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Comparison of Selective Serotonin Reuptake Inhibitors and USA FDA-Approved Serotonin-Norepinephrine Reuptake Inhibitors for Fibromyalgia: A Systematic Review and Network Meta-Analysis

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INTRODUCTION

- Fibromyalgia is a chronic condition characterized by widespread pain, fatigue, cognitive disturbances, sleep issues, and a diminished quality of life (QoL), affecting 2%-6% of the U.S. adult population.
- Pharmacological treatments, including SSRIs (e.g., Paroxetine, Fluoxetine, Citalopram) and SNRIs (e.g., Duloxetine, Milnacipran, Venlafaxine), are commonly used to manage fibromyalgia symptoms, with Duloxetine and Milnacipran being FDA-approved for the condition
- There is uncertainty regarding the comparative effectiveness of SSRIs and SNRIs in treating fibromyalgia, with off-label use of certain drugs, such as Paroxetine (an SSRI), further complicating treatment decisions

OBJECTIVE

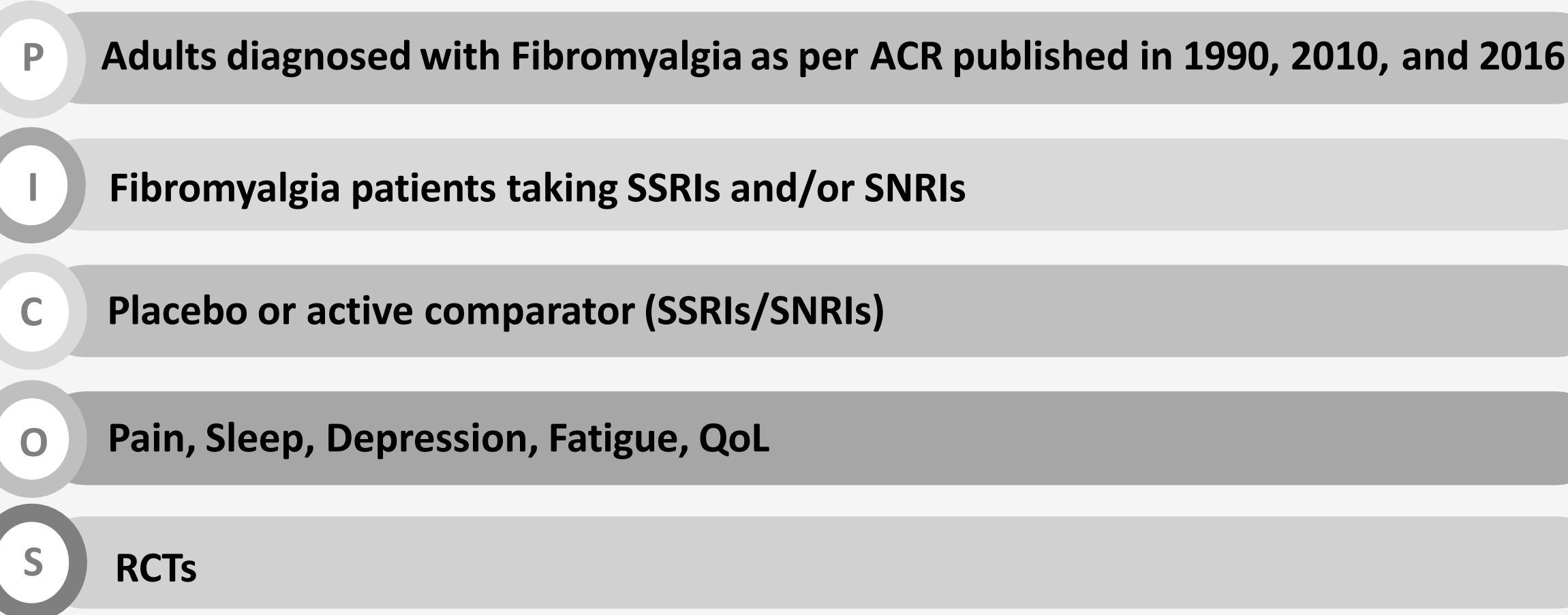
- To evaluate the efficacy of SSRIs and SNRIs in managing fibromyalgia symptoms, including pain, sleep disturbances, and depression

METHODS

- Study Selection and PICOS Criteria:** A systematic review and Network Meta-Analysis (NMA) were conducted, including randomized controlled trials (RCTs) that evaluated SSRIs and SNRIs for fibromyalgia treatment. Pain, sleep, and depression outcomes were assessed

- Data Sources:** PubMed, EMBASE, and the Cochrane Library were searched from inception to September 17, 2023 to identify relevant studies
- Statistical Analysis:**
 - The NMA performed using multivariate meta-analysis in Stata Statistical Software (version 18) with the network package
 - Standardized Mean Differences used for continuous outcome presentation across network comparisons
 - Consistency assessed through agreement between direct and indirect treatment effects in closed loops, employing a loop-specific approach
 - Treatment ranking determined by the Surface Under the Cumulative Ranking Curve (SUCRA), indicating relative effectiveness compared to a top-ranked hypothetical treatment

Figure 1. PICOS CRITERIA



KEY: ACR: American College of Rheumatology; SNRIs: serotonin-norepinephrine reuptake inhibitor; SSRIs: selective serotonin reuptake inhibitor; RCTs: randomized controlled trials; QoL: quality of life.

RESULTS

- The **PRISMA diagram** (Figure 2): A total of **21 studies**¹⁻²¹ were included after screening **466 records** from PubMed, EMBASE, Cochrane Library, with **423 studies excluded** for reasons such as irrelevant outcomes, non-English studies, or insufficient data in conference abstracts
- A total of 21 randomized controlled trials (RCTs) with 6,953 participants were included in the analysis. The studies having reported sample sizes ranging from 19 to 573 participants, with most studies having between 100 and 200 participants.
- The average age of participants was between 46-50 years, with a balanced sex distribution (49.5%–50.7% male); The studies primarily included White participants (77.4%–100%)

Figure 2. PRISMA Diagram

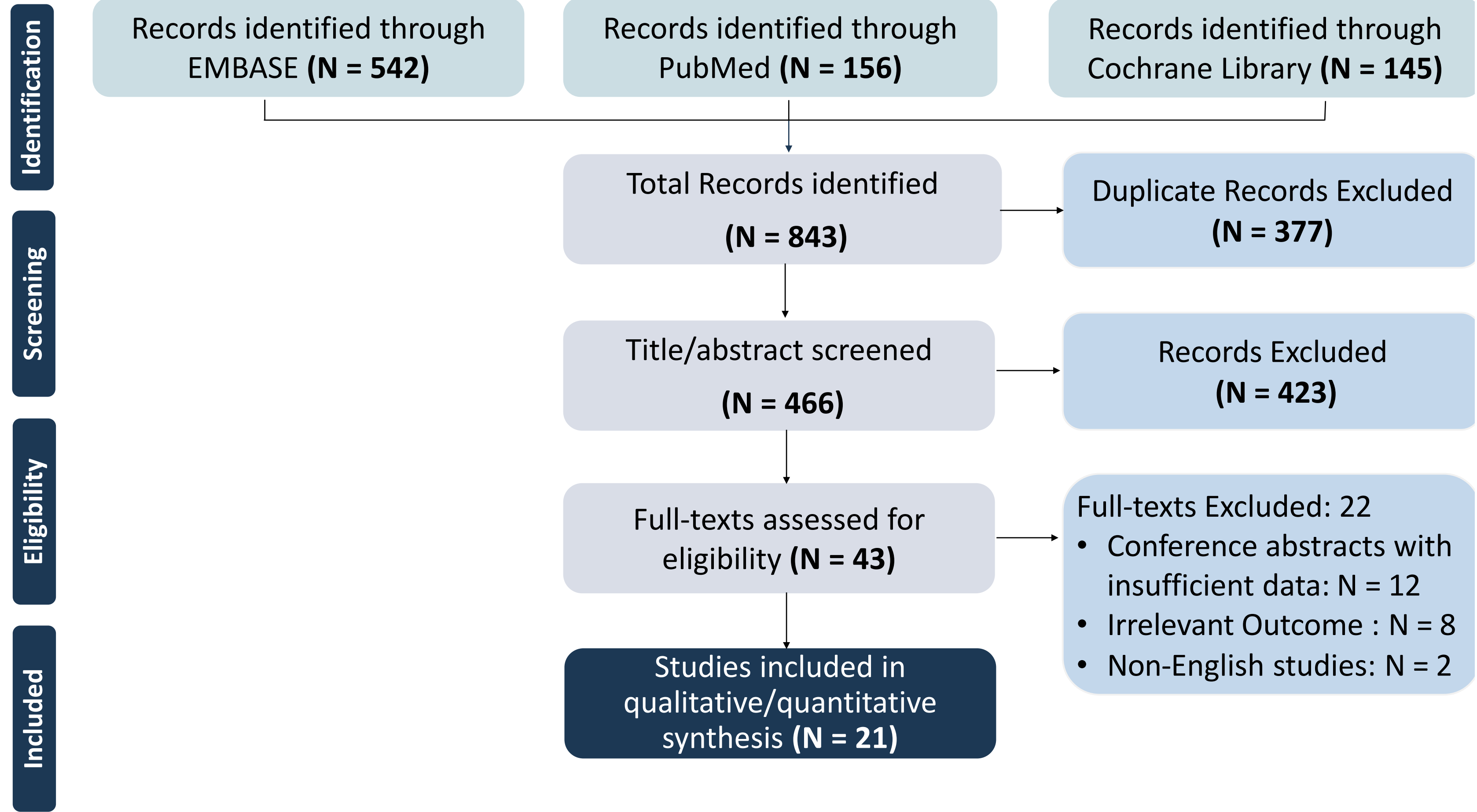


Figure 4. FOREST PLOT (PAIN)

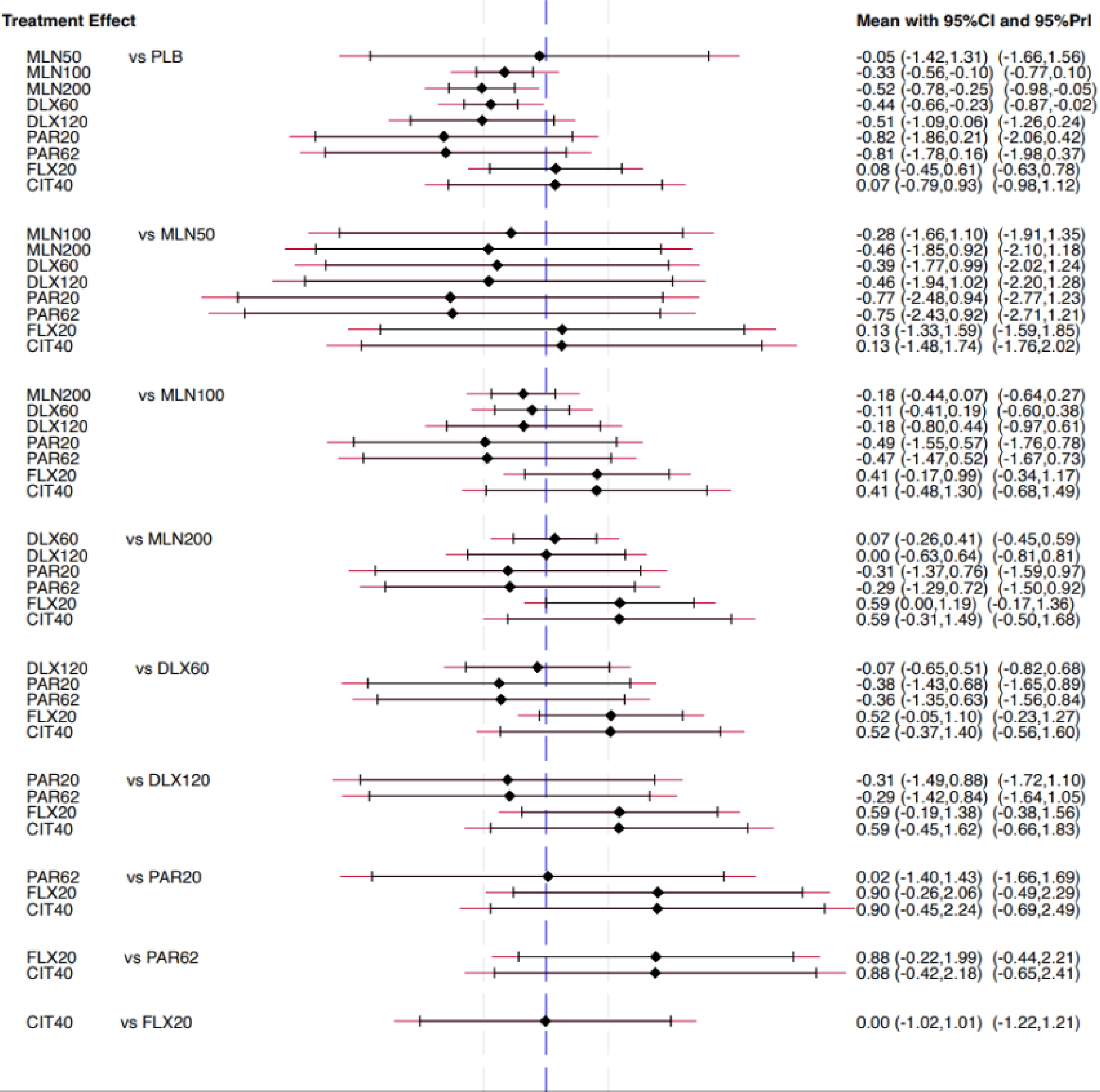
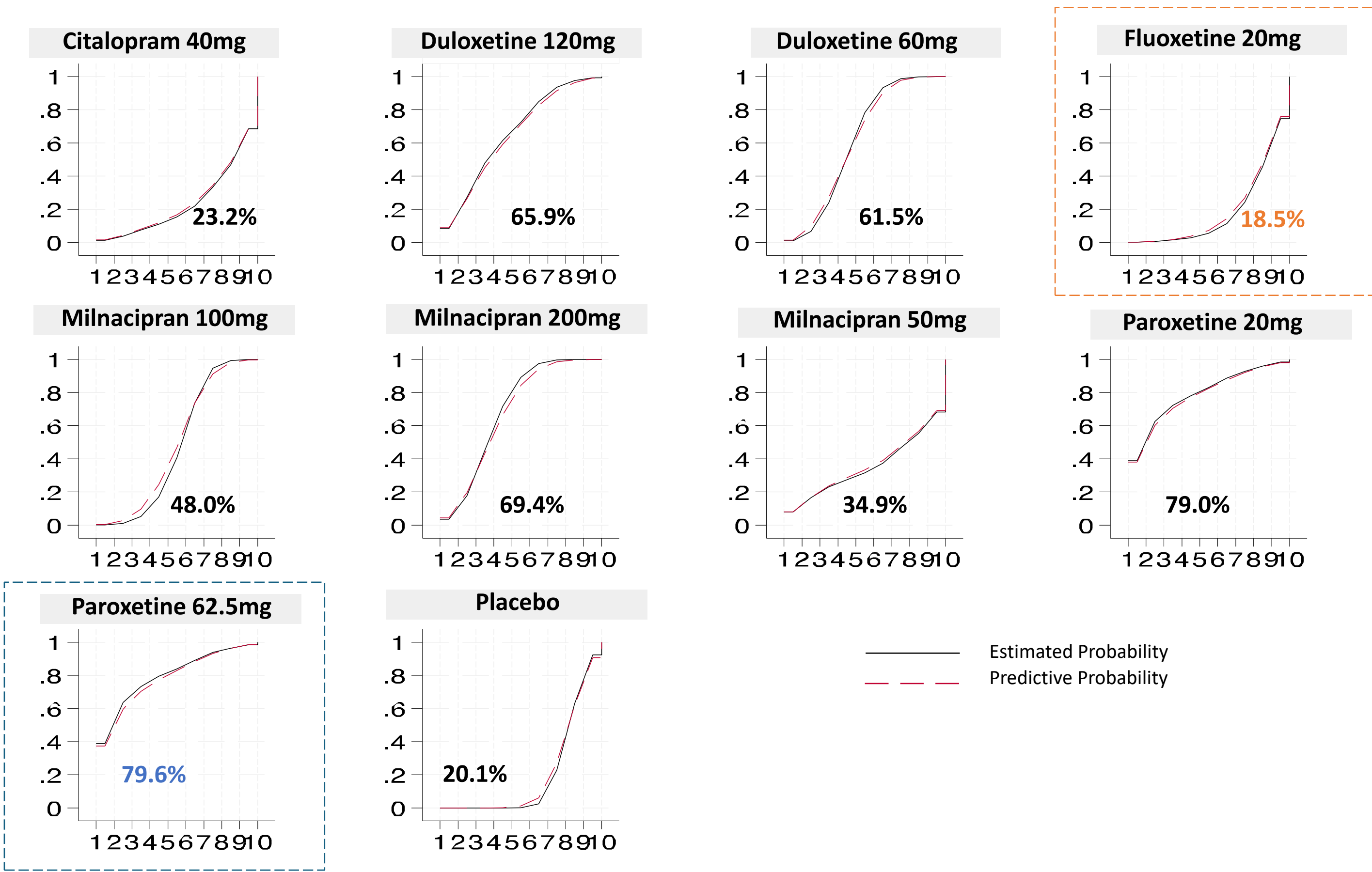


Figure 5. SUCRA PLOT (PAIN)



KEY: 1: Placebo; 2: Milnacipran 50mg; 3: Milnacipran 100mg; 4: Milnacipran 200mg; 5: Duloxetine 60mg; 6: Duloxetine 120mg; 7: Paroxetine 20mg; 8: Paroxetine 62.5mg; 9: Fluoxetine 20mg; 10: Citalopram 40mg

Figure 6. CLUSTER RANKING FOR PAIN VS SLEEP

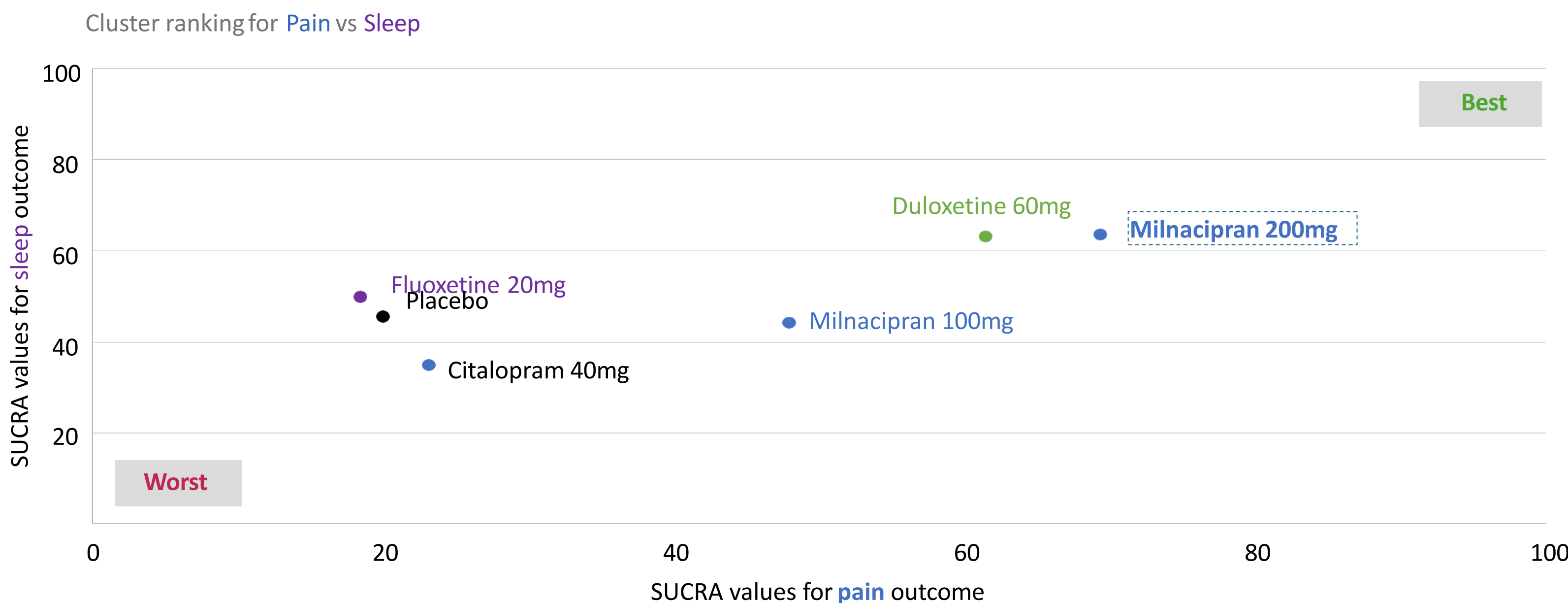
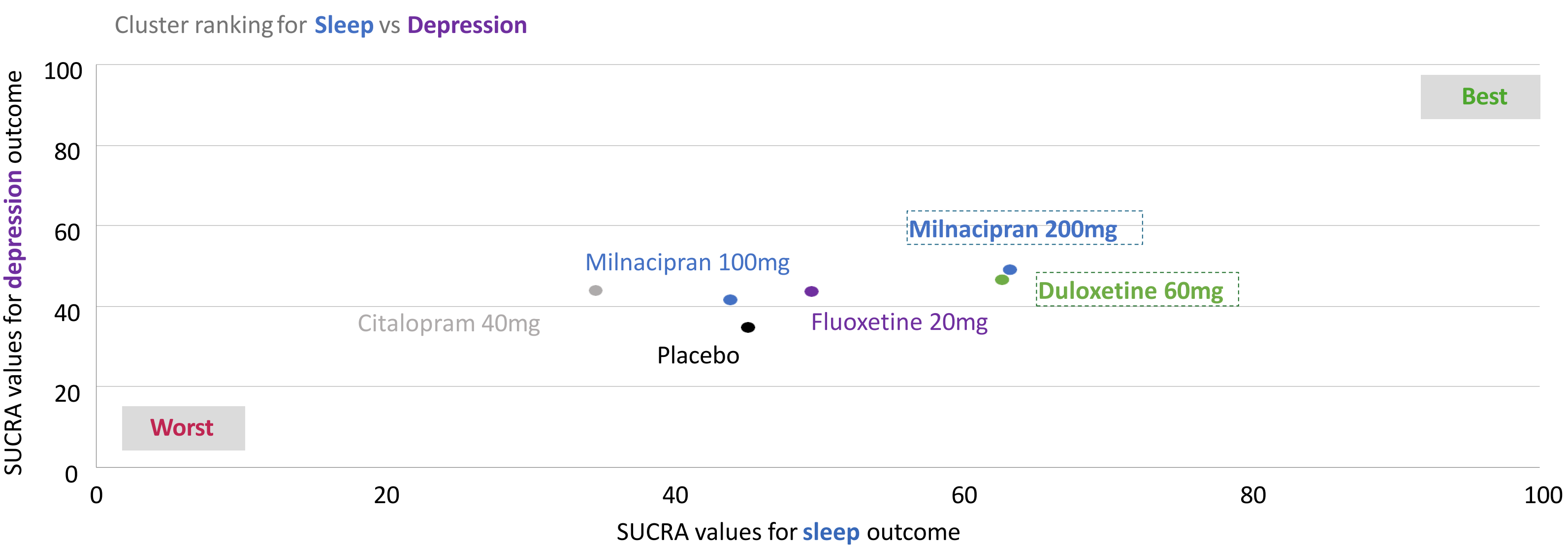


Figure 7. CLUSTER RANKING FOR SLEEP VS DEPRESSION



DISCUSSION

- The results of this NMA support previous studies, highlighting Milnacipran 200mg and Duloxetine 60mg as the most effective treatments for pain and sleep management
- These findings reinforce the importance of using these treatments in clinical practice.
- It helps clarify which treatments may offer the best outcomes for specific fibromyalgia symptoms. Further studies are needed to validate these results in larger, more diverse populations.
- Additionally, future research should explore long-term treatment efficacy and incorporate a broader range of pharmacological treatments

CONCLUSION

- Milnacipran 200mg and Duloxetine 60mg were the most effective treatments for managing pain, sleep disturbances, and depression in fibromyalgia patients, according to the NMA
- Many trials included in the analysis had small sample sizes, which may introduce bias
- Future studies should involve larger sample sizes and consider additional pharmacological treatments to build a more comprehensive understanding of fibromyalgia management

REFERENCES

1: Branco JC et al. 2010; 2: Clauw DJ et al. 2008; 3: Staud R et al. 2015; 4: Goldenberg DL et al. 2010; 5: Ahmed M et al. 2016; 6: Arnold LM et al. 2010; 7: Mease PJ et al. 2009; 8: Pickering G et al. 2018; 9: Arnold LM et al. 2010; 10: Arnold LM et al. 2004; 11: Arnold LM et al. 2005; 12: Murakami M et al. 2015; 13: Russell IJ et al. 2008; 14: Patkar AA et al. 2007; 15: Sencan S et al. 2004; 16: Wolfe F et al. 1994; 17: Goldenberg D et al. 1996; 18: Hadianfard M et al. 2012; 19: Arnold LM et al. 2002; 20: Nørregaard J et al. 1995; 21: Anderberg UM et al. 2000

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