Magnesium: Perioperative Use to Decrease Postoperative Pain in Adults

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Problem

A lack of knowledge was identified with the use of magnesium among anesthesia providers as a pain adjunct, a problem statement was formulated. Using the PICO format, the questions were formulated and served as the guide for the literature review. In patients undergoing surgery, there is a need for decreased opiate use postoperatively (P), how does the use of magnesium as an intraoperative pain adjunct (I) compare to traditional pain management (C) to diminish the need for opiates, and improve patient outcomes throughout the perioperative period (O)? That question raises interest to be answered in a setting where patient satisfaction and pain-free experience is a significant component of the anesthesia providers. Also, In the Adventist University SRNA's 2018 and 2019 cohort (P), did a 30-minute (T) power point presentation regarding the use of magnesium as a pain adjunct (I) result in an increase of knowledge(O)?

Literature Review

It was identified that the multimodal approach involves targeting different pain receptors to reduce the amount of opioid intake, minimizing side effects from opiates, and improving the management of pain. Magnesium has been shown to be efficacious in its ability to reduce the opioid consumption in the PACU, leading to reduced recovery time. Magnesium's use as a pain management adjunct promotes not only patient satisfaction but also improves quality, leading to increased hospital reimbursement. There has been substantial evidence on the efficacy of the use of magnesium regarding post-operative pain management, ultimately improving the overall quality of surgery. The effectiveness can range from 24-48 hours' post operation contingent on the type of surgery performed.

Methods
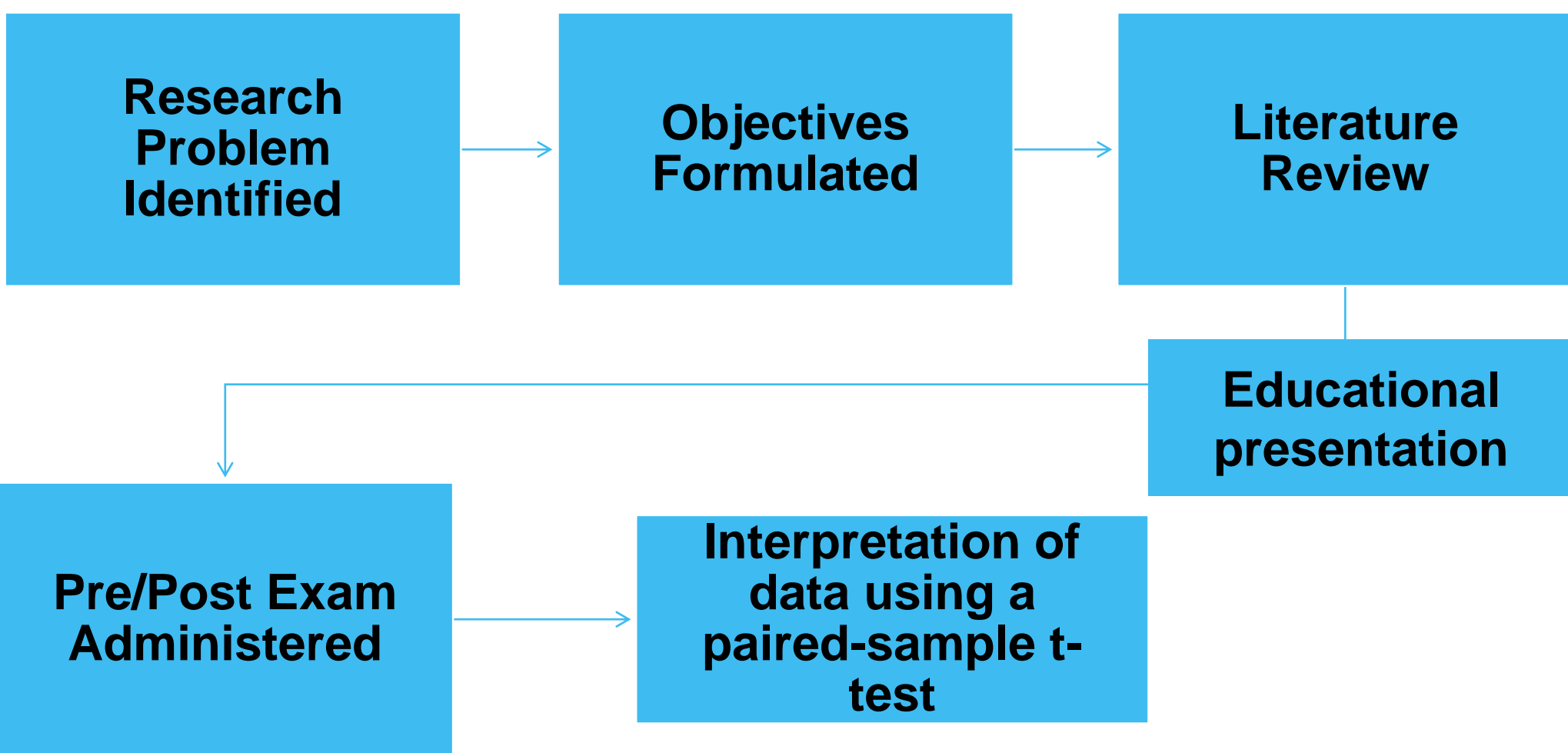
Analysis & Conclusions

A paired-sample t-test was utilized, and a significance level was determined with the help of Dr. Roy Lukman. The analysis was conducted using IBM SPSS computer software. The paired-samples t-test was conducted to analyze the data. The obtained t (-11.136) is associated with p < .0001 which indicates statistical significance. Therefore, it can be concluded that the average percentages increased significantly. Given the limited size, statistical significance may not be determined and potentially threaten the internal validity of the results. The sample size was limited to the two NAP cohorts, underrepresenting the entire SRNA population

Table 3
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Test	30.8696	46	16.30625	2.40423
	Post-Test	74.5652	46	18.22166	2.68664

Table 4
Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Test - Post-Test	- 26.61317 43.69565	3.92390		- 51.59879	- 35.79252	-11.136	45	.000

PRE AND POST
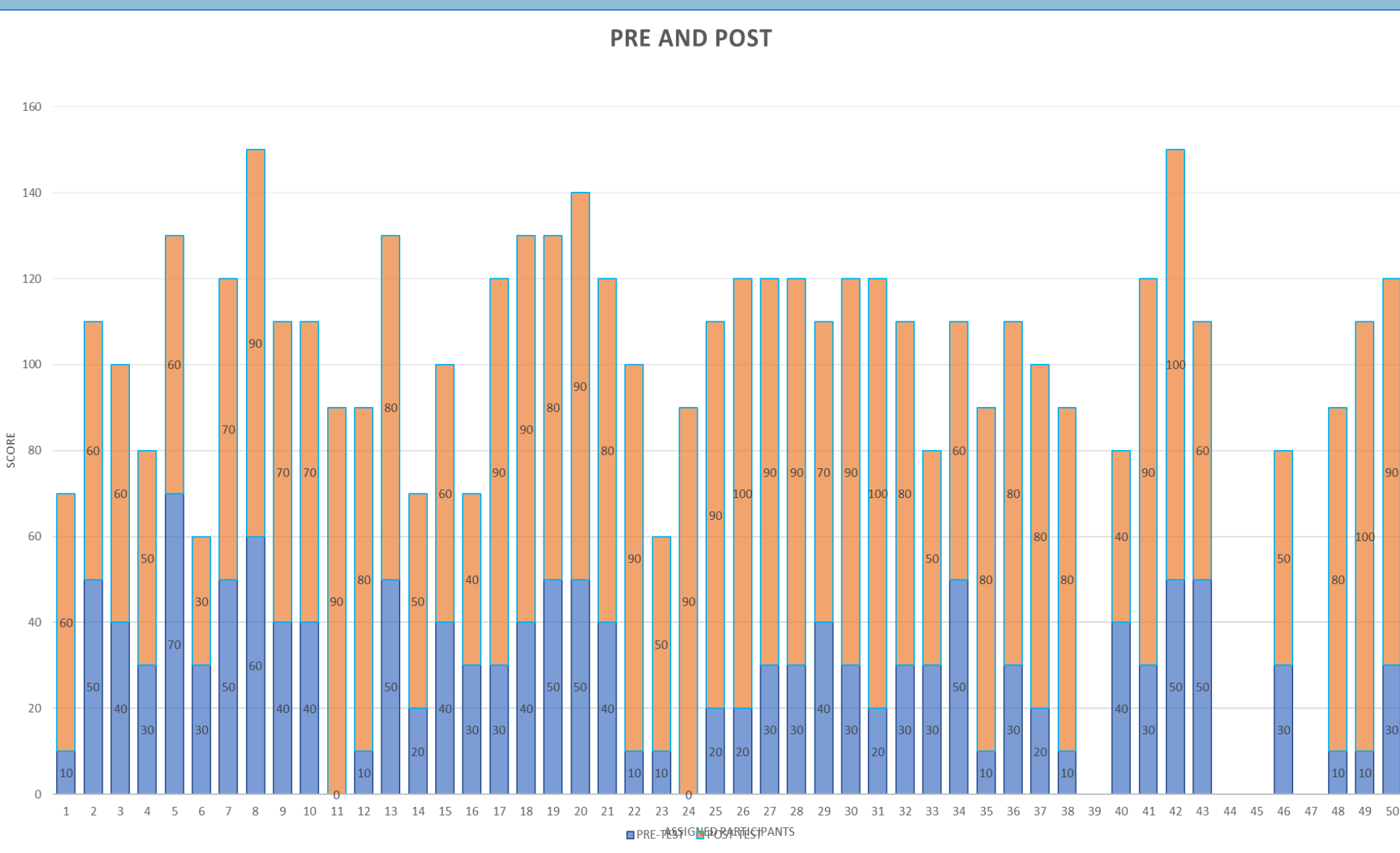
Impact of Findings

While narcotics continue to be the primary treatment for postoperative pain, the concept of multimodal analgesia is evolving, and there has been a definite decrease in the adult patient's need for narcotics after surgery. Students and other anesthesia providers lack the opportunity to learn how to integrate and manage magnesium in their anesthetic properly, due to its infrequent use in the operating room. An understanding of magnesium's usefulness as a pain management adjunct can help providers achieve a tight control of postoperative pain in the adult population. Most studies in the literature review used a bolus dose ranging from 30 to 50 mg/kg (given over 10 minutes), with a continuous infusion of 8 to 15 mg/kg per hour intraoperatively. The greatest analgesic effect was noted when systemic magnesium was administered both intraoperatively and postoperatively.

References

Available upon request

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