ORIGINAL PAPERS

Effect of an interventional training programme on communication skills for first-year medical students at Suez University, Egypt

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A – Study Design, B – Data Collection, C – Statistical Analysis, D – Data Interpretation, E – Manuscript Preparation, F – Literature Search, G – Funds Collection

Summary **Background.** Communication is a taught skill that improves clinical practice. Some of the basic competencies that must be taught in a medical curriculum are interpersonal and communication skills according to the Accreditation Council for Graduate Medical Education.
Objectives. This study was conducted to design, implement and evaluate the effect of an interventional programme on first-year medical students' communication skills.
Material and methods. This was a pre-post interventional study. The study sample was 109 first-year medical students who attended the field training course in four family medicine units/centres affiliated with the Egyptian Ministry of Health and Population in the Suez governorate. The current study aimed to measure their communication skills before and after the implementation of the interventional programme by using a pre-post observation checklist from December 2019 to June 2021.
Results. The study found that the post-intervention median total communication skills score was significantly higher than the pre-intervention median total score (30.0 (IQR: 28–32) vs 13.50 (IQR: 11–15)), with significant improvements in all items after the intervention. There was a statistically significant relationship between the percent change in the total Liverpool Communication Skills Assessment Scale and participants' residence and social participation.
Conclusions. The interventional programme improved communication skills among the study sample of first-year medical students after implementation. Communication among medical students needs to be improved in the faculty curriculum.
Key words: communication, medical students, Egypt.

Background

Communication is a purposeful process of two or more individuals using shared symbols to express, receive and understand messages comprising information, emotions, ideas and demands [1].

One of the most vital skills of a doctor is effective communication. Interpersonal skills and communication are among the fundamental competencies that must be learned in a medical programme according to the Accreditation Council for Graduate Medical Education (ACGME), the American Board of Medical Specialties (ABMS) and the Association of American Medical Colleges (AAMC) [2].

There is a risk that a student could lose sight of the essential principles of consultation and how to perform a safe, efficient and effective consultation due to the complexity of modern consulting models and the focus on teaching communication skills [3].

The evaluation of a student's communication skills in dealing with patients has also attracted interest recently. Checklists completed by observers of students' performances during real or simulated patient encounters, polls of real or simulated patient experiences in clinical interactions and video recordings with essay, oral or multiple-choice exam questions are some methods to assess the level of "knows" (remembering the skill) and/or "knows how" (applying the skill) of communication [4].

According to the previously mentioned facts about the importance of communication as a competency to effectively practice medicine, the absence of formal courses for communication skills in our faculty, and because the researcher could not find published studies in Egypt, there is an immense need to conduct the current study to improve the communication skills of first-year medical students at the faculty of medicine of the Suez University.

Objectives

To assess the basic communication skills of first-year medical students, design and implement an interventional programme regarding communication skills and evaluate the effect of the designed programme in improving communication skills.

Material and methods

Study design

A pre-post interventional study.

Setting

The study was conducted in four family medicine units/centres affiliated with the Egyptian Ministry of Health and Population (MOHP) in the Suez governorate (Al-Obour, Al-Sabbah, El-Mothalath and Al-Suez). These units/centres are training centres for the field training of first-year medical students. The study was conducted from December 2019 to June 2021 (pre-test from December 2019 to February 2020 – exposure from March 2020 to December 2020 – post-test from April to June 2021).

Participants

A total of 109 first-year medical students were selected by simple random sampling out of 194 students who were enrolled in the first year. All students who did not have previous communication skills workshops or formal training and spoke Arabic were enrolled.

Variables

- Independent (Exposure): The training programme for communication skills.
- Dependent (Outcome): Improvement of the communication skills score of students.
- Potential confounders and effect modifiers: None.

Data sources/measurement

Data was collected through an observational checklist for every student at the units\centres. The Liverpool Communication Skills Assessment Scale [5] was used (pre-post-programme) to evaluate the communication skills of first-year medical student.

The Liverpool Communication Skills Assessment Scale is a twelve-item assessment form that covers five fundamental domains: introductions, nonverbal behaviour, respect and empathy, questioning and giving information. The score of the students was an indicator of the effect of the training programme on their communication skills (a score less than two is unaccepted and scores of two or more are accepted), which was measured at baseline and after three months of intervention.

Assessment of the skills was carried out by the researcher through direct observation of the student during time with real patients. The score of the students was an indicator of their basic communication skills.

Intervention

The interventional programme was designed based Hannibal medical curriculum at Hannover Medical School [6] and applied to the study's participants. The learning objectives consisted of basic communication skills when taking patients' histories. The programme included seven sessions lasting two hours each. Each session started with a short presentation on specific topics like (building rapport, doctor–patient relationship, basic communication skills, verbal communication, non-verbal communication, biopsychosocial model) followed by practicing history-taking with real patients. The frequency of the sessions was one session every other week for each group, and the materials of the lectures were prepared by the researcher. The intervention programme was introduced in family medicine units/centres while the students attend a field training course within groups consisting of 19–22 students each.

Bias

Efforts were made to minimise the bias in our study, for example, students were randomly assigned to the research groups.

Sample size
The following formula was used to calculate the sample size [7]:

$$n = 2 \left[\frac{(Z_{\alpha/2} + Z_\beta) * \sigma}{\mu_1 - \mu_2} \right]^2,$$

where:
n = sample size,
$Z_{\alpha/2}$ = 1.96 (critical value that divides the central 95% of the Z distribution from the 5% in the tail),
Z_β = 0.84 (critical value that separates the lower 20% of the Z distribution from the upper 80%),
σ = estimate of the scores standard deviation = 4.04 [8],
μ_1 = mean in the first group = 27.2 [8],
μ_2 = mean in the second group = 25.59 [8].
Thus, by calculation, the sample size was equal to 99 subjects. Adding a 10% drop-out proportion provided a sample size of 109 subjects.

Statistical methods

The Statistical Package for the Social Sciences (SPSS) for Windows, version 25.0, was used to conduct all statistical analyses. Categorical variables were described as frequencies and percentages (%), while numeric variables were summarised as median and interquartile ranges, as the data was not normally distributed. Wilcoxon signed-rank test was used to test the difference in median scores before and after the intervention. The McNemar test was used to test for differences in repeatedly measured categorical variables. Per cent change was calculated as the difference between the pre- and post-intervention total score relative to the pre-intervention score. A multiple linear regression model was used to identify the predictors of the per cent change in total communication skills. A p-value less than 0.05 was considered statistically significant.

Ethical consideration

Approval from the faculty's research ethics committee was obtained before the study commenced (ID number 4128). Before any data was collected, all participants provided their written informed consent. The possibility for participants to leave the study at any time was granted. All data was confidential to the researcher and was published anonymously.

Results

Out of 109 students selected at the beginning of the research, 102 students completed this study. The participants were 19–21 years of age with an average of 19.7 years. Approx. 70% of the participants were female. One-third of participants were residing in rural areas, and most of their parents had completed their university education (84.3% of fathers, 79.4% of mothers). Approx. one-third of the participants were engaged in social (like campaigns and medical convoys) and team sports activities. All participants who did not receive any type of training in communication skills (97.1%) adequately perceived the importance of communication skills in patient care (Table 1).

Table 1. Distribution of study participants by their demographic and personal characteristics (*n* = 102)	
Characteristics	**No. (%)**
Age (years)	
mean ± SD	19.7 ± 0.49
range	19–21
Gender	
male	31 (30.4%)
female	71 (69.6%)
Residence	
urban	71 (69.6%)
rural	31 (30.4%)
Family medicine units/centres	
Al-Obour	42 (41.2%)
Al-Sabah	22 (21.6%)
Al-Mosalas	19 (18.6%)
Al-Suez	19 (18.6%)
Father's education	
illiterate	3 (2.9%)
read & write	1 (1.0%)
primary	2 (2.0%)
secondary	10 (9.8%)
university	86 (84.3%)

Mother's education	
illiterate	3 (2.9%)
read & write	3 (2.9%)
primary	2 (2.0%)
secondary	13 (12.7%)
university	81 (79.4%)
Participation	
social	39 (38.2%)
sports	30 (29.4%)
Perception of the importance of communication skills	
neutral	3 (2.9%)
agree	40 (39.2%)
strongly agree	59 (57.8%)

The most accepted communication skills were greeting and checking patient identity, audibility and enunciation and respecting the patient, while the questioning and giving information domains showed several items with the most deficient skills (Table 2).

The post-intervention median total score was significantly higher than the pre-intervention median total score (30.0 (IQR: 28–32) vs 13.50 (IQR: 11–15)), which leads to the rejection of the null hypothesis and accepting the alternating hypothesis (Figure 1).

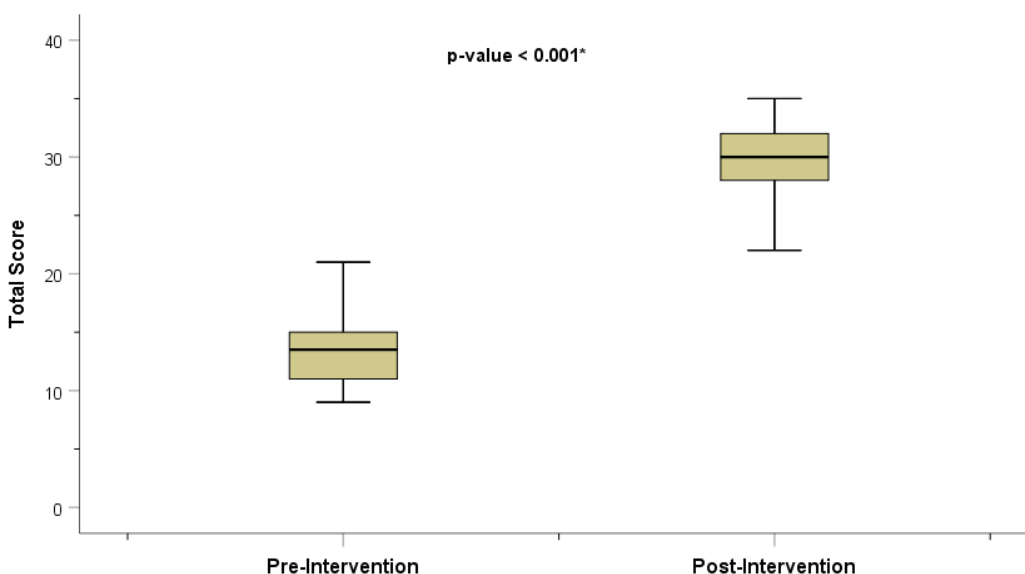| Table 2. Distribution of study participants by their baseline responses to the Liverpool Communication Skills Assessment Scale (*n* = 102)			
Domains	**Items**	**Acceptable/good skills**	**Unacceptable/ poor skills**
Communication (Introductions)	Greeting and checking the patient's identity	49 (48.5%)	52 (51.5%)
	Introduction of self and role	29 (28.4%)	73 (71.6%)
Non-Verbal Behaviour	Audibility and enunciation	65 (63.7%)	37 (36.3%)
	Eye contact	32 (31.4%)	70 (68.6%)
	Non-verbal facilitation	12 (11.8%)	90 (88.2%)
Respect and Empathy	Respect of patient	80 (78.4%)	22 (21.6%)
	Empathy-reflect of patient's feelings	6 (5.9%)	96 (94.1%)
Questioning	Appropriate open and closed questions	5 (4.9%)	97 (95.1%)
	Clarifying questions and summarising	0 (0.0%)	102 (100.0%)
	Sensitivity of questions	37 (36.3%)	65 (63.7%)
Giving Information	Use clear language	36 (35.3%)	66 (64.7%)
	Ensure understanding and closing appropriately	0 (0.0%)	102 (100.0%)

Figure 1. Distribution of the total Liverpool Communication Skills Assessment Scale (LCSAS) pre-and post-intervention (*n* = 102)

Table 3. Changes in the participants' responses to communication skills pre-and post-intervention (*n* = 102)					
Domains	**Items**	**% Acceptable/good skills**			***p***
		Pre-	**Post-**	**Change (post- pre)/pre**	
Communication (Introductions)	Greeting and checking the patient's identity	48.5%	98.0%	1.02	**< 0.001***
	Introduction of self and role	28.4%	97.1%	2.4	**< 0.001***
Non-Verbal Behaviour	Audibility and enunciation	63.7%	100.0%	0.6	**< 0.001***
	Eye contact	31.4%	100.0%	2.2	**< 0.001***
	Non-verbal facilitation	11.8%	98.0%	7.3	**< 0.001***
Respect and Empathy	Respect of patient	78.4%	97.1%	0.2	**< 0.001***
	Empathy-reflect of patient's feelings	5.9%	93.1%	14.8	**< 0.001***
Questioning	Appropriate open and closed questions	4.9%	93.1%	18.0	**< 0.001***
	Clarifying questions and summarising	0.0%	89.2%	~89.2	**< 0.001***
	Sensitivity of questions	36.3%	97.1%	1.7	**< 0.001***
Giving Information	Use clear language	35.3%	99.0%	1.8	**< 0.001***
	Ensure understanding and closing appropriately	0.0%	96.1%	~96.1	**< 0.001***

McNemar test; *Statistically significant ($p < 0.05$).

Table 4. Multivariate analysis for the predictors of per cent change in the total communication skills score among the study participants				
Predictors	**Unstandardised Coefficients**		***T***	***p***
	B	**Std. Error**		
Gender (female vs male)	16.9	9.6	1.76	0.082
Residence (urban vs rural)	31.3	9.7	3.24	**0.002***
Social participation (yes vs no)	12.3	9.2	1.34	0.185
(Constant)	86.2	10.7	8.07	**< 0.001***

R Square = 0.155; Model ANOVA: *F* (3,98) = 5.979, *p*-value = 0.001; *Statistically significant at *p*-value < 0.05.

Table 3 shows the percentage of students with acceptable skills after the intervention compared to the baseline. All items showed significant improvements after the intervention. Compared to the baseline, the maximum improvements were noticed in clarifying questions and summarising and ensuring understanding and closing appropriately, while the least improvement was seen in audibility and enunciation and respecting the patient.

Adjusted association between the percent change in total LCSA and the potential predictors as identified in bivariate analyses (i.e. gender, residence and social participation). A multiple linear regression model with a statistically significant ANOVA test (*F* (3,98) = 5.979, *p* = 0.001) and an *R*-square of 0.155 showed that residence was the only predictor for the per cent change in total LCSA. Participants residing in urban areas had significantly higher per cent change in total LCSA (Table 4).

Discussion

In this study, the baseline level of communication was not acceptable in almost all domains/items, as students were in the first year with no previous training in communication skills. These results are consistent with a descriptive-analytical study that assessed the level of communication skills among medical college students at Hamadan University in Iran, which showed that the level of communication skills in students was not at a desirable level [9]. This was also consistent with a cross-sectional study in Iran that assessed interpersonal communication skills and their associated factors, which showed that the students at Kurdistan University of Medical Sciences had poor interpersonal communication skills and which recommended intervention studies to improve communication skills [10].

These findings were in contrast with a descriptive cross-

sectional study in Iran that assessed communication skills (verbal, listening, feedback) among Ardabil Azad University medical students, along with related factors [11], as this study concluded that the communication skills among the students were at a moderate level. This could be explained by the difference in the target population and years of study, as our students in the first year, but in the other study, the students were selected randomly from all university medical students.

The post-intervention median total communication skills score was significantly higher than the pre-intervention median total score (30.0 (IQR: 28–32) vs 13.50 (IQR: 11–15)). These findings were consistent with a comparative study at the International Medical University in Malaysia that used pre-recorded interview videos to assess undergraduate medical students' communication skills using a modified Calgary-Cambridge checklist, which revealed that first-year medical students performed better because they had received formal communication skills training, with a significant difference in overall scores between the first- and second-year medical students (36.0 (IQR: 29.0–48.0) vs 29.0 (IQR: 22.0–40.0)) [12].

These findings were also consistent with an interventional study in India that assessed the change in attitude and basic clinical communication skills before and after training using the SEGUE (Set the stage, Elicit information, Give information, Understand the patient's perspective, End the encounter) framework score among undergraduate third-year medical students at GMERS (Gujarat Medical Education & Research Society) Medical College, Junagadh, which showed that the difference between the pre-post-training communication skills assessment mean score (10.0 (3.40) vs 16.1 (2.87)) was found to be significant (*p* = 0.0001) [13].

These results were also consistent with an interventional study at Medical College Valsad in India which assessed the clinical communication skills of medical students from the fifth

semester of MBBS through the simulated patient approach after communication skills training, which showed that following communication skills training, students improved greatly in each competency on the Kalamazoo scale. The overall mean communication skills score of the students was 49.86 (SD = 10.73) before training, and this significantly increased to 75.45 (SD = 15.78) after training ($p < 0.05$) [14].

In the current study, compared to the baseline, the maximum improvements were noticed in clarifying questions and summarising and ensuring understanding and closing appropriately, while the least improvement was in audibility and enunciation, as well as respecting patient. These results agreed with an interventional educational study conducted in India that evaluated the effect of training on the communication skills of final-year medical students and found that the training significantly improved students' abilities to avoid jargon, respond to questions, summarise and confirm understanding [15].

These findings were consistent with a study in a medical school in the United Kingdom whose students were given a curriculum that included communication skills training and found that those students who received the training significantly improved their communication skills and scored higher for not interrupting the patient, using silence and keeping the conversation relevant when compared to students who were given the traditional curriculum [16].

These results were in contrast with an interventional study carried out at a medical college in South India that measured the communication skills of second-year undergraduate medical students for health education [17], and it was discovered that between the intervention and control groups, there were no significant differences in any of the variables. It seemed that the reason for these differences could be due to the difference in the intervention programme, which was short-term training (only four sessions in health education), while our programme had seven sessions, including lectures on basic communication skills and clinical training with real patients.

Limitations of the study

There was no variety of methods for assessment of the participants, e.g. an assessment of knowledge, as the research depended only on observation by the researcher.

Conclusions

There were limited levels of communication skills among first-year medical students, which improved after implementing the interventional programme. Thus, introducing communication skills in the early phases of educational medical school is very important.

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