SKIN

RESEARCH LETTER

Virtual Medical Student Dermatologic Surgery Workshop Increases Confidence in Suturing and Skin Biopsy Skills in the Era of COVID-19

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ABSTRACT

Background: During the COVID-19 pandemic, many pre-clinical medical school courses were conducted virtually. In order to increase exposure to basic procedures in the remote learning setting, our group developed a virtual dermatologic surgery workshop.
Methods: All 147 second-year medical students at the University of Pittsburgh watched 70 minutes of pre-recorded lectures that introduced suturing, skin biopsies, and other dermatologic procedures. Each student was provided with a suturing kit to remotely practice the following skills: simple interrupted suture, simple running suture, horizontal mattress suture, vertical mattress suture, running subcuticular suture, shave biopsy, and punch biopsy. Pre- and post-workshop surveys were distributed to the students and paired using a randomized de-identified number.
Results: 117 (80%) students completed the pre-survey and 71 (48%) completed the post-survey. 61 (41%) responses were paired. The average baseline level of confidence ranged from 1.0 on a 10-point scale for subcuticular running suture to 2.4 for simple interrupted suture. The average level of confidence increased after the workshop for each skill, ranging from 3.7 for subcuticular running suture to 8.0 for instrument tie. In the paired responses, the average level of confidence increased significantly for each skill by an average of 5.5 points (SD=1.1, p<.001).
Conclusions: A virtual, asynchronous dermatologic surgery workshop significantly increases medical student confidence in their ability to perform suturing and skin biopsies.

INTRODUCTION

Medical students benefit from early and repeated practice with surgical skills. Students who participate in procedure training demonstrate increased confidence and ability when applying these skills to patients.[1] In the era of COVID-19, many pre-clinical medical school curricula have transitioned to remote learning, which may reduce critical early exposure to basic procedures. Our group developed a dermatologic surgery curriculum for second-year medical students in order to address the need for continued procedural education in the remote learning setting. We evaluated whether this asynchronous, virtual procedural workshop affected their level of confidence (LOC) in their ability to perform these skills.

METHODS

In this IRB-approved study (STUDY20110280), all second-year medical students at the University of Pittsburgh were invited to complete pre- and post-workshop surveys on Qualtrics. Students watched 70 minutes of prerecorded lectures that introduced suturing, skin biopsies, excisions, Mohs micrographic surgery, cryotherapy, electrodessication, and cosmetics (*https://pitt.hosted.panopto.com/Panopto/Pages/Sessions/List.aspx?folderID=69f36939-668a-4742-a9fe-acf9011a49b5*). Each student was provided with a suturing pad and surgical tools to remotely practice and submit photos of the following skills: simple interrupted suture, simple running suture, horizontal mattress suture, vertical mattress suture, running subcuticular suture, shave biopsy, and punch biopsy (Figure 1). A two-hour virtual office hour session was held by the senior author on Zoom to allow students to ask questions about the workshop.

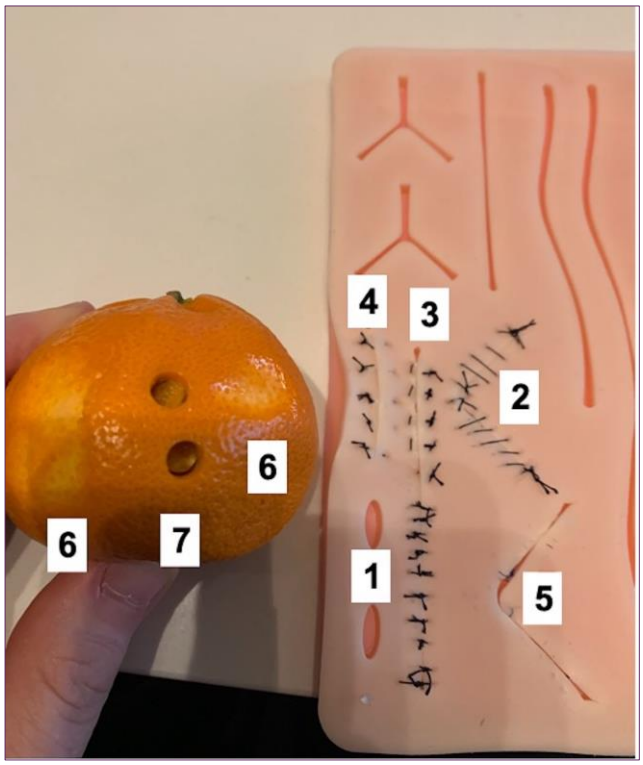

Figure 1: Example student submission of suturing and biopsy workshop. *1 = simple interrupted suture; 2 = simple running suture; 3 = horizontal mattress suture; 4 = vertical mattress suture; 5 = subcuticular running suture; 6 = shave biopsy; 7 = punch biopsy*

RESULTS

Surveys were distributed to 147 second-year medical students. A randomized de-identified number paired individual responses which were compared using a paired t-test. 117 (80%) students completed the pre-survey and 71 (48%) completed the post-survey, including 61 (41%) paired responses. Most students had limited prior suturing exposure – 66 (56%) had no suturing education through textbooks, lectures or videos, and 47 (40%) had five or fewer hours. 52 (44%) had no hands-on suturing experience, and 56 (48%) had five or fewer hours. 18 (15%) of the pre-survey respondents held clinical positions prior to medical school.

The average baseline LOC in each skill ranged from 1.0 for subcuticular running suture to 2.4 for simple interrupted suture on a 10-point Likert scale (Table 1). After the workshop, the average LOC increased for each skill, ranging from 3.7 for subcuticular running suture to 8.0 for instrument tie. LOC increased significantly for each skill in the 61 paired responses by an average of 5.5 points (SD = 1.1, $p<.001$). Students reported difficulty with the subcuticular running suture due to tearing of the suture pad. Most students (65, 92%) watched all of the workshop videos in their entirety. All students strongly agreed (57, 80%) or agreed (14, 20%) that they learned from the workshop and strongly agreed (64, 90%) or agreed (7, 10%) that it should be offered again next year. One student attended the virtual office hour session to discuss suturing technique, and several additional students emailed the instructors with questions.

Table 1. Average level of confidence in skills before and after virtual suturing and biopsy workshop

Skill	Level of confidence in skill, Mean (SD)*		Change in level of confidence in skill in paired responses (n=61)	
	Before workshop (n=117)	After workshop (n=71)	Mean (SD)	p†
Instrument tie	2.3 (2.9)	8.0 (1.9)	5.8 (2.8)	<.001
Simple interrupted suture	2.4 (3.0)	7.9 (1.9)	5.6 (2.8)	<.001
Simple running suture	1.9 (2.8)	7.2 (2.1)	5.4 (2.6)	<.001
Vertical mattress suture	1.2 (2.4)	6.8 (2.0)	5.7 (2.6)	<.001
Horizontal mattress suture	1.3 (2.4)	6.9 (2.1)	5.9 (2.5)	<.001
Subcuticular running suture	1.0 (2.2)	3.7 (2.5)	2.8 (2.2)‡	<.001
Shave biopsy	1.5 (2.5)	7.6 (2.1)	6.6 (2.4)	<.001
Punch biopsy	1.6 (2.7)	7.6 (2.0)	6.4 (2.5)	<.001

*On a 10-point Likert scale where 0=no confidence in ability to perform task and 10=full confidence in ability to perform task
†Paired t-test
‡Students reported difficulty with the subcuticular running suture due to tearing of the suture pad.

CONCLUSION

After participating in a virtual suturing and biopsy workshop, second-year medical students reported significantly increased confidence in their ability to perform the reviewed skills. Prior to our workshop, almost all students had no or little suturing exposure. All students learned from the workshop and felt that it should be offered again next year. Our students were more likely to utilize email rather than virtual office hours to discuss questions with their instructors. Participation bias is a potential limitation. Moving forward, this workshop may be adapted to a flipped classroom model to maximize the in-person learning experience.[2]

Abbreviations:
LOC = level of confidence

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