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## Introduction

Pain is a multidimensional experience that is not only dictated by innate biological processes, but by an individual's lived experiences and understanding of pain.<sup>1-4</sup> Paramedics use a range of pain assessment and measurement approaches to understand an individual's pain, that are seemingly sex-neutral, and do not consider the subjective nature of the pain experience, nor the biopsychosocial influence that sex has on pain expression.<sup>5-8</sup> Analgesic decisions are therefore informed by both a patient's symptoms and responses to objective clinical measures, and the paramedic's subjective clinical judgement, that is influenced by their experiences and scope of practice. A patient's sex is in turn imperative to investigate in the context of pain and its management, as males and females inherently perceive, tolerate and express pain differently.<sup>1-4,8</sup> Sex therefore challenges equitable pain management practices as a whole.

## Aim

Evaluate current literature on gender biases in paramedicine, to identify the influence of sex on analgesic pain management practices.

## Methodology

- A rapid review was conducted in accordance with Cochrane guidance<sup>9</sup> by searching five electronic databases and nine paramedic specific journals for literature that met the pre-determined inclusion criteria.
- Literature screening and data extraction were conducted via a two-stage process, in consultation with all authors.
- Risk of bias assessment using a JBI appraisal tool<sup>10</sup> was conducted with all articles required to meet a threshold score of at least 60%.
- Retrieved data were in turn subject to narrative synthesis.

## Results

- A total of 2545 articles were identified with initial searching (Figure 1), where 13 articles remained for analysis (Table 1).
- Eight articles specifically investigating sex as a primary outcome.<sup>11-18</sup>
- Seven studies indicated females to be statistically less likely to receive analgesia, particularly opioids, in comparison to males, remaining significant after controlling for confounders.<sup>11,12,15,17-20</sup>
- Five articles found that analgesic administration was not influenced by the sex of the patient, even after controlling for potential confounders.<sup>13,14,16,21,22</sup>
- One study found that while females were more likely to have their pain assessed and reported higher pain scores overall, males had statistically higher likelihoods of receiving analgesia.<sup>11</sup>
- One study indicated female paramedics provided better analgesia than male paramedics overall,<sup>13</sup> while two studies found no correlation between paramedic sex and analgesic administration.<sup>14,15</sup>

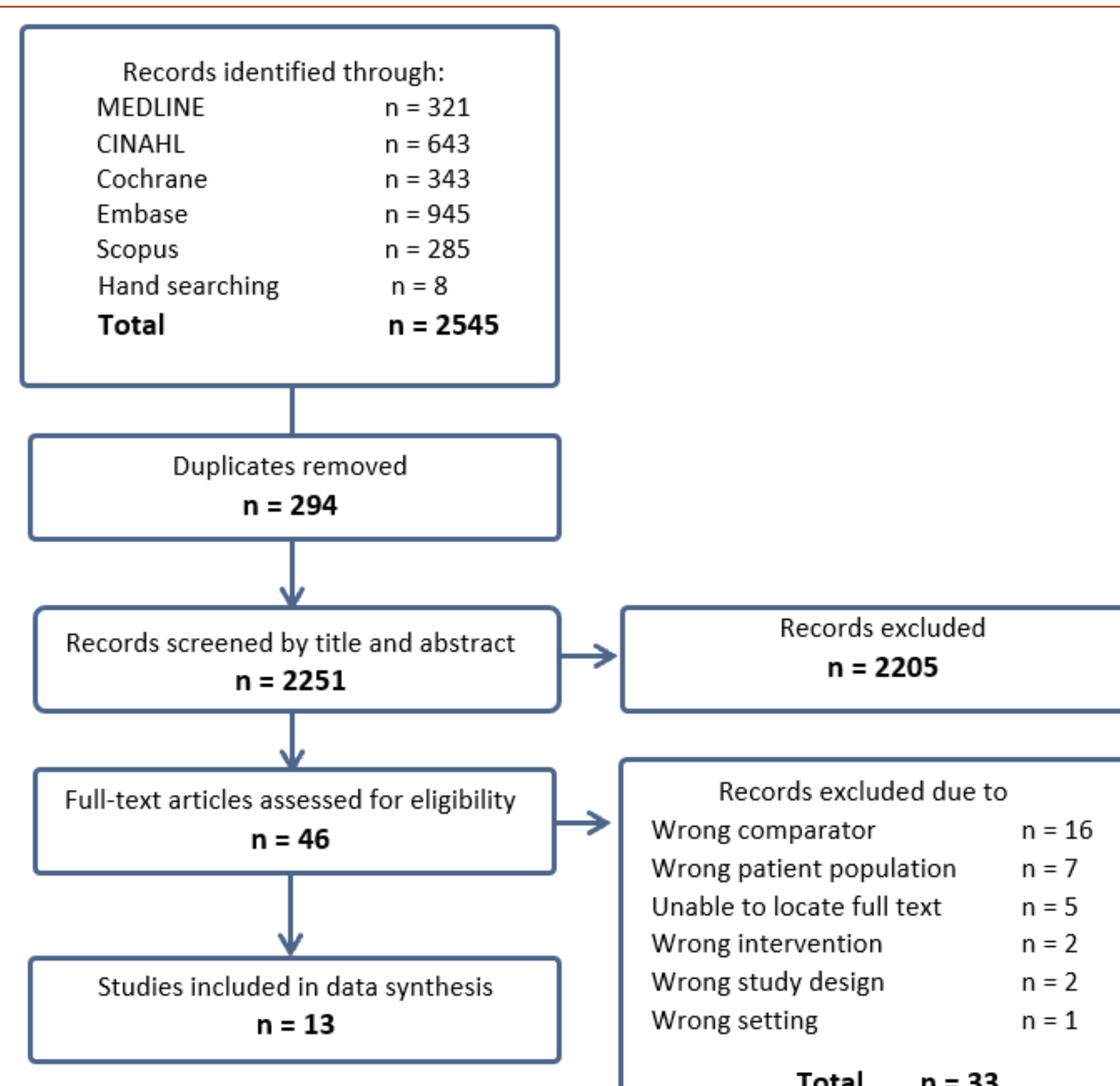


Figure 1. PRISMA flowchart of included and excluded studies

Author	Year of Publication	Country	Study Design	Sample Size (Male%)	Results Summary	ROB Score
Supples et al. <sup>11</sup>	2023	United States of America	Retrospective review	32,463 (49.8%)	Female < Male AR	8
Ferri et al. <sup>21</sup>	2022	Italy	Retrospective observational study	629 (49%)	Female = Male	6
Wimbish et al. <sup>12</sup>	2022	United States of America	Retrospective cross-sectional study	27,448 (46.1%)	Female < Male AR	8
Johansson et al. <sup>23</sup>	2021	Sweden	Prospective observational study	32 (50%)	Females were found to have statistically significant lower pain scores at hospital admission post Methoxyflurane administration than males.	5
Kiavialaitis et al. <sup>13</sup>	2020	Switzerland	Retrospective cohort study	20,978 (48%)	Female = Male AR	6
Lourens et al. <sup>22</sup>	2020	South Africa	Retrospective review	2,401 (68.7%)	Female = Male	6
O'Connor et al. <sup>19</sup>	2020	United States of America	Pre/post retrospective chart review	22,311 (48%)	Female < Male AR	6
Siriwardena et al. <sup>14</sup>	2019	England	Retrospective cross-sectional study	9,574 (47.3%)	Female = Male AR	6
Lord et al. <sup>15</sup>	2014	Australia	Retrospective cohort study	42,051 (49.6%)	Female < Male AR	6
Young, et al. <sup>16</sup>	2013	United States of America	Retrospective cohort study	6,398 (44%)	Female = Male AR	5
Bendall et al. <sup>20</sup>	2012	Australia	Retrospective cohort study	97,705 (49%)	Female < Male AR	6
Lord et al. <sup>17</sup>	2009	Australia	Retrospective cohort study	1,766 (48%)	Female < Male AR	8
Michael et al. <sup>18</sup>	2007	United States of America	Retrospective cohort study	953 (42.3%)	Female < Male AR	8

Table 1. Characteristics and results from included studies (n = 13). ROB: Risk of bias; ††: Nil sex disparity identified; †♂: Sex disparity identified favouring males; ⚡: Opioids specifically investigated; AR: Adjusted results; ⚡: Not influenced by paramedic sex; ⚡: Influenced by paramedic sex

## Discussion

- Females are disproportionality treated less for their pain, even when the complaints of pain are similar or greater than males. This may create an equity of care and patient safety problem in prehospital care, as female patients may go longer without adequate pain relief.
- Some research shows that females experience more severe, longer lasting and recurrent pain,<sup>1-8</sup> and therefore this may indicate that a mismatch in pain presentation and subsequent analgesic management may exist in paramedic practice.
- Although it is understood that pain is subjective and is described and experienced differently by different sexes, it is evident in some of the data that patients are treated appropriately in relation to the pain scores they report.
- There is a need to increase the variety of analgesic types as to better allow paramedics to treat pain more specifically and frequently, encourage investigation into how certain medications act differently in males and females, and provide training on how to incorporate sex-specificity in analgesic decision making.

## Conclusion

The research into equitable pain management practice among paramedics is limited. This review highlighted that while some studies have found no sex-specific discrepancy in analgesic administration, half of the included studies identified that males are unduly privileged with higher rates of analgesic administration, specifically opioids, in comparison to females, and that females were prejudiced with a higher risk of oligo-analgesia. Further research needs to be conducted to better analyse sex disparities in pain management, in the interest of promoting gender-equity in pain care responses in paramedicine.

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