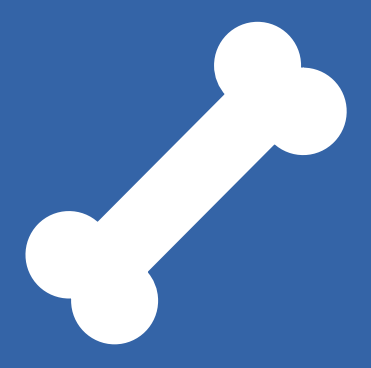


# Design, Implementation and Evaluation of a Novel Musculoskeletal Medicine Elective for Yale Medical Students



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REFERENCES



## OBJECTIVES

- This research project focused on the design, implementation and evaluation of a novel musculoskeletal (MSK) medicine elective for post-clinical Yale Medical Students.

## BACKGROUND

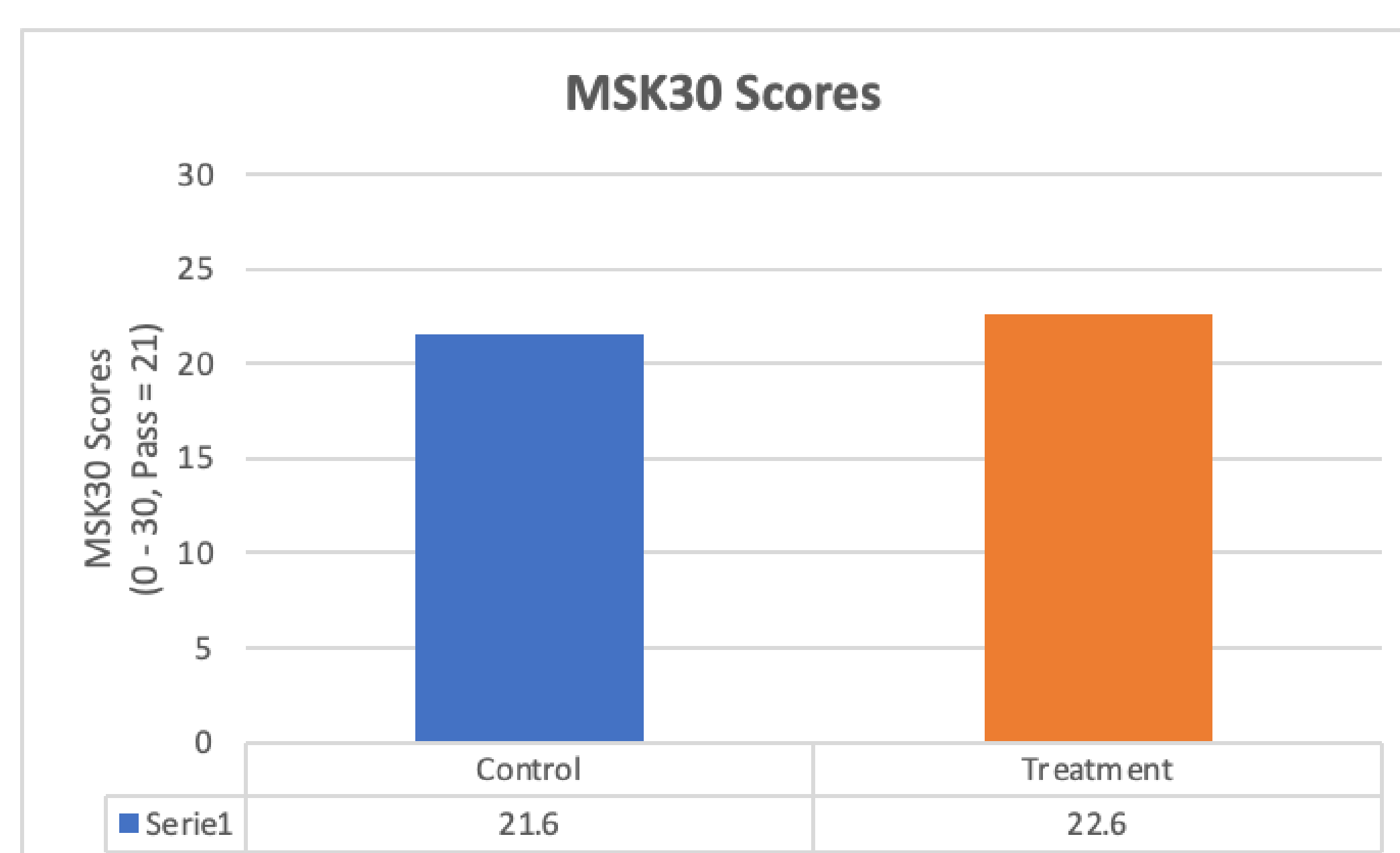
- Musculoskeletal concerns are among the most common and expensive drivers of healthcare visits and costs in the United States.<sup>1</sup> However, this subject remains underrepresented in medical education nationally, internationally and at the Yale School of Medicine (YSM), which impacts student knowledge, confidence, test scores and clinical abilities.<sup>2,3</sup> Improving MSK education for students at a particular institution requires characterizing the current local gaps in education, designing a medical education intervention based on prior research while also including novel elements in furtherance of education that is also customized to the student population, as well as evaluating the outcomes of this intervention.

**Musculoskeletal medicine has long been highlighted as an area for improvement in undergraduate medical education; however, this still represents a key area for the development of novel education interventions.**

## METHODS

- MSK curriculum design was conducted using Kern's 6-steps and backward curriculum design.<sup>4,5</sup> Evaluation of the elective was conducted through surveys and a focus group as well as at the completion of the elective activities.
- The MSK30—a validated MSK knowledge assessment—was administered at the end of the course. Outputs were analyzed after the course.

**FIGURE 1. MSK30 SCORES**

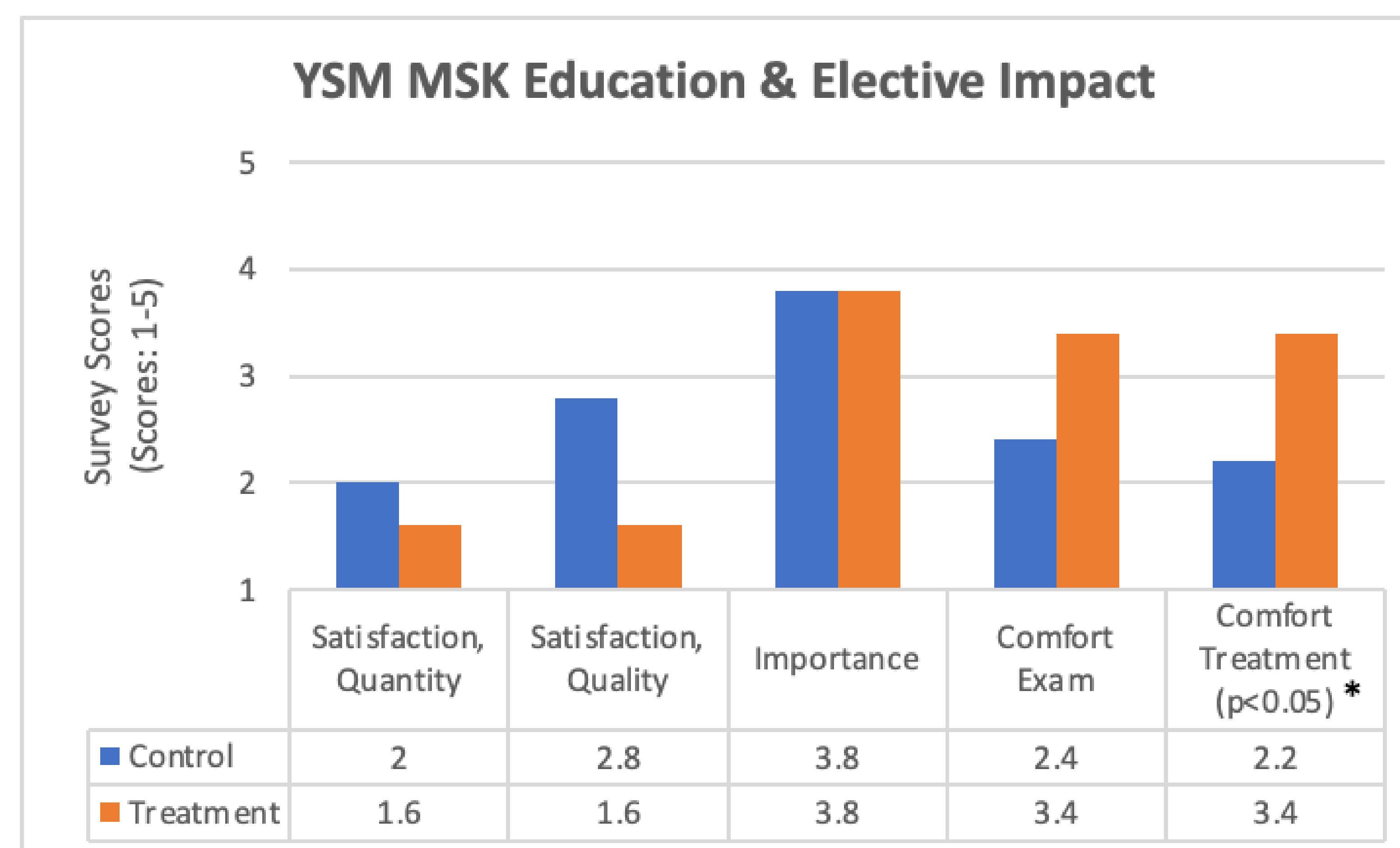


**A novel musculoskeletal medicine elective targeted to the needs of Yale Medical Students improved student satisfaction and confidence in musculoskeletal medicine subsequent to participation in a 2-week interdisciplinary course.**

## RESULTS

- Elective students scored an average of **22.6/30** on the **post-course MSK30**, a validated MSK knowledge assessment tool, with a pass score of 21/30.<sup>6,7</sup> Matched control students scored an average of **21.6/30** on the same assessment. (p-value = 0.55) (*Figure 1*)
- The students completed pre- and post-elective *Observed Structured Clinical Encounters (OSCEs) on the knee and shoulder*, respectively. They were scored on clinical evaluation and development of differential diagnosis (out of 5) and on selection of an appropriate diagnosis and formulation of a plan (out of 5). While the scores remained similar across the pre- and post-elective OSCEs for both categories.
- Pre/Knee: Evaluation & Differential: 3.3, Diagnosis & Plan: 3.1**
- Post/Shoulder: Evaluation & Differential: 3.2, Diagnosis & Plan: 3.1**
- The post-elective shoulder OSCE represents a more challenging assessment, thus consistent scores across these two assessments likely indicates continued progress in development of MSK clinical skills and knowledge, which is consistent with additional feedback that was provided in these sessions.

**FIGURE 2. YSM MSK EDUCATION & ELECTIVE IMPACT**



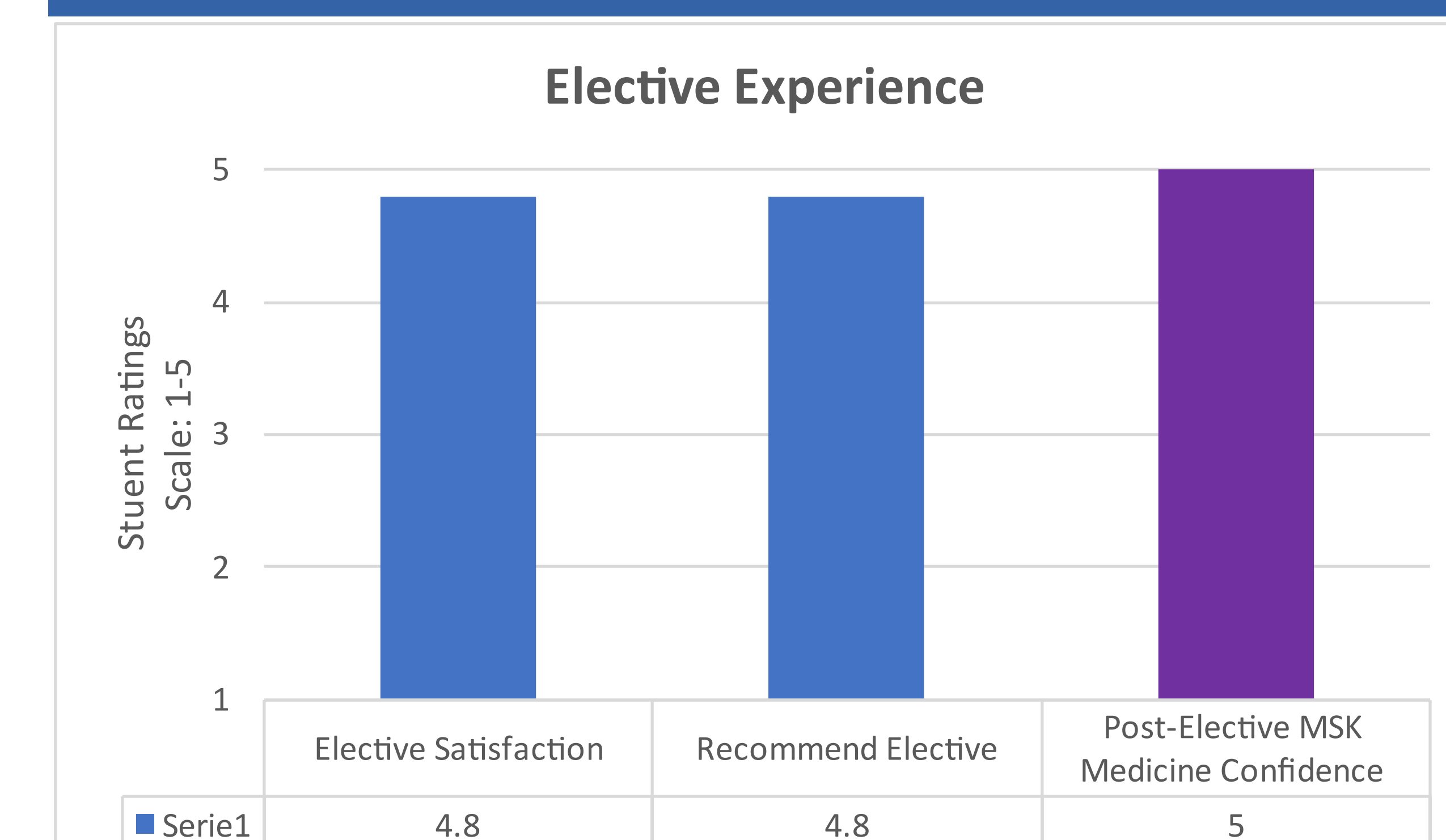
**Figure 1 (Left).** MSK30 Scores for Control & Treatment Groups  
**Figure 2 (Above).** Pre-Elective YSM MSK Education Satisfaction (Quantity & Quality), Importance of MSK Compared to Other Topics, Comfort with MSK Exam & Medical Management for Control & Treatment Groups

## RESULTS & CONCLUSION

- A general and targeted needs assessment guided the development of the curriculum specific to the YSM context.
- On the Post-Course Survey—all questions rated on scales from 1-5—students reported *dissatisfaction with MSK education in the YSM curriculum* of **1.6** for both **quantity** and **quality**, while highlighting **the importance of MSK relative to other subjects** with a score of **3.8**. The matched control students reported similar dissatisfaction with quality and quantity of YSM MSK education—2. and 2.8, respectively—and reported the same importance of this topic. (*Figure 2*)
- Notably, the students that took the elective reported a significantly increased comfort with MSK treatments (p = 0.033), and a similar comfort with the MSK exam as compared to the matched controls. (*Figure 2*)
- Students reported an **overall satisfaction with the elective of 4.8**, a **recommendation of this elective to other students of 4.8**, and an **increase in confidence in MSK medicine of 5**. (*Figure 3*)
- Finally, **focus group discussion themes** highlighted the **benefits of hands-on training, importance of anatomic correlations to understand MSK physiology and pathophysiology, the importance of an organized curriculum covering MSK topics and the need for increased exposure to MSK medicine for YSM students**. Additional *training in observation and opportunities to consolidate learning by teaching pre-clinical students* were highlighted as beneficial for improvement of knowledge and skills by the participating students.

**Overall, this project highlights the importance of increasing MSK education at YSM and tools to improve future didactic offerings in MSK and other curriculum areas.**

**FIGURE 3. MSK ELECTIVE SATISFACTION**



**Figure 3.** Elective Satisfaction, Post-Elective MSK Medicine Confidence & Recommendation of Elective