

Investigating the Predictive Power of Hair Biomarkers: Cortisol and Oxytocin Levels in Parental Stress

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Introduction

- * **Hair cortisol concentration (HCC)** is a validated hair biomarker for **chronic stress**.
- * **Hair oxytocin (HOC)**, known for its role in **social bonding**, is still being studied as a stress biomarker with mixed results.

Proprietary study:

- * This research utilizes Anand lab's **exclusive database**.
- * Supported by the **only patented technology** in the world for measuring **hair oxytocin concentration**.

Aim

Evaluate the predictive power of **hair cortisol (HCC)** and **hair oxytocin (HOC)** levels in assessing **parental stress**.

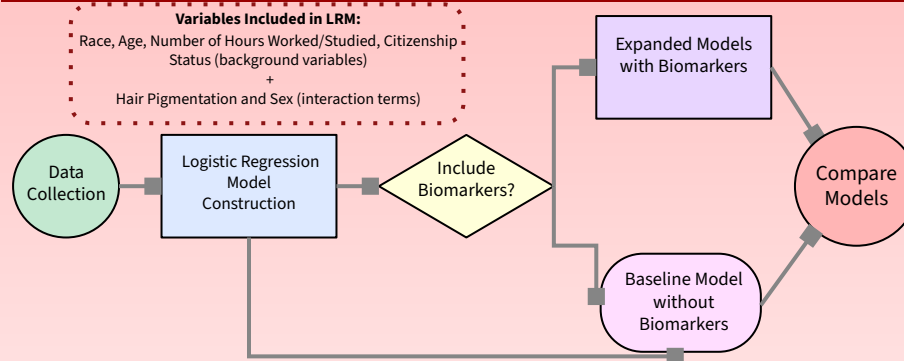
Sample Size: N = 198

Data Types: Parent Hair Samples, Parent Surveys

Location: Three Bay Area Counties (Santa Clara, San Mateo, Alameda)

Abstract
& References

Methodology



Results

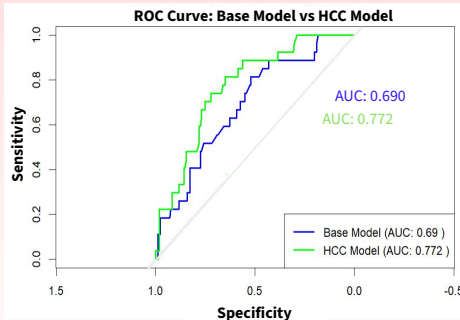


Figure 1. Receiver Operating Characteristic (ROC) curve analysis comparing the predictive accuracy of the Base Model and the **Expanded Model (HCC only)**

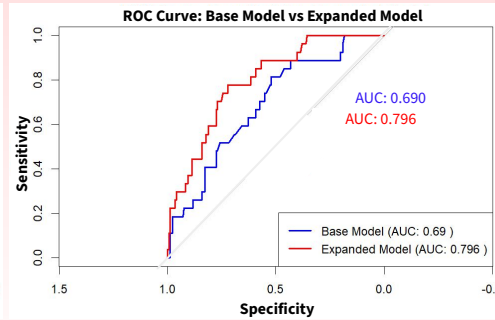


Figure 2. Receiver Operating Characteristic (ROC) curve analysis comparing the predictive accuracy of the Base Model and the **Expanded Model (HCC + HOC)**

Discussion

- * The **baseline** model (C-statistic: 0.690; Somers' D: 0.379) showed **moderate discrimination**. Adding **HCC improved prediction** (C-statistic: **0.772**; Somers' D: 0.545).
- * The final model, incorporating both **HCC** and **HOC** with interaction terms, showed the **greatest improvement** (C-statistic: **0.796**; Somers' D: 0.592).

Limitations

Small Sample Size and Data Attrition:

- * Reduction from over 2,000 to 198 participants due to data attrition.
- * **Limits generalizability** and **statistical power**.
- * Hinders detection of subtle effects or subgroup interactions.
- * Potentially introduces **bias**.

Conclusion

The **ROC curves** demonstrate that **HCC** and **HOC** enhance the **predictive accuracy** of the models for assessing **parental stress**, with **both biomarkers together** providing the **highest level of discrimination** and **accuracy** in **stress prediction**.

Future Directions

- * **Expand Stress Metrics** (e.g., BSI-18 Global Severity Index)
- * Refine Model by **Removing Limiting Variables**
- * Include **Additional Interaction Terms** (e.g., Rosenberg Self-Esteem Scale, Anxiety, Depression, etc.)