

The Association of EOP & EOPS Student Characteristics on Symptoms of Depression Across California Campuses

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INTRODUCTION

College students are at a pivotal developmental period where many mental health disorders first emerge (Miles et al., 2024). It is important to know what other factors affect student mental health, in addition to academics, in order to build support systems to alleviate mental struggles (Beiter et al., 2015). Previous research has highlighted the importance of targeted programs and interventions for students with depression. Our research addresses significant gaps in the existing literature by focusing on the most economically and educationally disadvantaged students, a population that has been historically underrepresented in mental health studies (Liu et al., 2022). Most studies focus on general college students, but our dataset specifically focuses on students who participated in Educational Opportunity Program (EOP) or Extended Opportunity Program and Services (EOPS), controlling for economic and educational disadvantages. The purpose of this study is to investigate the factors that influence depression within this more selective population. We hypothesize that characteristics such as college major and minority status will exhibit a significant relationship on whether a student might be depressed or not.

RESEARCH QUESTIONS

1. Is there an association between college major and depression within EOP/EOPS students
2. Is there an associations between underrepresented minority status and depression within EOP/EOPS students

METHODS

- The data we use in this analysis are from the statewide Basic Needs & Student Success Survey. This was collected by the Center for Healthy Communities at California State University Chico (Center for Health Communities 2023).
- The study population consisted of undergraduate students in EOP or EOPS programs across 12 colleges in California during 2022 to 2023. The inclusion criteria applied for data collection are students who were enrolled in those programs in selected california campuses.
- The variables used in our analysis are from the following: underrepresented minority, college major and whether a student would be considered depressed. Underrepresented minority is someone who identifies as black, hispanic, or american native (California State University, Chico 2019). Our depression score variable had a range from 0 to 27. It was recoded to have a clinical cutoff of 11 (Manea et al., 2012). This was to convert it into a binary variable to perform logistic regression, and have a value that was appropriate based on past research.
- Additional variables include gender identity, LGBTQ+ identity, and food insecurity to control the relationship between college major, underrepresented minority and depression.

- College major names were shortened to allow a cleaner visualization of plots and tables. The following are the full names of the shortened majors:
 - PH & Ed: Public Health, Social Services, Social Science and Education
 - Vocational: Vocational Certificate Program (Includes Electrical, Firefighting, Welding, Health Assistants, etc.)
 - STEM: Science, Technology, Engineering and Math (STEM) (Includes Medicine, Computer Science, Agriculture, Accounting, Statistics, Nursing, and Nutrition)
 - Bus. & Rec.: Business, Recreation, and Culinary Services
 - Arts & Hum.: Arts and Humanities

- Statistical analysis methods that were used for bivariate analysis include:
 - the Wilcox test for major and depression
 - the Kruskal Wallis test for underrepresented minority and depression
- For multivariable analysis,
 - the logistic regression model for college major, underrepresented minority, and depression
 - The data did not meet the assumptions for linear regression.

SAMPLE CHARACTERISTICS

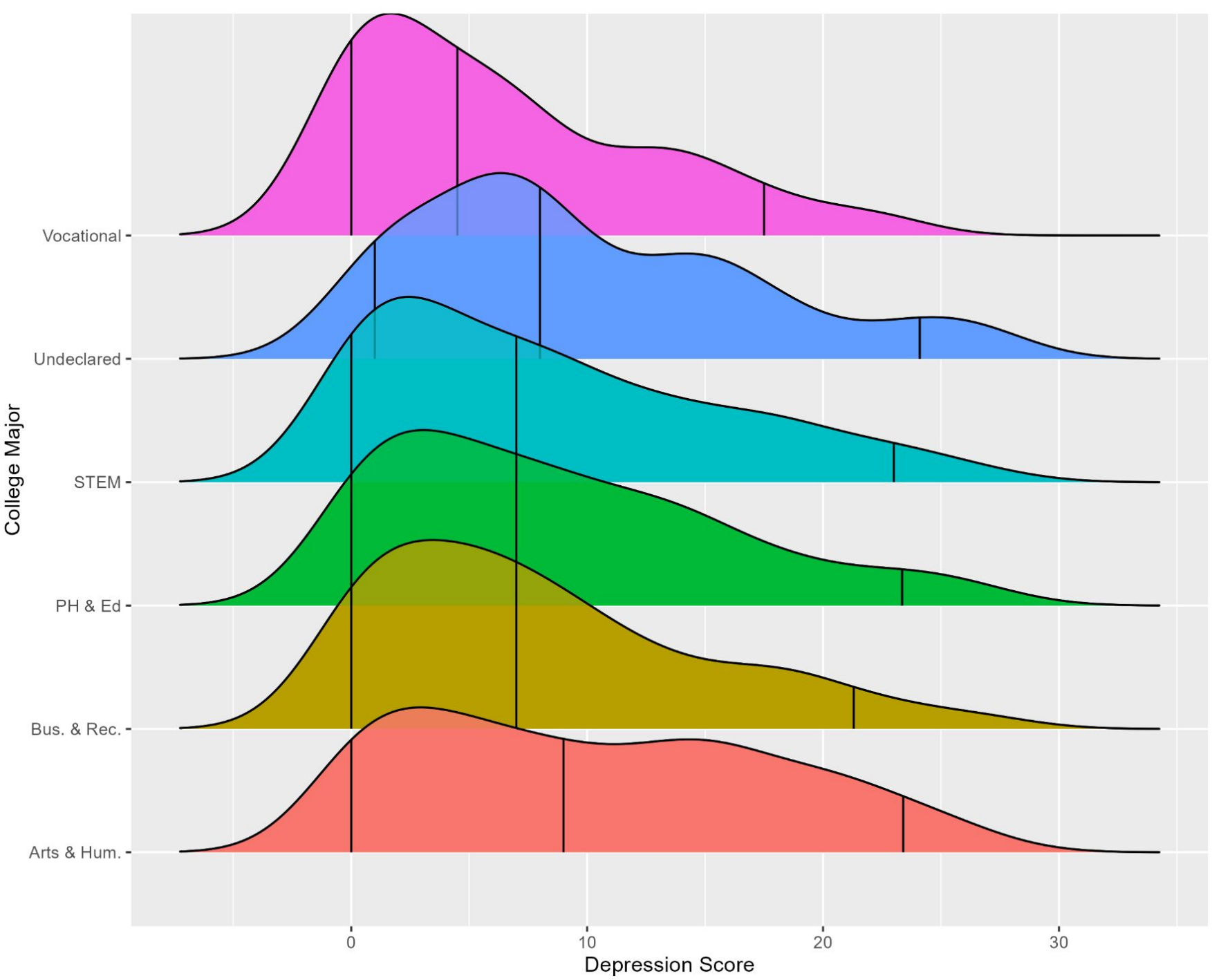
Table 1: Sample Characteristics

Characteristic	Overall N = 1,299	Depressed		p-value
		No N = 849	Yes N = 450	
College Major				0.053
Arts & Hum.	173 (13%)	96 (11%)	77 (17%)	
Bus. & Rec.	155 (12%)	110 (13%)	45 (10%)	
PH & Ed	556 (43%)	362 (43%)	194 (43%)	
STEM	370 (28%)	249 (29%)	121 (27%)	
Undeclared	23 (1.8%)	16 (1.9%)	7 (1.6%)	
Vocational	22 (1.7%)	16 (1.9%)	6 (1.3%)	
Unrepresented Minority	995 (77%)	642 (76%)	353 (78%)	0.25
LGBTQ+	198 (15%)	83 (9.8%)	115 (26%)	<0.001
Gender Identity				<0.001
Gender Nonconforming	23 (1.8%)	7 (0.8%)	16 (3.6%)	
Man	230 (18%)	173 (20%)	57 (13%)	
Woman	1,046 (81%)	669 (79%)	377 (84%)	
Food Insecurity	729 (56%)	419 (49%)	310 (69%)	<0.001
n (%)				
3% of LGBTQ+, Food Insecurity, and URM were missing				
Pearson's Chi-squared test				

- Table 1 shows the following:
 - 77% of respondents identified as an underrepresented minority (URM), while 15% identified as LGBTQ+ and 81% were women
 - 56% of students identified as being food insecure.
 - Bivariate analysis using chi-square tests, indicated that LGBTQ+ identity, gender identity, and food security were each significantly associated with higher rates of depression symptoms.
 - The most common major category sampled was Public Health and Education (43%).

BIVARIATE RESULTS

Figure 1 Bivariate Analysis

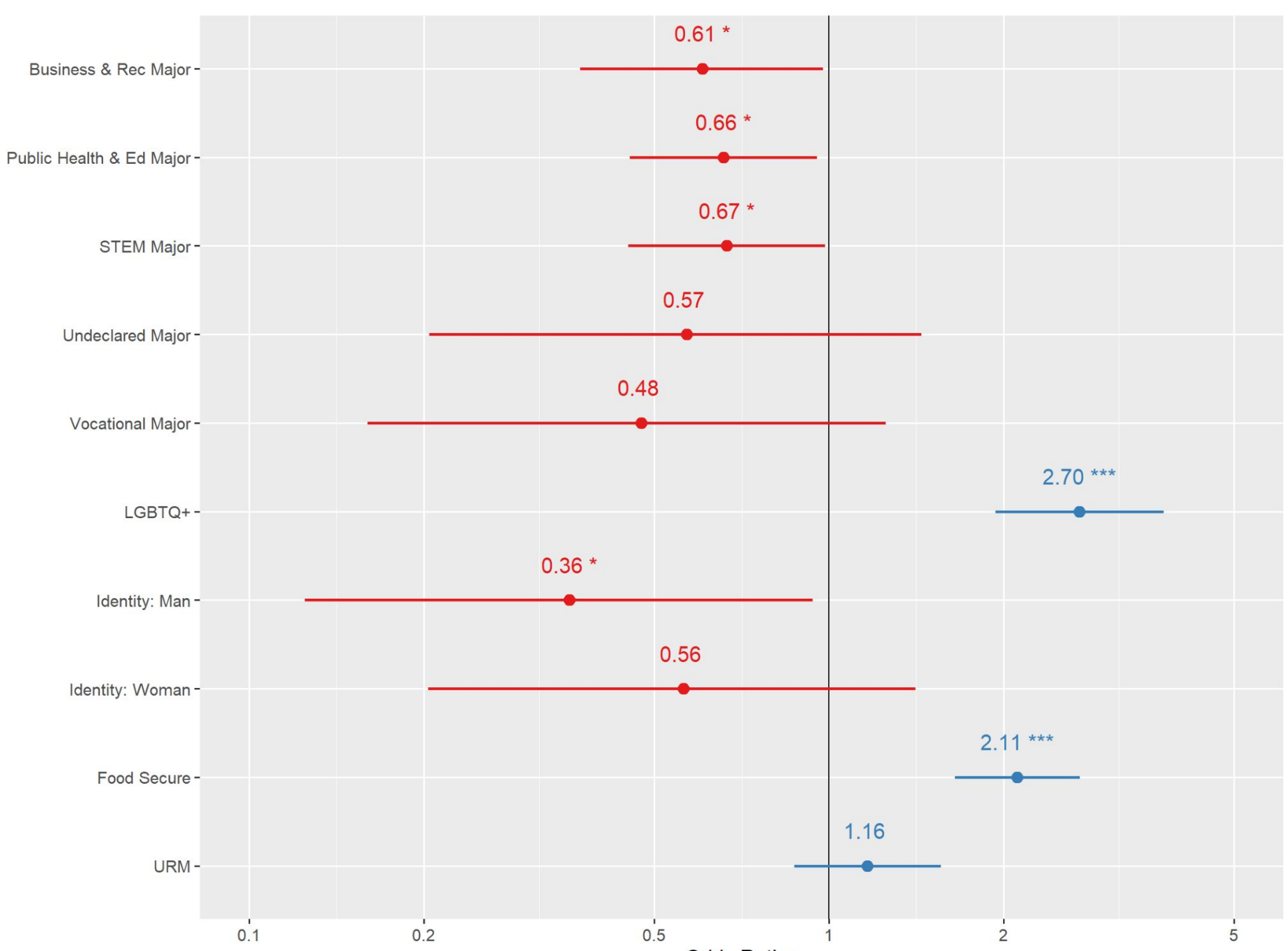


- In figure 1, most college major's depression score were skewed to the right with the exception of Arts & Humanities being less skewed to the right and having closer to a bimodal shape.
- The Kruskal Wallis test revealed statistically significant differences in median across all majors (p = 0.012).
- Post-hoc comparisons using Wilcoxon rank-sum tests show no significant pairwise differences between specific majors
- Some comparisons that had a smaller p value or that are significant at the 10% level were from the following:
 - Arts & Hum. and Bus. & Rec. at p = 0.077
 - Arts & Hum. and STEM at p = 0.057
 - Arts & Hum. and Vocational at p = 0.174

- In figure 2, students who are underrepresented had a higher median depression score of 8.89 points as compared to those who are not underrepresented at 8.12.
- By comparing medians, URM students are more depressed by a depression score of 1 (95%CI -3.2), although this is not significant (p-value = 0.055).
- Both distributions, like those shown in Figure 1, are also right-skewed.

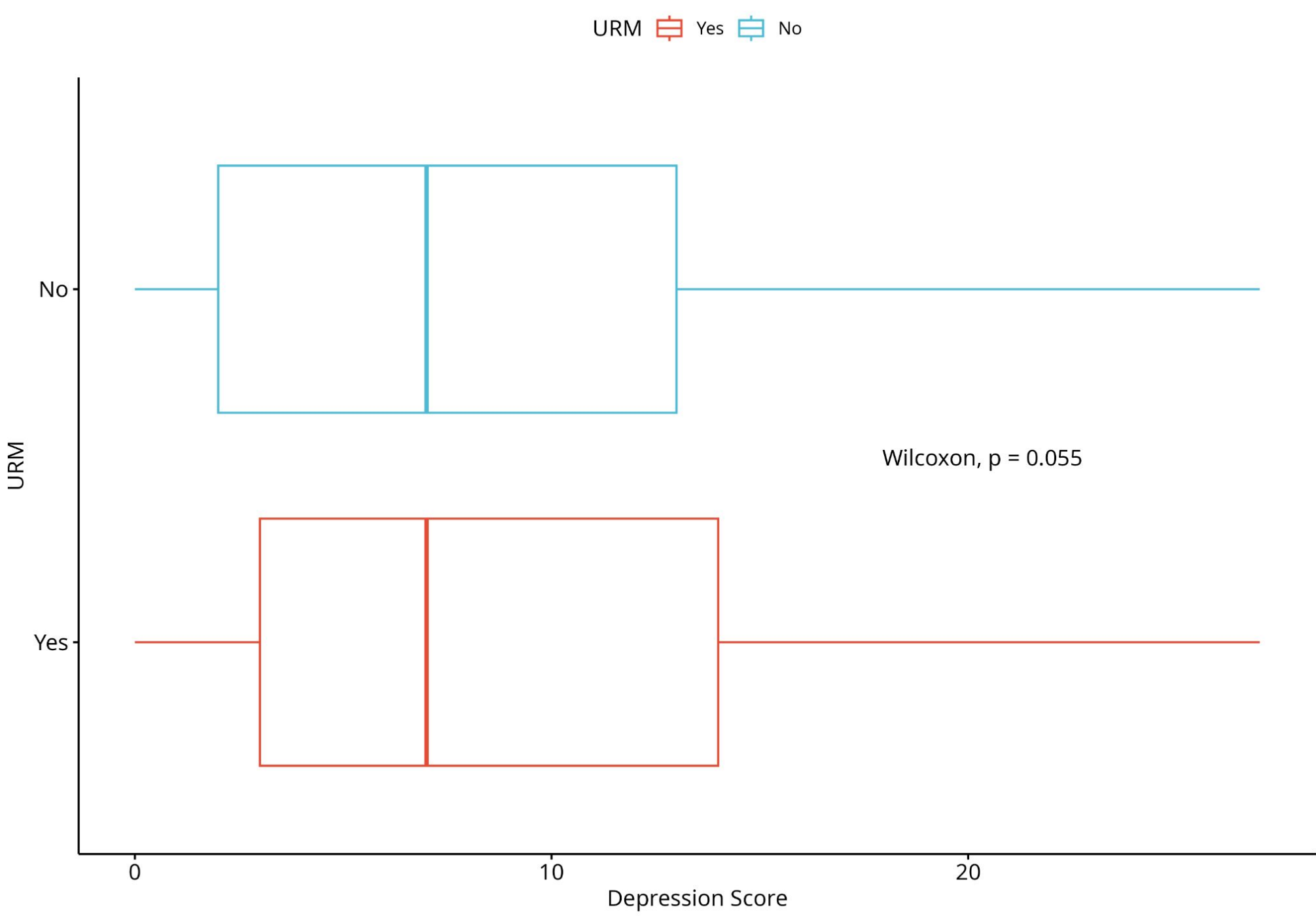
MODEL RESULTS

Figure 3: Logistic Regression Model



- Figure 3 shows
 - Business & Recreation students have 0.61 (0.37, 0.98) times the odds to be classified as depressed compared to Arts & Humanities students (p = 0.041).
 - Public Education, Social Science and Education students have 0.66 (0.45, 0.95) times the odds to be classified as depressed compared to Arts & Humanities students (p = 0.027).
 - STEM students have 0.67 (0.45, 0.98) times the odds to be classified as depressed compared to Arts & Humanities students (p = 0.041).
 - All these differences are significant. There's evidence that Arts and Humanities EOP and EOPS students may suffer from depression at a higher rate than other majors
 - Underrepresented minorities have 1.16 (0.87,1.56) times the odds to be classified as depressed (p= 0.3). This difference is not significant. We do not have evidence that underrepresented minorities from these programs are depressed more often than non underrepresented minorities.

Figure 2 Bivariate Analysis



CONCLUSION & DISCUSSION

- The logistic regression analysis shows a significant association between specific college majors and depression among EOP/EOPS students. On the other hand, the relationship between underrepresented minority status and depression is not significant, indicating no evidence of an association.
- The finding that arts and humanities students are more likely to suffer depression supports previous research. Specifically, Ajinkya et al (2016) highlights "College of Arts & Humanities" as having a significant association with higher odds of depression.
- Findings from Asher et al (2023) found Asians reported the highest depression symptoms prevalence. Given the differences in datasets, where Hispanic makeup 5-8% of the data, it is difficult to generalize findings from prior studies.

IMPLICATIONS

- This study contributes to understanding the factors associated to depression among EOP and EOPS university students.
- The depression logistic regression model serves as a model to advocate resources for students in programs like EOP and EOPS or similar programs.
- These findings can help with prioritizing or expanding mental health services or counseling services within EOP/EOPS or similar programs.
- Future research should consider variables such as college major, ethnicity, income levels and whether they have family history of depression to use to explore existing research gaps by focusing on the economically and educationally disadvantaged students.
- The findings may be generalizable to first generation or low income and educationally disadvantaged students at public colleges and universities in California. However, the unique characteristics of the student population suggest the results should apply to students in different academic settings, socioeconomic backgrounds or similar student support programs.
- Since observational data was used, the findings only show associations and should not be interpreted as cause-and-effect relationships.
- Other possible factors that are not included in the model are gpa. A correlations analysis was performed for gpa, but the pearson's correlation coefficient was close to 0. Other research literature provided gpa was a factor in depression (Hysenbegasi 2005). Therefore gpa should not be ruled out since it could be a possible factor in other future studies.

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