ANALYZING THE RELATIONSHIP BETWEEN MARITAL STATUS, AVERAGE INCOME, AND CORTISOL LEVELS IN PREGNANT WOMEN OVER TRIMESTERS

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ABSTRACT

Stress during pregnancy can be attributed to a host of biological, psychological, and environmental variables making it impossible to factor in all potential predictors. Recent research surrounding prenatal stress has proven several discrepancies related to income level and marital status. The purpose of this study is to quantitatively and qualitatively analyze the relationship between these two variables in addition to factoring in the trimester variable.

Data from the Ecological Momentary Assessment Study conducted by Dr. Pathik D. Wadwha and colleagues was used for our data analysis.

Our findings suggest a significant relationship between marital status, average income level, and cortisol levels over the trimesters with an increase in cortisol levels for married and unmarried pregnant women as the pregnancy term progressed.

BACKGROUND

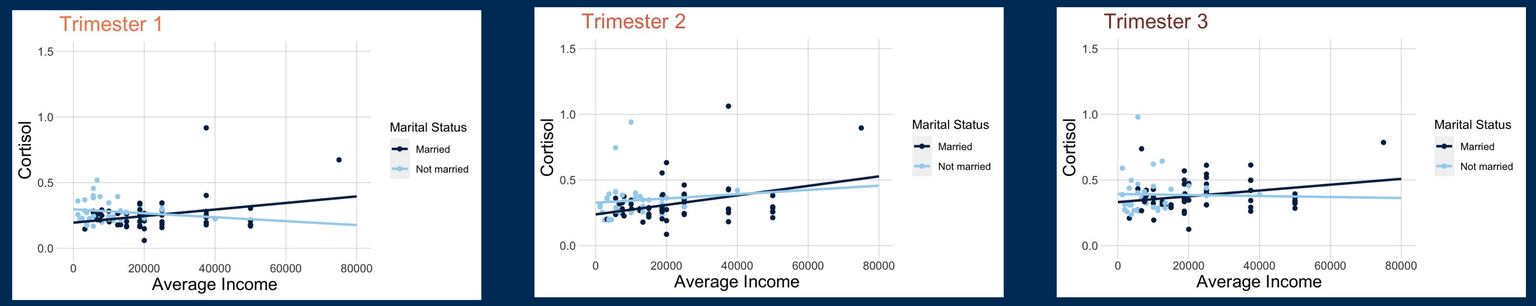
Prenatal stress is known to be linked to a variety of pregnancy complications and eventual birth defects, drastically impacting the life of the mother, family, and child. To better understand prenatal stress and potentially help curb such tragedies from occurring, several studies have been conducted to gain insight as to what factors are significantly associated with prenatal stress. Several variables have been examined, but marital status and income levels are of most interest to us. Studies have confirmed the association between marital status and income levels and others have detailed the association between low-income levels and increased prenatal stress. However, findings are inconsistent, especially regarding the relationship between income and stress.

Our question seeks to address this inconsistency through using both average income level and marital status of pregnant women as predictors for their cortisol levels (stress) over the three trimesters. Unlike prior studies, our study targets the ***change*** in prenatal stress over trimesters, whereas other studies didn't include this particular specificity. Also, utilizing cortisol levels as opposed to the perceived stress score can provide a more accurate measurement as it is biologically based whereas perceived stress is psychologically based.

PROCEDURES

1. Using data from 193 pregnant women, we graphed average income against their marital status for each participant of the study
2. Utilizing the given cortisol levels of pregnant women predicted by their income, we used a linear regression model to approximate the stress level in pregnant women with varying socioeconomic levels
3. Finding the confidence interval and coefficients of this linear regression proved that there were trends in the data
4. Plotting each individual women's average cortisol level per trimester illustrated trends in stress level as the pregnant woman approaches labor
5. Using all three datasets, a linear model was created estimating a pregnant woman's cortisol level based on her income, marital status and trimester combined
6. Confirming our results, an ANOVA test was run to see if there was a significant difference in the means of cortisol levels over the trimesters.
7. Devling deeper, t-tests were run for all combinations of 2 out of the 3 trimesters, using bonferroni adjustment, which provided surprising results

RESULTS



CONCLUSIONS

From this study, we analyzed the relationship between marital status and income level, specifically targeting how such factors associated, if at all, with cortisol levels over the three trimesters. Through fitting a linear model, we found that all factors tested were statistically significant predictors of cortisol levels ($P<0.05$). To delve deeper, we modeled the association between trimester and cortisol level using a one-sided ANOVA test. The results showed — due to a p-value of 2.62×10^{-9} — that there is in fact a significant difference in the variance between the means of the three groups (based on trimester). Confirming our initial hypothesis that cortisol levels changed as trimesters progressed, we then used three separate two-sided t-tests to confirm which specific trimesters presented a difference in cortisol levels — testing all the possible combinations of trimesters. To reduce the chances of making a Type I Error in our multiple tests, we utilized the Bonferroni Correction ($P = 0.05/3$). All results were statistically significant ($P<0.05/3$), indicating that cortisol levels differ in all trimesters, not just one.

It should be noted that contrary to our initial expectations, we did find an association between average income and cortisol level, indicating those with higher income also exhibited higher stress levels. Further research should be conducted to discover potential confounding variables in this relationship, such as parity for example.

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