

LESSONS LEARNED FROM ADOLESCENT AGED SIMULATED PATIENTS IN UNDERGRADUATE ADOLESCENT MEDICINE CURRICULUM: A STUDENT'S EXPERIENCE

Soe Soe Aye

MBBS, MRCPE, FRCPE, DCH (Glas), FRCPCH (UK), DrMedSc
(Paeds) (Myr)

Mohd. Azhar Mohd Noor

National Defence University Malaysia, Malaysia

Mohd. Rudduan Ab Rahman

Hospital Angkatan Tentera Tuanku Mizan, Malaysia

Abstract

Introduction: Worldwide, several studies have shown adolescent simulated patients being used for teaching of communications skills with adolescents. In Malaysia, there is scarce research demonstrating the educational benefits of simulated patients in adolescent medicine teaching over traditional teaching methods.

Objective: To evaluate the role and effectiveness of adolescent aged simulated patient as a teaching tool, in the adolescent medicine module at National Defence University of Malaysia.

Methodology: This is a cross-sectional study. Forty-four third year medical students participated. A total of 6 simulated patients (16 to 19 years old) were recruited to portray roles of adolescents with various psychosocial issues for two times during each posting for four postings. Each of the students, as a pair had two encounters, (as interviewer and observer). All students (in the interviewer roles) rated the abilities of the adolescent simulated patient playing a specific role on a validated questionnaire. The adolescent simulated patients and faculty teachers also gave feedback on similar validated questionnaires.

Result: Forty-four students gave the adolescent simulated patients general performance a mean mark 3.4 out of 4 point scale ($p=0.050$). All medical students reported that the simulated patients helped them in: (a) communicating with adolescents ($p=0.006$), and (b) understanding the different psychosocial issues that adolescents may encounter ($p=0.048$).

Feedback by teachers and adolescent simulated patient about the adolescent simulated patient program was very positive.

Conclusion: The lessons learned have shown that structured case scenario portrayal by the simulated patients had significantly complemented students' learning in communicating with adolescents.

Keywords: Adolescent medicine module, simulated patient and structured case scenarios

Introduction

World Health Organization (WHO) defines adolescents as individuals between the ages of 10 to 19 years (Encyclopaedia Britannica). In Malaysia, the adolescent population constitutes 19.2% of the population (Yearbook of Statistics Malaysia, 2009). The Malaysia National Adolescent Health Plan of Action (2006 – 2020) includes five priority areas such as physical and mental health issues, sex and reproductive health issues, nutritional health, eating disorders and risky health behaviors. Adolescence is a time of life when they develop habits that put them at higher risk for future chronic health concerns. Adolescents frequently tend not to share personal issues with their health care providers, thus communication with the adolescent patient requires unique skills on the part of the medical doctor.

Therefore, medical schools should take on the responsibility of teaching their students how to interact with and treat adolescents. At Faculty of Medicine and Defence Health, National Defence University of Malaysia, the Paediatric and Adolescent Medicine posting is of 8-weeks duration, with four group rotations in one academic year, which is implemented, in the third year of the undergraduate degree program. The objective of the Adolescent Medicine module, which is of 2 weeks duration within the 8 weeks posting, is for the students to acquire knowledge and skills in communicating with adolescents and understanding the core selected psychosocial issues experienced by adolescents, in order to be suitably robust for future significant contributions to the healthcare of adolescents. The teaching/learning activities identified in the module, include a mixture of exposure to adolescent health clinic with simulated patients, self-directed video production of core issues in adolescents and practice sessions on interview techniques using HEEDSSSSSS psychosocial assessments, didactic teaching, debate sessions, seminars, tutorials and case write ups using students' own created case scenarios.

Simulated patients have potential to be the highest fidelity 'simulator' and are well established in most undergraduate medical programs (Cleland et al., 2009; May et al., 2009). The literature on the role of simulated patient in medical education is expanding. However, at the level of the adolescent

medicine program, there are several gaps in the literature. We seek to fill this gap through documenting our experiences in using simulated patient in the adolescent medicine program.

Literature review

Paediatrics undergraduate curriculum

Generally, in other parts of the world, the undergraduate teaching in the Paediatrics posting includes the Adolescent Medicine as a module in some but not in others. To cite one example, at the University of Otago, Wellington, New Zealand, Paediatric and Adolescent Health Module is placed in the fifth year, which include two sessions: (1) the teaching of acute paediatric and (2) community paediatrics.

In Malaysia, out of the 34 public and private universities, only two universities (i.e. Universiti Teknologi Mara Malaysia and National Defence University of Malaysia) have included the teaching of Adolescent Medicine as a module in the paediatric curriculum. However, other universities also include sessions on Adolescent Health issues in a number of sessions only but not as a module.

Simulated patients

A review of the literature found many relevant topics concerning the use of simulated patients in undergraduate and postgraduate medical education. Howard Barrows is credited with using the first simulated patient in Los Angeles in 1963; this was an artist's model who posed as a patient with multiple sclerosis. Barrows, defines the term standardized patient (SP), the umbrella term for both a simulated patient (a well person trained to simulate a patient's illness in a standardized way) and an actual patient (who is trained to present his or her own illness in a standardized way (Barrows, HS 1993). Later on, the simulated patient is defined as "a normal person who has been carefully trained to present the symptoms and signs of an actual patient" (Collin and Harden, 1998). In their study, Barrow (1993) and Spencer and Dales (2006) stated that simulated patients are useful to train medical students to learn professional conduct and are also used extensively in testing of clinical skills of students, usually as a part of an Objective Structured Clinical Examination. The use of simulated patients in both undergraduate and postgraduate assessments of clinical skills, as well as in diverse areas of medical education, has since become progressively widespread (Clay et al., 2000). Continuing medical education programmes for primary care physicians aimed at improving their skills in communicating with adolescents, using simulation methodology with teenage actors have been reported by Hardoff and Schonmann (2001). Since the introduction of the first standardized patient in medical education by Dr. Howard Barrows in

1963, simulated patients are extensively used in medical and nursing education to allow students to practice and improve their clinical and conversational skills for an actual patient encounter (Suzanne et al., 2005; Gaba et al., 2006). Training programs to improve physicians' communication skills with adolescents have been developed at the Israel Center for Medical Simulation (MSR) (Hardoff et. al., 2008).

Justification/rationale of this study

In Malaysia, there is limited research showing the effectiveness of simulated patients in adolescent medicine teaching in any educational modality including knowledge, application, retention or performance. We seek to fill this gap through documenting our experiences in using simulated patient in the adolescent medicine program. The Faculty of Medicine and Defence Health (FMDH), National Defence University Malaysia (NDUM) had taken upon, the challenge in introducing the use of the adolescent simulated patient in the undergraduate adolescent medicine curriculum for the third year medical students. Using adolescents as simulated patients is relatively new in NDUM and we have conducted a cross-sectional study.

Objective

The objective of this study is to evaluate the role and effectiveness of adolescent aged simulated patient as a teaching tool, in the adolescent medicine module at National Defence University of Malaysia (NDUM).

Methodology

Study design

This was a cross-sectional study conducted at the Faculty of Medicine and Defence Health, National Defence University of Malaysia in Hospital Angkatan Tentera Tuanku Mizam Kuala Lumpur from September 2013 to May 2014. In this study, the focus was on the use of adolescent simulated patients for teaching purposes in undergraduate adolescent medicine curriculum. It had addressed the following research questions:

1. What are the implications of using simulated patients in the undergraduate adolescent medicine curriculum?
2. How can the strengths of simulated patient in the teaching of communication skills be applied in the undergraduate adolescent medicine education?

The answers to these questions were explored in the setting of the adolescent medicine curriculum at the NU DM. We evaluated the views of teachers, students and adolescent aged simulated patients with regard to the adolescent simulated patient program in our undergraduate adolescent medicine curriculum for the 2013/2014 academic session.

Study population

Medical students completing an eight-week rotation in Paediatric and Adolescent Medicine clinical clerkship during 2013/2014 academic sessions in year 3 of a five-year undergraduate medical program based in NDUM were eligible to participate in the study. All 44 third year medical students were recruited as the universal sample size for the study and divided into 4 groups (Group 1: n=11, Group 2: n=12, Group 3: n=10 and Group 4: n = 11).

A total of 6 simulated patients (16 to 19 years old) were recruited to portray roles of adolescents with various psychosocial issues for two times per posting for four postings, during the initial academic year. Informed consent was obtained from the recruited simulated patients and their parents. In the initial meeting with all 6 adolescent simulated patients, we explained the objectives of the simulated encounters and introduced the simulated case scenarios (structured by the faculty) and “coached” them on the specific case scenarios. The simulated patients were children of the staff at NDUM campus and their friends.

Instruments

During the period of study three sets of questionnaires were used:

- (a) Questionnaire 1 - the students were given a 6-item questionnaire to provide feedback on the simulated patient performance and the benefits from their experience;
- (b) Questionnaire 2 – the simulated patients were given a 15-item questionnaire to provide feedback on the student’s communication skills. A 4-point Likert’s scale (1 = complete disagreement; 2 = somewhat disagree; 3 = somewhat agree; 4 = complete agreement) was used to measure the students and simulated patient responses.
- (c) Questionnaire 3- the teachers involved in the program was given a 10-item questionnaire to provide feedback on the students’ and simulated patients’ performances.

The questionnaires were pretested to ensure face validity.

Implementation of study

Six adolescents, aged 16 to 19 years were recruited to participate in the simulated adolescent health clinic at FMDH NUDM. Each of the adolescents (simulated patient) with some experiences at the local Drama group, were “coached” by the Faculty lecturers, to enact a total of eleven-twelve realistic adolescent case scenarios during each of the two weeks Adolescent Medicine Module posting. Each encounter with the respective simulated patient involved a pair of students. Each of the students had two encounters, (One as interviewer, who is engaged in interview technique using HEEADSSSSSSS psychosocial assessment and other as observer).

Students (in the interviewer role) rated the abilities of the adolescent simulated patient playing a specific role on a validated questionnaire. Therefore, each of the six simulated patients had two encounters per posting for four times in the initial academic year. At the end of each encounter, the adolescent simulated patient's evaluation of the student's communication skills was collected using a structured questionnaire using a 4-point Likert's scale. Although only a small number of adolescent simulated patients were involved, their comments proved to be insightful, personal and sensitive to the needs of the adolescent. The encounters were video-taped and shown for review and feedback, to all the (11, 12-10-11) students, respectively, in each of the respective group rotations.

Outcome measure

Outcome measures consisted of self-rated knowledge, clinical confidence, communication skills, and effectiveness of simulated clinical teaching.

Data analyses

Means and standard deviations of variables were calculated. Univariate analysis of variance (ANOVA) models were used to determine significant. SPSS (version 19.0) statistical programs were used to undertake analyses.

Results

Feedback from the students on the simulated patients' performance:

All 44 (100%) year 3 medical students took part in the adolescent medicine module that offered teaching using adolescent simulated patients over the duration of the study period. There were 23 (52.3%) male students and 21 (47.7%) female students. Their age ranges from 21-22 years with the mean age of 21.4 ± 0.2 years (Table 1)

Table 1: Student profile

Student group	N (sample size)	Mean Age (years)	Gender	
			Male	Female
Group 1	11	21.3 \pm 0.2	5	6
Group 2	12	21.4 \pm 0.3	7	5
Group 3	10	21.5 \pm 0.1	5	5
Group 4	11	21.3 \pm 0.2	6	5

All students (n=44) completed the structured questionnaire and gave their feedback on the adolescent simulated patients at the end of the simulated adolescent health clinics (Table 2).

A majority (n= 42, 95.4%) of third-year students reported that the role played by the simulated patients had considerably increased their sensitivity to the needs of adolescent patients, and to a lesser degree, assisted their knowledge and enhanced their skills for dealing with adolescents. Students rated highly (97.2%) the involvement, relevance and understanding and the opportunity to work with adolescent simulated patients.

Table 2: Response from the students regarding the role of the simulated patient.

Items	N	Mean	SD
1. Can clearly convey exactly what he/she is experiencing like a real patient.	44	3.6	0.7
2. Can provide relevant information so that the student would be able to identify the health issue at hand.	44	3.5	0.5
3. Can portray the key features present in that particular health issue.	44	3.6	0.7
4. Had included some bodily cues so that the student could easily pick up.	44	3.7	0.6
5. Had acted just like an adolescent with particular health issue.	44	3.7	0.6
6. The simulated patient is able to portray and communicate effectively to the students (doctor to be).	44	3.4	0.5

In Table 3, all medical students reported that the simulated patients helped them in: (a) communicating with adolescent (p=0.006), and (b) understanding the different psychosocial issues that adolescents may encounter during their transitional period into adulthood (p=0.048).

Table 3: Response of medical students: Effectiveness of simulated patient in clinical teaching

Item	Grp 1 (N=11)		Grp 2 (N=12)		Grp 3 (N=10)		Grp 4 (N=11)		p value
	x	sd	x	sd	x	sd	x	sd	
1. Help me in my communicating skill	3.7	0.4	3.0	0.5	3.5	0.5	3.2	0.5	0.006*
2. Help me in understanding the psychosocial issue faced by the adolescent	3.7	0.6	3.3	0.5	3.5	0.5	3.1	0.4	0.048*

(x=mean, sd=standard deviation)

(*p significant (<0.05))

Forty-four students gave overall rating the adolescent simulated patients' general performance 7.7 out of 10 point scale. Comparing the feedback between the four groups of students on the role played by the adolescent simulated patient was found to be significant, $p=0.050$ ($F=3.306$) (Table 4).

Table 4: Performance of simulated patient according to student groups (One-way ANOVA)

Item	Grp 1 (N=11)		Grp 2 (N=12)		Grp 3 (N=10)		Grp 4 (N=11)		p value
	x	sd	x	sd	x	sd	x	sd	
Very good roles and very authentic role playing	3.7	0.6	3.3	0.6	3.5	0.5	3.1	0.5	0.050*

(x=mean, sd=standard deviation)

*p significant (<0.05)

Feedback from the simulated patients

Six simulated patients (2 male and 4 female), aged between 16 to 19 years, were selected to participate in the adolescent medicine teaching sessions from 1.9.2013 to 30.5.2014. All the simulated patients (n=6) were considered to have sufficient abilities to play consistent realistic roles, and to provide formative feedback to the students upon completion of the session.

The simulated patients were asked to respond anonymously to a number of close-ended questions on the student communication skills. Good communication can be described as "*authentic, non-judgmental, active listening for the essence in order to understand the patient (attitudes), and talking well (skills)*".

Table 5, show that the simulated patients reported that a significant proportion (n= 38; 86.3%) of the students demonstrated good communication skill and they are able to communicate effectively with the patient (simulated patient). The stimulated patients reported that all medical students (n=44; 100%) can clearly convey exactly what sort of information he/she is looking for during the interview session. All medical student (n=44; 100%) has shown good attitude in '*ensuring everything said will be kept confidential*'. It has been shown, that 93.1% of medical students has demonstrated good attitude and professionalism during the interview sessions.

Feedback from the teachers

Table 6, shows the scores of the teachers about the quality of the role playing by the adolescent simulated patients were positive, for example: "*very good roles and very authentic role playing*", "*very natural in answering question*" and "*communicate effectively with student*". Marks for

the overall performance of the adolescent simulated patient were high, 8.1 on a 10-point scale (Table 7)

Table 5. Simulated patient feedback on the student communication skills
(1=complete disagreement; 2=somewhat disagree; 3=somewhat agree; 4=complete agreement)

	Item	1 (N)	2 (N)	3 (N)	4 (N)
Attitudes:					
1	Had reassured that everything said will be kept confidential.	0	0	34	10
2	Actively listening for the essence in order to understand the patients	0	0	24	20
3	Had acted like a doctor to be and was not judgemental or patronizing.	0	0	35	9
4	Had made the simulated patient feel important and respected.	0	3	30	11
5	Had shown empathy	0	0	21	23
Communication Skill:					
1	Can clearly convey exactly what sort of information he/she is looking for	0	0	35	9
2	Had obtained the relevant information pertaining to health issue.	0	3	33	8
3	Has been able to recognize the body cues even when it is at variance with the spoken words given by me (simulated patient)	0	7	32	5
4	The student is able to communicate effectively with the patient (simulated).	0	6	30	8

Table 6. Teacher evaluation on the performance of the adolescent simulated patients

Items	N	Mean	sd
1. Simulated patient appears authentic	5	3.6	0.4
2. Simulated patient could be a real patient	5	3.4	0.5
3. Simulated patient is clearly role playing	5	3.6	0.4
4. Simulated patient stay in his/her role all the time	5	3.4	0.5
5. Simulated patient can provide relevant information so that the student would be able to identify the health issue at hand.	5	3.4	0.5
6. Simulated patient can portray the key features present in that particular health issue.	5	3.2	0.6
7. Simulated patient has included some bodily cues so that the student could easily pick up.	5	3.0	0.4
8. Simulated patient answer question in natural manner	5	3.4	0.5
9. Simulated patient stimulate student to ask question	5	3.0	0.4
10. Simulated patient is able to portray and communicate effectively to the students	5	3.2	0.6

The teachers remarked that the adolescent simulated patient encounters addressed interesting aspects of communication, for example: “*dealing with peers professionally (less formally, yet remaining serious)*”, “*learning to deal with two people in a consultation (dividing attention)*”, “*defining personal barriers in a consultation (with a quarrelling couple)*” and “*asking questions about/discussing health issues*”.

The teachers’ and students’ overall rating score of the performance of simulated patients was 8.1 (SD = 0.5) and 7.3 (SD = 0.7), showing a significant authenticity of role play ($p < 0.016$) when analyzed, using the unpaired *t* test (Table 7). These findings suggest simulated patient can be very authentic. Our study had shown that the simulated patients are a valuable complement to other teaching- learning methodology in teaching adolescent medicine.

Table 7: Teachers’ and students’ overall rating score of the performance of the simulated patient

Item	Teacher N=5		Students N=44		p value
	Mean	SD	Mean	SD	
Overall rating of the simulated patient performance on a 10-point scale.	8.1	0.5	7.3	0.7	0.016*

Discussion

Since the introduction of simulated/standardized patients by Barrows in 1964, adults have extensively been used as simulated patient in medical education (Barrow, 1964). The use of adolescents as simulated patients is relatively new in medical education, especially in Adolescent Medicine program and has been scarcely reported. To fill in this gap, we evaluated the views of teachers, students and adolescent aged simulated patient with regard to the effectiveness of the adolescent simulated patient’s involvement, in our undergraduate Adolescent Medicine curriculum.

From the findings in this study several conclusions can be made:

- (1) The majority (95.4%) of the students felt that the adolescent aged simulated patient conveyed what he/she is experiencing like a real patient. Authentic adolescent responses toward the doctor to be (student) had been achieved by the simulated patients, who themselves are in their teenage years
- (2) It is interesting to note that all (100%) of the students felt that the simulated patient had provided the relevant information so that they

(student) would be able to identify the health issue at hand. This can be attributed to fact that the simulated patient had been “coached” by the faculty beforehand as well as the fact that the simulated patient are teenagers who themselves may be experiencing or are in “empathy” with those feelings and issues

- (3) A significant proportion (95.4%) of the students felt that the simulated patient can portray the key features present in that particular health issue. This may in part be due to the fact that, the simulated patients belong to the local Drama group which was also complemented by the “coaching” received from the faculty beforehand.
- (4) A higher proportion (84.1%) of the students was able to pick up the body cues that the simulated patient had added into the encounter (Table 5). This had provided authenticity to the simulated patient’s performance.
- (5) All student (n=44, 100%) are in an agreement that the simulated patient had acted just like an adolescent with that particular health issue (Table 2). This is not surprising since the simulated patient themselves are adolescents and they had been “coached” beforehand.
- (6) The feedback from the students reported that 100% of the students had given the final conclusion that the simulated patient is able to portray and communicate effectively to the students (doctor to be).

Thus it can be said that simulated patients may be used as a teaching tool, as in this study in the teaching of Adolescent Medicine. However, the differential value of real patients as opposed to SP has been recognized as an important research area.

From the study (Table 5), it is interesting to note that the simulated patients reported that a significant proportion (86.3%) of the students demonstrated good communication skill and they are able to communicate effectively with the patient (simulated patient). Good communication can be described as *“authentic, non-judgmental, active listening for the essence in order to understand the patient (attitudes), and talking well (skills)”*. From the feedback of the simulated patients all medical students (100%) can clearly convey exactly what sort of information he/she is looking for during the interview session. It has been shown in this study, that 93.1% of medical students has demonstrated good attitude, communication skills and professionalism during the interview sessions.

From the teacher point of views, it has been shown that the overall performance of the adolescent simulated patient was high, 8.1 on 10-point scales. The role played by the adolescent simulated patients were positive, for example: *“very good roles and very authentic role playing”*, *“very natural in answering question”* and *“communicate effectively with student”*.

With regard to authenticity, both the teachers and students agreed that the simulated patient showed a significant authenticity of role play ($p < 0.016$) (Table 7). These findings suggest simulated patient can be very authentic. Our study has shown that the simulated patients are a valuable complement to other teaching learning methodology in teaching adolescent medicine.

Outcome measure

Self-rated knowledge- Students had clearly stated that the simulated patients had helped them in their understanding of the core and selected psychosocial issues faced by adolescents (Table 3).

- a) **Communication skills-** Students had stated that the simulated patients had helped them in their interviewing techniques ie communication skills (Table 3).
- b) **Clinical confidence-** The simulated patients had stated that the student (s) had been able to communicate well in order to elicit the psychosocial issue(s) in hand when they had portrayed the structured case scenario (Table 5)
- c) **Effectiveness of simulated teaching-** The simulated patient is able to portray and communicate effectively to the students (doctor to be) (Table 4)

From our study, we concluded that the **implications of using simulated patients** include the following:

- 1) By participating in simulated patient encounters, students gradually become more comfortable in the role of clinician in a controlled educational environment, with help from the faculty they know well, rather than the teacher they just met.
- 2) The primary goal in Adolescent Medicine Module is to teach to the students the interviewing techniques using HEADSSSSSS acronym. Variable clinical experience, ambiguous evaluation criteria and inconsistent methods of instruction, can undermine this goal. Simulated patients, coached to consistently portray a wide variety psychosocial issues, can help overcome many of these educational problems.
- 3) All medical educators are familiar with the difficulty most students encounter applying information learned through didactic instruction into practical skills and clinical decision-making. The ability of students to elicit a thorough history, develop appropriate treatment plans, and communicate effectively is often more difficult to teach, and therefore more difficult to evaluate, than memorization of disease presentations, treatment protocols, and clinical complications. Unfortunately, when students have problems assimilating information into clinical settings, they are frequently not detected until later in the

clinical training, leaving limited opportunities for remediation and/or additional instruction. Using simulated patient encounters during the period of Adolescent Medicine posting, can identify weaknesses that may otherwise go unrecognized during the students' clinical rotations and this support the finding by Calhoun and Bridget (2004).

Finally, lessons learned from the study are summarised in Box 1.

Box 1: Lessons learned from the study

1. The simulated patient is able to portray and communicate effectively to the students (doctor to be).
2. The simulated patient had helped the student(s) in their interviewing techniques using the HEADSSSSS acronym
3. The simulated patient had helped the student(s) in their understanding of the core & selected psychosocial issue(s) faced by the adolescent from the structured case scenario portrayal.
4. The feedbacks from the students on the simulated patients had highlighted the valued learning experiences in communication skills
5. The feedbacks from the simulated patients on the student's interviewing techniques and communication skills had highlighted that the students had been able to pick up the issue(s) at hand, portrayed by the patients and they had assured confidentiality just like in a real patient-doctor relationship

In summary, this study supports the view that the use of adolescent aged simulated patients in our Adolescent Medicine program is of value, from the point of view of teachers, students as well as adolescent aged simulated patient. Important lessons were learned during the period of the study. The major lessons learned are summarized in Box 1. Although further research on evaluation of adolescent aged simulated patient program is important, we believe that the use of adolescent aged simulated patients in the Adolescent Medicine program hadproved to make a valuable contribution in the undergraduate medical curriculum.

Conclusion

Our results indicate that the use of simulated patients in the adolescent medicine program resulted in students feeling more confident about their communication and history-taking abilities. Teachers, students and adolescent simulated patients have highly valued the adolescent aged simulated patient program in teaching of adolescent medicine at National Defence University of Malaysia. The study supported and concluded that simulated patients had complemented students' learning.

In adolescent medicine, it seems highly probable that the use of simulated patients will continue to increase both for teaching and for

assessments. Furthermore, it seems highly probable that the use of simulated patients has numerous advantages as opposed to real patients and this needs further study. It is to be hoped that research into medical education will receive the attention it merits and will be facilitated by the use of simulated patients.

We hope our experiences may be valuable for faculty entering this field and for those already established, to promote reflection on their programs and to plan future activities. We believe our own perception in using simulated patients in the adolescent medicine program has improved, as a consequence of discussing the experiences in the process of preparing this paper. A concluding message is the need for continued efforts in establishing an evidence-based simulated patient methodology in Adolescent Medicine modules.

Acknowledgements

We would like to thank the Dean Faculty of Medicine and Defence Health, the third year medical students, the simulated patients who participated in this study and last but not the least Professor Dr Adlina Suleiman, for her invaluable and tireless recruitment of the Simulated Patients without which this study would not have been possible.

References:

- Ainsworth, M.A; Rogers, L.P; Markus, J.F (1991). Standardized patient encounters: a method for teaching and evaluation. *JAMA*, 266, 1390 -1396.
- Alinier G, Gordon R, Hunt B (2003). Effectiveness of the use of simulation in nurse education: Study design & initial results, International Meeting on Medical Simulation. San Diego, CA.
- Alinier G, Gordon R, Hunt B(2003). Effectiveness of the use of simulation in nurse education: Study design & initial results, International Meeting on Medical Simulation. San Diego, CA.
- Al-Yousuf NH (2004). The clinical skills laboratory as a learning tool for medical students and health professionals. *Saudi Med J*; 25: 549-51
- Barrows, H (1993). "An overview of the uses of standardized patients for teaching and evaluating clinical skills". *Academic Medicine*68(6): 443–453.
- Beyea SC (2004). Human patient simulation: a teaching strategy. *Aorn J*; 80: 738 – 741
- Blackburn T; Sadler C (2003). The role of human patient simulators in health-care training. *Hosp Med*; 64: 677-81
- Blum R, Raemer D, Carroll J, Dufresne R, Cooper J (2005). A Method for Measuring the Effectiveness of Team Based Training for Improving Communication Skills. *Anesth Analg*.

- Bokken. L; JJ. Rethans; A.Scherpbier; C.van der Vleuten (2008). Lessons learned from an adolescent simulated patient educational program: Five years of experience. *Medical Teacher*; 20:1-8
- Bokken. L; JJ. Rethans; A.Scherpbier; C.van der Vleuten (2008). Strengths and weaknesses of simulated and real patients in the teaching of skills to medical students: A review. *Simulation to Health Care*; 3(3):161-9.
- Bond W; Deitrick L; Kostenbader M; WorriLOW C (2003). Using human patient simulation to instruct emergency medicine residents in cognitive forcing strategies, International Meeting on Medical Simulation. San Diego, CA.
- Bond WF; Kostenbader M; McCarthy JF (2001). Prehospital and hospital-based health care providers' experience with a human patient simulator. *Prehosp Emerg Care*; 5: 284-7
- Boulet JR; Murray D; Kras J; Woodhouse J; McAllister J; Ziv A (2003). Reliability and validity of a simulation-based acute care skills assessment for medical students and residents. *Anaesthesiology*; 99: 1270-80
- Calhoun; Bridget C (2004). Standardized Patients and Simulated Patient Encounters in the Evaluation of Students. *Perspective on Physician Assistant Education*; 15(2): 99-101
- Candler C; Andrews MD (2004). Technology in medical education: how the OU College of Medicine has used technology to enhance the medical education experience. *J Okla State Med Assoc*; 97: 8-10
- Carroll JS; Edmondson AC (2002). Leading organizational learning in health care. *Qual Saf Health Care*; 11: 51-6
- Christensen C; Raynor M (2002). *The Innovator's Solution Creating and Sustaining Successful Growth*. Harvard Business School Press: 101-123
- Clay M.C; Lane, H; Willis, S.E (2000). Using a standardized family to teach clinical skills to medical students. *Teaching and Learning in Medicine*, 12, 145 -149.
- Cleland J; Abe K; Rethans J (2009). The use of simulated patients in medical education: AMEE Guide No 42 *Medical Teacher*, 31(6):477-486.
- Collins JP; Harden RM (1998). AMEE Medical Examination Guide No 13: real patients, simulated patients and simulators in clinical examinations. *Med Teach*. 20(6):508-521.
- Encyclopaedia Britannica. Adolescent. Accessed 21st May 2014. Available from <http://www.global.britannica.com/Ebchecked/topic/6216/adolescent>.
- Hardoff D; Benita S; Ziv A (2008). Simulated-patient-based programs for teaching communication with adolescents: the link between guidelines and practice. *Georgian Med News*. (156):80-3.
- Hardoff D; Schonmann S (2001). Training physicians in communication skills with adolescents using teenage actors as simulated patients. *Med Educ*. 35(3):206-10.

Lane C; Rollnick S (2007). The use of simulated patients and role-play in communication skills training: a review of the literature to August 2005. *Patient Educ Couns*, 67(1-2):13-20.

May W; Park J; Lee J (2009). A ten-year review of the literature on the use of standardized patients in teaching and learning: 1996-2005 *Medical Teacher*.31: 487-492.

National Adolescent Health Plan of Action (2006-2020). Malaysia Ministry of Health 2007.

Spencer, J; Dales J (2006). Meeting the needs of simulating patients and caring for the person behind them. *Med Educ*40 (1): 3–5.

Suzanne M. Kurtz, Jonathan Silverman, Juliet Draper (2005). *Simulated patients. Teaching and Learning Communication Skills in Medicine*. Radcliffe Publishing.

University of Otago, Wellington, New Zealand. Undergraduate teaching in the Department of Paediatrics and ChildHealth. Overview of MICN501, 5th year Child & Adolescent Health Module (MBChB)

Yearbook of Statistics, Malaysia. (2009). Publication of the Department of Statistics Malaysia Series, ISSN 0127-2624.