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Empowerment through Knowledge of Menstrual Cycles and Female Fertility

CAPSTONE

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AGENDA

PRESENTATION DIRECTION



Topic Introduction



Literature Review



Theory and Hypotheses



Methodology and Data



Analysis and Results



Discussion

INTRODUCTION

SOCIAL CHALLENGE

- Over half of females lack basic knowledge about what constitutes a normal menstrual cycle.¹
- 58% of females feel ashamed of menstruating while 51% of males find discussion on the topic inappropriate.²



IMPORTANCE

- Vulnerable to misinformation, harmful practices, and undiagnosed health conditions
- Need for comprehensive menstrual health education initiatives and advocacy



BACKGROUND

INSPIRATION

- Siddique et al. (2023)
- Study done with early-reproductive females in Bangladesh
- Suffers from limited generalizability



INSPIRATION

- Mohammed and Larsen-Reindorf (2020)
- Longer exposure to menstrual cycles and higher educational attainment
- Across diverse cultural contexts



RESEARCH QUESTION

For UNC Charlotte students, what factors are associated with increased knowledge of and attitude towards menstrual cycles and female fertility?

HYPOTHESIS



LEVEL OF EDUCATION

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- Those with advanced educational degrees have greater knowledge in general.⁴
- Hypothesis: Those with higher levels of education also have higher levels of menstrual knowledge

METHODOLOGY

DATASET



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Highlights on our data source

1 Survey

Anonymous

Google Form

3 Sections

Socio-demographics
(Background)

Attitude

Knowledge

23 Variables

+/-0.7 Correlation Cutoff

Dummy Variables

159 Observations

Launch: Mon, Feb 26

Cutoff: Mon, Mar 11



39 Unique Disciplines

Data Science, Computer Science,
Nursing, Biology, Psychology,
and more



16 – 55 Age Range

Median age of 20



All Students

Did not include alumni or
faculty responses



Google Forms



Voluntary
Response Bias



Small Data
Sample



Uncontrolled
Respondent
Environment



Non-reflective
of Population

LIMITATIONS

Opportunities for
improvement



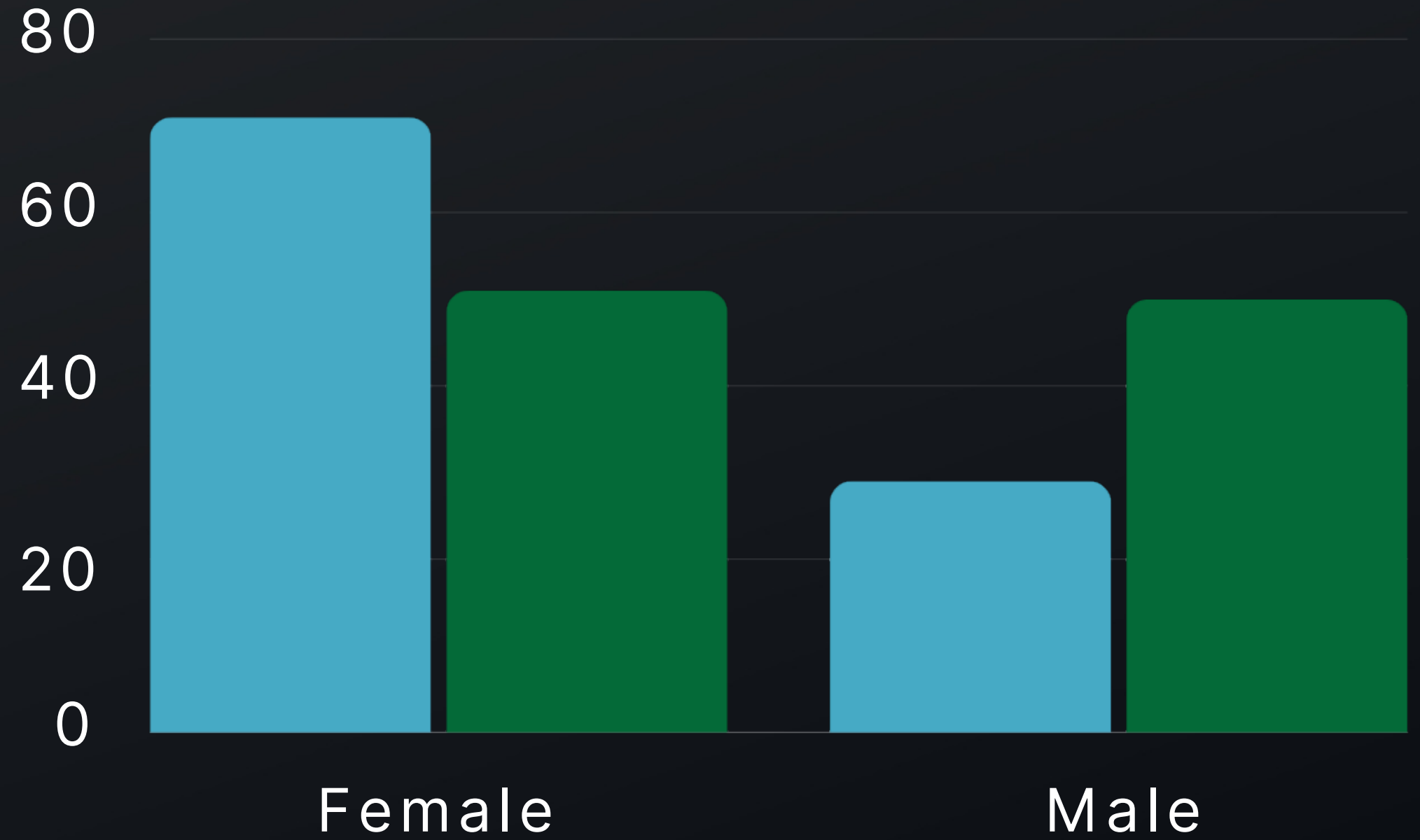
SEX DISTRIBUTION



% Sample



% UNCC Student
Population



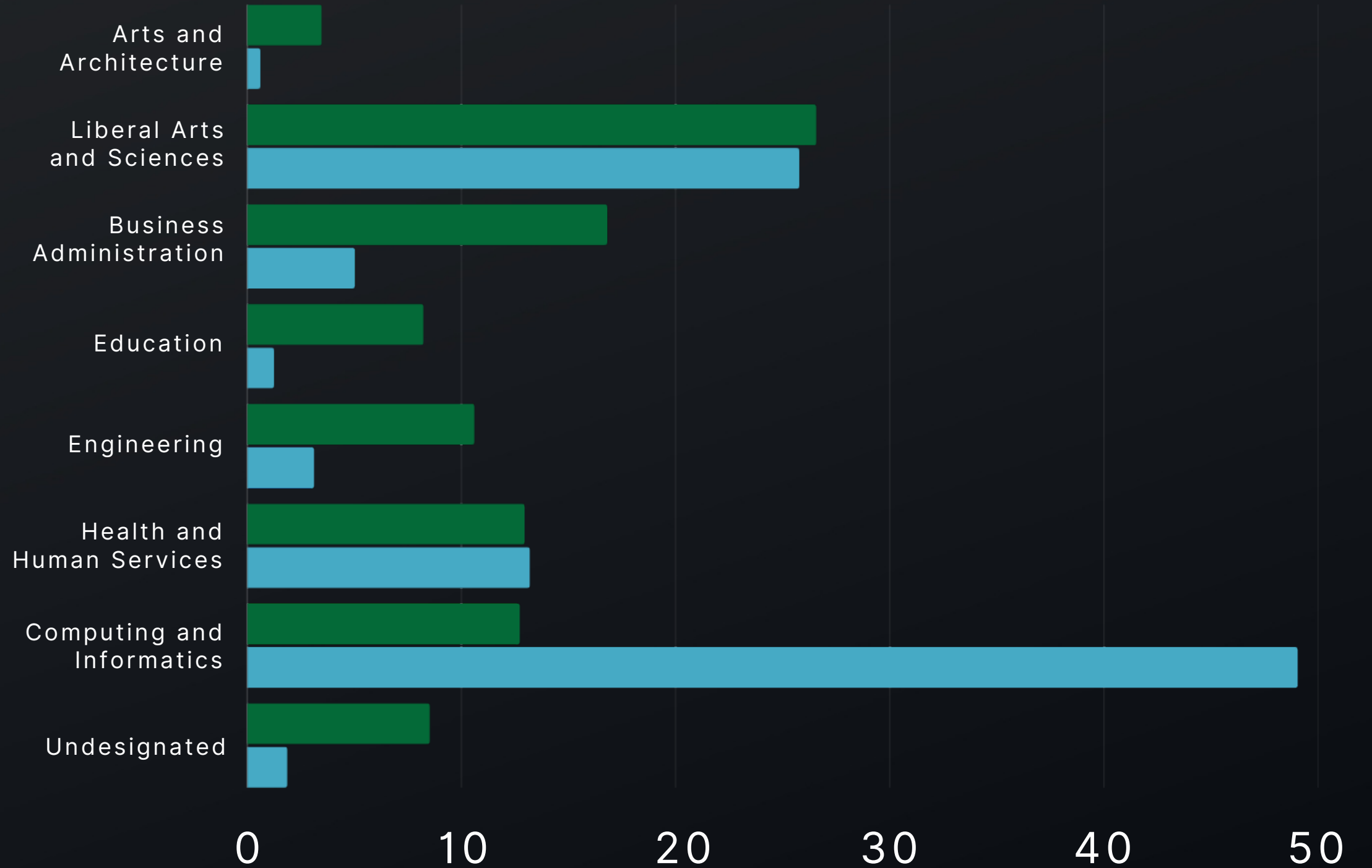
COLLEGE DISTRIBUTION



% Sample



% UNCC Student
Population

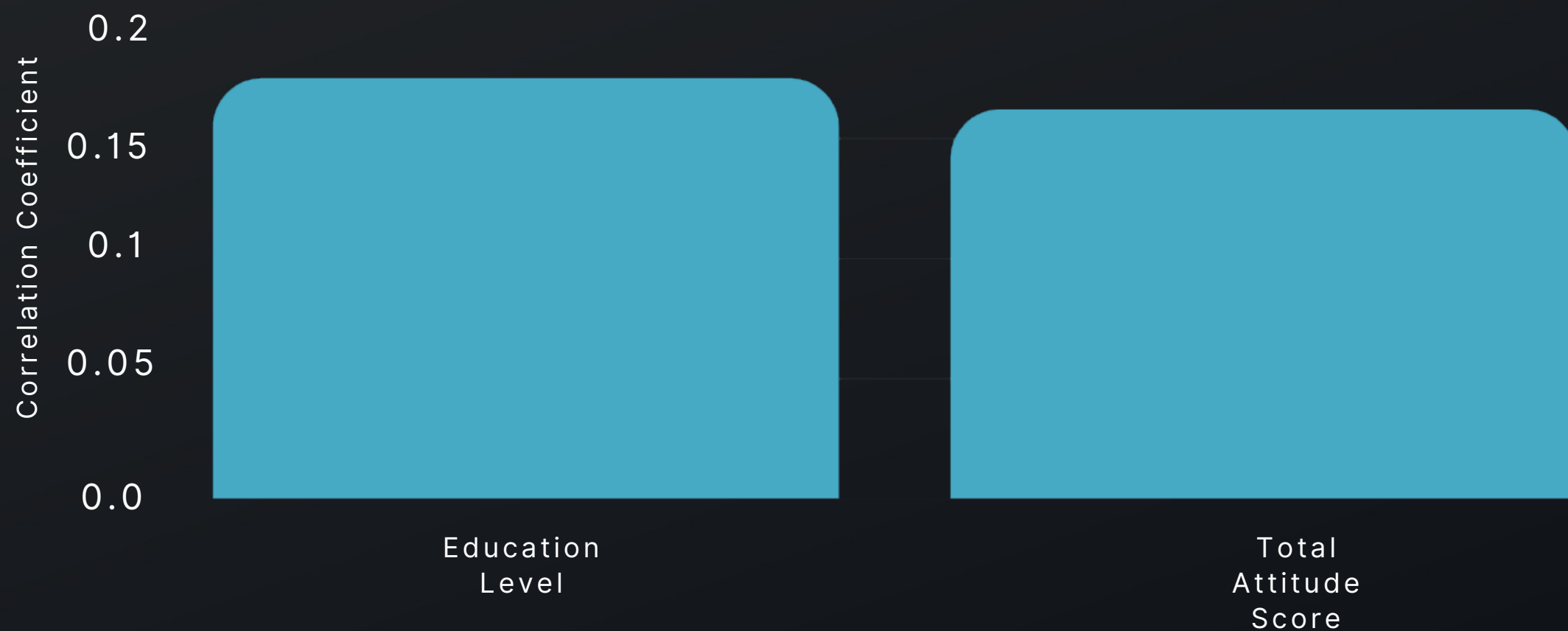


ANALYSIS

SIGNIFICANT CORRELATIONS WITH KNOWLEDGE



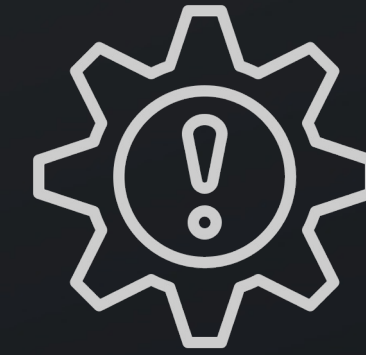
Statistically Significant Features



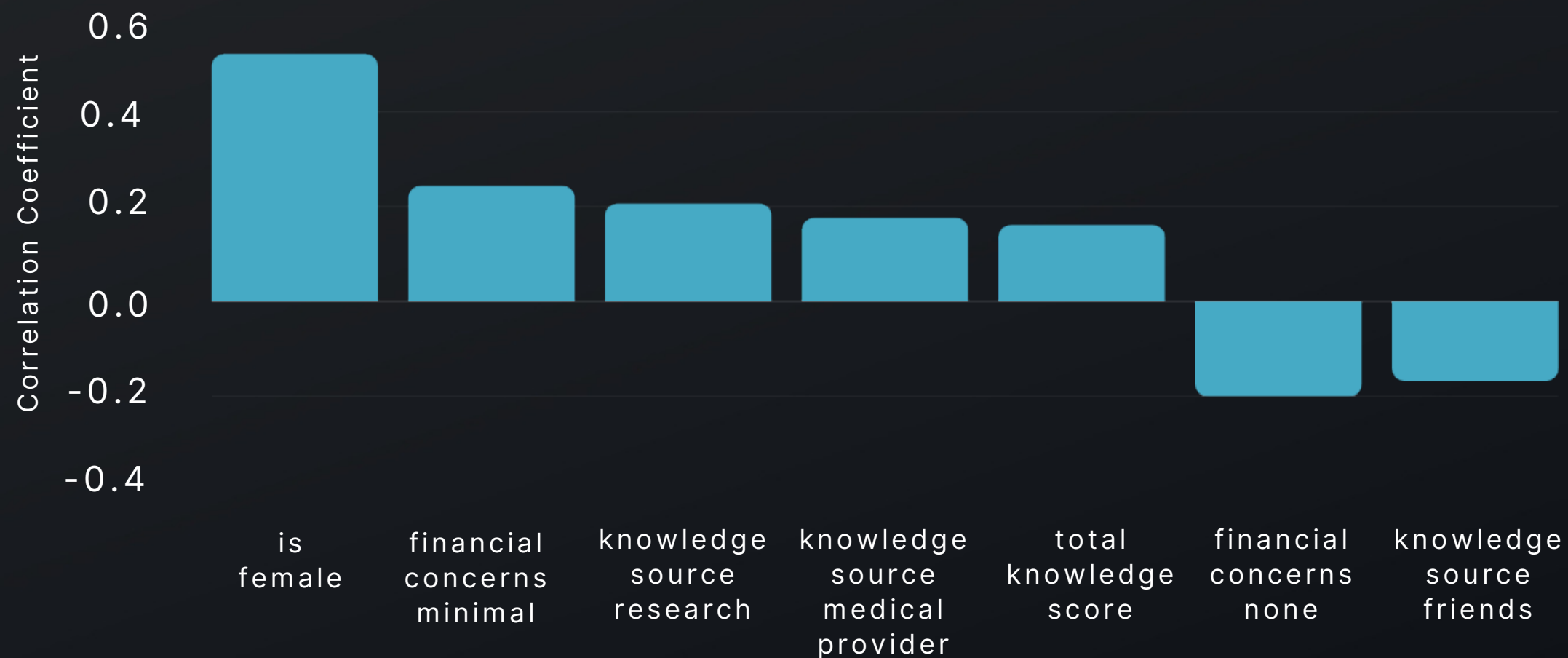
P-Values

Feature	P - Value
Education Level	0.029
Total Attitude Score	0.044

SIGNIFICANT CORRELATIONS WITH ATTITUDE



Statistically Significant Features



P-Values

Feature	P - Value
Is Female	3.18×10^{-12}
Financial Concerns - Minimal	0.00215
Knowledge Source - Research	0.00954
Knowledge Source - Medical Provider	0.0275
Total Knowledge Score	0.0437
Financial Concerns - None	0.0356
Knowledge Source - Friends	0.0120

MODEL TYPES

How models were chosen

RANDOM
FOREST



- Feature importances
- Robust to outliers and irrelevant features

LOGISTIC
REGRESSION



- High interpretability
- Less prone to overfitting



ACCURACY SCORES

* *Test accuracy
beats baseline*

Random Forest

Logistic Regression

	Baseline
Female Knowledge	61%
Female Attitude	65%
Male Knowledge	52%
Male Attitude	57%

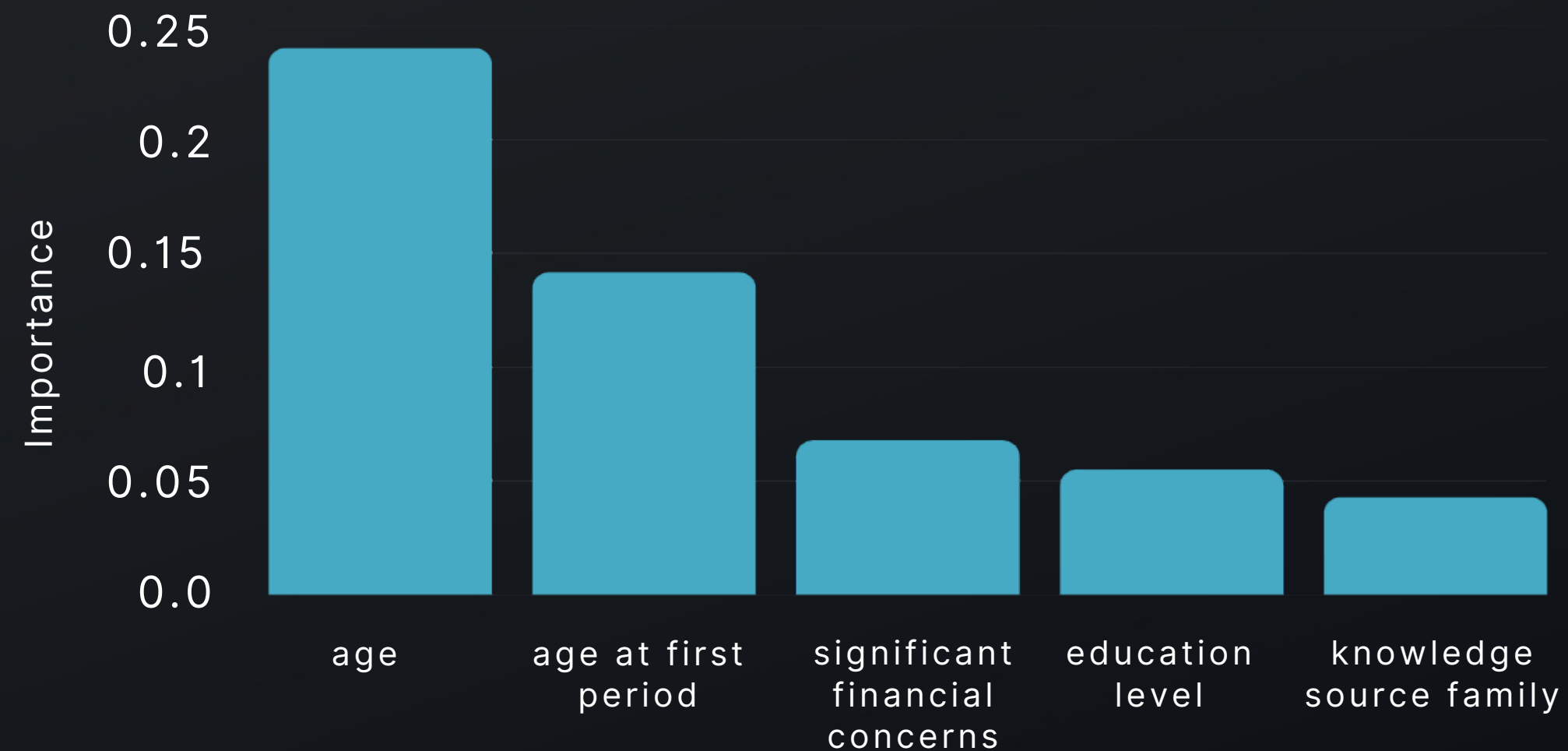
Train	Test
73%	* 67%
68%	57%
61%	* 57%
54%	50%

Train	Test
64%	73%
71%	62%
77%	61%
81%	50%

FEMALE KNOWLEDGE: FEATURE IMPORTANCES



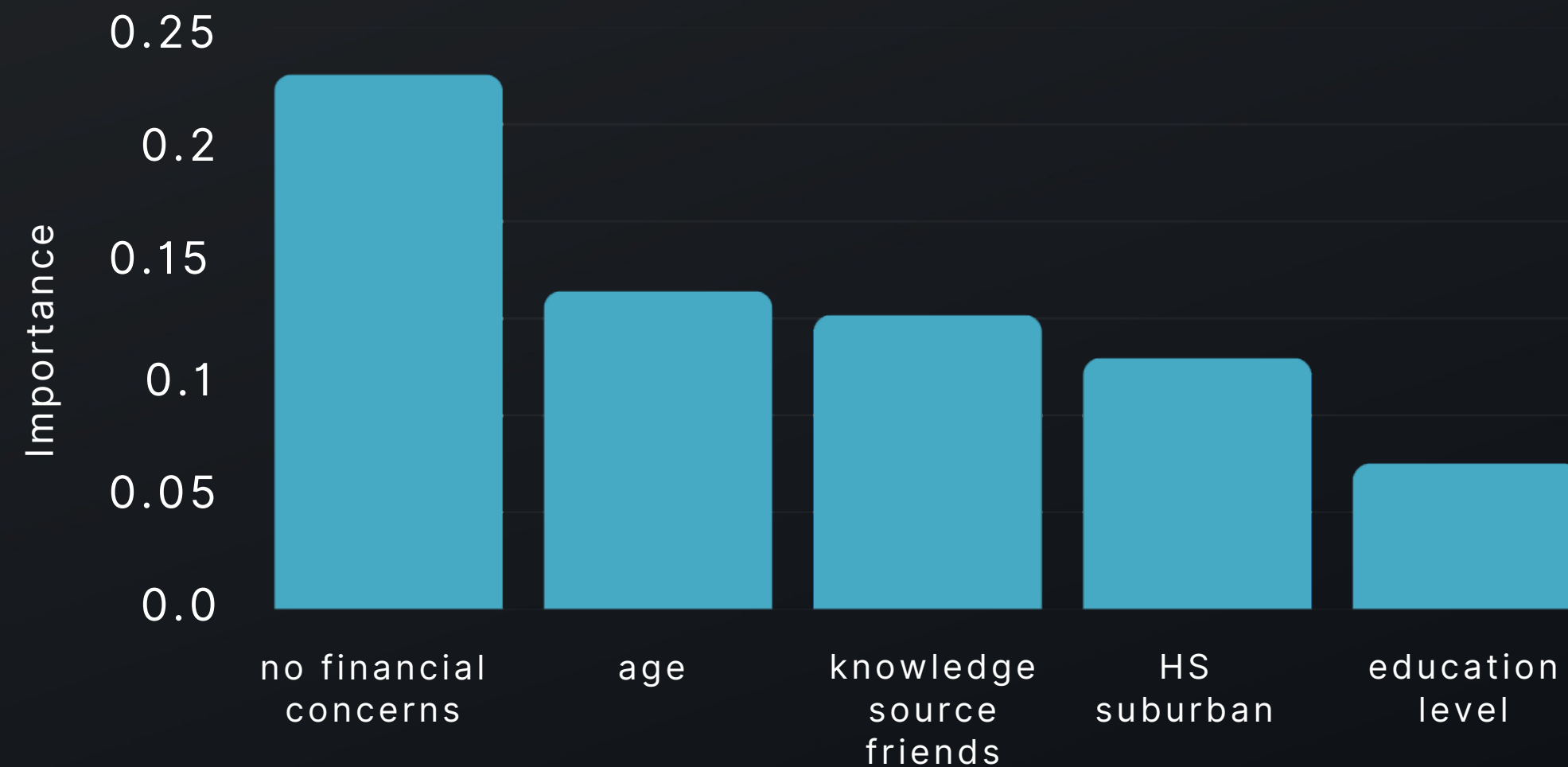
Top 5 Most Important Features



MALE KNOWLEDGE: FEATURE IMPORTANCES



Top 5 Most Important Features



CONCLUSIONS

- Confirmed that educational attainment correlates with increased menstrual knowledge
- Positive attitudes are associated with a mix of demographic, social, and personal factors



NEXT STEPS



Expand the dataset to achieve a greater representation of the population to increase generalizability



Explore clustering for deeper insights into significant features

THANK YOU

Q & A

REFERENCES

Flo Health's US Reproductive Health Report. Flo.health - #1 mobile product for women's health. (2023). <https://flo.health/landings/reproductive-health-report-us>.¹

Jaafar, H., Ismail, S. Y., & Azzeri, A. (2023). Period Poverty: A Neglected Public Health Issue. *Korean journal of family medicine*, 44(4), 183–188. <https://doi.org/10.4082/kjfm.22.0206>.²

Mohammed, S., & Larsen-Reindorf, R. E. (2020). Menstrual knowledge, sociocultural restrictions, and barriers to menstrual hygiene management in Ghana: Evidence from a multi-method survey among adolescent schoolgirls and schoolboys. *PloS one*, 15(10), e0241106. <https://doi.org/10.1371/journal.pone.0241106>³

Siddique, A. B., Deb Nath, S., Mubarak, M., Akter, A., Mehrin, S., Hkatun, M. J., Parvine Liza, A., & Amin, M. Z. (2023, October 30). Assessment of knowledge, attitudes, and practices regarding menstruation and menstrual hygiene among early-reproductive aged women in Bangladesh: A cross-sectional survey. *Frontiers*. <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1238290/full>⁴