



## Research Paper

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# Expectations of students from a skills lab: An innovation in medical education in Jordan

Accepted 9<sup>th</sup> August, 2017

### ABSTRACT

Clinical skills laboratories in Jordanian medical schools are relatively new. This study explores medical students' expectations of skills laboratory training in performing certain clinical procedures including suturing, vascular access, intradermal and intramuscular injection, male and female catheterization, nasogastric tube placement, rectal examination and rectal enema and endoscopy simulation. Furthermore, it evaluates the need for further utilization of the skills laboratory. This cross-sectional study was conducted in the School of Medicine, Jordan University, 2016. Medical students not yet enrolled in skills laboratory training were recruited for the study. Sixty-four 6<sup>th</sup>-year and fifty-eight 4<sup>th</sup>-year medical students were invited to complete a questionnaire exploring their experiences, including their confidence in performing certain clinical procedures. 99% of students believed that skills laboratory training will affect their clinical skills, while 93.5% believed that it will increase their motivation for learning other subjects. 34.4% were not confident in their skills in obtaining an intravenous access with the percentage being significantly higher in fourth year students. On the other hand, 91% were not confident in their skills in obtaining a central venous access or an arterial access, 85.8% were not confident in their skills in endoscopy simulation and 82.6% were not confident in their skills in male and female catheterization. The differences between the two groups were insignificant in central venous cannulation, arterial access and endoscopy simulation. The vast majority of students seem to appreciate the value of skills laboratory training. The current level of students' clinical skills seems to be poor with minority of students being able to independently perform basic clinical skills which call out for further utilization of skills laboratory.

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**Keywords:** Medical students, skills laboratory, clinical skills.

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## INTRODUCTION

One of the fundamentals of medical practice is "above all and do no harm". However, according to the Institute of Medicine's landmark report of 2000, up to 98,000 patients die in the hospitals of the United States annually as a result of errors (Linda et al., 2000). "See one, Do one and Teach one" has been the traditional method of clinical practice (Halsted, 1904), although, it is one method to acquire clinical skills and pose risk on patients. Therefore, methods of health training which prevent or minimize

exposure of patients to risks are of utmost importance. One of these methods is skills laboratory training, which provides a safe environment for repeated practice (Ziv et al., 2005). Hence, students are required to attend a training program and pass a skill examination in techniques with high risk of fatal complications (Ma et al., 2011).

Skills laboratory training in which students can practice on manikins with standardized patients or with each other has shown to improve the procedural skills in both

beginners and experts (Barrow, 1993; Bradley, 2003; Nikendei et al., 2005). In a systematic review, Lynagh and Sanson-Fisher (2007) concluded that skills laboratory training is superior to standard training in enhancing procedural skills performance. On undergraduate level, skills laboratory training has shown to improve the performance of clinical skills on objective structured clinical examinations (OSCE) (Bradley, 1999; Junger et al., 2005).

Medical students seem to be underexposed to essential clinical procedures and feel uncomfortable while performing them. According to Barr and Graffeo (2016) most fourth-year medical students had never placed an arterial line (71%) or a central venous line (81%). The only procedures greater than 50% of fourth-year medical students performed more than 5 times were venipuncture, suturing and Foley catheter placement.

Medial simulation and clinical skills laboratories are relatively new in Jordan. The first laboratory skills were inaugurated in the academic year 2003/2004 at Jordan University and since then the efficacy of its level of utilization has not been studied. The current approach to acquiring clinical skills at the university depends mainly on clerkships with a limited utilization of the laboratory facilities.

This study aims to give an insight on medical students' expectations of skills laboratory training and to evaluate their level of confidence in performing certain clinical procedures including suturing, intravascular access, central venous access, arterial access, intradermal and intramuscular injection, male and female catheterization, nasogastric tube placement, rectal examination and rectal enema and endoscopy simulation. The level of students' clinical skills revealed whether the faculty's current approach to teaching clinical skills depends greatly on clerkships with limited utilization of the skills laboratory being adequate or there is a need for further utilization of the laboratory skills.

## MATERIALS AND METHODS

This cross-sectional study was conducted in the School of Medicine, Jordan University, 2016. The target population was medical students who have not yet enrolled in a skills laboratory training course. The sample consisted of 64 sixth-year medical students and 58 fourth-year medical students with a sample size of 122. The sample was a convenient sample as the students were targeted during classes that permit the handing out of questionnaires.

A questionnaire was applied at the skills laboratory of the faculty and the questions were obtained from anonymous literature review. The first part of the questionnaire evaluated students' expectations of skills laboratory training using seven (7) questions (skills laboratory training will affect clinical skills and training will increase my motivation for becoming a doctor and

learning other subjects in the semester, while skills laboratory training will make it easier for me to learn clinical skills. At the end of this course I will be able to perform clinical skills supervised by a doctor, I do not have to be afraid to hurt the patient and I can try each skill as much as I need) scored by a 4 Likert scale (strongly agree, agree, disagree and strongly disagree).

Students' level of confidence in their performance of certain clinical procedures was also evaluated. The procedures included suturing, vascular access, intradermal and intramuscular injection, male and female catheterization, nasogastric tube placement, rectal examination and rectal enema and endoscopy simulation rated as not confident, somewhat confident, very confident or able to do independently as well as, by a score from 1 to 10 with 1 being least skilled and 10 being most skilled.

The collected data was entered into Microsoft Excel, 2010. Descriptive statistics of the results were computed as frequencies (count and percent), mean  $\pm$  standard deviation and median according to variable's type. Fisher-Freeman-Halton exact test was used for differences between 4<sup>th</sup> and 6<sup>th</sup> years about distributions of the answers of questions. The differences between 4<sup>th</sup> and 6<sup>th</sup> years were evaluated using Mann-Whitney U test with regard to scale values. If P value is lower than 5%, it is accepted as statistically significant. All computations were done by using PASW (ver. 18) program.

## Ethics statement

The participants gave their voluntary verbal consent to enroll in the study and supply the required information. The confidentiality of the participants was ensured as the questionnaires were anonymous with no questions regarding the identity or the address of the participant. The participants had full knowledge of the purpose of the study and the identity of the party conducting the study.

## RESULTS

The response rate was 100%. The percentages of medical students who believe (agree or strongly agree) that skills laboratory training will affect their clinical skills was 99.1%. 99.9% believed that training will increase their motivation for becoming doctors and 93.5% believed that it will increase their motivation for learning other subjects this semester. Regarding the acquisition of clinical skills, 96.7% of students believed that skills laboratory training will make it easier for them to learn clinical skills. Students seem to appreciate the effect of skills laboratory with 92.6% of students believing that by the end of skills laboratory training course will be able to perform clinical skills supervised by a doctor. 35.2% of students do not believe that with skills laboratory training they do not have to be afraid to hurt the patient. 86.6% of students

**Table 1:** The distribution of the expectations from the skills laboratory in 4<sup>th</sup> and 6<sup>th</sup> years.

Variable		Year (Class)						p
		6 <sup>th</sup> year (n=64)		4 <sup>th</sup> year (n=58)		Total (n=122)		
		Count	%	Count	%	Count	%	
Skill laboratory training will affect my clinical skills	Disagree	1 <sup>a</sup>	1.6	0 <sup>a</sup>	0.0	0.8	0.8	0.013
	Agree	18 <sup>a</sup>	28.1	30 <sup>b</sup>	51.7	39.3	39.3	
	Strongly agree	45 <sup>a</sup>	70.3	28 <sup>b</sup>	48.3	59.8	59.8	
Training will increase my motivation for becoming a doctor	Strongly disagree	1	1.6	0	0.0	1	0.8	0.307
	Disagree	2	3.1	2	3.4	4	3.3	
	Agree	20	31.3	26	44.8	46	37.7	
	Strongly agree	41	64.1	30	51.7	71	58.2	
Training will increase my motivation for learning other subjects this semester	Disagree	0 <sup>a</sup>	0.0	8 <sup>b</sup>	13.8	8	6.6	0.005
	Agree	32 <sup>a</sup>	50.0	27 <sup>a</sup>	46.6	59	48.4	
	Strongly agree	32 <sup>a</sup>	50.0	23 <sup>a</sup>	39.7	55	45.1	
Skills laboratory training will make it easier for me to learn clinical skills	Disagree	1	1.6	3	5.2	4	3.3	0.122
	Agree	23	35.9	29	50.0	52	42.6	
	Strongly agree	40	62.5	26	44.8	66	54.1	
By the end of the course I will be able to perform clinical skills supervised by a doctor	Strongly disagree	2	3.1	0	0.0	2	1.6	0.345
	Disagree	2	3.1	5	8.6	7	5.7	
	Agree	39	60.9	37	63.8	76	62.3	
	Strongly agree	21	32.8	16	27.6	37	30.3	
I do not have to be afraid to hurt the patient	Strongly disagree	5	7.8	6	10.3	11	9.0	0.723
	Disagree	17	26.6	15	25.9	32	26.2	
	Agree	26	40.6	27	46.6	53	43.4	
	Strongly agree	16	25.0	10	17.2	26	21.3	
I can try each skills as much as I need	Strongly disagree	1	2.2	3	5.2	4	3.8	0.719
	Disagree	3	6.5	7	12.1	10	9.6	
	Agree	25	54.3	28	48.3	53	51.0	
	Strongly agree	17	37.0	20	34.5	37	35.6	

believe that with skills laboratory training they can repeat each skill as much as they need (Table 1).

The percentage of fourth year students who do not believe that skills laboratory training will increase their motivation for learning other subjects during this semester were significantly higher than sixth year ( $p=0.005$ ).

Only 75.4% of students were not confident in their skills in suturing; 45.1% were not confident in their skills in intradermal and intramuscular injection, 91% were not confident in their skills in obtaining central venous access or an arterial access and 82.6% were not confident in their skills in male and female catheterization. 77.9% of students were not confident in their skills in nasogastric tube placement, 62.3% were not confident in their skills in rectal examination and rectal enema and 85.8% were not confident in their skills in endoscopy simulation.

Only 4.1% of all the students evaluated themselves as being able to obtain an intravenous access independently and 34.4% of them were not confident in their skills in performing this task with the percentage of fourth year medical students being significantly higher. Only 6.6% of the students evaluated themselves as being able to perform an intradermal and intramuscular injection independently.

The procedures which had the lowest confidence scores were central venous cannulation and arterial access (91% not confident) followed by male and female catheterization (82.6% not confident) (Table 2).

The differences between 4<sup>th</sup> and 6<sup>th</sup> year medical students were found statistically significant about score of suture practice, score of intravenous access, score of intradermal and intramuscular injection, score of male and

**Table 2:** Distributions of answers of “How confident are you with these clinical skills” in 6<sup>th</sup> and 4<sup>th</sup> years.

How confident are you with these clinical skills	Year (Class)						p	
	6 <sup>th</sup> year (n=64)		4 <sup>th</sup> year (n=58)		Total (n=122)			
	Count	%	Count	%	Count	%		
Suture practice	Not confident	46	71.9	46	79.3	92	75.4	0.519
	Able to do independently	0	0.0	1	1.7	1	0.8	
	Somewhat confident	16	25.0	10	17.2	26	26	
	Very confident	2	3.1	1	1.7	3	2.5	
IV access	Able to do independently	2 <sup>a</sup>	3.1	3 <sup>a</sup>	5.2	5	4.1	0.001
	Not confident	11 <sup>a</sup>	17.2	31 <sup>b</sup>	53.4	42	34.4	
	Somewhat confident	42 <sup>a</sup>	65.6	20 <sup>b</sup>	34.5	62	50.8	
	Very confident	9 <sup>a</sup>	14.1	4 <sup>a</sup>	6.9	13	10.7	
Central venous cannulation	Not confident	60	93.8	51	87.9	111	91.0	0.327
	Somewhat confident	2	3.1	6	10.3	8	6.6	
	Very confident	2	3.1	1	1.7	3	2.5	
Arterial access	Able to do independently	0	0.0	1	1.7	1	0.8	0.203
	Not confident	61	95.3	50	86.2	111	91.0	
	Somewhat confident	3	4.7	6	10.3	9	7.4	
	Very confident	0	0.0	1	1.7	1	0.8	
Intradermal and intramuscular injection	Able to do independently	4	6.3	4	6.9	8	6.6	0.527
	Not confident	25	39.1	30	51.7	55	45.1	
	Somewhat confident	22	34.4	16	27.6	38	31.1	
	Very confident	13	20.3	8	13.8	21	17.2	
Male and female catheterization	Able to do independently	0	0.0	1	1.7	1	0.8	0.262
	Not confident	50	79.4	50	86.2	100	82.6	
	Somewhat confident	12	19.0	5	8.6	17	14.0	
	Very confident	1	1.6	2	3.4	3	2.5	
NG tube placement	Not confident	47	73.4	48	82.8	95	77.9	0.395
	Somewhat confident	14	21.9	7	12.1	21	17.2	
	Very confident	3	4.7	3	5.2	6	4.9	
Rectal examination and rectal enema	Able to do independently	2 <sup>a</sup>	3.1	0 <sup>a</sup>	0.0	2	1.6	0.013
	Not confident	32 <sup>a</sup>	50.0	44 <sup>b</sup>	75.9	76	62.3	
	Somewhat confident	27 <sup>a</sup>	42.2	12 <sup>b</sup>	20.7	39	32.0	
	Very confident	3 <sup>a</sup>	4.7	2 <sup>a</sup>	3.4	5	4.1	
Endoscopy simulation	Not confident	53	85.5	50	86.2	103	85.8	0.999
	Somewhat confident	8	12.9	8	13.8	16	13.3	
	Very confident	1	1.6	0	0.0	1	0.8	

**Table 3:** Descriptive values of rate (score) of clinical skills on 4<sup>th</sup> and 6<sup>th</sup> year.

On a scale of (1-10), rate yourself in the following clinical skills	Year (Class)											P	
	6 <sup>th</sup> year						4 <sup>th</sup> year						
	N	Mean	SD	Percentiles			N	Mean	SD	Percentiles			
				25 <sup>th</sup>	Median	75 <sup>th</sup>				25 <sup>th</sup>	Median		75 <sup>th</sup>
Suture practice	64	2.11	1.783	1.00	1.00	3.00	58	1.52	1.287	1.00	1.00	1.00	0.012
IV access	64	4.86	2.107	3.00	5.00	6.75	58	3.47	3.130	1.00	1.00	6.25	0.001
Central venous cannulation	64	1.31	0.833	1.00	1.00	1.00	58	1.38	1.322	1.00	1.00	1.00	0.609
Arterial access	64	1.27	0.718	1.00	1.00	1.00	58	1.66	1.812	1.00	1.00	1.00	0.845
Intradermal and intramuscular injection	64	4.22	2.930	1.00	4.00	7.00	58	3.14	2.964	1.00	1.00	5.00	0.016
Male and female catheterization	64	1.88	1.409	1.00	1.00	2.00	58	1.48	1.490	1.00	1.00	1.00	0.004
NG tube placement	64	2.03	1.681	1.00	1.00	3.00	58	1.45	1.569	1.00	1.00	1.00	0.002
Rectal examination and rectal enema	64	3.27	2.269	1.00	3.00	5.00	58	1.79	1.989	1.00	1.00	1.00	0.001
Endoscopy simulation	62	1.40	0.819	1.00	1.00	1.25	58	1.36	1.294	1.00	1.00	1.00	0.077

\* Different letters which are located on the percentages indicate significant differences between 4<sup>th</sup> and 6<sup>th</sup> year; \*\*SD: Standard deviation.

female catheterization, score of nasogastric tube placement and score of rectal examination and rectal enema ( $P < 0.05$  for each these skills). According to these results, we can say that 6<sup>th</sup> year scores were significantly higher than 4<sup>th</sup> year (Table 3).

## DISCUSSION

The vast majority of students seem to appreciate the value of skills laboratory training, believing that it will improve both their clinical skills and their academic education; students believe simulation training can also improve their clinical skills (Barr and Graffeo, 2016). This would make the utilization of skills laboratory more successful since it will not be viewed by students merely as a mandatory course.

Students also believed that skills laboratory training can reduce their fear of hurting patients when performing newly learned clinical skills on them. They also believe that skills laboratory training will motivate them during their educational journey and make this journey easier. This would explain why learning in skills laboratory was found to be one of the factors that determine academic achievement in high achieving undergraduate medical students (Abdulghani et al., 2014).

The current level of students' clinical skills seems to be poor with minority of students being able to independently perform basic clinical skills such as obtaining a peripheral intravenous access (4.1%). These results can be explained in part by the dependency of the faculty mostly on short-term clerkships as a method of clinical skills acquisition; for over the past decade there has been a growing sense that a clinical training based on random and short-term opportunistic in-patient care experiences is poorly aligned with student learning (Hirsh et al., 2007; Hauer and Poncelet, 2009). Another contributing factor is the minimal utilization of skills

laboratory facilities, especially during the fourth year in which students are only exposed to the laboratory during the anesthesia and the cardiology rotations, practicing auscultation, peripheral intravenous cannulation, airway management and basic and advanced life support.

Students seem to be unconfident when it comes to performing essential clinical skills. With the exception of intravenous access and intradermal and intramuscular injection, more than 50% of students were not confident performing any of the clinical skills included in this research. This finding may be explained by the underexposure of medical students to essential bedside procedures, a trend that according to Barr and Graffeo (2016) worsened over the past 25 years.

The skills in which students scored the poorest are also the ones in which the scores of 4<sup>th</sup> and 6<sup>th</sup> year students had insignificant differences which implies that the educational system does not adequately expose students to these skills throughout their 6-year medical journey.

Further utilization of skills laboratory by incorporating it into the agenda of medical students and providing the time and the instructors needed for it to become a structured formal training can improve the clinical skills of students. The best way to incorporate skills laboratory training into the curriculum may be through a mandatory and protected time which would improve participation in simulation training. Furthermore, facilitating the usage of skills laboratory by the students beyond the mandatory hours in light of students' current enthusiasm could increase the yield of skills laboratory training programs. Some of the aspects proven to influence the effectiveness of such a program include educational feedback, deliberate practice and integration into curriculum (Issenberg et al., 2005). The key factor seems to be educational feedback which helps students better understand the tasks they are learning and increases the likelihood of a correct performance (Issenberg et al., 2005; Domuracki et al., 2008).

Since clerkships are an integral part of the University's educational approach, as it is the case with many other medical schools, they should be improved to become more objective and systematic in the training they provide. This type of clerkship-based training is often impaired by the limited supervision of physicians and the assignment of students to redundant activities of limited educational outcome (Van der et al., 2001; Schrauth et al., 2009). This can be achieved by implementing longitudinal, integrated clerkship educational model rather than the current short-term clerkship model (Norris et al., 2009; Teherani and Loeser, 2013). Furthermore, determining and informing the students about the clinical skills that they must acquire at the end of each clerkship and providing enough mentors to closely guide them throughout this process could help students make the most out of these clerkships.

This study has some limitations, one of which is the fact that it is based on a non-random sample; that is, a convenience sample which poses restrictions on the generalizability of the results to medical students studying at the University of Jordan as well as, the rest of the Jordanian Universities. As there are optional courses held at the skills laboratory which students could sign up for and having inclusion criteria targeting students who did not enroll in such courses could be a source of selection bias. There were no questions targeting the reasons behind students' current level of clinical skills or the quality of clerkships. Further studies could focus on whether the faculty's clerkship model needs alterations and what are the possible improvements that could be applied. This study was cross sectional with no interventions being made and future studies could investigate the impact of implementing a skills laboratory course on students' clinical skills. Some of the authors of this paper are current medical students of the faculty; this helped in giving a precise insight on the educational process that students go through in their clinical years. Furthermore, the data was relatively easy to analyze and interpret.

In conclusion, students think that skills laboratory training has the capacity to improve and influence their clinical skills. Moreover, their current level of clinical skills seems to be poor which calls out for further utilization of skills laboratory.

## REFERENCES

- Abdulghani HM A-DA, Khalil MS, Ahmad F, Ponnampereuma GG, Amin Z (2014). What factors determine academic achievement in high achieving undergraduate medical students? A qualitative study. *Med. Teach.* 36(1):S43-8.
- Barr J, Graffeo CS (2016). Procedural Experience and Confidence Among Graduating Medical Students. *J. Surg. Edu.* 15:00297-4.
- Barrow HS (1993). An overview of the uses of standardized patients for teaching and evaluating clinical skills. *Acad. Med. J. Assoc. Am. Med. Colleges.* 68:443-51.
- Bradley PBJ (1999). One year's experience with a clinical skills resource centre. *Int. J. Med. Edu.* 33:114-20.
- Bradley PPK (2003). Setting up a clinical skills learning facility. *Int. J. Med. Edu.* 37:6-13.
- Domuracki KJMC, Owen H, Kostandoff G, Plummer JL (2008). Learning on a simulator does transfer to clinical practice. *Resuscitation.* 80:346-9.
- Halsted WS (1904). The training of the surgeon. *Bull Johns Hopkins Hosp.* 15:267-75.
- Hauer KE OBB, Poncelet AN (2009). Longitudinal, Integrated Clerkship Education: Better for Learners and Patients. *Acad. Med.* 84:902-7.
- Hirsh DA OB, Thibault GE, Cox M (2007). New models of clinical clerkships: "Continuity" as an organizing principle for clinical education reform. *Eng. J. Med.* 356:858-66.
- Issenberg SB MW, Petrusa ER, Lee Gordon D, Scalese RJ (2005). Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med. Teach.* 27(10-28).
- Juñger JSS, Roth C, Schellberg D, Friedman Ben-David M, et al (2005). Effects of basic clinical skills training on objective structured clinical examination performance. *Int. J. Med. Edu.* 39:1015-20.
- Linda TK, CJM DMS (2000). *To Err is Human: Building a Safer Health System.* Washington (DC): National Academies Press (US).
- Lynagh MBR, Sanson-Fisher R (2007). A systematic review of medical skills laboratory training: where to from here? *Int. J. Med. Edu.* 41:879-87.
- Ma IW BM, Ronksley PE, Lorenzetti DL, Sauve RS, Ghali WA (2011). Use of simulation-based education to improve outcomes of central venous catheterization: a systematic review and meta-analysis. *Acad. Med.* 86:1137-47.
- Nikendei CZA, Dieckmann P, Roth C, Schäfer S et al (2005). Role-playing for more realistic technical skills training. *Med. Teach.* 27:122-6.
- Norris TESD, DeWitt D, Ogur B, Hunt DD (2009). Longitudinal integrated clerkships for medical students: an innovation adopted by medical schools in Australia, Canada, South Africa, and the United States. *Acad. Med.* 84:902-7.
- Schrauth MWP, Kraus B, Junger J, Zipfel S, et al (2009). Workplace learning for final-year medical students: a comprehensive analysis of student's expectancies and experiences. *Z Evid Fortbild Qual Gesundheitswes.* 103:169-74.
- Teherani AID, Loeser H (2013). Outcomes of different clerkship models: longitudinal integrated, hybrid, and block. *Acad. Med.* 88:35-43.
- Van der Hem-Stokroos HH SA, van Der Vleuten C, De Vries H, Haarman HJ (2001). How effective is a clerkship as a learning environment? *Med. Teach.* 23:599-604.
- Ziv A, Ben-David S, Ziv M (2005). Simulation based medical education: an opportunity to learn from errors. *Med. Teach.* 27:193-199.

### Cite this article as:

Lana NN, Handan A, Hana T, Ali MA, Abdallah FM, Mahmoud AA, Moaath A, Islam M, Orhan A (2018). Expectations of students from a skills lab: An innovation in medical education in Jordan. *Acad. J. Educ. Res.* 6(2): 043-048.

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