

Background

Polycystic Ovary Syndrome (PCOS) affects 8- 22.5% of reproductive-age women globally, with ~70% cases remaining undiagnosed. University students in India represent a high-risk, under-screened population facing rising metabolic complications. Due to lifestyle transitions, academic stress and limited access to ultrasound and hormonal testing, many young university students are particularly vulnerable, yet early screening remains inadequate.

Modified Ferriman-Gallwey (m-FRG) scoring and menstrual cycle tracking are simple, **zero-cost**, self-reported tools that can facilitate early identification of high-risk individuals.

Objectives

- To assess prevalence of PCOS, High-Risk PCOS among university students and its clinical and metabolic predictors.
- To evaluate menstrual irregularity and Modified Ferriman-Gallwey (m-FRG) scores as shared predictors of diagnosed and high-risk PCOS.
- To assess feasibility of symptom-based questionnaire screening in a university setting.

Methodology

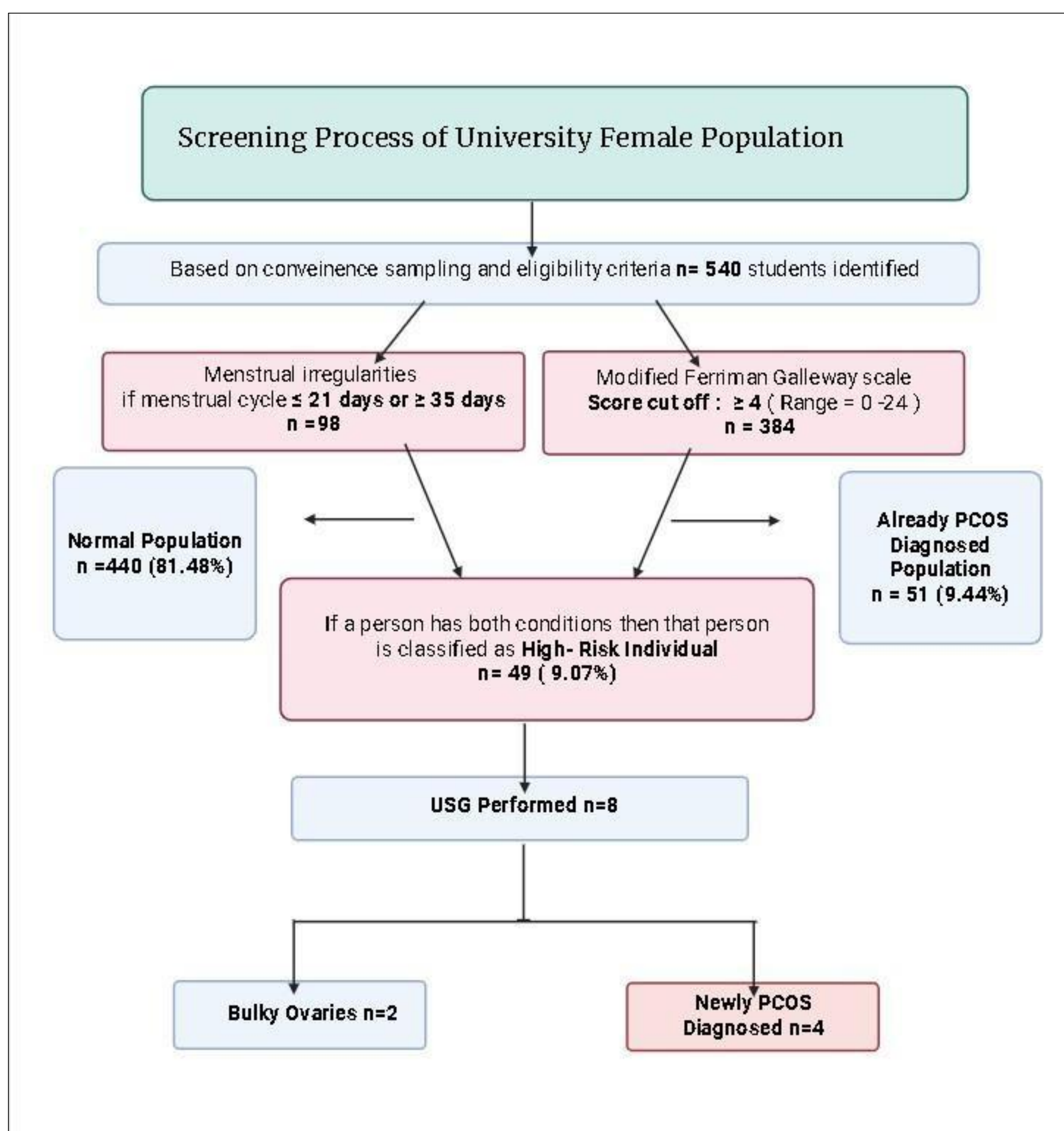
Study Design: Cross-sectional observational study

Participants: Age: 18–30 years

Inclusion Criteria: Currently Enrolled Students: Must be actively enrolled at the University. Age 18 or Older: Participants must be at least 18 years old.

Exclusion Criteria : Inability to Provide Informed Consent: Cognitive or language barriers preventing understanding.

Statistical analysis was done by One-way ANOVA, Chi-square, binary logistic regression SPSS V30 .



Results

- In the present study, prevalence of previously diagnosed PCOS was 9.4% (n=51).
- Moreover, prevalence of High-Risk PCOS was 9.1% (n=49). Upon multivariate logistic regression, the significant predictors of PCOS were BMI: AOR = 1.1 (95% CI: 1.0–1.1, p = 0.013), Not using birth control pills: AOR = 30.4 (95% CI: 8.9–104.3, p = 0.001), AN : AOR = 1.8 (95% CI: 1.2- 2.7, p = 0.003), Chest hair growth: AOR = 2.6 (95% CI: 1.3–5.2, p = 0.006), Upper abdominal hair growth: AOR = 2.8 (95% CI: 1.3–5.7, p = 0.004).
- Similarly, the significant predictors of High-Risk PCOS were , AN : AOR = 2.4 (95% CI: 1.7–3.4, p = 0.001), Chest hair growth: AOR = 3.0 (95% CI: 1.6–5.8, p < 0.001), Chin hair growth: AOR = 1.5 (95% CI: 0.9–2.5, p = 0.001), Upper lip hair growth: AOR = 1.8 (95% CI: 1.0–3.4, p = 0.045).

Variable	Normal (n=440)	High-Risk (n=49)	Diagnosed (n=51)
Menstrual Cycle Length (days)	29.31 ± 2.94	52.49 ± 8.28	51.80 ± 28.68
Total m-FRG Score	4.75 ± 2.38	6.10 ± 2.18	6.88 ± 2.93
BMI (kg/m ²)	20.31 ± 4.01	21.00 ± 5.21	23.32 ± 4.56

Table 1: Quantitative Comparison of Menstrual cycle length vs m-FRG scores vs BMI

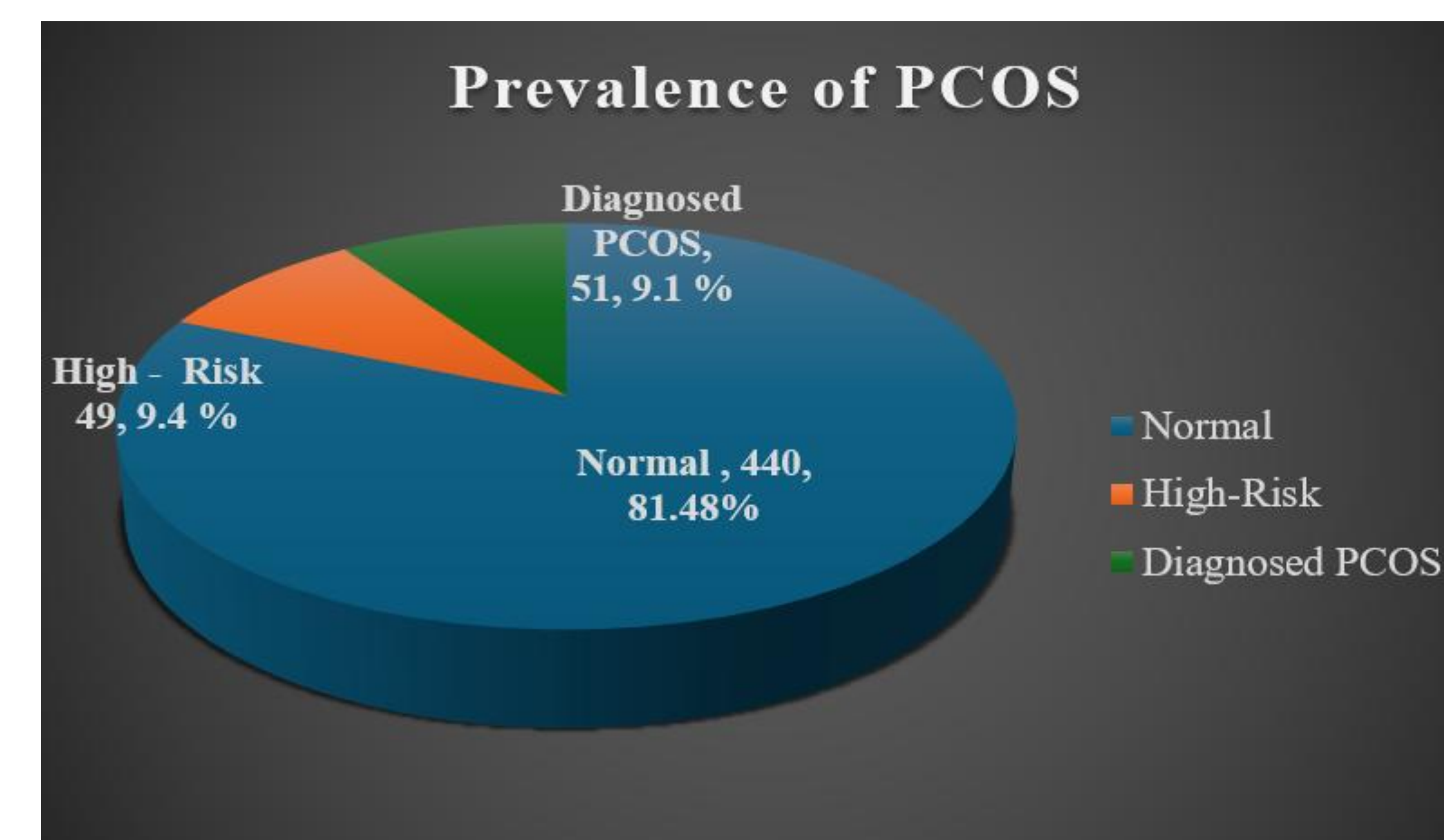


Figure 2: Prevalence of PCOS

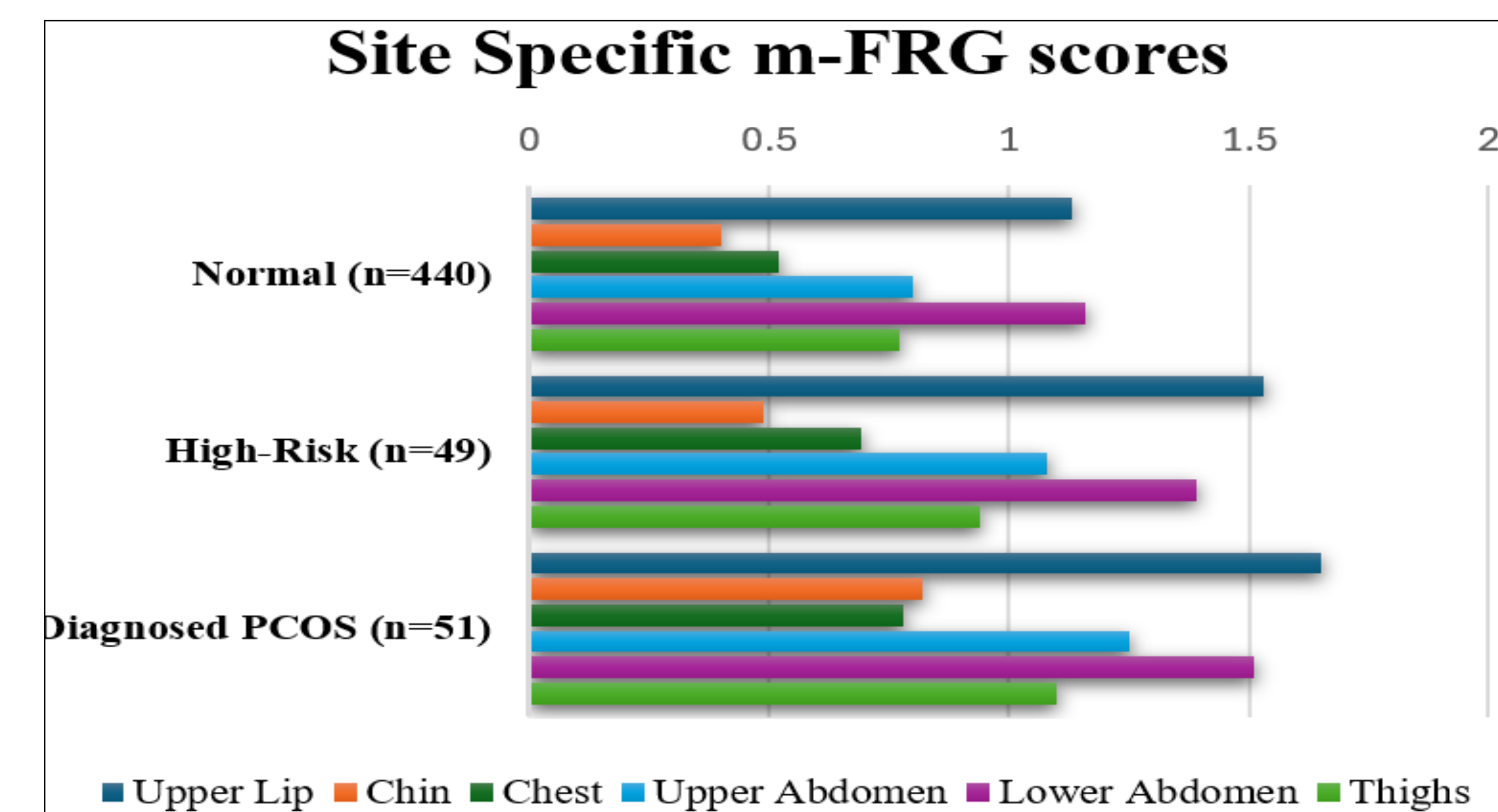


Figure 1: Site-Specific m-FRG Scores: Mean Score per Body Area by Population Group

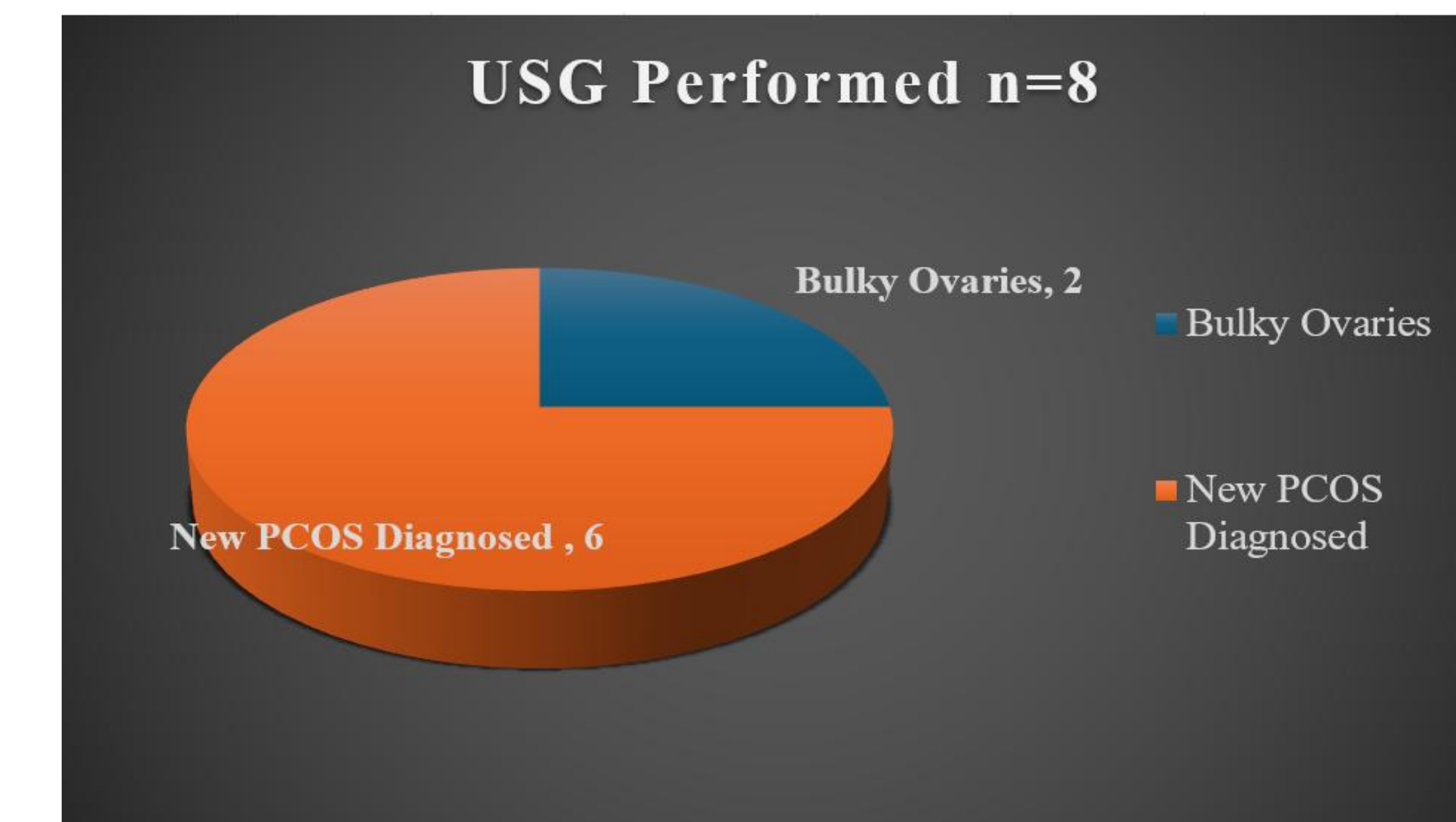


Figure 3: USG Performed Result

Variables	PCOS Population				High-Risk Population			
	Univariate Binary Logistic Regression		Multivariate Logistic Regression		Univariate Binary Logistic Regression		Multivariate Logistic Regression	
	Unadjusted odds ratio (95% CI)	Significance	Adjusted odds ratio (95% CI)	Significance	Unadjusted odds ratio (95% CI)	Significance	Adjusted odds ratio (95% CI)	Significance
BMI	1.1 (1.0-1.2)	0.013	1.1 (1.0-1.1)	0.013				
Birth control pill (if not used)	33.0 (12.1-89.8)	<0.001	30.4 (8.9-104.3)	<0.001				
Waist-to-Hip ratio	262.1 (1.6-143376.43)	0.031		(Dropped 0.642)				
Chin				(Dropped 0.717)				
Upper lip	2.2 (1.5-3.4)	<0.001		(Dropped 0.429)	2.1 (1.6-3.7)	<0.001	1.5 (0.9-2.5)	<0.001
Chest	2.3 (1.4-3.9)	<0.001	2.6 (1.3-5.2)	0.006	1.7 (1.0-3.0)	0.035	1.8 (1.0-3.4)	0.045
Upper Abdomen	3.8 (2.2-6.6)	<0.001	2.8 (1.3-5.7)	0.004	2.5 (1.4-4.4)	<0.001	3.0 (1.6-5.8)	<0.001
Lower Abdomen	1.9 (1.3-2.7)	<0.001		(Dropped 0.384)	1.4 (1.0-2.2)	0.043		(Dropped 0.377)
Acanthosis Nigricans	2.2 (1.6-3.0)	<0.001	1.8 (1.2-2.7)	0.003	1.7 (1.2-2.4)	<0.001	2.4 (1.7-3.4)	<0.001

Table 2: Unadjusted and adjusted odds ratio of significant variables.

Discussion

This study reveals a considerable burden of PCOS among university students, with 9.4% previously diagnosed and an additional 9.1% identified as high-risk using simple symptom-based criteria.

The similar prevalence of diagnosed and high-risk cases indicates substantial under-diagnosis in this population.

Menstrual irregularity (>35 days) and elevated m-FRG scores, particularly in the chest, upper abdomen, chin, and upper lip regions, emerged as strong shared predictors of both diagnosed and high-risk PCOS. Acanthosis nigricans and higher BMI were also significant predictors, highlighting the metabolic component of the syndrome.

These findings support the use of menstrual history and site-specific m-FRG scoring as practical, low-cost screening tools for early identification of PCOS in university settings.

Early screening using these simple parameters can help reduce diagnostic delay and prevent long-term reproductive and metabolic complications.

Conclusion

-This study shows a notable burden of PCOS among university students, with similar prevalence of diagnosed and High-Risk cases. The strong overlap of predictors in both models supports menstrual irregularity and elevated m-FRG scores as simple , reliable screening tools for early PCOS detection.

-Menstrual irregularity and m-FRG scores (particularly upper lip, chin, chest & upper abdomen) are reliable **shared predictors** of PCOS.

-Symptom-based screening identified **9.1%** of students for further evaluation except the PCOS condition students.

- Highly feasible, low-cost tool suitable for university health programs.

Clinical & HEOR Implications

- Reduces diagnostic delay and long-term costs of infertility, diabetes, and cardiovascular disease.

- Supports integration with period-tracking apps for self-awareness and monitoring.

Future Directions

- Longitudinal validation of the screening tool.

- Cost-effectiveness analysis of questionnaire-based screening.

- Development of a digital tool combining m-FRG and period tracking.

Acknowledgments

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