements of primary health care</b>	$4.4 \pm 1.3$	$5.0 \pm 1.6$	0.09
<b>Main rural health problem</b>	$3.6 \pm 2.7$	$3.1 \pm 1.8$	0.2
<b>Components of health education sessions</b>	$4.8 \pm 2.5$	$4.9 \pm 0.7$	0.8
<b>Health information system, medical records and ICD-10 classification</b>	$3.2 \pm 1.2$	$4.1 \pm 1.3$	0.003
<b>Types nosocomial infections</b>	$3.6 \pm 0.9$	$3.4 \pm 2.1$	0.6
<b>Overall mean scores</b>	$19.6 \pm 3.1$	$20.5 \pm 2.2$	0.11

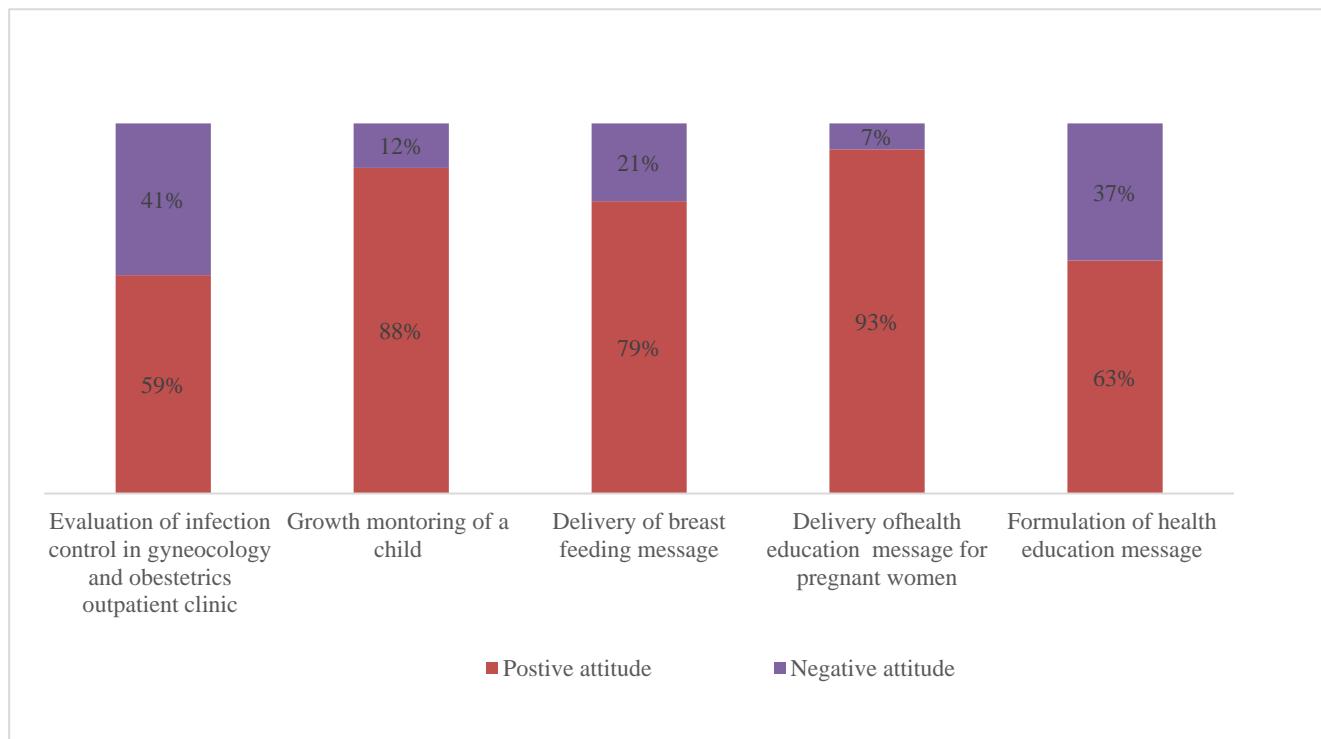
The main stream students are mainly exposed to tutorial sessions and their only skills were mainly statistical ones and observation field visits to primary health care centers and Egyptian rural community. While the students of the intervention group were subjected to acquisition of new skills tabulated in Table 3.

Highest performance score was that of delivering breast feeding message for mothers attending the rural health unit, while the least was that for the infection control evaluation for gynecology and obstetrics clinic. There were statistically significant differences between the different performance scores acquired by the intervention group ( $p=0.0003$ ).

Students belonging to the intervention group their attitude towards the given course were illustrated in (Figure 1) which shows that the highest positive attitude percentage was that of conducting a health education session about breast feeding practice to mother attending the rural health unit 93%. The highest negative attitude was that related to evaluation of infection control in an outpatient clinic 41%.

**Table 3: Performance mean scores of intervention group.**

Item	Performance mean scores
<b>Formulation of health education message</b>	$12.3 \pm 3.1$
<b>Delivery of health education message for pregnant women</b>	$10.3 \pm 5.9$
<b>Delivery of breast-feeding message</b>	$14.1 \pm 8.6$
<b>Growth monitoring of a child</b>	$14.9 \pm 1.5$
<b>Evaluation of infection control in a gynecology and obstetrics outpatient clinic</b>	$9.3 \pm 2.1$
<b>P value</b>	0.0003



**Figure 1: Students' attitude towards public health training course.**

## DISCUSSION

It is well known that any medical school mission statement include that their graduated doctors should be proficient and competent in clinical skills, and be work for their communities.<sup>10</sup>

In addition, integrated physicians' skills are needed for modelling the coming health care services this could be achieved through forming corporations with other authorities in communities, also effective skills training should include linking skills to student knowledge and attitude.<sup>11</sup>

In this interventional study, we compared the effect of public health training course upon the skill acquisition

and knowledge level of preclinical students (first three academic grads) compared to their peers of the main stream students (4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grades). Previous researches highlighted that medical students may face problems when conducting the skills learned in their tutorial classes to actual field in primary health care settings. To smooth this conversion, researchers recommended that public health curricula should include field visits and on field supervised practice which should be earlier as much as possible in the preclinical curriculum.<sup>12</sup>

Numerous researchers found that students who were exposed early for clinical experiences in any primary health care setting have more confidence about being ready to join the community services, compared to their

colleagues who had only practiced in a primary health care setting after graduation.<sup>7,13</sup>

Summative assessment of the interventional group students showed statistically insignificant lower scores than those of the main stream students, changes in the students' knowledge scores was not expected as the traditional teaching methods focus on the knowledge gain of the medical students. In addition, the medical students feel more comfortable in the passive way of teaching with enriched outstanding experience of recall memory rather than skill related or problem-based learning. These results are in agreement with Bossche et al and Albanese MA, Mitchell S who stated that medical students score lower grads in any introduced methods of learning other than the conventional one.<sup>14,15</sup> However Norman in 2002 raised the debate of bias of the comparison of summative assessments as medical students are not blinded during the intervention and factors such as inspiration or interest are likely to affect their performance.<sup>16</sup>

In addition to the tutorial session the interventional group students were subjected to field visits and conducted the acquired skills in a rural health unit each skill was evaluated by the field instructor this is in agreement with Karthikeyan and Kumar in 2014 who recommended integrated learning module in they found that using combined methods of learning in modular way helps in better learning than to didactic session.<sup>17</sup> Schmidt et al in 1996 also reported high skills in Dutch students after introducing an integrated curriculum compared to conventional teaching as the only part of this variance was attributable to skill acquisition.<sup>18</sup>

Furthermore, a large percentage of students acknowledged that they were confident and have a positive attitude in the skills they acquired during this training course. Making the students face a clinical exercise at the end of the course is expected to be helpful in achieving this education at "knows how" level in cognitive domain.

Early clinical exposure in primary health care settings had a positive impact on medical students' confidence, clinical practice, and social communication.<sup>19,20</sup> Also Maastricht University promoted the integration of knowledge, skills, attitudes and early clinical exposure of medical undergraduate students' education.<sup>21,22</sup>

#### **Limitations**

Among the enormous topics of the public health and community medicine only few topics were covered for comparison between two teaching learning methods. In addition, this intervention could not be generalized to include the whole undergraduates of the fourth academic grade due to both administrative and academic issues. Short implementation duration is considered a challenging issue in order to conduct the whole spectrum of the planned program.

## **CONCLUSION**

Our research results suggest that joining the community health services and early exposure to primary health care components through field work training enable undergraduate students to accomplish more of their learning outcomes such as practical skills. Primary health care team collaboration is considered good instructor to undergraduate medical students with appreciated qualifications and experiences.

#### **Recommendations**

Association to the community healthcare services in the first three academic years in medical schools is highly recommended to be included in the educational program of public health in order to increase the medical students' skills and gain more positive attitude towards public health teaching modules.

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