

Original article

Evaluating the Gains of Using Stories in Medical Education—A Pilot Study Example

Zerrin Gamsızkan¹, Mehmet Ali Sungur², Mehmet Göktuğ Günel³

Abstract

Objectives: Medical education develops day by day with the effect of its unique dynamics, excessive information load and changing education approach depending on its professional characteristics. The aim of this study was to determine effects on the knowledge and attitude gains of story usage in education. **Material and Methods:** This is a training intervention study with a twenty-five study group and twenty-five control group students. A 20-question test was applied to the students before and after the study, including the topics of course. In addition, students were asked to provide feedback on the educational practice. **Results and Discussion:** According to the results of this study applied with twenty-five students study and control groups; in addition to theoretical lessons, reading and discussing patient stories covering lesson topics significantly increases students' academic knowledge ($p < 0.001$). 90.4% of the students stated that the study generally met their expectations, 95.2% of them wanted to take this kind of application in other education modules and 89.6% of them stated that the study contributed to their learning. **Conclusions:** Student-centered interactive education sessions increase students' academic success in higher education. The student feedbacks we obtained in our study results have guided our future education interventions.

Keywords: Academic performance; Medical Education; Medical students; Patient stories; Students' perception

Bangladesh Journal of Medical Science Vol. 21 No. 03 July'22 Page : 694-701
DOI: <https://doi.org/10.3329/bjms.v21i3.59587>

Introduction

Until the 19th century, medical education was carried out in a teacher-centered framework where theoretical education was predominant and graduation qualifications were not defined.

Since the beginning of the 1900s, awareness has been raised to increase the effectiveness of medical education, especially after the effects of the flexner report.¹ It is emphasized that the medical education curricula need to be constantly updated to keep up with the rapid change in societies and medical

knowledge.² Wagenschutz and his colleagues say that they are constantly updating curriculum with students feedbacks and added that students' reactions ranged from affirming to critical.³ Future physicians are expected to grow up as individuals who can quickly combine theoretical professional knowledge with clinical situations and at the same time be able to communicate competently.⁴ With these perspectives, medical education aims to educate physician candidates in the framework of their graduate qualifications, which are self-learning and combine

1. Associate professor, Dr. Zerrin Gamsızkan, Düzce University Faculty of Medicine, Department of Family Medicine, *Konuralp 81100 Duzce / Turkey*, E-Mail: zgamsizkan@yahoo.com ORCID No: 0000-0001-8677-4004
2. Mehmet Ali Sungur, Assit Prof. Düzce University Medical Faculty Department of Biostatistics, *Konuralp 81100 Duzce / Turkey*, E-Mail: malisungur@yahoo.com ORCID No: 0000-0001-5380-0819
3. Mehmet Göktuğ Günel, Medical Student, Düzce University Medical Faculty, *Konuralp 81100 Duzce / Turkey*, E-Mail: goktuggunel3@gmail.com, ORCID No: 0000-0002-3972-5709

Correspondence: Zerrin Gamsızkan, Duzce University, Medical Faculty. Department of Medical Education, E-Mail: zgamsizkan@yahoo.com, Add: Duzce University, Medical Faculty. Konuralp 81100 Duzce / Turkey.

by making sense of what they learn.⁵ In this context, education methods are increasingly diversified and updated with effective practices that improve the graduate qualifications by lecturers who want to train their students equipped. New education models that complement the deficiencies in medical education such as problem-based education, small group education applications, outcome based education, integrated education, simulated case scenarios and application trainings have been developed.⁶⁻
⁸Developing curriculum in medical education makes educators and administrators anxious. The biggest reason for this anxiety is that there is no guarantee that the work done is sustainable and effective before the application. Implementing training interventions in small steps before changing the entire curriculum and seeing their impact is the right step to move forward.⁹ The fact that student-centered practices are time-consuming, and not all trainers have the same awareness may be an obstacle in the dissemination of effective training methods.¹⁰ Nevertheless, educators' initiatives that can increase student learning are being supported by the educational institution according to new perspectives.

Material and Method

This study is an educational intervention study with case control groups. The study was conducted by Düzce University Faculty of Medicine, Department of Medical Education between March 2019 and April 2019.

About the curriculum development process

Düzce Faculty of Medicine has aimed to create new programs for student-centered applications in medical education in the past few years and has started to develop its curriculum in this direction. Commissions have been set up to enrich and diversify education with the recommendations of the national accreditation committee. In the educational development commission; the fact that the curriculum was only theoretical education in the Faculty of Medicine for the first 3 years was considered insufficient to prepare the students for the clinic. In the 2018-2019 curriculum, pilot training interventions were planned for third grade students to link theoretical knowledge with critical clinical thinking before clinical courses. While making curriculum development plans, pilot applications were preferred to observe the impact and sustainability of newly developed applications

on student and learning outcomes

In this regard, the small group courses chosen by the students were presented to the third grades, 6 hours before each module. The students participated in these applications as elective courses. One of these group studies is focused on the theoretical and clinical information acquisition with structured patient stories of the diseases.

While designing this course, which we set out to increase the educational attainment of medical school students, we were inspired by narrative medicine. Narrative medicine provides the opportunity for physician candidates to evaluate patients in a holistic way with their disease stories. While students learn the diseases with patient stories, they can also emphatically evaluate the moods of the patients.¹¹ The contributions of enriching education with stories are supported by studies. It is said that storytelling creates a permanent behavior change by attracting the attention of the student and bringing their attention to the lesson.¹² In the course, we wanted to define the holistic approach acquisitions besides enhancing the academic knowledge by reading and discussing patient stories.

Development of the educational material

In this course, a 17-page patient story written for the "Muscle- Skeletal System, Neurological Sciences and Psychiatry" module, which is the 6th module of the 3rd grade of the Faculty of Medicine, was prepared as educational material. This story was prepared by a lecturer of the Department of Medical Education and Informatics, using various sources within the framework of the module topics. Story topics included neurological, psychiatric and musculoskeletal diseases.

The story was sent to the expert lecturers in the areas to control the neurology, musculoskeletal and psychiatry knowledge. Arrangements and corrections were made in the story with the recommendations and suggestions required by the relevant field experts.

Implementing the pilot training

The story reading activity was carried out by dividing a 6-hour period defined as the course hour at the beginning of the module by 3 sessions. During 3 sessions of 120 minutes, medical students were held in an interactive session in a training room with a U-table where everyone can see each other better. The story prepared for study in the first session

was read quietly by the students. At the end of the session, the health conditions of the characters in the story were discussed. While discussing what these health problems might be, learning objectives to be researched and read while coming to the next session were created. After 2 days, students were gathered in the same hall again and new learning objectives were created by discussing what can be done in biopsychosocial diagnosis and treatment around the story characters and the topics that overlap with what they learned. In the last session, the students discussed the patient approach with the diseases and study topics around the story characters and stated how they would approach those patients if they were physicians. Course Design Process and Implementation of Steps is shown in Table 1.

In order to determine the effectiveness and execution of the developed program, it was aimed to evaluate the applications with some measurements and feedback.

Evaluation process

Twenty-seven students enrolled in the course until March 2019, the module date of which was prepared. to evaluate training results; grade averages of the students enrolled in the course were determined for previous years. Twenty-six students from the same class who have the grade point average of the students in the course but who did not take this course were determined as the control group to evaluate the course achievements. Both groups of students were informed about the story reading activity that will be held before the module lessons begin. it was explained that the gains at the end of the course will be shared in the educational commission and scientific environments. It was stated that the students determined as the control group can take the same course after the evaluation is over. Consent was obtained from both group students. A 20-question test for measuring the information providing activity of the study was formed and finalized by examining the relevant expert faculty members. The questions prepared were applied to 10 of the students of the previous year as pilot tests. Pre-test of these 20 questions was applied to both the control group and the course group students before the course. After this training intervention, both the course group and the control group students took the didactic lessons of the “Musculoskeletal System, Neurological Sciences and Psychiatry” module. The prepared test

was applied again to the course and control groups as a post-test 3 weeks after the end of the course. After performing the education intervention, the course group students were asked to give feedback.

For feedbacks, students were asked to give a score of 10 expressions in the form of a 5-point Likert scale from 1: strongly disagree to 5: strongly agree. In addition, two open-ended questions were asked after 4 weeks while theoretical lessons continue, in order to understand the perception of this new learning intervention for the student more deeply and to express their experiences and perceptions about the study. The open-ended questions asked for feedback about the study was;

“What is your perception and impression about this kind of education model?”

“What could be considered incomplete and need improvement in this study?”

Data analysis

Continuous variables were summarized in mean and standard deviation while categorical data were summarized as frequency and percentage. McNemar test was used to evaluate correct/false proportion of each question obtained before and after tests. Correct answer points of whole test obtained before and after the application were compared with Paired samples t test in each group, while two-way Repeated Measures ANOVA was used to analyse interaction effect of group and application periods. Statistical significance level was considered as 0.05, and statistical analyses were done by SPSS v.20 statistical package.

Ethics approval and consent to participate

Ethics Permission was obtained from the “Ethics Committee of Düzce University Faculty of Medicine” for the study (Approval no:2019/26).

All students participating in the study filled in the consent form.

Results

The data of two students who took the course but could not complete the tests and 1 student from the control group were excluded from the evaluation. Twenty-five course group and twenty-five control group students' data were used.

Table 1. The answers given by the students to the open-ended questions

<i>Have a good time while learning</i>	<p>“I had a good time while learning”</p> <p>“These different ways of learning attract us more than traditional education. It was more enjoyable when I learned with my friends. “</p>
<i>Holistic and empathetic approach to the patient</i>	<p>“In addition to the information in the study, there was an awareness of the empathic approach of the problems experienced by the patients.”</p> <p>“ We cannot gain a holistic and empathetic approach to the patient with only theoretical lessons. I think I will be more sensitive to patients with this study”</p> <p>“I realized that I look at the patient not only as a body, but as a whole.”</p>
<i>Contextual contribution to learning</i>	<p>“ In the third grade, we only receive theoretical training and we have no choice but to memorize. We forget it after the exam. I think that when a subject is learned by connecting with such stories, I will never forget it again”</p> <p>“In a theoretical lesson 3 weeks after this study, when a disease in the story was told, I listened to the lesson more carefully and understood the subject better. “</p> <p>“The discussions made during the study contributed to my learning while studying.”</p>
<i>Expectations and recommendations for future lessons</i>	<p>“I think sessions should take longer. Thus, more ideas are discussed and these conversations help us remember the issue. “</p> <p>“ I think it should have been read by dividing it into 3 days instead of reading the whole story in the first session. In this way, we could be curious about the continuation of the story in the next 2 days.</p> <p>“ Only theoretical education leads us to memorization. I think similar course materials should be added in the curriculum. “</p> <p>“Setting up learning goals about what I need to learn has become a situation that I will apply more to myself in the future. “</p>

Table-2. Course Design Process and Implementation of Steps

First step	<p>Pretest to both study and control groups</p> <p>Gathering in the training room with the study group, Introducing the study design, Reading the story, Discussing the characters and their diseases</p>
First session	<p>in the story, Creating learning objectives</p>
Second Session*	<p>Discussion of diseases with titles formed in line with learning objectives Establishing new learning goals in the context of diagnosis and treatment</p>
Third Session**	<p>Discussion of holistic approach to patients Discussion “What we learned, what we gained in professional context”</p>

*: Two days after the first session, **: Two days after the second session,

According to the results of the posttest and pretest comparison that the study group gave after the third week; the scores that the students had from the post-test were found to be significantly higher than the scores they received from the pre-test ($p < 0.001$, Table 3, Figure 1).

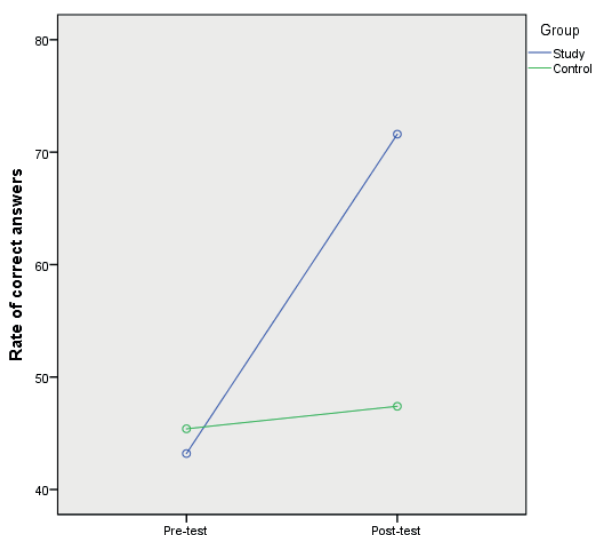


Figure 1. The Percentage of Posttest Responses of the Study and Control Groups After 3 Weeks

Table 3. Study Group Students’ results before and 3 week after study (pretest-posttest) results

	Pretest	Posttest	P
Correct answers(n)	8.64±2.84	14.32±2.61	<0.001
Correct answers(%)	42.2±14.2	71.60±13.05	<0.001

According to the post-test results after 3 weeks in the course plan, the number of correct questions answered by the course group students in the post-test was significantly higher than that of the control group students.

($p < 0.001$, Table 4).

Table 4. Number of correct answers given by the Study and Control group to the pretest and posttest 3 weeks later

	StudyGroup	Control Group	P
Pretest	8.64±2.84	9.08±2.63	<0.001
Posttest (3 weeks)	14.32±2.61	9.48±3.36	

According to the results of the feedback, 90.4% of the students stated that the study generally met their expectations, 95.2% of them wanted to take this kind of application in other education modules and 89.6% of them stated that the study contributed to their learning. The average scores of the students on the expressions according to the 5-point Likert scale are shown in table 5.

The answers given by the students to the open-ended

questions are shown in table 1.

Discussion

According to our education intervention results, using patient stories in medical education as educational materials increases both students’ academic knowledge and awareness of holistic approach to patients. In studies conducted, it is seen that knowledge and skill acquisitions have increased significantly with courses and such educational interventions.¹³⁻¹⁴

The majority of the students who participated in the study were satisfied with the application and expressed their opinion that such training modules should be included in the curriculum. In the studies conducted, it is seen that the students are satisfied with the education interventions different from formal education. Likewise, the inclusion of these model education interventions in the curriculum is the common idea of the majority of students.^{13,15}

In the education intervention, according to the answers given to the open-ended questions asked for students to express their experiences and perceptions about the work comfortably without being directed, indicate that such learning materials help students learn more permanently without memorizing their lessons. Evaluating the studies designed with new teaching interventions, students say that such interventions encourage critical thinking and provide a holistic perspective on the subject.¹⁶ In the educational work of Lodhiya et al., Students stated that they preferred learning methods with group interactions rather than traditional education models.¹⁷ In our study, the students also stated that these different learning pathways attracted more attention than traditional education and it was more enjoyable to learn with their friends. Learning interventions made with different approaches to tiring and often boring traditional medical education contribute to learning and attract students’ interest.¹⁸ In the study conducted in Skaggs School of Pharmacy and Pharmaceutical Sciences besides to make the lessons more attractive and effective with the use of stories, it is stated that it is an effective method to encourage students to think while learning.¹⁹ In our study, it was stated that it is a gain to be used in the future to get students’ own learning goals as a result of the application. It is stated that it will contribute to the students to understand why they are important in

Table-5. Feedbacks received from students with expressions asked to be scored after the study

Feedbacks and Perceptions Responses of Likert Scale	5	4	3	2	1
The study was good with all its steps.	21(77.8)	5(18.5)	1(3.7)	0	0
The study was generally useful	14(51.9)	12(44.4)	1(3.7)	0	0
The study contributes to academic knowledge	14(51.9)	8 (29.6)	4(14.8)	1(3.7)	0
I would like to see such training modules in the curriculum	8 (29.6)	13(48.1)	6(22.2)	0	0
I fully grasped the purpose of the study	9(33.3)	16(59.3)	2(7.4)	0	0
The training I received met my expectations	8 (29.6)	14(51.9)	16(59.3)	0	0
In addition to information within the application, it also provides patient approach practice	10(37.0)	8 (29.6)	6(22.2)	3(11.1)	0
I would like to benefit from this application in other study modules.	11(40.7)	13(48.1)	3(11.1)		0
I can recommend this application to my friends in general.	8 (29.6)	18(66.7)	1(3.7)	0	0
I think that the discussions in the study will contribute to my learning	13(48.1)	12(44.4)	2(7.4)	0	0

Values are calculated as number of responses to each statement (%) Response Likert scale.

5=Strongly agree, 4=Agree, 3=Uncertain, 2=Disagree, 1=Strongly disagree

their professional lives by determining their learning goals during education.²⁰

In the story reading course, the students stated that the holistic and empathic approach to the patient could not be provided only in the theoretical course and that she would be more sensitive with this study. It has been also demonstrated with studies that narrative medicine and using patient stories in education provide gains in professional empathic approach.^{21,22} Educators of the professions that serve people state that using stories in education is useful in increasing the effectiveness of education and critical thinking by linking theory and practice.²³

We think that the results of our study can also be used in the changing medical education after the pandemic we have experienced for the last year. Restricting students' interaction with patients may require these activities to be included in the agenda, especially as they are risky in many medical schools. Studies indicate that different teaching methods will be used more in post-pandemic medical education.²⁴

One of the limitations of this study was the application of educational intervention only to a small group of third graders. It is stated that student feedback

in medical education may vary depending on the academic year.²⁵ Another limitation of the study was that we applied the course in one module only. As we mentioned at the beginning of the study planning, we stated that we had to translate a pilot application in order to be more effective due to some limitations in our faculty. In accordance with the hypothesis results we established at the beginning of the study, the positive results of a contextual intervention in education can serve as a guide for use in other parts of medical education.

Quantitative data of the results of the course may constitute the idea that we are categorizing students numerically. As an educator, our effort is to try to find the most effective ways of learning by introducing new perspectives to discussion. Measuring the academic knowledge gains of course evaluation We believe that it will be instructive for the educators to demonstrate that this story reading course, which attracts the attention of the student and meets the learning goals, benefits the information equipment, although we do not have a primary goal in our next course applications. We recommend that such education, which contributes to both the

educator and the student, to be implemented by other medical faculties. With the results of the education intervention, we think that medical education is an example of a model that can provide effective results in the future education concept. The positive results of a contextual intervention in education can serve as a guide for use in other parts of medical education.

Conclusion

According to our study results, using lecture topics and contextual stories in medical education increases the academic success of students. At the same time, such interactive educational interventions attract students' attention to the lesson. Student interest and

satisfaction are important to motivation to learn. It is recommended to use educational interventions with this strategy and understanding.

Authors' Contributions

Data gathering and idea owner of this study: ZG,

Study design: ZG, MAS

Data gathering: MAS, MGG

Writing and submitting manuscript: ZG, MGG

Editing and approval of final draft: MAS

Conflict of interest

The authors declare that they have no conflict of interest.

References

1. Prideaux D. Integrated learning. In: John A, Dent RM, editors. *A Practical Guide for Medical Teachers*. London: Churchill Livingstone Elsevier; 2010
2. Breipohl W, Johansson C, Hansis M, Steiger J, Naguro T, Müller K, et al. Undergraduate medical education: tendencies and requirements in a rapidly developing Europe. *Folia Med (Plovdiv)* 2000;42: 5-16
3. Wagenschutz H, McKean EL, Mangrulkar R, Zurales K, and Santen S. A first-year leadership programme for medical students. *Clin Teac* 2019;16(6):623-629 <https://doi.org/10.1111/tct.13005>
4. Kaplan-Liss E, Lantz-Gefroh V, Bass E, Killebrew D, Ponzio NM, Savi C, et al. Teaching Medical Students to Communicate With Empathy and Clarity Using Improvisation. *Acad Med* 2018;93: 440-443. <https://doi.org/10.1097/acm.0000000000002031>
5. Hsieh CR, and Tang C. The multi-tiered medical education system and its influence on the health care market-China's Flexner Report. *Hum Resour Health*. 2019;5:17(1):50.

- <https://doi.org/10.1186/s12960-019-0382-4>
6. Demirören M, Turan S, and Taşdelen TG. Determinants of self-regulated learning skills: the roles of tutors and students. *Adv Physiol Educ* 2020; **1**: 93-98. <https://doi.org/10.1152/advan.00121.2019>
 7. Salam, A., Yaman, M. N., Hashim, R., Suhaimi, F. H., Zakaria, Z., & Mohamad, N. (). Analysis of Problems Posed in Problem Based Learning Cases: Nature, Sequence of Disclosure and Connectivity with Learning Issues. *Bangladesh Journal of Medical Science* 2018 ;**17**(3): 417-423. <https://doi.org/10.3329/bjms.v17i3.36997>
 8. Cleveland J, and LeClair RJ. An Interactive Process for Delivering Pharmacologic Interventions for Migraine Headache to First-Year Medical Students. *Med Ed PORTAL* 2020; **7**: 10877. <https://doi.org/10.15766/mep.2374-8265.10877>
 9. Schneiderhan J, Guetterman TC, and Dobson ML. Curriculum development: a how to primer. *Fam Med Community Health* 2019; **8**: e000046. <https://doi.org/10.1136/fmch-2018-000046>
 10. Ehlers C, Wiesener N, Teichgräber U, and Guntinas-Lichius O. Reformed conventional curriculum promoting the professional interest orientation of students of medicine: JENOS. *GMS J Med Educ* 2019; **36**: Doc50. <https://doi.org/10.3205/zma001258>
 11. Charon R, and Wyer P. NEBM Working Group. Narrative evidence based medicine. *Lancet* 2008; **26**: 371: 296-297. [https://doi.org/10.1016/s0140-6736\(08\)60156-7](https://doi.org/10.1016/s0140-6736(08)60156-7)
 12. Cooper K, Hatfield E, and Yeomans J. Animated stories of medical error as a means of teaching undergraduates patient safety: an evaluation study. *Perspect Med Educ* 2019; **8**: 118-122. <https://doi.org/10.1007/s40037-019-0498-1>
 13. Vavasseur A, Muscari F, Meyrignac O, Nodot M, Dedouit F, Revel-Mouroz P. et al. Blended learning of radiology improves medical students' performance, satisfaction, and engagement. *Insights Imaging* 2020; **2811**: 61. <https://dx.doi.org/10.1186/s13244-020-00865-8>
 14. Mosalanejad, L., Sani, M. S., Hosseini, Y., & Abdollahifrad, S. (). Implementation of Serial Workshop by Students Educational Need: Trend to Accountability in Medical Education. *Bangladesh Journal of Medical Science* 2018; **17**(1): 78-83. <https://doi.org/10.3329/bjms.v17i1.35285>
 15. Willis MH, Frigini LA, Lin J, Wynne DM, and Sepulveda KA. Clinical Decision Support at the Point-of-Order Entry: An Education Simulation Pilot with Medical Students. *Acad Radiol* 2016; **23**: 1309-1318. <https://doi.org/10.1016/j.acra.2016.01.020>
 16. Vashe A, Devi V, Rao R, Abraham RR, Pallath V, and Umakanth S. Using an integrated teaching approach to facilitate student achievement of the learning outcomes in a preclinical medical curriculum in India. *Adv Physiol Educ* 2019; **43**: 522-528. <https://doi.org/10.1152/advan.00067.2019>
 17. Lodhiya KK, and Brahmabhatt KR. Effectiveness of Collaborative Versus Traditional Teaching Methods in a Teaching Hospital in Gujarat. *Indian Journal of community medicine : Official publication of Indian Association of Preventive & Social Medicine*. 2019; **44**: 243-246. https://doi.org/10.4103/ijcm.ijcm_378_18
 18. Mosalanejad L, Razeghi B, Ifard S. Educational Game: A Fun and team based learning in psychiatric course and its effects on Learning Indicators. *Bangladesh Journal of Medical Science* 2018; **17**(4), 631-637. <https://doi.org/10.3329/bjms.v17i4.38328>
 19. Gilliam E, Brunner J, Bolan J, Lee S, Nuffer W, Franson KL, et al. Cultivating a Culture of Reflection Among Pharmacy Students Through Storytelling. *Am J Pharm Educ* 2020; **84**: Article 7633 <https://doi.org/10.5688/ajpe7633>
 20. Gilliam E, Brunner J, Jeffres M, Nuffer W, and Thompson M. Assessing a longitudinal reflection curriculum: a case study of student self-awareness expressed through rotation goal achievement. *Inov Pharm* 2018; **9**: Article 5.
 21. Liao HC, and Wang YH. Storytelling in Medical Education: Narrative Medicine as a Resource for Interdisciplinary Collaboration. *Int J Environ Res Public Health* 2020; **17**(4): pii: E1135. <https://doi.org/10.3390/ijerph17041135>
 22. Paton A, and Kotzee B. The fundamental role of storytelling and practical wisdom in facilitating the ethics education of junior doctors [published online ahead of print, *Health (London)* 2019; 1363459319889102. <https://doi.org/10.1177/1363459319889102>
 23. Sabio C, and Petges N.A. (2019). Framework for Educator Storytelling: Situation, Background, Assessment, Recommendation, Review (SBARR). *Nurse Educ* **44**, 207-210. <https://doi.org/10.1097/nne.0000000000000588>
 24. Rashid, A., Rashid, M. R., Yaman, M. N., & Mohamad, I. (). Teaching Medicine Online During the COVID-19 Pandemic: A Malaysian Perspective. *Bangladesh Journal of Medical Science*, 2020; **77**-S 81. <https://doi.org/10.3329/bjms.v19i0.48170>
 25. Ayoob, M., Alsultan, A., Begam, N., Sumaih, S., & Albuali, H. (). Impact of Socio-demographic factors on Quality of life in Medical Students of Eastern Saudi Arabia. *Bangladesh Journal of Medical Science*, 2021; **20**(2): 250-257. <https://doi.org/10.3329/bjms.v20i2.51531>