



A Meta-Analysis Comparing Assessment Methods of Obstructive Sleep Apnea During Pregnancy

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INTRODUCTION



Sleep apnea is a condition in which, during sleep, a person undergoes several events in which there is a lack of oxygenation for greater than ten seconds. Under normal circumstances, having five or fewer apneic-hypopneic episodes is considered normal and warrant no further investigation. The most common form of sleep apnea is OSA. The gold standard in diagnosing is an in-laboratory polysomnography, but, due to lack of access in many areas, the use of screening tools has been substituted.

Pregnant people are an extremely vulnerable population, as they experience rapid growth in weight in a relatively short amount of time. Obstructive sleep apnea (OSA) has profound effects on both maternal and fetal health. The effects of OSA on the maternal health include, but are not limited to, cardiovascular disease and gestational diabetes mellitus. Identifying effective screening methods are needed to reduce long term effects.

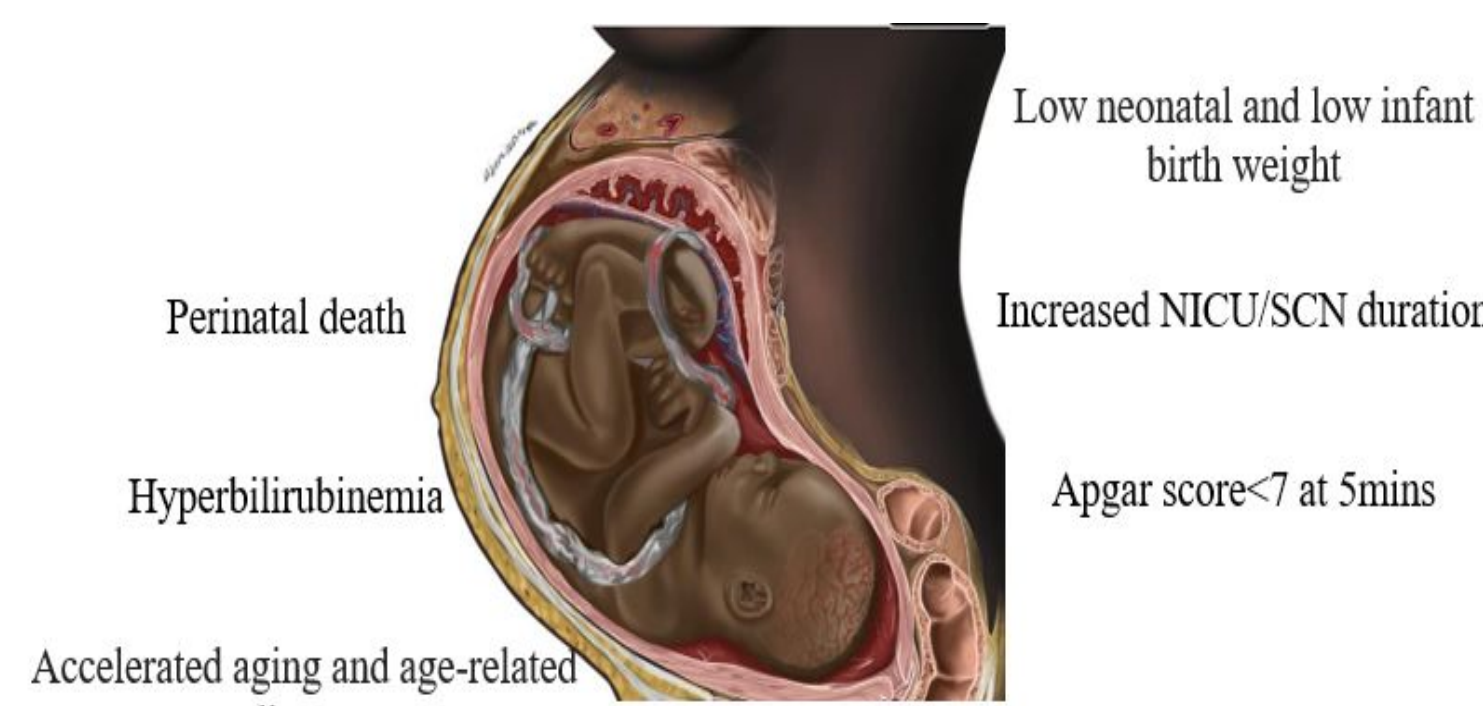


Fig. 2 effects of maternal hypoxia on fetal health outcomes

Literature Review- Current Protocols for OSA in Pregnant Women

Literature review was conducted to compile the current protocols used to screen for Obstructive Sleep Apnea in pregnant women. Approximately four protocols are most commonly used. (Figure 3) With the PICO method in mind, (Figure 4), exclusionary criteria were applied to the screened literature. The following results are conclusions drawn from the literature review.

SIGNIFICANT RESULTS

- The prevalence of OSA in the pregnant population is likely between 8% and 32%^[2]. Exact prevalence rates are difficult to determine as there are very few easily accessible and accurate screening methods.
- The most common obstructive sleep apnea questionnaire-based screening methods include the STOP-BANG, Berlin Questionnaire, the Epworth Sleepiness Scale, and more recently, Facco's Prediction Model (Facco PM).
- Limitations of current screening methods include the lack of validity in earlier stages of pregnancy and in less severe cases of OSA, failure to account for confounding variables (such as daytime sleepiness being a common symptom of pregnancy)^[14], over-reliance on self-reported measures, and lack of sensitivity and/or specificity.
- To address these limitations new screening methods with different variables are being tested and used for the pregnant population. These variables include observable measures, such as craniofacial structure^[32], tongue enlargement^[16], neck circumference^[19,21], hypertension^[2,7,14,15,19,21], BMI^[14,16,19,21,40], and age^[14,21]. Some subjective variables have also been linked to OSA in pregnancy and are used in new screening methods such as tiredness upon awakening^[40], and snoring frequency/volume^[14,40].

CONCLUSIONS

- Diagnosis of OSA in pregnancy has been hindered due to a lack of applicable and reliable screening tools.
- Due to the potentially long term effects, assessing the quality and effectiveness of current screening protocol specific to pregnant mothers is beneficial.
- Currently, the most sensitive questionnaire-based screening protocol is Facco's Prediction Model while the B.A.T.E screening method is the most specific.
- The most reliable management protocol is a patient-focused management plan with interviews and personalized follow-up appointments to address the barriers in treatment.
- Limitations to care include access to appropriate screening tools and access to CPAP machines and qualified sleep medicine physicians.
- Many pregnant women are under-diagnosed and that places a large burden of disease on this population.

FUTURE DIRECTIONS

- Identifying additional variables that should be used to improve screening of pregnant population.
- Adjusting current screening protocols to increase sensitivity and specificity for the pregnant population, potentially by combining variables of highly sensitive and highly specific screening models or utilizing multiple methods when screening for obstructive sleep apnea.
- Increasing screening protocol access through medical apps for providers.

EXPERIMENTAL DESIGN AND METHODS

Figure 3

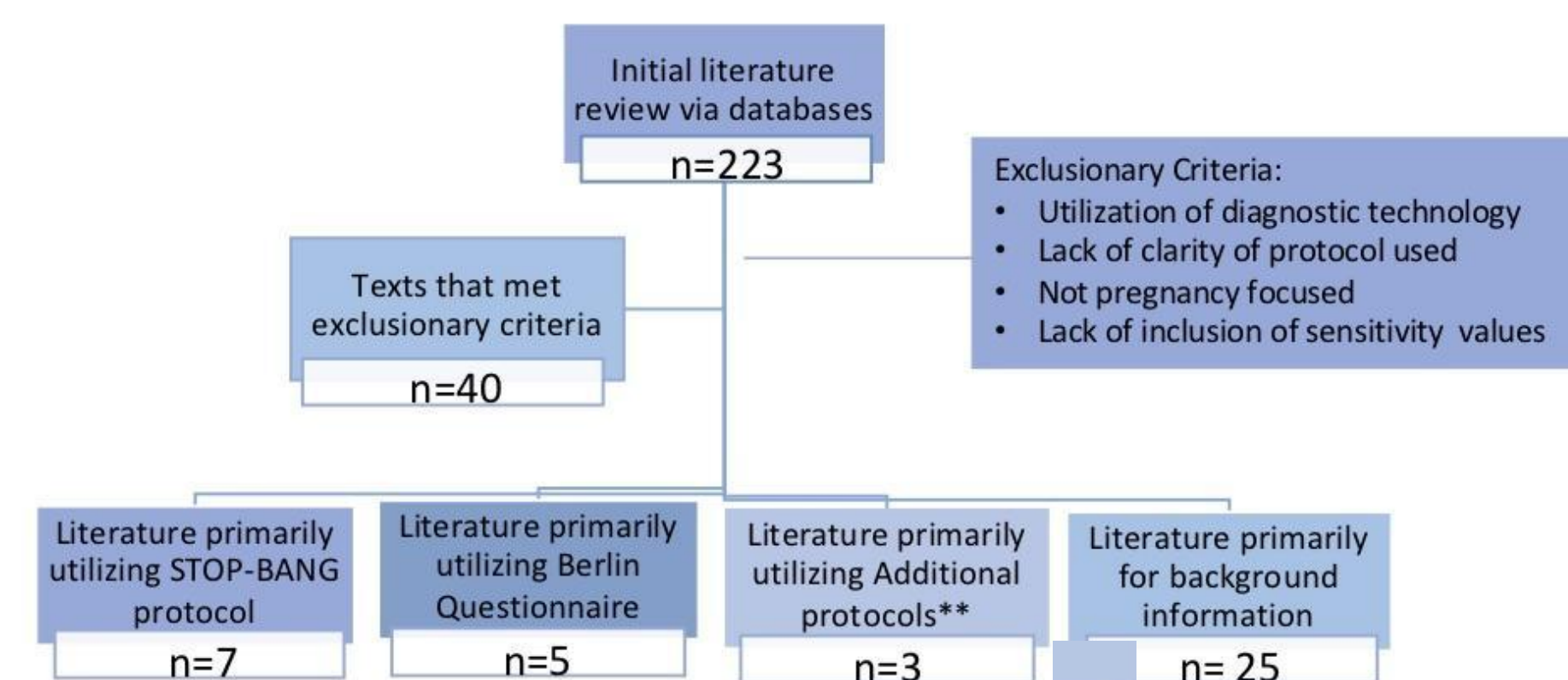


Figure 4

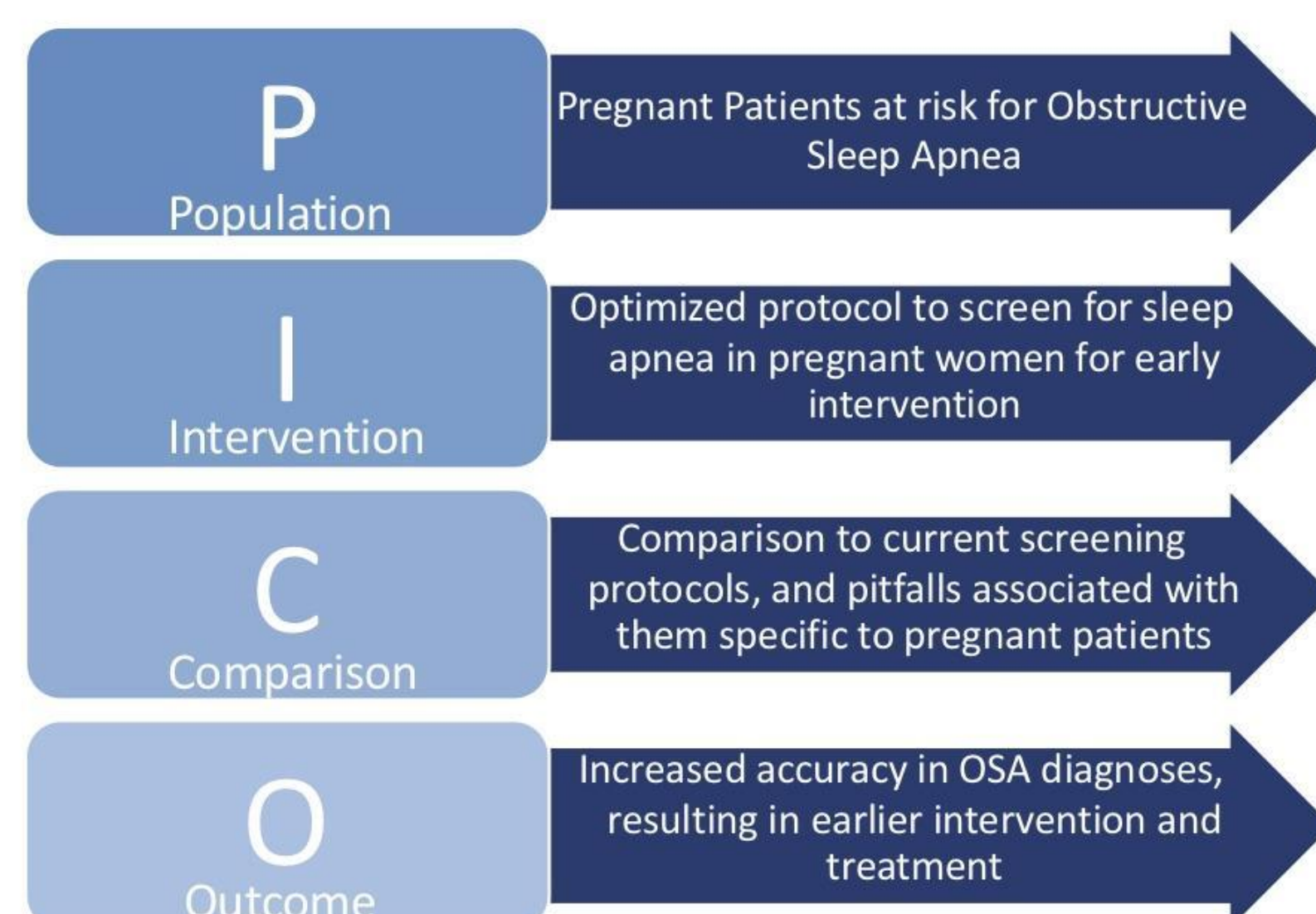


Figure 3: Literature Search Strategy. Figure 4: Diagram Demonstrating PICO Method Used for Research Question

Figure 5

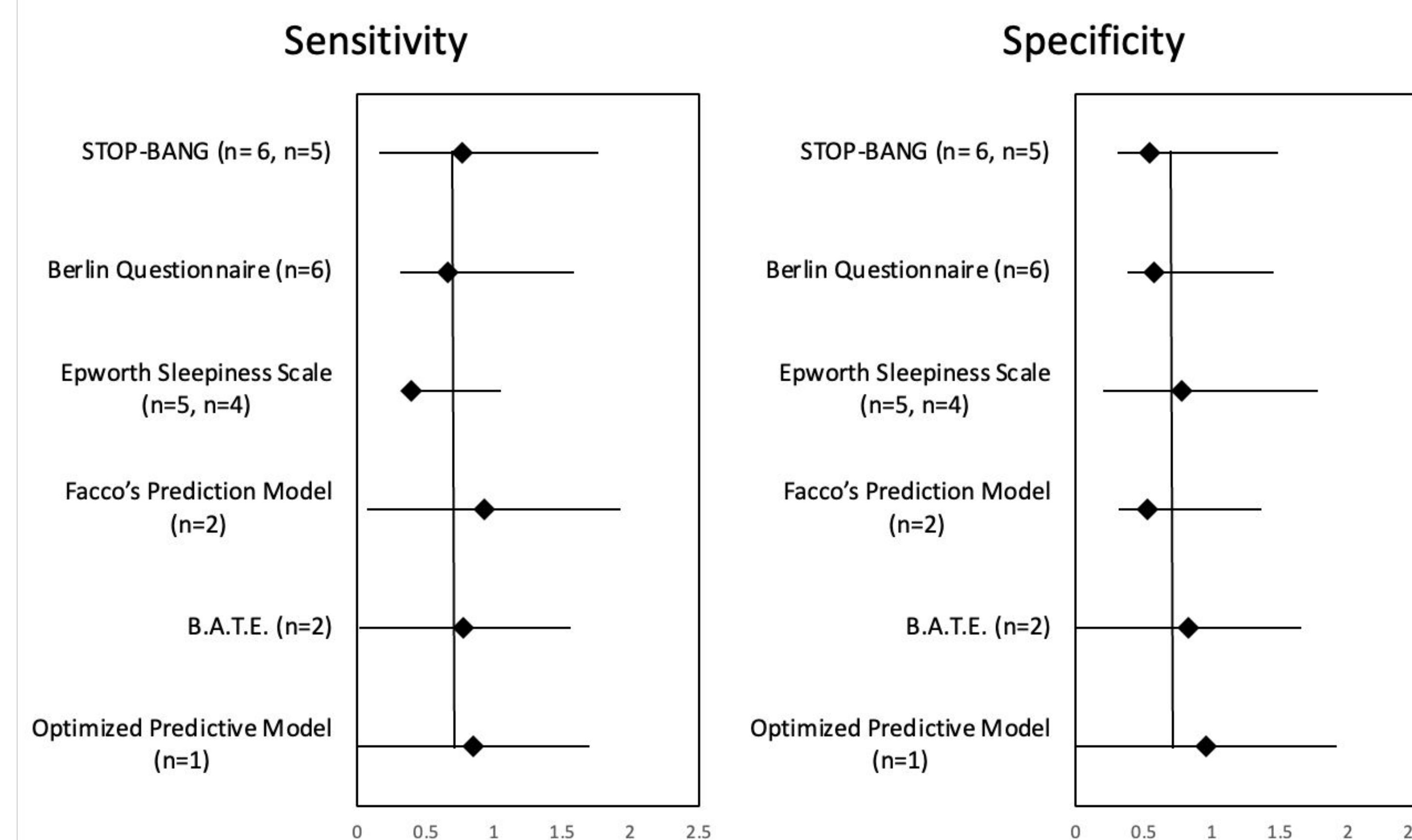


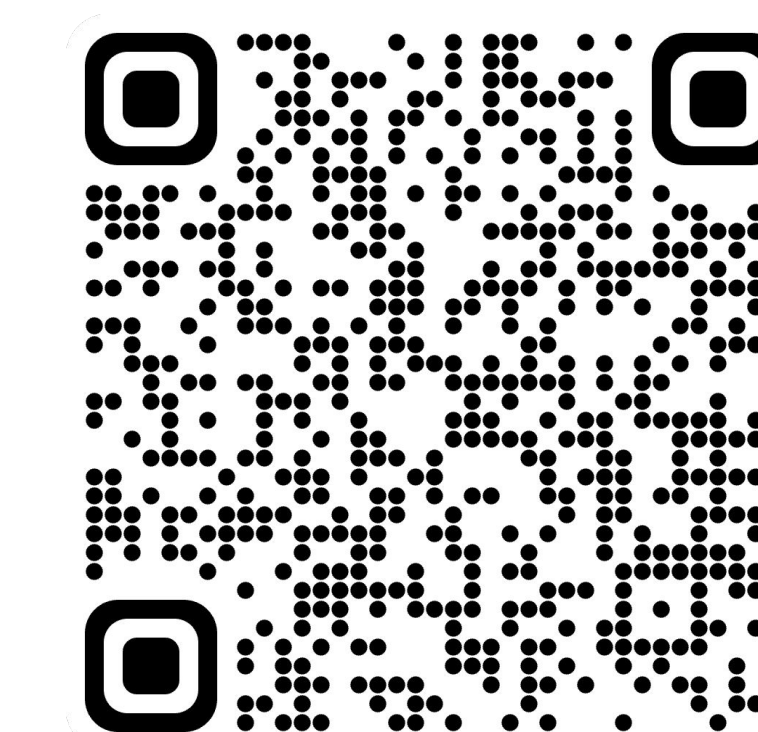
Figure 5: Forest Plot Analyzing Sensitivity and Specificity for Current Obstructive Sleep Apnea Screening Methods

REFERENCES

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References:



Note:

For the purposes of this poster, pregnant people will be referred to as women and mothers. It should be noted that not everyone who gets pregnant and/or gives birth identifies as a woman and their gender identity and pronouns should always be respected.