

**REVIEW QUESTION**

In patients undergoing laparoscopic surgery, does intravenous intraoperative remifentanyl compared to dexmedetomidine affect postoperative pain?

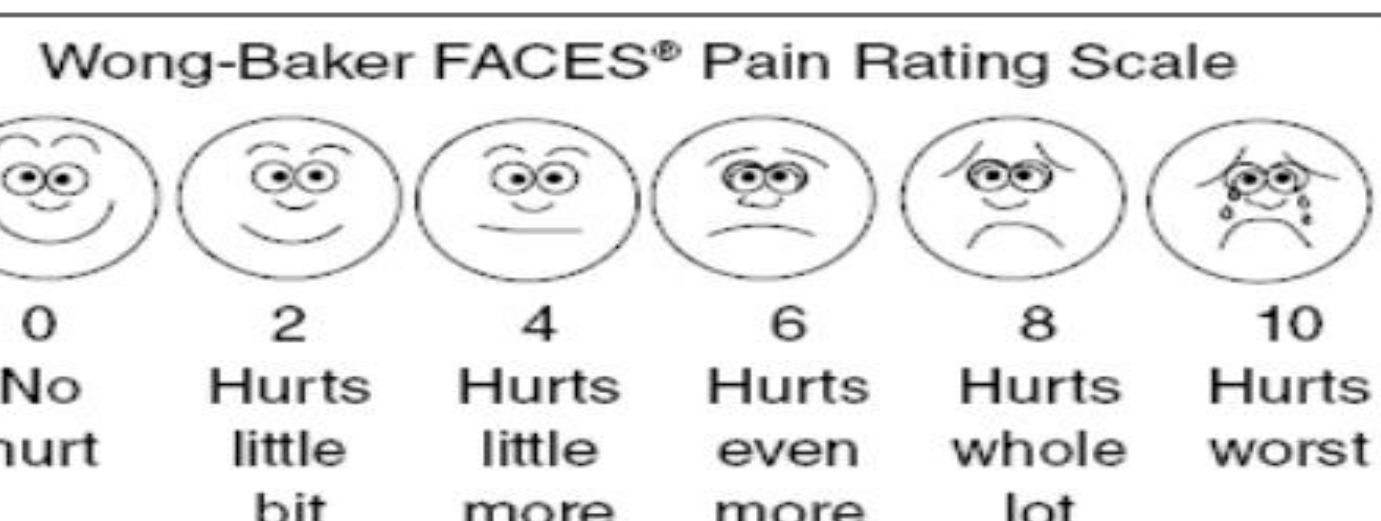
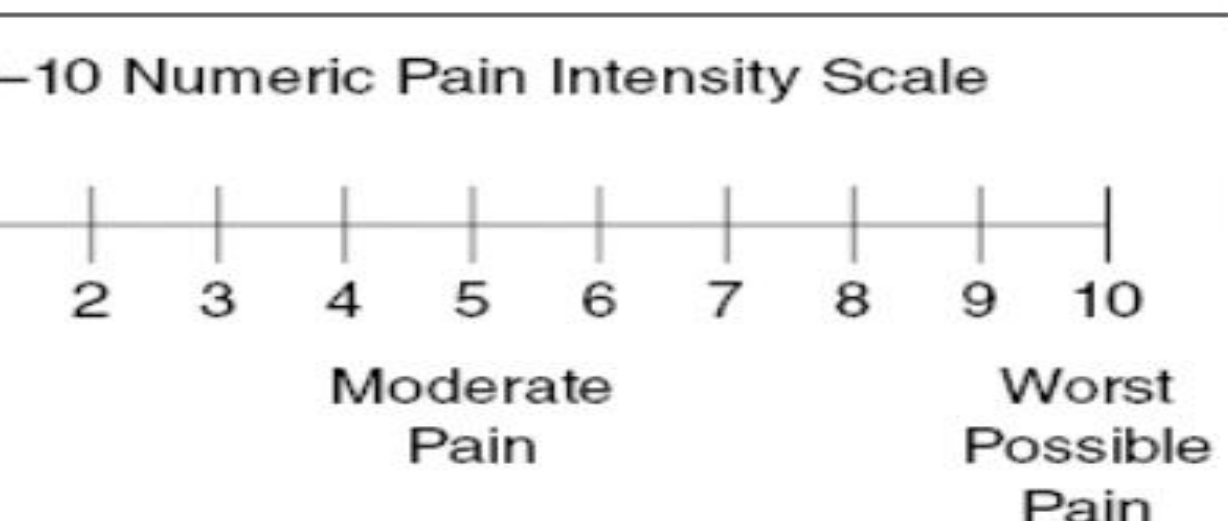
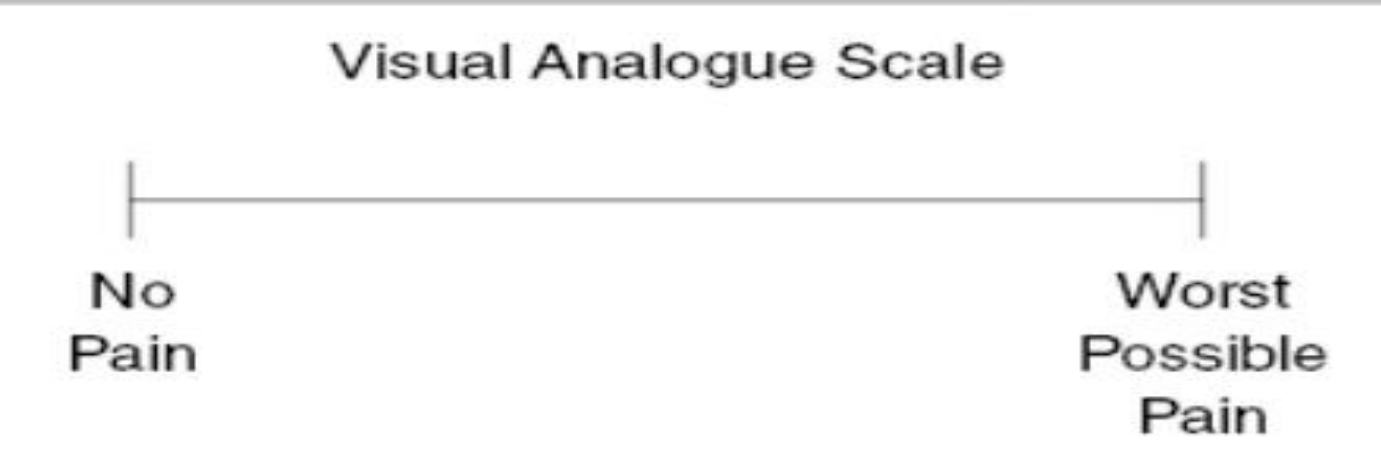
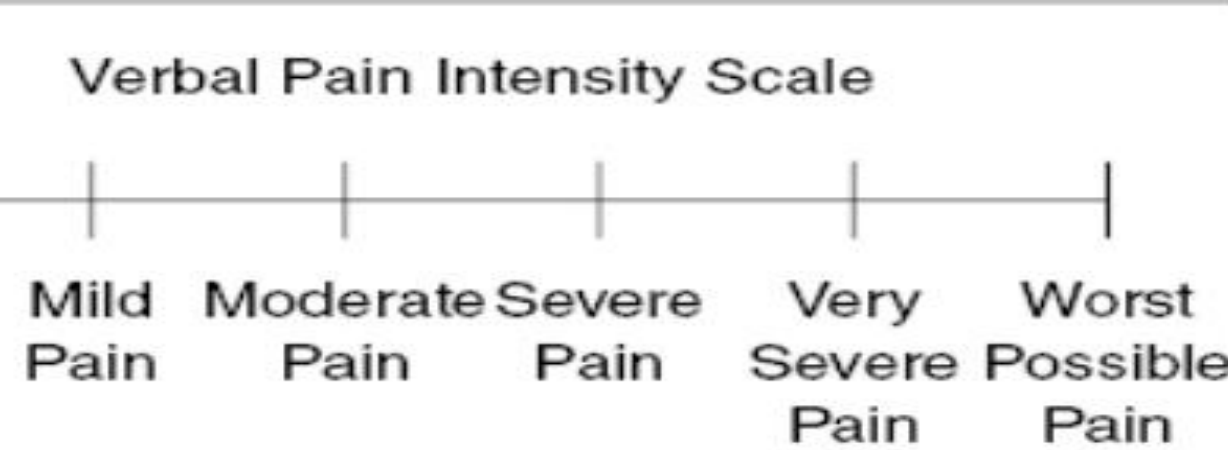
**Objective:** To systematically evaluate the effect of intravenous dexmedetomidine versus intravenous remifentanyl in reducing postoperative pain in adult patients undergoing laparoscopic surgery.

**BACKGROUND**

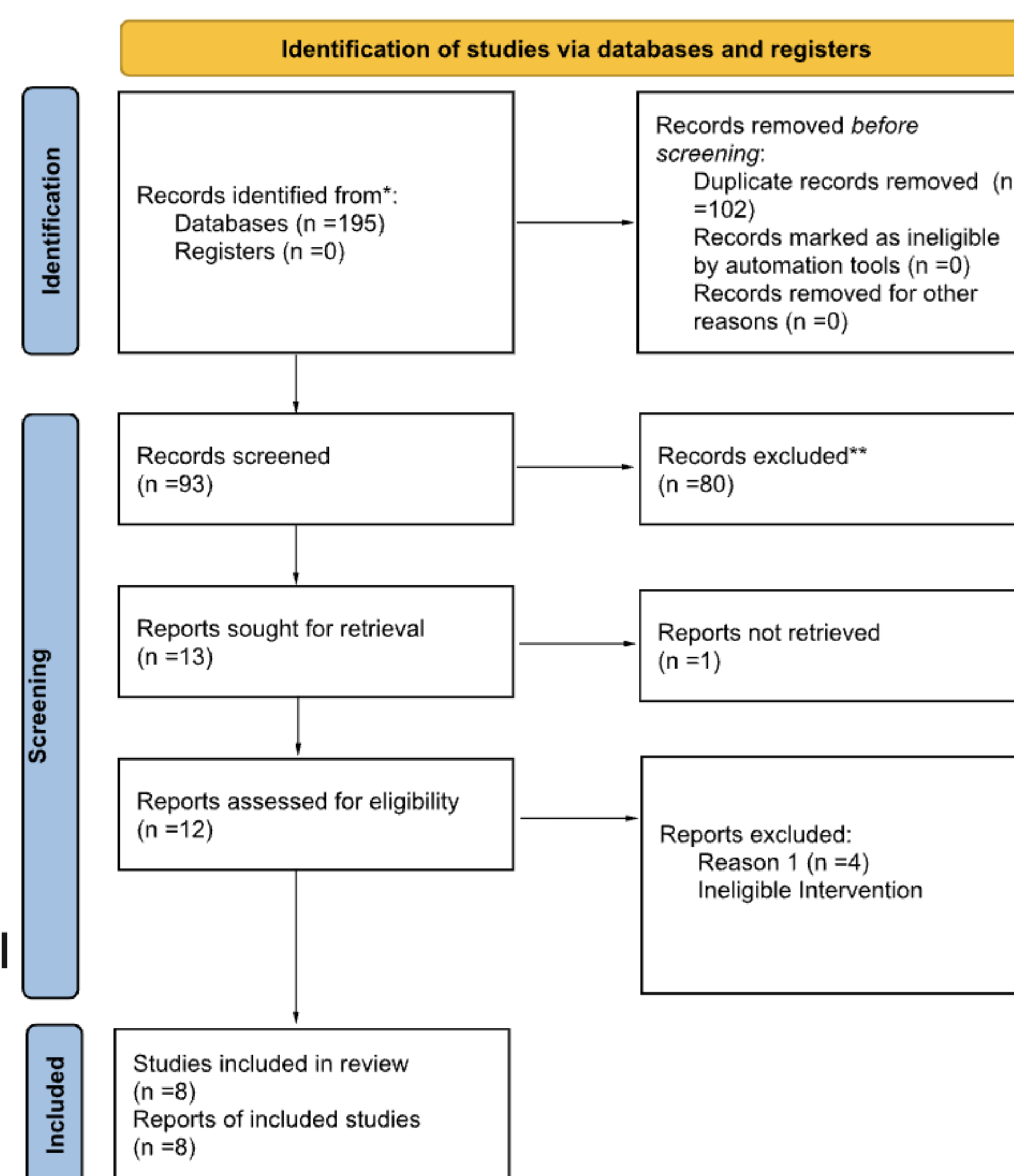
- Since the advent of laparoscopic surgery (LS) in the 1980s, its use in modern-day surgery has increased exponentially. LS allows patients to undergo an array of surgical procedures with smaller surgical incisions, reduced hospital stays, fewer complications, and less damage to the body (Mayo Clinic, 2023).
- Over 80% of surgical patients experience postoperative pain, contributing to patient dissatisfaction, prolonged hospitalization, and increased healthcare costs (Chou et al., 2016).
- Opioid-based anesthetics such as remifentanyl provide rapid intraoperative analgesia but may contribute to opioid-induced hyperalgesia and increased postoperative pain. Dexmedetomidine, a selective  $\alpha_2$ -adrenergic agonist, provides analgesia and sedation while reducing perioperative opioid requirements.

**METHODS**

- **Inclusion criteria:** Studies that included adults, of both gender over the age of 18, undergoing laparoscopic surgery.
- **Intervention:** Administration of Intravenous Remifentanyl
- **Comparison:** Administration of intravenous Dexmedetomidine
- **Outcomes:** Post-operative pain scores using validated instruments including visual analog scale (VAS), numeric pain rating scale (NPRS), faces pain scale (FPS), and verbal rating scale (VRS)
- **Databases searched:** PubMed, Embase, Scopus, CINAHL, Academic Search Premier, and Web of Science
- **Assessment of methodological quality:** JBI critical appraisal checklists
- **Data extraction:** Data on study design, setting, intervention, comparison, outcome
- **Data synthesis:** A random-model meta-analysis using the SPSS statistical package



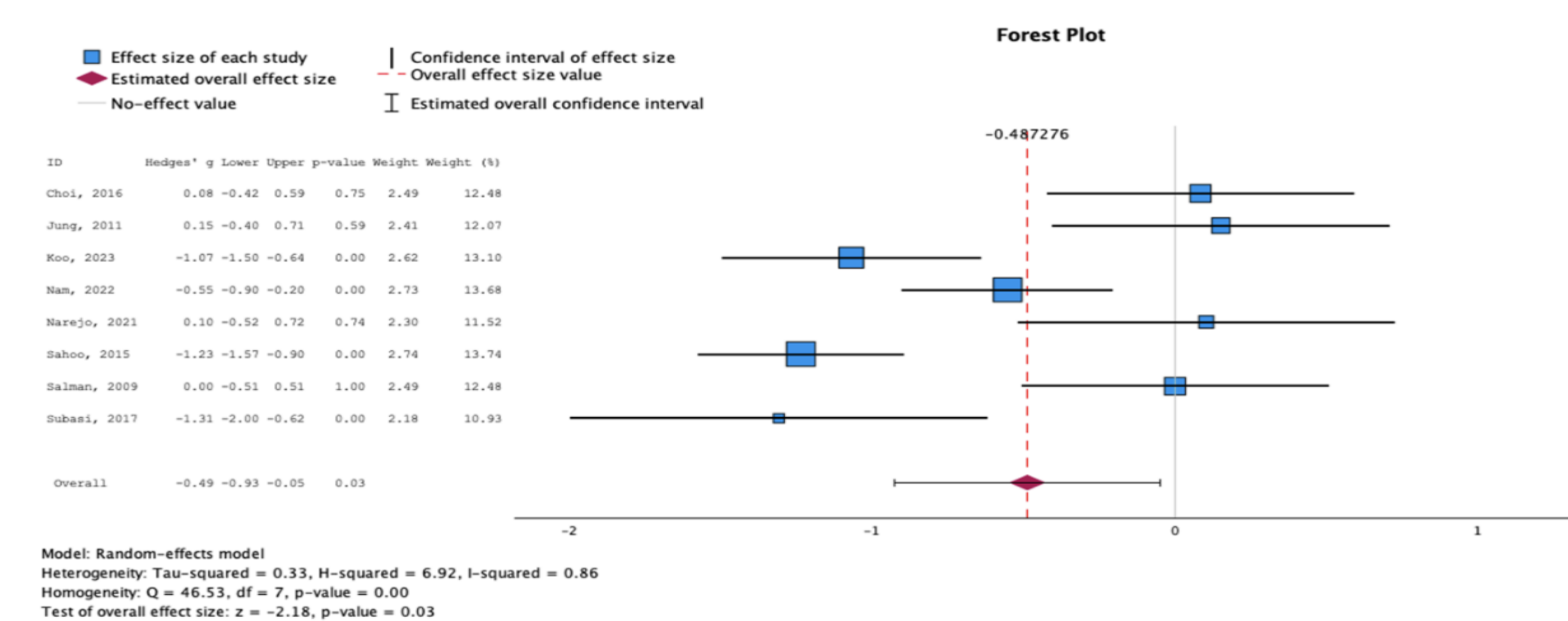
**SEARCH RESULTS**



**DESCRIPTION of INCLUDED STUDIES**

- Eight studies were included
- This consisted of one case control study and seven randomized control studies
- Studies were conducted in four different countries: South Korea, Saudi Arabia, Turkey, and India
- There were a total of 640 participants
- All participants were adult men and women, over the age of 18 undergoing laparoscopic surgery.
- Six studies were of good methodological quality while two were of moderate quality

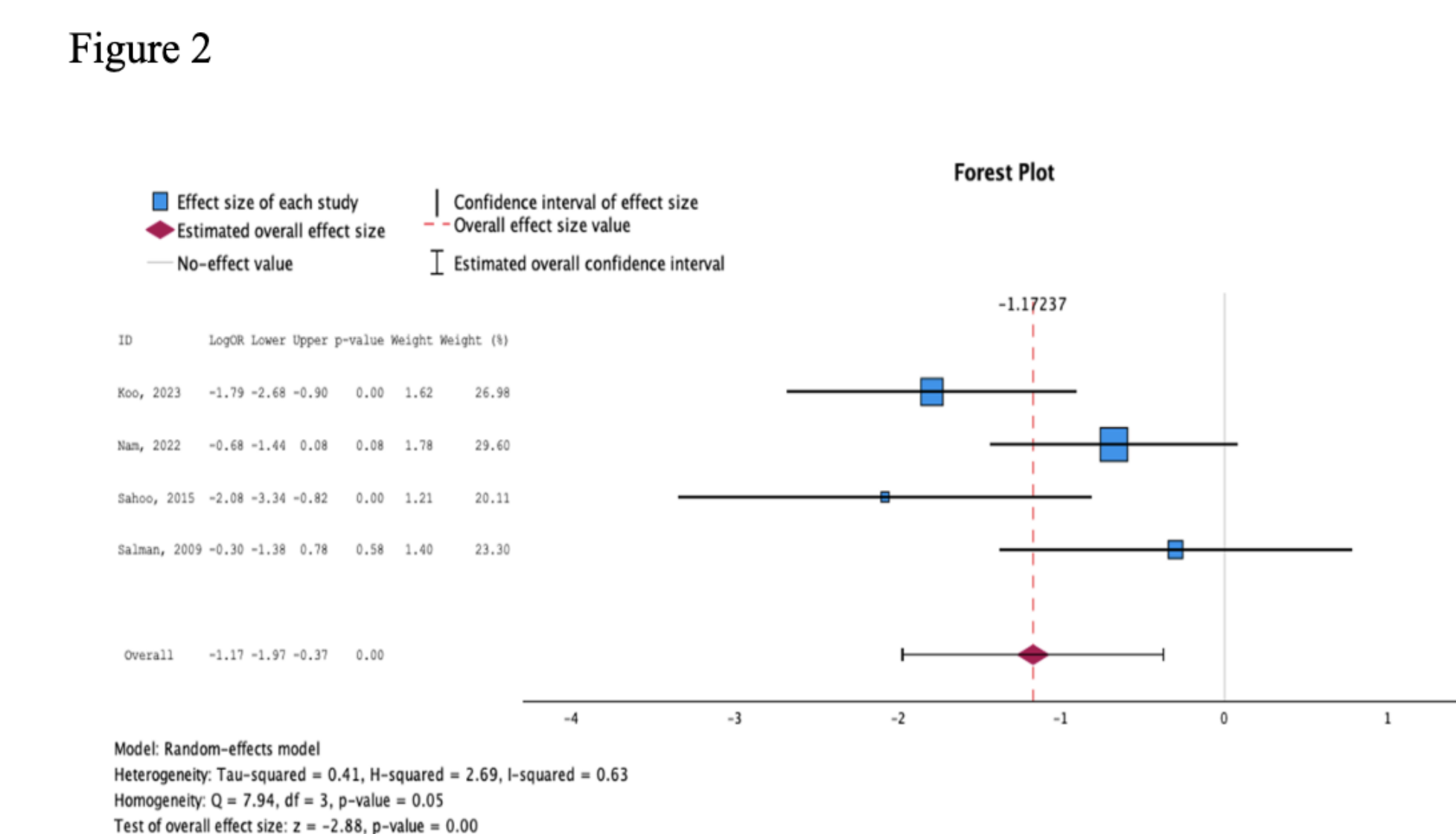
**RESULTS : Post operative Pain score (0.5-4 hours)**



- The overall Hedges g = -0.49 (95% CI -0.93 to -0.05, p=0.03)
- Q-value (heterogeneity) of 0.513, p = 0.00
- I<sup>2</sup> value of 86%

**RESULTS: Need for Postoperative Analgesic**

- The overall OR of -1.17 (95% CI: -1.97; -0.37, p=0.00)
- Q-value (heterogeneity) of 7.94, p=0.05)
- I<sup>2</sup> value of 63%



**CONCLUSIONS and RECOMMENDATIONS**

- **Overall, lower pain scores and reduced use of rescue analgesics were observed in the Dexmedetomidine group in comparison to the Remifentanyl group.**
- Anesthesia providers should consider using dexmedetomidine in lieu of remifentanyl in patients undergoing laparoscopic surgery.

**LIMITATIONS**

- The search strategy was only limited to those in English, as studies in other languages were excluded.
- Small amount of participants and studies were all conducted outside of the United States.
- High degree of heterogeneity within the meta-analysis.

**KNOWLEDGE TRANSLATION**

- The knowledge can be used to develop an **evidence to practice implementation plan.**
- **Type of implementation plan:** Clinical decision making algorithm
- **Objective:** To provide a structured practice pathway with measurable endpoints to facilitate evidence-based analgesic strategies, support quality improvement, and minimize opioid exposure.
- **Target Audience:** Anesthesia providers in perioperative and ambulatory surgery centers.
- **Evaluation plan:** Assess post operative pain in patients undergoing laparoscopic surgery.

**REFERENCES**



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