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Benefit of Ultrasound Curriculum Development for Family Medicine Residents

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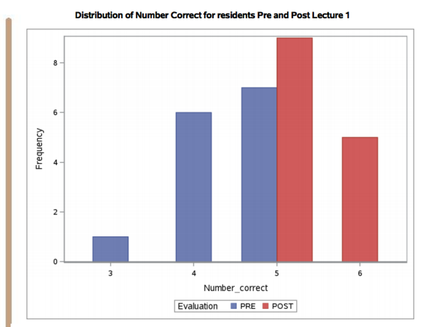
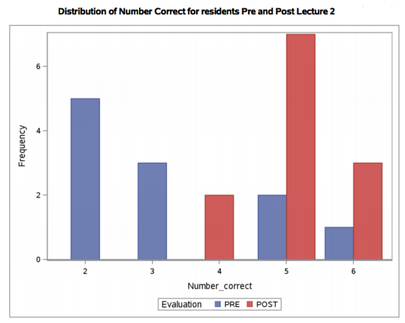
Introduction:

Musculoskeletal problems comprise some of the most common reasons for ambulatory care encounters in the United States, accounting for 8.3% of the 1.2 billion visits per year according to CDC. Musculoskeletal Ultrasound use has become more common in primary care for diagnosis and therapeutics. In Family Medicine Residency Programs (FMR) there is a deficiency of a structured, competency-based musculoskeletal ultrasound (MSKUS) training despite its growing popularity. There is no formalized requirement for Ultrasound education as in Emergency Medicine, Physiatry and Sports Medicine in spite of its benefit.

Methods:

We conducted a needs analysis for incorporating MSKUS in FMR in our family medicine residency program which received a positive response on our needs analysis survey with 96%(24 residents surveyed) reporting they would be interested in receiving MSK US education. Following this Family Medicine residents and medical students were recruited. A Sports Medicine attending with expertise in MSKUS supervised curriculum-design and exam question assessment. A structured curriculum was developed for 2 lectures starting with “Introduction to MSKUS”, followed by a focused lecture on “MSKUS of the Shoulder”. This included educational material, reserved practice time, and a pre- and post-test for each lecture. Following the second lecture and time for practice, an observed clinical exam was used for competency assessment with evaluation by Sports Medicine attending, fellow and 2 qualified residents. No incentives were given for completion or participation in study. Private board review was given as alternative option to participating in the study.





Lecture 1 15:41 Friday, February 17, 2017

The MEANS Procedure

Variable	Label	Minimum	Median	Maximum	Mean	Std Dev	N	Lower 95% CL for Mean	Upper 95% CL for Mean
pre_resident	Pre Resident % correct	0.43	0.64	0.71	0.63	0.09	14	0.58	0.68
post_resident	Post Resident % correct	0.71	0.71	0.86	0.76	0.07	14	0.72	0.81
resident_change	Change in resident % correct (Post-Pre)	0.00	0.14	0.29	0.13	0.13	14	0.06	0.21

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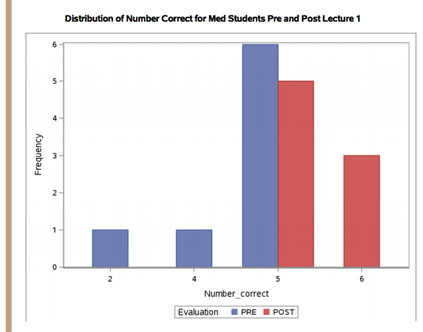
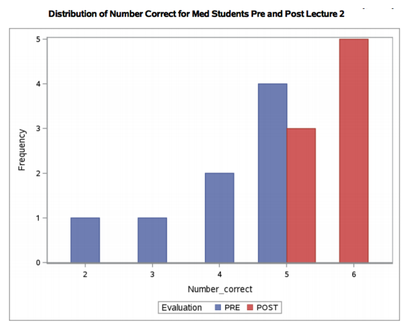
The MEANS Procedure

Variable	Label	Minimum	Median	Maximum	Mean	Std Dev	N	Lower 95% CL for Mean	Upper 95% CL for Mean
pre_resident	Pre Resident % correct	0.33	0.50	1.00	0.53	0.23	12	0.38	0.67
post_resident	Post Resident % correct	0.66	0.83	1.00	0.84	0.11	12	0.77	0.92
resident_change	Change in resident % correct (Post-Pre)	-0.17	0.33	0.67	0.32	0.21	12	0.19	0.45





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The MEANS Procedure

Variable	Label	Minimum	Median	Maximum	Mean	Std Dev	N	Lower 95% CL for Mean	Upper 95% CL for Mean
pre_med_student	Pre medical student % correct	0.29	0.71	0.71	0.64	0.15	8	0.51	0.77
post_med_student	Post medical student % correct	0.71	0.71	0.86	0.77	0.08	8	0.70	0.83
med_student_change	Change in medical student % correct (Post-Pre)	0.00	0.15	0.42	0.13	0.14	8	0.01	0.24

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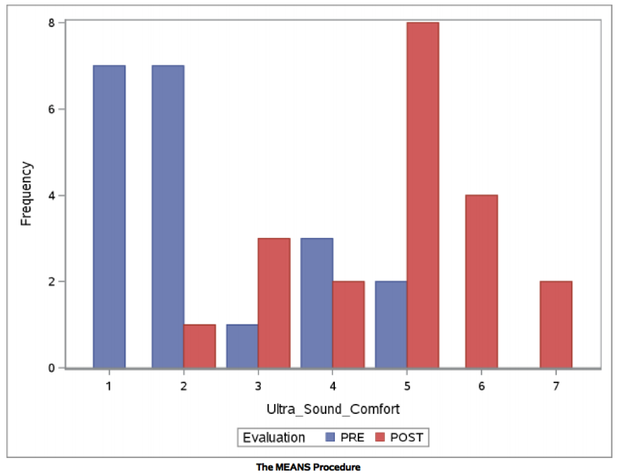
The MEANS Procedure

Variable	Label	Minimum	Median	Maximum	Mean	Std Dev	N	Lower 95% CL for Mean	Upper 95% CL for Mean
pre_med_student	Pre medical student % correct	0.33	0.75	0.83	0.69	0.19	8	0.53	0.84
post_med_student	Post medical student % correct	0.83	1.00	1.00	0.94	0.09	8	0.86	1.01
med_student_change	Change in medical student % correct (Post-Pre)	0.00	0.17	0.67	0.25	0.24	8	0.05	0.45



The MEANS Procedure

Variable	Label	Minimum	Median	Maximum	Mean	Std Dev	N	Lower 95% CL for Mean	Upper 95% CL for Mean
pre_US_comfort	Pre Ultra Sound Comfort	1.00	2.00	5.00	2.30	1.38	20	1.65	2.95
post_US_comfort	Post Ultra Sound Comfort	2.00	5.00	7.00	4.85	1.35	20	4.22	5.48
Ultra_sound_change	Change in Ultra Sound Comfort (Post-Pre)	0.00	3.00	6.00	2.55	1.57	20	1.81	3.29

Results:

We began with fifteen residents and eight medical students. Twelve residents and eight medical students completed the course series and evaluation. Residents lost to study was due to clinical responsibilities during the second lecture. Using SAS Enterprise Guide 7.1 for analysis, we found sufficient evidence of a significant positive change in self-reported MSKUS knowledge from pre to post for both medical students (p=.03125) and residents (p=.0039). We also found a significant positive change in self-reported MSKUS of the Shoulder knowledge from pre to post in both medical students (p=.0156) and residents (p=.0010) as well as a significant increase in MSK US comfort level from pre-curriculum to post-curriculum (p<0.0001).

Conclusion:

The data of this study shows that a curriculum as short as 2 lectures with accompanying practical skills training improves proficiency, clinical and academic knowledge along with confidence in MSK US use. As the ultrasound use in the primary care setting becomes standard of care it would be prudent to establish a formal yearly curriculum in ultrasound earlier rather than later so as to stay competitive with other Family Medicine Residency programs.

Resources

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