

INTRODUCTION

Despite national guideline recommendations for a train of four ratio > 0.9 prior to extubation using quantitative monitoring, no formal processes are noted nor consistently followed (Lin et al., 2020). Therefore, CRNAs are left at this institution to use clinical judgment and personal preference selecting methods for monitoring neuromuscular function. There is, additionally, a lack of understanding of CRNA providers' perceptions and preferences for quantitative versus qualitative neuromuscular blockade reversal monitoring.

The purpose of this quality improvement project was to assess anesthesia providers' perceptions of the usefulness of and preference for qualitative (PNS) versus quantitative (acceleromyography) neuromuscular blockade reversal measurements in the perioperative setting.

METHODS

The model for improvement using the Plan, Do, Study, Act (PDSA) cycle endorsed by the Institute for Healthcare Improvement was used to develop and perform this project (Associates in Process Improvement, 2021).

After project approval was obtained and participants recruited, a pre-survey questionnaire was given to participants followed by a video reviewing quantitative monitors for determining adequate neuromuscular blockade reversal. Participants were then asked to use the objective measuring device in their practice and to record their assessment practices for two weeks. Upon completion of the two-week period, they were again asked to complete a questionnaire about their perceptions of the usefulness of the qualitative and quantitative neuromuscular blockade methods. Qualtrics survey software was used to create and deliver the surveys used to gather participant perceptions of acceptability and adequacy of the qualitative and quantitative methods prior to and post implementation of the project. Excel was utilized for data analysis.

Link for Educational Video:
<https://youtu.be/6YzMU5F9brs>

RESULTS

Figure 1

Comparison of Pre-intervention, Implementation, and Post-Intervention Likelihood of Acceleromyography Usage (n=5)

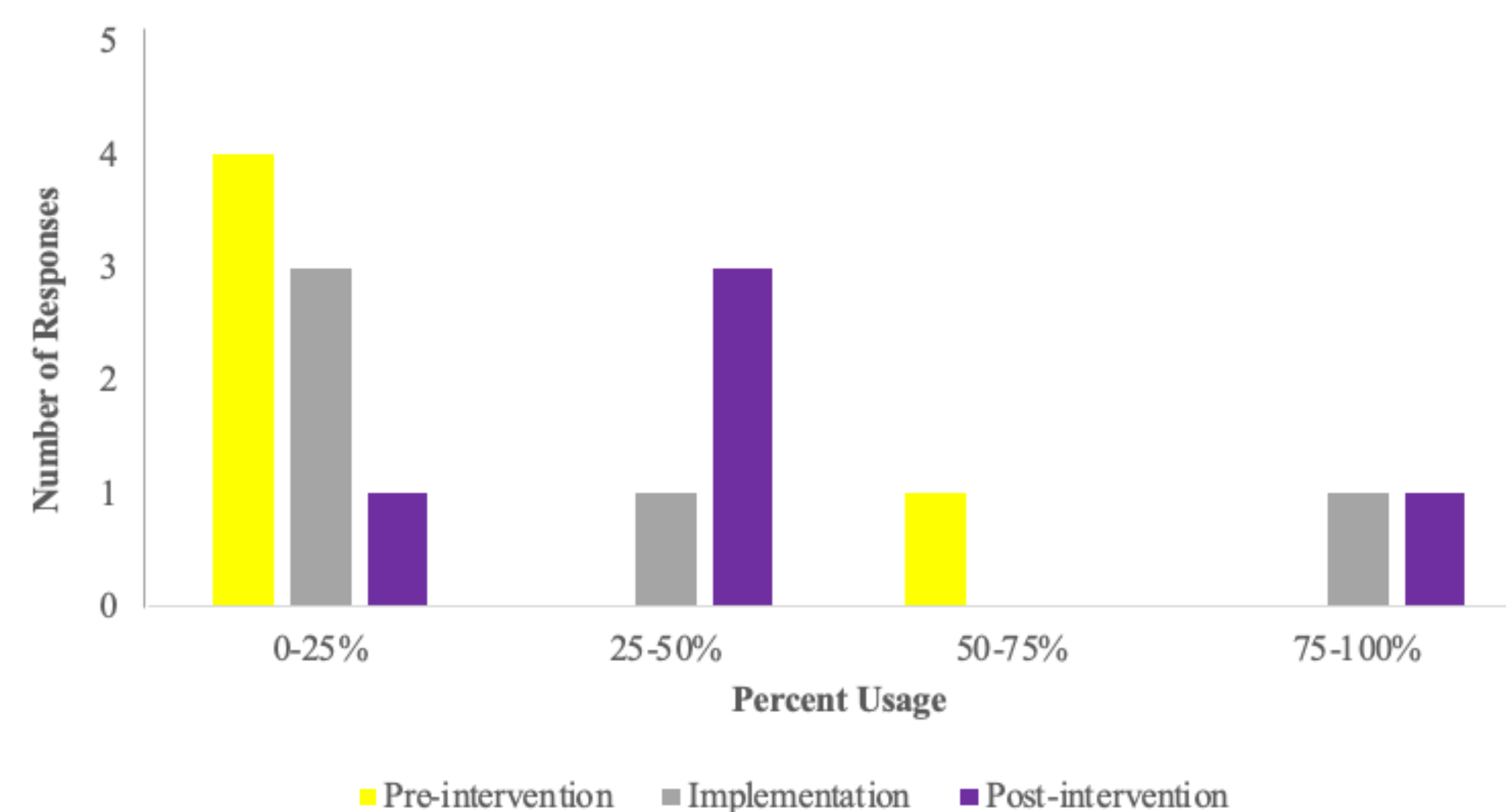
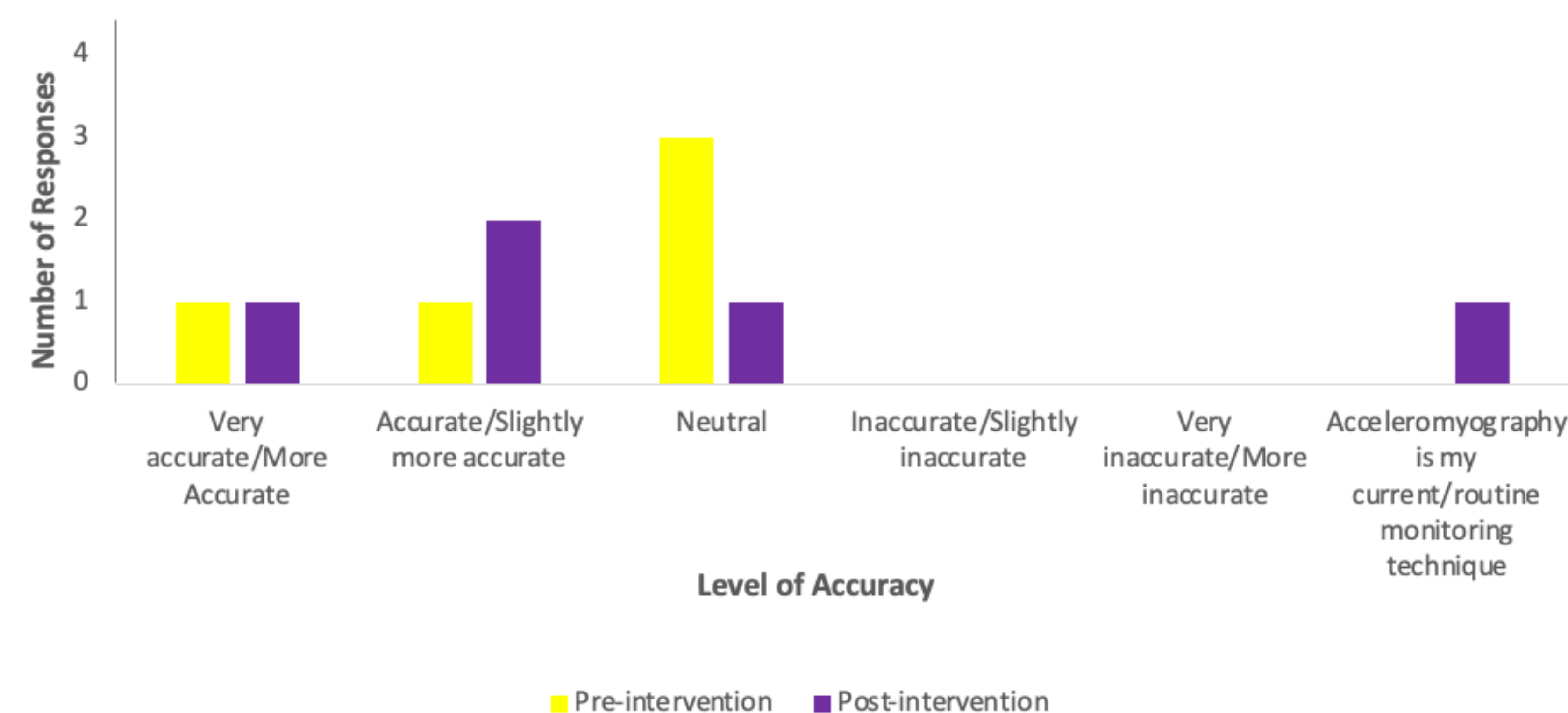


Figure 2

Perceptions of Acceleromyography (n=5)



DISCUSSION

Equipment education, comfort with use of the monitor, availability, and time were suggested as potential barriers to use PNS monitors for assessing neuromuscular blockade. However, after completion of the intervention, only one out of four respondents reported that acceleromyography was difficult to use. The one respondent that said that acceleromyography was difficult to use, reported it was due to comfort of use with monitor, availability, and time. Every participant that claimed to have had prior experience with rNMB did not utilize acceleromyography as their monitoring method. This potentially demonstrates that, had acceleromyography been utilized, rNMB may not have been encountered. Perhaps the most important take away from this project is that with education and proper training, utilization of acceleromyography can be increased as seen in Figure 1. With increasing utilization of acceleromyography comes a decreasing risk of rNMB, which as discussed previously within the literature has many negative consequences such as reintubation, pneumonia, and prolonged hospitalization.

CONCLUSIONS

The findings identified in this study align with findings from the literature. The main finding is that there are barriers that prevent the quantifiable measurement of NMB. One can assume that increasing availability and preventing misplacement of acceleromyographers will eliminate the barrier of availability. However, unfamiliarity with the device may limit its use as well as time to set up. With increased availability and more education, anesthesia providers may be encouraged to learn more about it while becoming more time efficient in set up leading to increased utilization. Overcoming these obstacles will better improve patient outcomes. If time is a barrier, one more minute to potentially eliminate the risk of rNMB postoperatively requiring intubation is well worth the wait. Understanding production pressure by operating room staff may make this barrier difficult to overcome. Future education to non-anesthesia staff on implications and complications of rNMB may aid in this resolution.

REFERENCES

- Associates in Process Improvement. (2021). *Model for improvement*. <http://www.apiweb.org/>
- Lin, X. F., Kuen Yong, C. Y., Sam Mok, M. U., Ruban, P., & Wong, P. (2020). Survey of neuromuscular monitoring and assessment of postoperative residual neuromuscular block in a postoperative anaesthetic care unit. *Singapore Medical Journal*, 61(11), 591-597. <http://dx.doi.org/10.11622/smedj.2019118>