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Original Study

Improving the Training Process for Student Providers in a Student-Run Free Clinic: Assessing the Impact of a Small Group, Peer-Led Training Process

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Abstract

Background: Student-run free clinics give students crucial opportunities to improve their skills as future medical professionals. However, many students at our institution feel unprepared to take on student provider roles despite completing a training curriculum. This study describes an improved way to train student providers using a small group, peer-led training process.
Methods: Participants in the control group completed our institution's current training process consisting of viewing e-modules and observing a clinic visit. Participants in the experimental group took part in small group, peer-led training sessions. All study participants completed pre- and post-training surveys to assess their confidence in navigating the electronic health record, performing physical exams, and patient interviewing and in their sense of overall preparedness. Participants' pre-training to post-training confidence change scores were calculated for each question, and the two groups' results were compared using Mann-Whitney-U tests.
Results: Results revealed a statistically significant increase in confidence in performing physical exams and navigating the electronic health record for students in the experimental group compared to the control group. While both groups saw an increase in confidence in overall preparedness to serve as a student provider and in patient interviewing, no significant differences were observed between the two groups.
Conclusions: While both groups showed increases in confidence change scores for all components surveyed, participants in the small group, peer-led training process reported a larger increase in their confidence to perform physical exam and electronic health record navigation skills after the training intervention than the control group participants. Small-group, peer-led training sessions give students opportunities to receive early hands-on exposure to technical skills. The findings of this study can lead to lasting improvement in our institution's provider training process while serving as a model for other student-run clinic programs to better prepare student providers to care for at-risk populations.

Introduction

Student-run free clinics (SRFCs) are outpatient clinics organized by health care students in which students serve as the providers under the supervision of licensed healthcare professionals. SRFCs are now present at more than 75% of medical schools with many clinics focused on care for low-income patients.[1,2] These clinics provide medical students with hands-on experience in an environment that replicates a real-world clinical setting. Studies have shown that students volunteering in SRFCs are more likely to work with underserved populations, have a greater understanding of the responsibilities of other healthcare professions, and develop empathy in

patient care.[3-6]

While many SRFCs assign their first- and second-year medical student providers to more limited roles (taking vitals, obtaining chief complaints), medical students at our institution function independently as student providers as soon as they complete the requirements of viewing an online e-module curriculum and shadowing, or observing, a current student provider during a clinic session. Because of the independence given to student providers early in their medical education, the training curriculum is essential to student provider competency and quality patient care.

Several issues were identified with the established training process for our student providers including outdated curriculum information, high patient no-show rates which limits shadowing opportunities, and variability in the information and instruction received during shadowing sessions. Furthermore, like many SRFCs, our clinic frequently sees new leadership and new volunteers, limiting the consistency of student provider training. An experimental curriculum was developed and implemented that sought to minimize these limitations and better prepare students to become student providers. This study has the potential to lead to lasting changes in the student provider training model at our institution while encouraging other SRFCs to examine and improve the educational curricula for their student providers.

Methods

A randomized controlled trial was performed to assess differences in students' confidence in their provider abilities after completing a small group, peer-led training session or an e-module and shadowing training process. To recruit student participants, emails were sent to first- and second-year medical students asking for volunteers. Students willing to volunteer completed a Google form (2022, Google, Mountain View, CA) in which they had to verify that they had not viewed the e-modules or shadowed in the SRFC. Student volunteers were then randomly assigned to the control or experimental training groups.

Control Group

Students in the control group were first required to complete a series of e-modules consisting of information about clinic locations; appropriate attire; and relevant clinical information including common medications, lab orders, and electronic health record (EHR) documentation. After completing the e-modules, students shadowed a student provider at our SRFC. During the shadowing session, students received further instruction on EHR navigation, physical exam techniques, and patient interviewing. Students are allowed to serve as independent student providers upon completion of these requirements. The time to complete the e-modules and shadowing experience totaled about five hours.

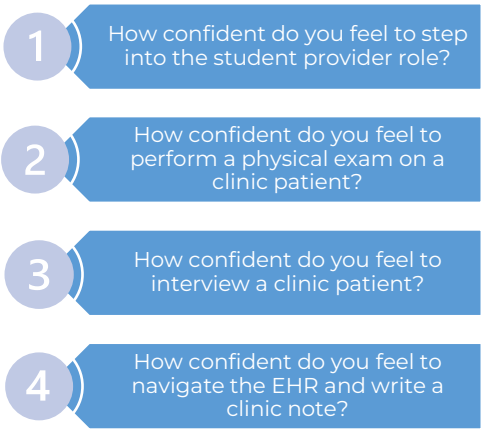
Experimental Group

Students assigned to the experimental group took part in small group, peer-led training sessions that consisted of EHR navigation, physical exam skill practice, and patient interviewing practice. This curriculum was designed using both current training documents (preexisting e-modules and EHR resources) and peer leader experiences.

The authors requested the assistance of six fourth-year medical students to serve as peer leaders in the training program; selection was based on their prior involvement in the SRFC as well as their prior leadership experience. After agreeing to serve as peer leaders, they were required to attend a Zoom (v5.17.11, Zoom, San Jose, California) training session led by the study authors. In this session, the authors reviewed the small group, peer-led training materials (EHR PowerPoint (v16.88.1, Microsoft, Redmond, WA) and physical exam/patient interviewing checklist; see Supplementary material) and provided instruction on the desired teaching methods for the components of the training session. After the training, each peer leader was provided with the curriculum materials to review independently prior to the student provider training session. During the training session, peer leaders were split into groups of two, and each dyad was responsible for teaching a portion of the curriculum (physical exam, patient interviewing, or EHR navigation).

To complete the training portion in the EHR

Figure 1. Survey questions distributed to student participants before and after training



EHR: electronic health record.

system, a simulation environment was used that allowed student participants to view charts, edit histories/medications, add orders, and write notes in simulated patient charts. Student participants were guided through the common steps of chart review and documentation during a typical clinic visit with the help of a PowerPoint presentation (see online appendix A). Students also received practice in note-writing using templates created for clinic visits.

During the physical exam portion, student pairs practiced a checklist of physical exam maneuvers (see online appendix B). Similarly, paired students practiced interviewing on one another using a suggested interview outline (see online appendix C). Time to complete the small group, peer-led training session totaled about two hours. Student participants were required to complete one training session, and afterward, were qualified to serve as student providers.

Before undergoing their respective training processes, participants in each group were required to complete a survey to assess their perceived confidence in performing the clinical skills necessary to serve as student providers (Figure 1). The survey used a 5-point scale to assess students' confidence in performing physical exam skills, using our EHR, and interviewing patients.

Students in both groups were then required to complete the same survey after undergoing their respective training processes. Pre- and post-training survey responses were matched to the same subject. Participant information and survey scores were recorded in Excel (v16.88.1, Microsoft, Redmond, WA). Approval for this project was obtained through the University of Nebraska Medical Center Institutional Review Board.

Statistics

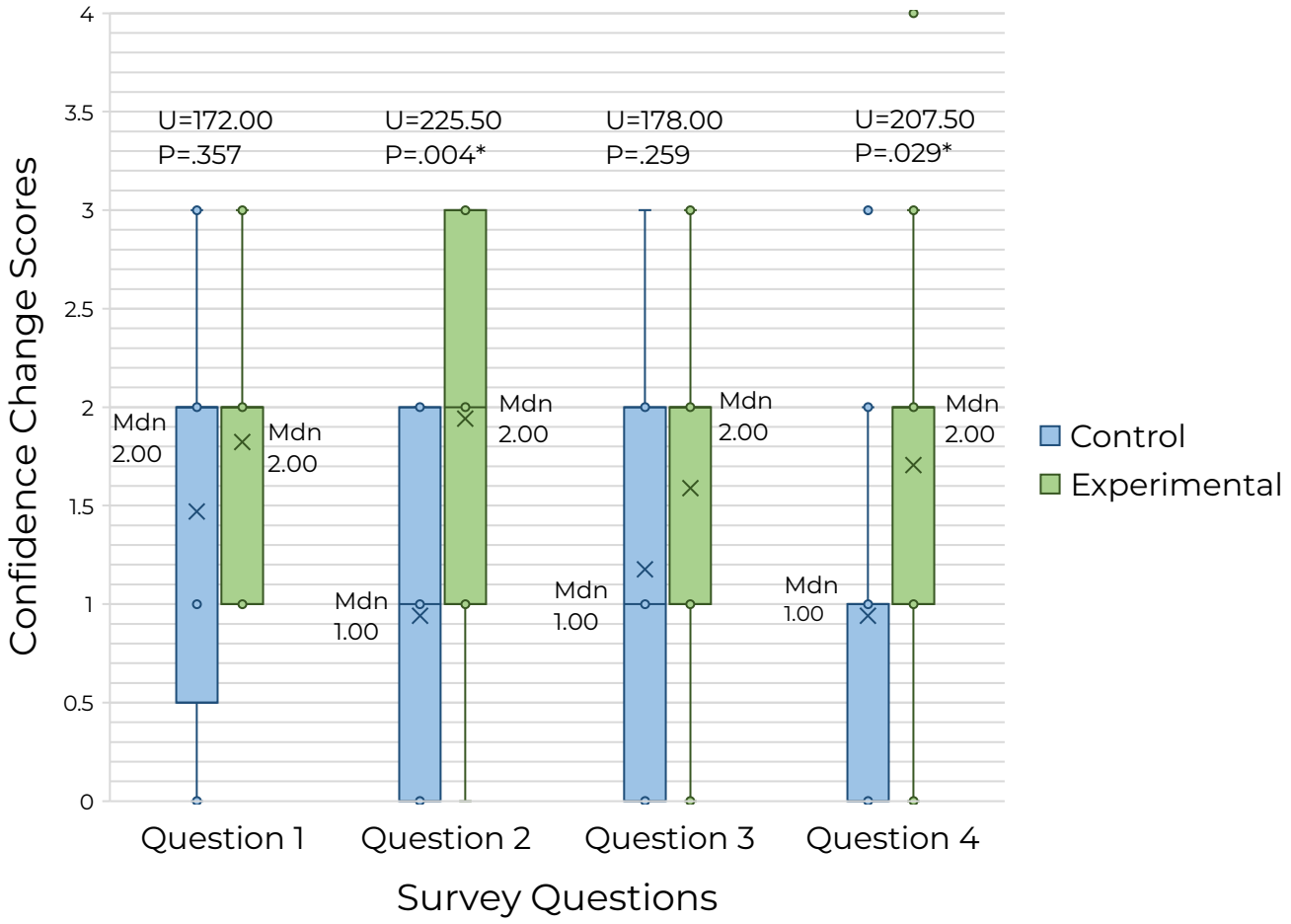
Data was analyzed by calculating the difference between pre-training survey scores and post-training survey scores for each question; this difference was referred to as confidence change scores. Mann-Whitney-U tests were conducted on confidence change scores for each question to determine statistical significance between control and experimental training groups. Descriptive statistics were used to characterize our student population (i.e. mean, median). SPSS Statistics (v29.0, IBM, Armonk, NY) was used to perform statistical analyses.

Results

Thirty-eight students signed up to be participants in this project. Two participants assigned to the control group and two participants assigned to the experimental group were unable to attend their respective shadowing and training sessions due to scheduling conflicts and therefore dropped out of the study. Both the experimental and control groups contained 17 participants, totaling 34 participants altogether. The control group consisted of 12 first-year and five second-year medical students. Ten students had prior clinical experience while seven did not. The experimental group consisted of 15 first-year medical students and two second-year medical students. Fourteen students had prior clinical experience while three did not. Prior clinical roles included certified nursing assistant, pharmacy tech, emergency medical technician, hospital volunteer, optometry technician, phlebotomist, medical scribe, medical assistants, hospice volunteer, and medical transport workers.

Median and mean values of pre-training confidence scores were similar, and the distribution of pre-training survey scores was not statistically different between the two groups, $U = 159.0$, $z = .549$, $p = .610$. Also, none of the pre-training survey responses contained scores of five that would prohibit increasing confidence post-training. Of note, eight out of 17 participants in the control

Figure 2. Comparison of confidence change scores between control and experimental groups for each survey question



Median confidence change scores are displayed to the side of each box while U and p values are listed above.
**p < 0.05.*
Mdn: median.

group reported that the patient did not show up for their required shadowing encounter. Distributions of confidence change scores for each question were similar in experimental and control groups.

The experimental group reported statistically significant greater increases in confidence change scores for question 2-physical exam skills (p=.004) and question 4-EHR navigation (p=.029), than the control group (Figure 2). Median confidence change scores were statistically similar in experimental and control groups for question 1-overall preparedness (p=.357) and question 3-patient interviewing (p=.259) (Figure 2).

Discussion

While most medical schools in the United States operate SRFCs, each program differs on the responsibilities assigned to students at different stages of their medical education and the required curricula students must complete before volunteering. Many challenges have been identified within the current training process for students at our institution, including maintenance of an e-module curriculum and variable qualities of required shadowing of SRFC visits. The issues impacting the quality of training of student providers at our SRFC are shared in many other educational and clinical settings.

Regarding the use of e-modules, many studies have questioned whether e-learning, when used alone, makes any difference in health professionals' behaviors, skills, or knowledge and posits that it may be an ineffective teaching method, especially when technical skills are part of the curriculum.[7-9] While no-shows affect many medical clinics in the United States, the rate is much higher for lower-income patients—the socioeconomic status of all patients at our SRFC.[10-12] The experimental training curriculum in this study was designed to address these issues; in doing so, this study provides a guide for other student-run clinics that may be experiencing similar issues when preparing their student providers.

To our knowledge, minimal research exists evaluating different curricula for students providing patient care at SRFCs; although this area of research is lacking, many studies have identified effective medical education and teaching strategies. Several studies have shown the benefit of peer-assisted learning in medical education, supporting our model of a peer-led training environment.[13-16] This learning pedagogy stimulates critical thinking, clinical reasoning, professional development, communication skill-building, and peer mentorship.[17] A meta-analysis of studies on peer-learning versus traditional, teacher-led learning in medical school curricula showed that peer-learning led to improvements in clinical knowledge and technical skill development compared to traditional teaching.[18] Other studies have demonstrated that peer-assisted learning increases students' confidence in clinical skills training and is as effective as faculty-led training for learning technical procedures.[15,19,20] The peer teacher also greatly benefits in the peer-assisted learning relationship. As identified in a systemic review on peer-learning, peer tutors developed a deeper understanding of education material, identified knowledge gaps, learned to communicate and educate effectively, and experienced the responsibility of being part of another individual's professional development.[21,22]

Small group learning has also been shown to be effective. A study comparing EHR accuracy between a large-group versus a small-group showed that small-group, interactive learning resulted in better EHR accuracy.[23] Studies have identified collaboration with peers, increased team building skills, and greater understanding when learning in conjunction with peers as benefits of small group learning.[24]

Our survey results show that participants in the experimental group (small group, peer-led training) reported a larger increase in their confidence to perform physical exam and EHR navigation skills (questions 2 and 4) after the training intervention than the control group participants. Physical exam techniques and EHR navigation are more technically-based skills, and students felt more confident in these areas due to the opportunity to practice before performing them in clinic. These findings mirror other studies that have shown the benefit of early exposure to skills-based techniques prior to starting clinical rotations in medical school curricula.[25-27]

While both control and experimental groups saw increases in confidence change scores after the training intervention for questions 1 and 3, the difference in the change from pre- to post-training scores was not statistically significant between the two groups. Question 1 assessed overall confidence to serve as student providers. Given the significant difference between control and experimental groups for questions 2 and 4, this result is surprising. Perhaps, participants were considering other variables, such as navigating the clinic, presenting to the attending, or entering real medication orders, that were not addressed in our experimental training process. Question 3 assessed confidence in patient interviewing before and after training interventions. While the experimental group was able to practice with a partner during the training session, this dialogue may be limited without a standardized patient template. Furthermore, observing a patient interview during shadowing may have given the control group participants better context learning, as they were able to learn from a real-life patient conversation.

Another advantage of the experimental training session described in this study is the significantly reduced time burden in training new student providers, one two-hour session in the experimental group compared to the five hours for the control group. Reduction in training time benefits students as it allows them to start providing in the SRFC earlier, increasing their

patient contact opportunities and may help in recruiting students.

Limitations

There are several limitations to discuss in this study. Although participants were randomized, the control group contained more second year medical students than the experimental group, and the experimental group contained more participants with prior clinical experience. With increased exposure to EHR navigation and physical exam skills during the progression through medical school, the control group may have experienced less perceived benefit in passively shadowing a visit, resulting in smaller confidence change scores for the technical skills compared to the experimental group. Although clinical experience provides greater familiarity in the field of medicine, many of the tasks in this training were student-provider specific; therefore, prior clinical experience likely did not alter confidence change scores in this study. Future studies could partially address this by limiting the participants to students in the same year of medical school. Also, no follow-up survey was administered to student providers after serving independently at the clinic. Future studies can address this by sending an additional survey or assessment after participants have served as student providers to more comprehensively evaluate how both training processes prepared participants to provide care in the SRFC. Many participants in the control group were affected by patient no-shows during their shadowing dates, prohibiting them from observing a patient visit or using the EHR. Four participants dropped out of our study due to scheduling limitations. Despite this, we anticipate similar results given that the dropout population was similar to our study population in terms of prior clinical experience and distribution of first- and second-year medical school status. Additionally, scheduling conflicts were random and unrelated to our study outcome, further supporting that dropouts were a random sample.

Conclusion

The greater increase in students' confidence in performing physical exams and navigating the EHR showed that small group, peer-led training sessions are effective when teaching students, especially in technical skills. The structure of this training process alleviates several concerns within our SRFC's current training process while incorporating research showing the benefits of peer-led and small group learning environments. This study encourages other programs to evaluate their own student-run clinic student provider curricula while presenting an efficient and effective student provider training process. In addition, this study calls for further research assessing SRFC student provider training and education, both before and during students' time volunteering. We are optimistic that this study will encourage the continuation of small group training in SRFCs, and we look forward to improving the preparation process for SRFC student providers.

Disclosures

The authors have no conflicts of interest to disclose.

References

1. Rupert DD, Alvarez GV, Burdge EJ, et al. Student-run free clinics stand at a critical junction between undergraduate medical education, clinical care, and advocacy. Acad Med. 2022;97(6):824-31. https://doi.org/10.1097/acm.0000000000004542 LINK
2. Smith S, Thomas R, Cruz M, et al. Presence and characteristics of student-run free clinics in medical schools. JAMA. 2014;312(22):2407-10. https://doi.org/10.1001/jama.2014.16066 LINK
3. Baker SE, Brenner A. How medical students view the influence of a student-run free clinic on empathy development: a pilot study. Acad Psychiatry. 2017;42(3):428–9. https://doi.org/10.1007/s40596-017-0869-z LINK
4. Modi A, Fascelli M, Daitch Z, Hojat M. Evaluating the relationship between participation in student-run free clinics and changes in empathy in medical students. J Prim Care Community Health. 2017;8(3):122-6. https://doi.org/10.1177/2150131916685199 LINK
5. Pittenger AL, Westberg S, Rowan M, Schweiss S. An interprofessional diabetes experience to improve pharmacy and nursing students' competency in collaborative practice. Am J Pharm Educ. 2013;77(9):197. https://doi.org/10.5688/ajpe779197 LINK
6. Smith CS, Ester TV, Inglehart MR. Dental education and care for underserved patients: an analysis of students' intentions and alumni behavior. J Dent Educ. 2006;70(4):398-408. https://doi.org/10.1002/j.0022-0337.2006.70.4.tb04094.x LINK
7. Abbasi MS, Ahmed N, Sajjad B, et al. E-learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. Work. 2020;67(3):549-56. https://doi.org/10.3233/wor-203308 LINK
8. Ruggeri K, Farrington C, Brayne C. A global model for effective use and evaluation of e-learning in health.

Telemed J E Health. 2013;19(4):312-21. https://doi.org/10.1089/ tmj.2012.0175 LINK
9. Vaona A, Banzi R, Kwag KH, et al. E-learning for health professionals. Cochrane Database of Syst Rev. 2018;1(1):CD011736. https://doi.org/10.1002/14651858.cd011736.pub2 LINK
10. DuMontier C, Rindfleisch K, Pruszynski J, Frey JJ 3rd. A multi-method intervention to reduce no-shows in an urban residency clinic. Fam Med. 2013 Oct;45(9):634-41. https://pubmed.ncbi.nlm.nih.gov/24136694/ LINK
11. George A, Rubin G. Non-attendance in general practice: a systematic review and its implications for access to primary health care. Fam Pract. 2003 Apr;20(2):178-84. https://doi.org/10.1093/fampra/20.2.178 LINK
12. Starnes JR, Slesur L, Holby N, Rehman S, Miller RF. predicting no-shows at a student-run comprehensive primary care clinic. Fam Med. 2019 Nov;51(10):845-9. https://doi.org/10.22454/FamMed.2019.406053 LINK
13. Burke J, Fayaz S, Graham K, Matthew R, Field M. Peer-assisted learning in the acquisition of clinical skills: a supplementary approach to musculoskeletal system training. Med Teach. 2007 Sep;29(6):577-82. https://doi.org/10.1080/01421590701469867 LINK
14. Choudhury N, Khanwalkar A, Kraninger J, et al. Peer mentorship in student-run free clinics: the impact on preclinical education. Fam Med. 2014 Mar;46(3):204-8. https://pubmed.ncbi.nlm.nih.gov/24652639/ LINK
15. Field M, Burke JM, McAllister D, Lloyd DM. Peer-assisted learning: a novel approach to clinical skills learning for medical students. Med Educ. 2007 Apr;41(4):411-8. https://doi.org/10.1111/j.1365-2929.2007.02713.x LINK
16. Seifert LB, Schaack D, Jennewein L, et al. Peer-assisted learning in a student-run free clinic project increases clinical competence. Med Teach. 2016 May;38(5):515-22. https://doi.org/10.3109/0142159X.2015.1105940 LINK
17. Guraya SY, Abdalla ME. Determining the effectiveness of peer-assisted learning in medical education: A systematic review and meta-analysis. J Taibah Univ Med Sci. 2020;15(3):177-84. https://doi.org/10.1016/j.jtumed.2020.05.002 LINK
18. Zhang Y, Maconochie M. A meta-analysis of peer-assisted learning on examination performance in clinical knowledge and skills education. BMC Med Educ. 2022;22(1):147. https://doi.org/10.1186/s12909-022-03183-3 LINK
19. Tolsgaard MG, Gustafsson A, Rasmussen MB, et al. Student teachers can be as good as associate professors in teaching clinical skills. Med Teach. 2007 Sep;29(6):553-7. https://doi.org/10.1080/01421590701682550 LINK
20. Weyrich P, Celebi N, Schrauth M, et al. Peer-assisted versus faculty staff-led skills laboratory training: a randomised controlled trial. Med Educ. 2009 Feb;43(2):113-20. https://doi.org/10.1111/j.1365-2923.2008.03252.x LINK
21. Burgess A, McGregor D, Mellis C. Medical students as peer tutors: a systematic review. BMC Med Educ. 2014;14:115. https://doi.org/10.1186/1472-6920-14-11 LINK
22. Tai J, Molloy E, Haines T, Canny B. Same-level peer-assisted learning in medical clinical placements: a narrative systematic review. Med Educ. 2016;50(4):469-84. https://doi.org/10.1111/medu.12898 LINK
23. Sega A, Bossan A, Abrams M, et al. Improving student EHR accuracy: An analysis of training methods to better prepare students to volunteer at student-run clinics. J Stud Run Clin. 2021;7(1). https://doi.org/10.59586/jsrc.v7i1.228 LINK
24. Burgess A, van Diggele C, Roberts C, Mellis C. Facilitating small group learning in the health professions. BMC Med Educ. 2020 Dec 3;20(Suppl 2):457. https://doi.org/10.1186/s12909-020-02282-3 LINK
25. Hammoud MM, Dalymple JL, Christner JG, et al. Medical student documentation in electronic health records: a collaborative statement from the Alliance for Clinical Education. Teach Learn Med. 2012;24(3):257-66. https://doi.org/10.1080/10401334.2012.692284 LINK
26. Lander L, Baxter SL, Cochran GL, et al. Self-perceptions of readiness to use electronic health records among medical students: survey study. JMIR Med Educ. 2020 Jun 12;6(1):e17585. https://doi.org/10.2196/17585 LINK
27. Seale J, Knoetze M, Phung A, Prior D, Butchers C. Commencing technical clinical skills training in the early stages of medical education: exploring student views. Med Sci Educ. 2018 Nov 30;29(1):173-179. https://doi.org/10.1007/s40670-018-00657-2 LINK