Assessment of practice of pedigree drawing and application of standardized patient in medical faculty students

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Drawing a pedigree is a useful and effective tool in medicine and has an important place in medical education.

The aim of this study is to share our feedbacks on the pedigree drawing practice of 3rd year medical faculty students with a standardized patient applied in professional training skills program between 2012–2017.

Materials and methods. A total of 583 medical faculty students asked appropriate questions to a standardized patient and drew a family tree. At the end of the practice, students were asked to fill an evaluation form. Propositions on the form were rated according to the 5 Likert scales. A chi-square was used to assess the differences in scoring.

Results. 566 students (97.08 %) rated strongly agreed or agreed that appropriate tools and equipment were used in the practice. The attitude of the instructor was evaluated as appropriate, representing 98.11 % of the participants. About 97.09 % of the respondents reported that the time of practice was enough. These skills were reported to be necessary and might be used in their professional life, representing 82.19 % and 78.35 % respectively.

No correlation was found between the scoring of propositions and the application of standardized patients. However, we have observed that the use of standardized patients in practice significantly increases the general assessment scores of family tree drawing practice ($P < 0.032$).

Conclusions. Our data demonstrated that pedigree drawing training was evaluated positively by the students and standardized patient use did not make any differences in student evaluations.

Оцінювання практики створення родоводу та застосування стандартизованого пацієнта студентами медичного факультету

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Створення родоводу – необхідний та ефективний інструмент у медицині, посідає чільне місце в медичній освіті.

Мета роботи – поділитися результатами оцінювання студентами третього курсу медичного факультету щодо практики створення родоводу стандартизованого пацієнта, яку застосовували під час навчання професійним навичкам у 2012–2017 рр.

Матеріали та методи. 583 студенти медичного факультету Ondokuz Mayis University поставили відповідні запитання стандартизованому пацієнту та намалювали родове дерево. Після завершення завдання студентам запропонували заповнити форму оцінювання за п'ятибальною шкалою Лайкерта (Likert scale). Для оцінювання різниці балів використали критерій хі-квадрат.

Результати. 566 студентів (97,08 %) оцінили позитивно те, що у практиці використовували відповідні інструменти й обладнання. Діяльність інструктора оцінили як належну 98,11 % учасників опитування. Майже 97,09 % респондентів повідомили, що часу на виконання завдання було достатньо. Студенти стверджували, що ці навички є необхідними та можуть використовуватися під час професійної діяльності, – 82,19 % та 78,35 % відповідно.

Не виявили кореляції між оцінюванням пропозицій і застосуванням стандартизованого пацієнта. Однак помітили, що використання стандартизованих пацієнтів на практиці суттєво збільшує загальні бали в оцінюванні практики створення родинного дерева ($p < 0,032$).

Висновки. Результати показали: навчання візуалізації спадковості студенти оцінили позитивно, а використання стандартизованого пацієнта не мало жодних відмінностей в оцінюваннях студентів.

Ключові слова: родовід, медична освіта, стандартизований пацієнт, відгуки.

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Оценка практики создания родословной и применение стандартизированного пациента студентами медицинского факультета

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Создание родословной – необходимый и эффективный инструмент в медицине, занимает ведущее место в медицинском образовании.

Цель работы – поделиться результатами оценивания студентами третьего курса медицинского факультета относительно практики создания родословной стандартизированного пациента, которую применяли в программе обучения профессиональных навыков в 2012–2017 гг.

Материалы и методы. 583 студента медицинского факультета Ondokuz Mayis University задали соответствующие вопросы стандартизированному пациенту и нарисовали родовое дерево. По завершению задания студентам предложили заполнить форму оценки по пятибалльной шкале Лайкерта (Likert scale). Для оценки разницы баллов использовали критерий хи-квадрат.

Результаты. 566 студентов (97,08 %) оценили положительно то, что на практике использовали соответствующие инструменты и оборудование. Деятельность инструктора оценили положительно 98,11 % участников опроса. 97,09 % респондентов сообщили, что времени на выполнение задания было достаточно. Студенты утверждали, что эти навыки необходимы и могут использоваться в профессиональной деятельности, – 82,19 % и 78,35 % соответственно. Не установили корреляцию между оценкой предложений и применением стандартизированного пациента. Однако заметили, что использование стандартизированного пациента на практике существенно увеличивает общие баллы в оценке практики создания родового дерева ($p < 0,032$).

Выводы. Результаты показали, что обучение визуализированию наследственности студенты оценили положительно, а использование стандартизированного пациента не имело никаких различий в оценках студентов.

Ключевые слова: наследственность, медицинское образование, пациент.

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Medical education is a complex and long education period including various types of education and training experiences [10]. Pedigree (family tree) is an important tool in medical genetics, representing the genetic relationship among the family members, the transmission of genetic information from generation to generation and family history diagrammatically [2]. A family tree is used to identify individuals with an elevated risk of inherited disorders/diseases and the inheritance pattern of the disease [6] (Carver, Cunningham, et al. 2018). Pedigree also helps to choose the best genetic testing strategies and establish an early diagnosis, and clinical management of genetic disorders [1,5].

Until the early 1990s, the use of pedigree symbols by researchers and genetic professionals was showing inconsistencies in recording the genetic nature of family history and in genetic publications [1,2]. In 1995, Pedigree Standardization Task Force (PSTF or PSWG), which is the professional issues committee of the National Society of Genetic Counsellors Pedigree Standardization Task Force (NSGC), has made recommendations to reduce the inconsistencies in drawing pedigrees [2].

Simulation is a useful and effective tool in medical education, pretending patient care scenarios for the purposes of assessment and feedback [9](Okuda, Bryson, et al., 2009). Giving feedback either in oral or written format is known to be essential for the learning process [12].

Aim

The aim of this study is to share our pedigree drawing practice with a simulated patient and feedbacks applied in the professional training skills program at Ondokuz Mayis University, Faculty of Medicine (OMUFM).

Material and methods

A Pedigree Drawing Education Guide has been included in the Clinical and Professional Skills Learning Program. Drawing pedigree training has been applied to 3rd year Turkish and English Medical Education students between 2012–2017 academic years. Pedigree Drawing Education Guide was prepared and distributed to all students (*Fig. 1*).

Students who participated in this practice session were first taught how to draw a family tree according to the guidance provided and then an illustrative pedigree was drawn using a sample of the family story. Finally, two different practice methods were applied to students. During the 2012–2014 academic years students were divided into pairs and asked appropriate questions to each other to draw up their family tree. After 2014, students asked similar questions to a standardized patient portrayed Huntington's disease. All students participating in the practice drew up at least three-generation family tree of their class fellow or standardized patient using standard symbols and nomenclature in accordance with the learning guide. At the end of the practice, students were asked to fill an evaluation form about the practice of family pedigree drawing. An Objectively Structured Clinical Examination (OSCE) was applied at the end of the semester to evaluate their learning outcome.

A total of 583 third year medical faculty students participated in the survey after the practice. The forms were filled out anonymously and all forms were given the instructor at the end of the practice. Two different evaluation forms were filled by students. During the first two academic years (2012–2014) the students completed an evaluation form including 5 propositions and 9 proposition forms in the last four years. Four propositions were added to the evaluation forms after starting to use the standardized patient after 2014.

Table 1. Propositions on the application evaluation forms

	Propositions
1	The equipment and the materials were appropriate.
2	The attitude of the instructor was appropriate.
3	The allocated time for the skill was sufficient.
4	I think learning this skill is essential.
5	I can use this skill in my professional life.
6	I could draw a pedigree based on the knowledge I acquired from the standardized patient.
7	I received appropriate feedback for the pedigree I drew.
8	I could determine the inheritance pattern of the pedigree I drew.
9	Use of a standardized patient made it easier for me to learn the skill.

All propositions of the evaluation form are listed in *Table 1*. The students rated these propositions using a 5 point Likert scale from 5 (strongly agree) to 1 (strongly disagree). The first five propositions were common and the rest were prepared for the evaluation of practice after starting to use standardized patent.

Statistical analysis. Correlation between scoring and before and after use of standardized patient was investigated with χ^2 test. $P < 0.05$ was considered significant.

Results

The scores of the first five propositions and the general assessment before and after including standardized patients in the practice are shown in *Tables 2* and *3*, respectively. No correlation was found between the scoring of the first five propositions before and after the application of standardized patients.

In total, 97.08 % (n = 566) of the students participated in the survey rated strongly agreed or agreed that appropriate tools and equipment were used in the practice. The attitude of the instructor was assessed appropriate by 98.11 % (n = 573) of the participants. This proposition was at the highest level among the students that positively evaluated propositions. The rest of the students responded to this question as neutral or disagree, 1.54 % and two students respectively. The time allocated for this skill was found to be sufficient by 97.09 % (n = 569) of the respondents. Fourteen students preferred to stay neutral and three students disagreed with this proposition. This skill was expressed to be necessary by 82.19 % (n = 480) of the students, whereas 3.76 % of students were disagreeing with this proposition. Four hundred fifty six students (78.35 %) reported that they will be using the knowledge of this practice in their professional life. However, twenty nine students did not agree on this proposition.

We have observed that the use of standardized patients in practice significantly increases the general assessment scores of family tree drawing practice ($P < 0.032$). Our results showed that students who gave 5 points to the practice before

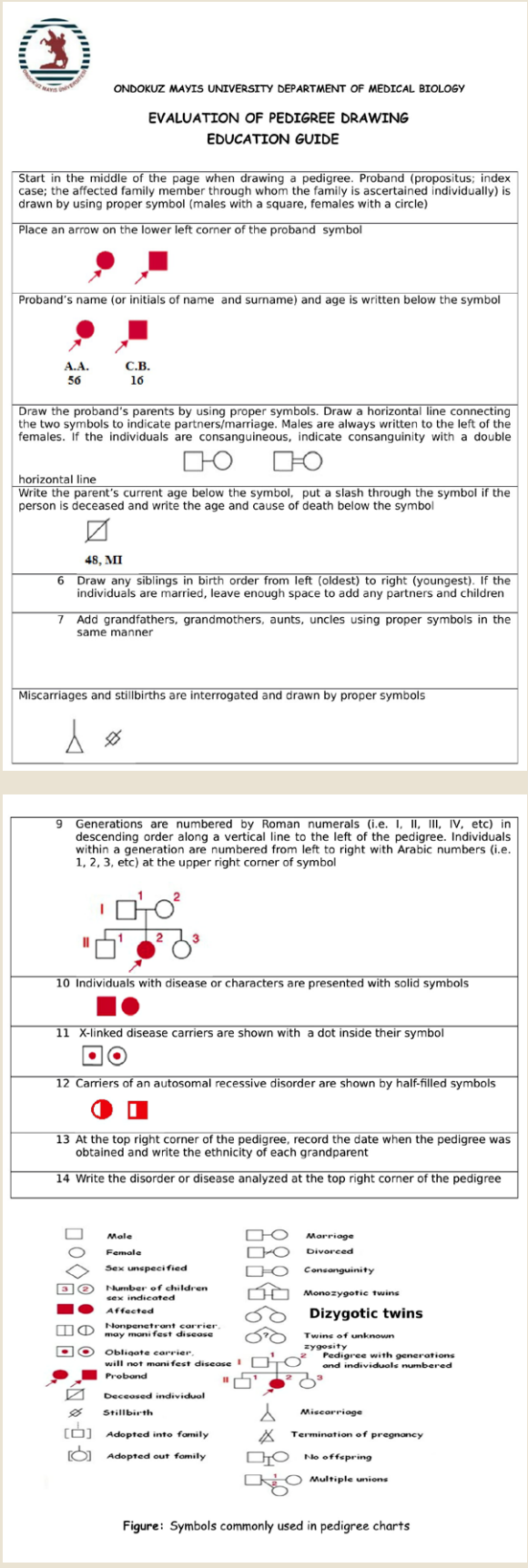

Fig. 1. Evaluation of Pedigree Drawing Education Guide.

Table 2. Score distribution of the first five propositions before and after the use of standardized patient

Groups			Proposition 1				Proposition 2					Proposition 3					
			Score			Total	Score				Total	Score					Total
			5	4	3		5	4	3	2		5	4	3	2	1	
Groups	Before Standardized Patient	n	180	96	6	282	223	56	3	0	282	214	65	3	0	0	282
		% within group	64	34	2	100	79	20	1	0	100	76	23	1	0	0	100
		% within score	47	51	35	48	50	46	34	0	48	49	49	21	0	0	48
	With Standardized Patient	n	200	90	11	301	227	67	6	2	302	222	68	11	2	1	304
		% within group	66	30	4	100	75	22	2	1	100	73	22	7	1	0	100
		% within score	53	48	65	52	50	55	67	100	52	51	51	78	100	100	52
P- value			0.35				0.342					0.137					
Total		n	380	186	17	583	450	123	9	2	584	436	133	14	2	1	586
		%	65	32	3	100	77	21	2	0	100	74	22	2	0	0	100

Groups			Proposition 4						Proposition 5					
			Score					Total	Score					Total
			5	4	3	2	1		5	4	3	2	1	
Groups	Before Standardized Patient	n	141	101	34	6	0	282	130	101	37	14	0	282
		% within group	50	35	12	2	0	100	46	36	13	5	0	100
		% within score	50	51	42	33	0	48	51	51	38	50	0	49
	With Standardized Patient	n	140	98	48	12	4	302	126	99	60	14	1	300
		% within group	46	32	16	4	1	100	42	33	20	5	0	100
		% within score	50	49	59	67	100	52	49	50	62	50	100	52
P- value			0.101						0.2					
Total		n	281	199	82	18	4	584	256	200	97	28	1	582
		%	48	34	14	3	1	100	44	34	17	48	1	100

Table 3. Score distribution of the general assessment before and after the use of standardized patient

Groups		General Assessment							Total
		10	9	8	7	6	5	4	
Before Standardized Patient	n	90	102	56	28	0	6	0	282
	% within group	31.9	36.2	19.9	9.9	0.0	2.1	0.0	100.0
	% within score	51.1	48.6	47.5	56.0	0.0	85.7	0.0	49.5
With Standardized Patient	n	86	108	62	22	8	1	1	288
	% within group	29.9	37.5	21.5	7.6	2.8	0.3	0.3	100.0
	% within score	48.9	51.4	52.5	44.0	100.0	14.3	100.0	50.5
P-value 0.032*									
Total	n	176	210	118	50	8	7	1	570
	%	30.9	36.8	20.7	8.8	1.4	1.2	0.2	100.0

*: statistically significant.

Table 4. The scores of the four proposals added to the evaluation forms after the use of the standardized patient

		Proposition 6					
		Score					Total
		5	4	3	2	1	
Group	n	204	120	39	2	2	367
	%	55.59	32.70	10.63	0.54	0.54	100.0
		Proposition 7					
		Score					Total
		5	4	3	2	1	
Group	n	199	129	30	4	2	364
	%	54.67	35.44	8.24	1.10	0.55	100.0
		Proposition 8					
		Score					Total
		5	4	3	2	1	
Group	n	165	140	51	6	4	366
	%	45.08	38.25	13.93	1.64	1.09	100.0 %
		Proposition 9					
		Score					Total
		5	4	3	2	1	
Group	n	213	98	22	4	2	339
	%	62.83	28.91	6.49	1.18	0.59	100.0

the use of the standardized patient were more than those who gave the same score after using the patient. Likewise, the number of students who evaluated the practice as 6 points increased after the use of standardized patients.

The scores of the other four propositions added to the evaluation forms after the use of standardized patients are given in *Table 4*.

Three hundred eleven students who participated in the survey assessed the 9th proposition as strongly agreed or agreed. Therefore 91.74 % of students agreed that the 'use of a standardized patient made it easier to learn the skill'.

Discussion

All clinicians take family histories, but developments in genomics suggesting genetic factors should be considered during taking family histories. According to the World Health Organization, taking family history should be used to identify genetic risk factors within the first step of the content of health care measures. All diseases besides trauma have genetic components. The power of a genetic component in a family can be understood by the number of people affected by a particular condition. A pedigree consists of information about the affinity status of family members and any

medical conditions they have. Drawing a pedigree allows the researchers and the clinicians to discuss the probability of the genetic origin of the disease and risk assessment. A carefully drawn family tree sheds light on the heredity risk of specific diseases, shared environmental factors, and concerns about the individual's health [13].

Drawing a family tree has an important place in genetics. International schematized language is used for drawing of pedigrees and the use of this nomenclature in drawing of pedigrees makes the analysis of patient and disease easier particularly in large families. Hence, the use of standardized language facilitates the communication among health professionals, patients and their families regarding diagnosis and testing and has the potential to decrease the medical inaccuracies and [2]. Likewise, health professionals all over the world enable to share, understand and interpret the pedigree information. Thus, clinicians need to draw and interpret pedigrees using standardized competence. This necessity is overcome by designing a practice session for standardizing pedigree drawing at Medical Faculty. Indeed, a high percentage of our students stated that this skill was necessary and they thought that they were able to use it in their professional life.

During the first two years of our practice, students were asked to draw the family tree by asking appropriate questions to each other, later students asked similar questions to a standardized patient portrayed Huntington's disease at the end of the teaching session. In this way, we wish to analyze the feedbacks made by the students about the family tree practice and evaluate the possible impact of standardized patients using student feedback. Our results demonstrated a general increase in assessment scores of the last four propositions after the use of standardized patients suggest that the application of standardized patient was favorable in medical education.

McGovern et al (2006) stated that the use of standardized patients in pedigree practice increases the confidence of students for their similar future patient assessments. The interaction with standardized patients may influence medical students positively to draw pedigrees, evaluate genetic risks and give genetic counseling [4,8,9] also reported that simulated patients practice and personal drug choice in problem based learning sessions were appreciated by the students. In addition, the instructor applied an examination using a simulated patients after this pharmacotherapy teaching session. About 93.9 % of their students stated that this educational program should be applied all medical faculty students.

At the end of the education, some of the participants demanded more frequent simulated patients in their educations [4]. The use of a standardized patient did not make any differences in the evaluations of the suitability of tools and equipment, the attitude of the instructor, the time of practice, the necessity and the future use of these skills.

Feedback is the constructive and objective evaluation of a practice that develops skills. The goal of feedback which is non-critical and based on direct observations of learners is to increase the learner's ability and improve their behavior and performance in education [3]. We used 5 points Likert scale which is frequently used in medical education and researches of medical education for evaluation [11].

Practicing pedigree drawing may help the students recognize the challenges faced in collecting family history information, particularly in the setting of acute hospitalization [7].

Conclusion

This study has shown that applied family tree drawing training was evaluated positively by the students and the use of standardized patients improves the general assessment evaluation of the student.

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References

[1] Bennett, R., Hampel, H., Mandell, J., & Marks, J. (2003). Genetic counselors: translating genomic science into clinical practice. *Journal Of Clinical Investigation*, 112(9), 1274-1279. doi: 10.1172/jci200320113
[2] Bennett, R. L., Steinhaus, K. A., Uhrich, S. B., O'Sullivan, C. K., Resta, R. G., Lochner-Doyle, D., et al. (1995). Recommendations for standardized human pedigree nomenclature. Pedigree standardization task force of the National Society of genetic counselors. *Am J Hum Genet*, 56(3), 745-752.
[3] Bienstock, J., Katz, N., Cox, S., Hueppchen, N., Erickson, S., & Puscheck, E. (2007). To the point: medical education reviews – providing feedback. *American Journal Of Obstetrics And Gynecology*, 196(6), 508-513. doi: 10.1016/j.ajog.2006.08.021

[4] Bilge, S. S., Akyuz, B., Agri, A. E. & Ozlem, M. (2017). Rational drug therapy education in clinical phase carried out by task-based learning. *Indian J Pharmacol*, 49(1), 102-109. doi: 10.4103/0253-7613.201009
[5] Brock, J., Allen, V., Kieser, K., & Langlois, S. (2010). Family history screening: use of the three generation pedigree in clinical practice. *Journal Of Obstetrics And Gynaecology Canada*, 32(7), 663-672. doi: 10.1016/s1701-2163(16)34570-4
[6] Carver, T., Cunningham, A. P., Babb de Villiers, C., Lee, A., Hartley, S., Tischkowitz, M., et al. (2018). Pedigreejs: a web-based graphical pedigree editor. *Bioinformatics*, 34(6), 1069–1071. doi: 10.1093/bioinformatics/btx705
[7] Korf, B. (2002). Integration of genetics into clinical teaching in medical school education. *Genetics In Medicine*, 4(6), 33-38. doi: 10.1097/00125817-200211001-00007
[8] McGovern, M., Johnston, M., Brown, K., Zinberg, R., & Cohen, D. (2006). Use of standardized patients in, undergraduate medical genetics education. *Teaching And Learning In Medicine*, 18(3), 203-207. doi: 10.1207/s15328015tlm1803_3
[9] Okuda, Y., Bryson, E., DeMaria, S., Jacobson, L., Quinones, J., Shen, B., & Levine, A. (2009). The utility of simulation in medical education: what is the evidence? *Mount Sinai Journal Of Medicine: A Journal Of Translational And Personalized Medicine*, 76(4), 330-343. doi: 10.1002/msj.20127
[10] Spencer, J., & Jordan, R. (1999). Learner centred approaches in medical education. *BMJ*, 318(7193), 1280-1283. doi: 10.1136/bmj.318.7193.1280
[11] Sullivan, G., & Artino, A. (2013). Analyzing and interpreting data from likert-type scales. *Journal Of Graduate Medical Education*, 5(4), 541-542. doi: 10.4300/jgme-5-4-18
[12] Tekian, A., & Taylor, D. (2017). Master's degrees: Meeting the standards for medical and health professions education. *Medical Teacher*, 39(9), 906-913. doi: 10.1080/0142159x.2017.1324621
[13] Wang, C., Sen, A., Ruffin, M., Nease, D., Gramling, R., & Acheson, L., et al. (2012). Family history assessment: impact on disease risk perceptions. *American Journal Of Preventive Medicine*, 43(4), 392-398. doi: 10.1016/j.amepre.2012.06.013