

# Effect of a Simulated Patient-Based Educational Program on the Quality of Medical Encounters at Military Recruitment Centers

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**ABSTRACT:** **Background:** Simulation-based medical education has become a powerful tool in improving the quality of care provided by health professionals.

**Objectives:** To evaluate the effect of a simulated patient-based educational program for military recruitment center physicians on the quality of medical encounters with adolescent candidates for military service.

**Methods:** Twelve physicians participated in an educational intervention that included a one day SP-based workshop, where simulations of eight typical candidates for military service were conducted. Assessment of the physicians' performance before and after the intervention was based on questionnaires filled by 697 and 508 military candidates respectively upon completion of their medical examination by these physicians. The questionnaire explored health topics raised by the examining physician as well as the atmosphere during the encounter. The candidates were also asked whether they had omitted important medical information during the medical encounter.

**Results:** Pre- and post-intervention comparison revealed significant changes in the percentages of candidates who reported that they had been asked questions related to psychosocial topics: school problems – 59.7% and 68.9% ( $P = 0.01$ ), protected sex – 29.6% and 36.4% ( $P = 0.01$ ), mood changes – 46.9% and 52.2% ( $P = 0.05$ ) respectively. Physicians were perceived as being interested in the candidates by 68.2% of the candidates before the intervention and 77.5% after ( $P < 0.01$ ). The percentage of candidates who reported omitting medical information decreased from 6.6% before the intervention to 2.4% after ( $P < 0.01$ ).

**Conclusions:** A simulated patient-based educational program for military physicians improved the quality of physician-candidate encounters. Such programs may serve as an effective instrument for training physicians to communicate with adolescents.

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**KEY WORDS:** simulated patients, educational program, medical encounter, adolescents, military

**M**ilitary service is mandatory for most Israeli youths at age 18. Approximately 18 months prior to enlistment, Israeli adolescents are requested to report to military recruitment centers for general assessment including medical screening. At the end of the assessment process candidates for military service are classified for appropriate military training and functioning within the Israel Defense Force.

The medical screening consists of a review of medical information submitted by the candidate's primary care physician, a medical history obtained from the candidate, and a physical examination. When necessary, the recruitment center physician may refer the candidate to medical specialists and request additional tests. The candidate's medical fitness for military service is determined by the recruitment center physician and is represented by standard codes known as "the medical profile."

The fact that Israeli adolescents are obliged to undergo medical screening in these specialized centers at about age 17 is a unique opportunity to explore multiple health issues, even if they are not necessarily linked to the military tasks that await the young person. Still, several obstacles make this screening difficult to achieve. Adolescents frequently tend not to share personal issues with health care providers – either because they deny the health hazards related to these issues or because they do not wish to share confidential matters with adults identified as part of the "establishment" [1,2]. The adolescent military service candidate is ordered by law to report for medical screening at the recruitment center on an arbitrary date, with an unfamiliar physician who will not be his or her health care provider. The candidate may also suspect that any information on risky behaviors disclosed at the medical encounter might serve against his or her best interest in the military service. Moreover, Israeli military physicians are not expected to be familiar with general adolescent health issues that are not related to military service and may not be sufficiently skilled to talk with the candidates about such issues.

SP = simulated patient

Improving these physicians' communication skills with adolescents may lead to the creation of a trustful and less alien atmosphere during the encounter that will allow an appropriate approach toward sensitive aspects of adolescent health.

Role-play models where either colleagues or actors simulate the patients' roles are commonly used to improve the communication skills of health care professionals [3-5]. Simulation-based medical education is a rapidly growing field that has become a powerful tool in improving the quality of care provided by health professionals [6-8]. Simulation-based medical education offers a safe and "mistake-tolerating" environment where trainees can learn from their errors without the risk of harming real patients [9]. The Israel Center for Medical Simulation is an international leader in the innovative and evolving field of medical simulation and patient safety. During the period 2002–2008 over 40,000 health care professionals were trained at this center in various simulation modalities that included encounters with standardized patients as well as clinical exercises using sophisticated human-like (mannequin) simulators [10].

Educational programs in adolescent health that included role-play techniques improved the quality of care provided by general practitioners [11,12]. However, similar experiences in military recruitment programs have not been reported. We therefore hypothesized that exposing military recruitment center physicians to an intensive simulated patient-based program on communication with adolescents will be beneficial and improve the quality of the medical encounters with the military candidates.

## SUBJECTS AND METHODS

Twelve recruitment center physicians (6 males, 6 females) participated in this study throughout its three stages. None of them practiced pediatrics, and apart from their experience in military health they had not received any training in adolescent medicine. Following the pre-intervention assessment 23 recruitment center physicians were trained at the Israel Center for Medical Simulation, but for only 12 of them was post-intervention assessment available, without any selection bias.

### PROCEDURE

- *Stage 1:* Pre-intervention assessment of physicians' performance with the use of questionnaires filled out anonymously by military candidates [Appendix I]. The questionnaire was pretested for language clarity but was not validated in a pilot study.
- *Stage 2:* Intervention: a one day SP-based workshop, where eight simulated cases of typical candidates reporting at a recruitment center were used for the training. All actors were professional performers with special training in stan-

darized medical simulation and in providing genuine feedback to health care professionals after the simulated scenarios.

- *Stage 3:* Post-intervention assessment of physicians' performance using the same questionnaires.

### SP-BASED WORKSHOP PROCEDURE

#### MORNING

- A 1 hour simulation exercise of four different scenarios was performed and repeated three times, enabling each physician to encounter one SP and to observe two other physician-SP encounters through a one-way mirror. All encounters were video-recorded. At the end of each physician-SP encounter, feedback was delivered by each actor to the physician regarding his or her communicative performance during the encounter.
- A 2 hour debriefing session with the 12 physicians after the simulation exercise was facilitated by an adolescent medicine pediatrician (D.H.) experienced in SP-based programs, and a military medical officer from the Medical Classification Branch of the IDF Medical Corps (A.F.). Video recordings of the encounters were used to discuss key points regarding both content and communication skills for each scenario.

#### AFTERNOON

The morning procedure was repeated in the afternoon with four different scenarios.

### SCENARIOS

Common problems encountered during the medical screening at the recruitment centers were enacted using eight scenarios. Each scenario included a hidden agenda that was expected to be disclosed by the physician when using a comprehensive physical and psychosocial system review.

- A female candidate reports postural dizziness and general weakness. Physical system review reveals heavy menstrual bleeding. Blood count and referral to a gynecologist is indicated.
- A female candidate with mild persistent asthma reveals poor compliance with treatment. She claims to be fit for a frontline unit, but the physician does not give his approval.
- A male candidate with no documented health problems discloses recent bloody stools and significant weight loss on physical system review. Inflammatory bowel disease is suspected, and his fitness for military service is questioned.
- A male candidate who is in good health reports multiple complaints during the physical system review. A psycho-

IDF = Israel Defense Force

social assessment reveals low motivation for and fears of military service.

- A female candidate wearing sloppy clothing speaks in a very low voice, without eye contact, and is reluctant to disclose any information. Depression is suspected, and referral to mental health consultation is indicated.
- A female candidate reports excellent health. Physical system review reveals secondary amenorrhea for a year, with underweight and body mass index of 17 kg/m<sup>2</sup>. Eating disorder is suspected.
- A male candidate reports being in good health. During the encounter significant restlessness is noted, and attention deficit hyperactivity disorder with refusal to use medication is disclosed.
- A male candidate reports being in good health. Routine urine analysis at the recruitment center prior to the medical encounter reveals significant leukocyturia. Physical system review discloses dysuria following unprotected sexual activity with multiple partners. Psychosocial review for other risky behaviors reveals also heavy smoking and significant alcohol consumption.

**ASSESSMENT OF PHYSICIANS' PERFORMANCE**

Prior to the intervention, candidates reporting to three military recruitment centers completed an anonymous questionnaire about the medical encounter [Appendix 1]. The questionnaire included two parts. In Part I the candidates were asked to answer yes or no as to whether the physician had addressed 20 health items during the encounter (or 21 for female candidates regarding menstrual periods – item 11), including topics related to adolescent psychosocial issues and risky behaviors (items 15, 17–21). In Part II they were asked about the physician's clarity of speech, the physician's interest in them, and the atmosphere during the encounter, using a Likert scale rating. They were also asked whether they had omitted important health information during the encounter. An arbitrary date was chosen for the survey at each recruitment center, and all candidates reporting for the medical examination filled out the questionnaire on that date. To avoid recall bias the questionnaire was filled out immediately after the candidate left the physician's office. The physicians were not cognizant that their performance was being surveyed.

Four to five months after the educational intervention described above, the same questionnaire was completed anonymously by other candidates after their medical encounters with the same physicians at the same recruitment centers. By comparing the candidates' responses to the questionnaire before and after the intervention using chi-square analysis we could assess the effect of the educational intervention on the physicians' performance at the recruitment centers. Since we were interested only in the trends of change in the physicians'

approach toward psychosocial issues, no multivariate analysis was performed.

The study was approved by the Internal Review Boards of both the IDF and Sheba Medical Center.

**RESULTS**

Questionnaires were filled out by all military service candidates on the days that were chosen for the pre- and post-intervention evaluation: 697 candidates (470 females, 67.4%) before the educational intervention and 508 candidates (423 females, 83.3%) after. All data were analyzed separately for males and females for the pre- and post-intervention responses and were found similar. Therefore, the results are presented for males and females together for the whole group of participating physicians. No attempt was made to evaluate each physician separately.

For most of the medical items in the questionnaire (items 1–10, 12–14, 16, 20), no significant differences were noted in the candidates' responses before and after the intervention. However, 60% and 73% of the female candidates responded that they had been asked by the physician about their menstrual periods before and after the intervention respectively ( $P = 0.05$ ). Table 1 displays jointly the percentages of candidates responding that they had been asked questions regarding each of the five psychosocial topics, demonstrating significant differences in responses to three items – school problems, mood, and protected sexual relations (items 15, 19, 21, respectively) – in the pre- and post-intervention questionnaires. No significant differences were noted regarding cigarette smoking and alcohol consumption (items 17 and 18 respectively). Table 2 displays the percentages of candidates' best ratings in the Likert scale for characteristics of the physicians' conduct. There was a trend for post-intervention improvement in the physicians' ability to create a relaxed atmosphere during the interview with the candidates, and in the clarity of their questions, but this did not reach statistical significance. A significant change was noted in the physicians' interest in the candidate after the intervention. Comparison

**Table 1.** Percentage of military service candidates who reported that they had been asked questions related to psychosocial topics

	Pre-intervention (N=697)	Post-intervention (N=508)
School problems*	59.7	68.9
Mood**	46.9	52.2
Protected sexual relations*	29.6	36.4
Smoking	71.5	71.9
Alcohol use	82.9	83.3

\*  $P = 0.01$

\*\*  $P = 0.05$

**Table 2.** Percentage of military service candidates marking the best ratings in the Likert scale for the physicians' conduct

	Pre-intervention (N=697)	Post-intervention (N=508)
Clear questioning	80.8	82.7
Interest*	68.2	77.5
Atmosphere	69.7	77.9

\*  $P = 0.03$

of candidates' reports regarding omission of important health information during the encounter before and after the intervention demonstrated a significant decrease from 6.6% to 2.4% of the candidates respectively ( $P < 0.01$ ).

## DISCUSSION

Simulation-based medical education programs are considered useful for teaching and evaluating communication competence for both undergraduate and postgraduate health professionals [13-18]. The training is learner-oriented and takes account of the trainees' needs, deficiencies, and pace of learning, without the ethically disturbing use of actual patients that is associated with traditional medical teaching. Another important benefit of simulation-based medical education is the reproducible, standardized, objective setting provided for both formative assessment (debriefing) [19] and summative assessment (testing) [20,21].

Several undergraduate and postgraduate educational programs in adolescent medicine have included in their curricula SP-based education to improve practitioners' communication skills with adolescents [22,23]. One comprehensive intervention project that included simulation techniques demonstrated sustainable improvements in knowledge, skill, and self-perceived competency of family physicians caring for adolescents [11,23]. Other studies in which adolescents completed questionnaires showed that implementation of educational programs for physicians led to increased screening for risky behaviors [12,24].

The present study, which was based on the adolescents' reports, evaluated an SP-based educational program that included intensive discussions of the physicians' performance in their encounters with the SPs, as a tool to improve the communication skills of military recruitment center physicians. Indeed, the candidates' reports indicated low screening rates for protected sexual relations, mood changes and school problems before the intervention and significantly higher rates following the intervention. The physicians' conduct during the medical encounter seemed to improve following the intervention: The physicians were perceived as significantly more interested in the candidate, somewhat clearer in their questions, and creating a more relaxed atmosphere during the

encounters. The purpose of the recruitment center's medical screening is first and foremost to classify the candidate for health-related appropriate military service. The recruitment center physician frequently needs to rely solely on information that is voluntarily provided by the candidate regarding significant health conditions such as depression, eating disorder, weight loss and risky behaviors. Optimal classification therefore cannot be achieved if the candidate withholds relevant information from the physician. The study's finding of an almost threefold decrease in the percentage of candidates who reported omitting health information (from 6.6% to 2.4%) is therefore of utmost importance. We assume that the improvement in the physicians' communication skills with the candidates contributed to this dramatic change.

Several limitations in this study should be noted. The questionnaire was developed specifically for the study and had not been validated before its introduction except for its language clarity. Owing to the candidates' busy schedule during their day at the military recruitment center, only a limited number of questions regarding their perception of the physicians' conduct could be included in the questionnaire (part II). The pre- and post-intervention questionnaires were completed by different groups of candidates with large percentages of females. Candidates are scheduled to report at the recruitment centers when they reach the age of 17, and the dates for distribution of the questionnaires were chosen at random without any previous information regarding the candidates' gender. A gender bias in the two cohorts of recruits could be expected since a larger percentage of females comprised the post-intervention group and better gender-matched groups would have been preferable. However, since there were no significant differences when males' and females' responses were separately analyzed, we considered the pre- and post-intervention groups as representing the Israeli population of candidates for military service.

Thus, our findings support the hypothesis that physicians' skills in screening adolescent health issues, as well as the general atmosphere during the medical encounters could be improved by implementing a training program that includes SP-based intervention.

Twelve physicians participated in this project throughout its three stages, and although they were selected at random they may not represent the whole group of military recruitment center physicians. Despite the relatively small number of physicians, the strength of the study derives from the large number of candidates who participated and that the "post test" was done several months after the intervention – clearly reflecting true behaviors.

We may conclude from the persistent trend of improvement in the physicians' communicative skills that intensive SP-based intervention programs are an effective method for training physicians to obtain a comprehensive health his-

tory and creating a trustful atmosphere during the medical encounter with adolescents.

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**Appendix**

**Questionnaire to be completed by military candidates upon leaving the military recruitment center physician's office**

This questionnaire will help improve the medical screening procedure at the recruitment center. It is anonymous and requires only a few minutes to complete.

**Part I:** Did the physician ask whether you – (please mark Yes or No)

1. Suffer from prolonged headaches
2. Ever had convulsions
3. Have visual problems
4. Complain of wheezing during respiration
5. Have suffered from dizzy spells or fainting
6. Have back pains
7. Have knee pains
8. Ever had shoulder dislocation
9. Suffer from recurrent ankle sprain
10. Suffer from recurrent abdominal pain or prolonged diarrhea
11. Have any problems with your periods (girls only)
12. Have ever been hospitalized
13. Suffer from any allergies
14. Suffer from skin problems
15. Have problems at school

16. Take medications continuously
17. Smoke cigarettes
18. Consume alcohol
19. Have mood swings or mood problems
20. Have been in psychotherapy
21. Have been practicing protected sexual relations

**Part II:** Please mark one possibility for each question:

- Were the questions asked by the physician clear to you?
  - All of them    Most of them    Some of them
  - None of them
- Was the physician interested in what you said?
  - Very much    Partly    Very little    No
- To what extent did the physician create a relaxed atmosphere during the medical encounter?
  - Very much    Partly    A little    Not at all
- Was there any medical information that you did not share with the medical recruitment center physician?
  - Yes    No