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The saliva spectrum: Understanding Knowledge, Awareness, and Attitudes towards Salivary Diagnostics among dental students

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ABSTRACT

Aim: This study is designed to explore how well dental students understand, are aware of, and perceive salivary diagnostics. It aims to:

- Assess their knowledge about the subject.
- Evaluate their level of awareness.
- Understand their attitude toward the use of saliva as a diagnostic medium in clinical dentistry.
- Emphasize the clinical significance of salivary diagnostics in modern dental practice.

Background: Salivary diagnostics is gaining prominence as a non-invasive and efficient tool for detecting both oral and systemic diseases. Despite advancements in the field, the preparedness of future dental professionals to utilize these diagnostics remains uncertain.

This study aims: To evaluate the knowledge, awareness, and attitude of dental students toward salivary diagnostics, and to identify key gaps that may hinder its integration into clinical practice.

Materials and methods: A 15 multiple choice questionnaire was prepared by the principal investigator and the guide circulated among peers for validation. An online survey was created using google forms and distributed among Oral Medicine Specialists. Data was tabulated in Excel spreadsheets. Imported to IBM SPSS software version 2.0 and statistical analysis were performed.

Key words: Dental students, Knowledge, awareness, attitude, Oral biomarkers, Non- invasive diagnosis.

INTRODUCTION

In recent years, there has been a growing interest in the use of alternative diagnostic tools that are non-invasive, cost-effective, and patient-friendly. Among these, salivary diagnostics has emerged as a promising and innovative approach in both medical and dental fields. Saliva, a complex biological fluid secreted by the salivary glands, contains a diverse range of components such as enzymes, hormones, antibodies, proteins, DNA, RNA, and microorganisms. These constituents make it a reflective medium of an individual's oral as well as systemic health status.

Saliva has shown potential as a diagnostic fluid for a wide range of conditions, including oral diseases like dental caries, periodontal diseases, and oral cancer, as well as systemic diseases such as diabetes mellitus, cardiovascular disorders, hormonal imbalances, autoimmune diseases, HIV, and even infectious conditions like COVID-19. The non-invasive nature of saliva collection, its ease of handling and storage, and reduced risk of cross-contamination offer several advantages over traditional diagnostic fluids like blood or urine. These features make salivary diagnostics especially suitable for use in mass screening programs, pediatric care, geriatric settings, and resource-limited environments.

As the global healthcare system increasingly shifts toward preventive and personalized medicine, the role of salivary diagnostics is becoming more relevant than ever. However, despite its growing importance and expanding research evidence supporting its utility, the implementation of salivary diagnostics in routine dental practice remains limited. One of the key reasons for this gap is the lack of sufficient exposure and training related to salivary diagnostics during the undergraduate dental curriculum.

Dental students, being the future practitioners and educators, play a vital role in promoting and integrating such diagnostic advancements into clinical practice. Their knowledge, awareness, and attitude (KAA) toward salivary diagnostics are critical factors that will determine the future application and acceptance of this diagnostic modality. A clear understanding of their current level of preparedness can help identify the shortcomings in the existing dental education system and guide the development of updated, competency-based curricula that include emerging diagnostic technologies.

This study titled "The Saliva Spectrum: Knowledge, Awareness and Attitude towards Salivary Diagnostics among Dental Students" aims to evaluate the KAA of undergraduate dental students toward the use of salivary diagnostics. By assessing their familiarity with salivary biomarkers, their perception of its usefulness in clinical practice, and their willingness to adopt it in future practice, this study seeks to bridge the gap between innovation and implementation. Ultimately, the findings can contribute to curriculum development and improved educational strategies that prepare students for the evolving demands of modern dental healthcare**.**

MATERIALS AND METHODS

Study Design
A cross-sectional, questionnaire-based survey will be conducted to assess the knowledge, awareness, and attitude (KAA) of dental students regarding salivary diagnostics. This observational study will be descriptive in nature and will utilize both quantitative and qualitative data obtained through a structured questionnaire. The study will be conducted among undergraduate dental students of the School of Dental Sciences, Krishna Vishwa Vidyapeeth (Deemed to be University), Karad, Maharashtra. The total of duration the study will be six months from the date of ethical approval and initiation of data collection.

The study population will include undergraduate dental students from all academic years (1st to final year BDS). A simple random sampling technique will be employed to ensure each student has an equal chance of being included in the study.

Inclusion Criteria:
- Undergraduate dental students (BDS) from 1st to final year
- Students who are willing to participate and provide informed consent

Exclusion Criteria:
- Students who are unwilling or unable to provide informed consent
- Students not present during the time of data collection Data Collection Tool

A pre-designed, structured questionnaire will be used. It will include:
- Multiple Choice Questions (MCQs) to assess knowledge
- Likert-scale items to assess attitudes
- Yes/No and checklist items to assess awareness
- Open-ended questions to gather subjective inputs

The questionnaire comprises three major sections:
1. Knowledge
2. Awareness
3. Attitude

The questionnaire has been content-validated and pilot-tested on a small group of students to ensure clarity and reliability. Variables and Measures:
- Independent variable: Academic year, gender, prior exposure to salivary diagnostics.
- Dependent variables:
- Knowledge Score (based on correct responses)
- Awareness Score (based on familiarity with kits, curriculum exposure, etc.)

- Attitude Score (based on Likert-scale responses)

Data analysis:
- Data will be entered into Microsoft Excel and analyzed using SPSS software version 22.
- Descriptive statistics (mean, median, standard deviation) will be used for numerical data.
- Frequencies and percentages will be calculated for categorical data.
- Inferential statistics like Chi-square test or ANOVA may be applied to assess associations between variables (e.g., year of study and knowledge level).
- Thematic analysis will be done for open-ended responses.

Ethical considerations:
- Ethical clearance will be obtained prior to the commencement of the study.
- Participation will be voluntary with the option to withdraw at any point.
- Informed consent will be obtained from all participants.
- Confidentiality and anonymity will be strictly maintained.
- No identifiable personal information will be disclosed or published.

Data Analysis
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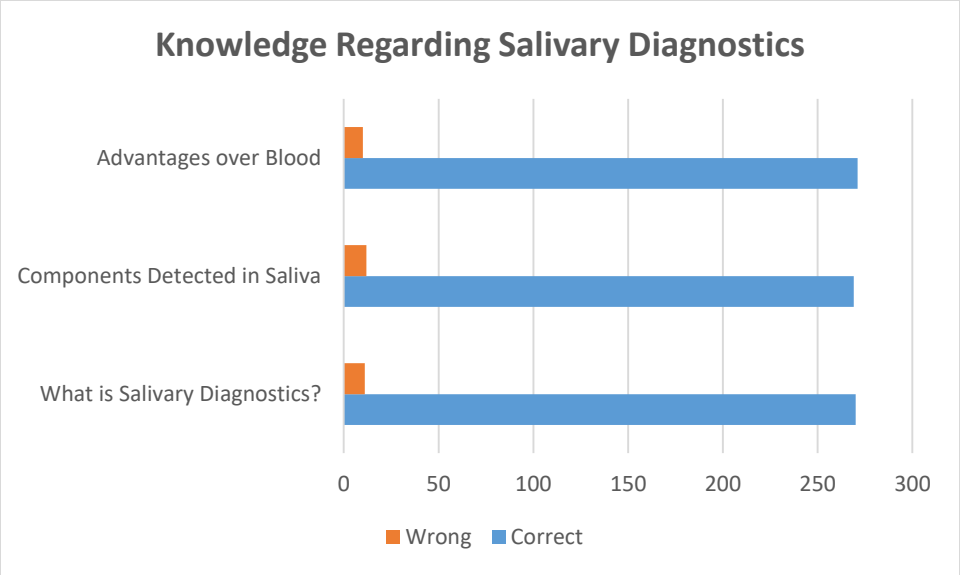
- Thematic analysis will be done for open-ended responses.

RESULTS

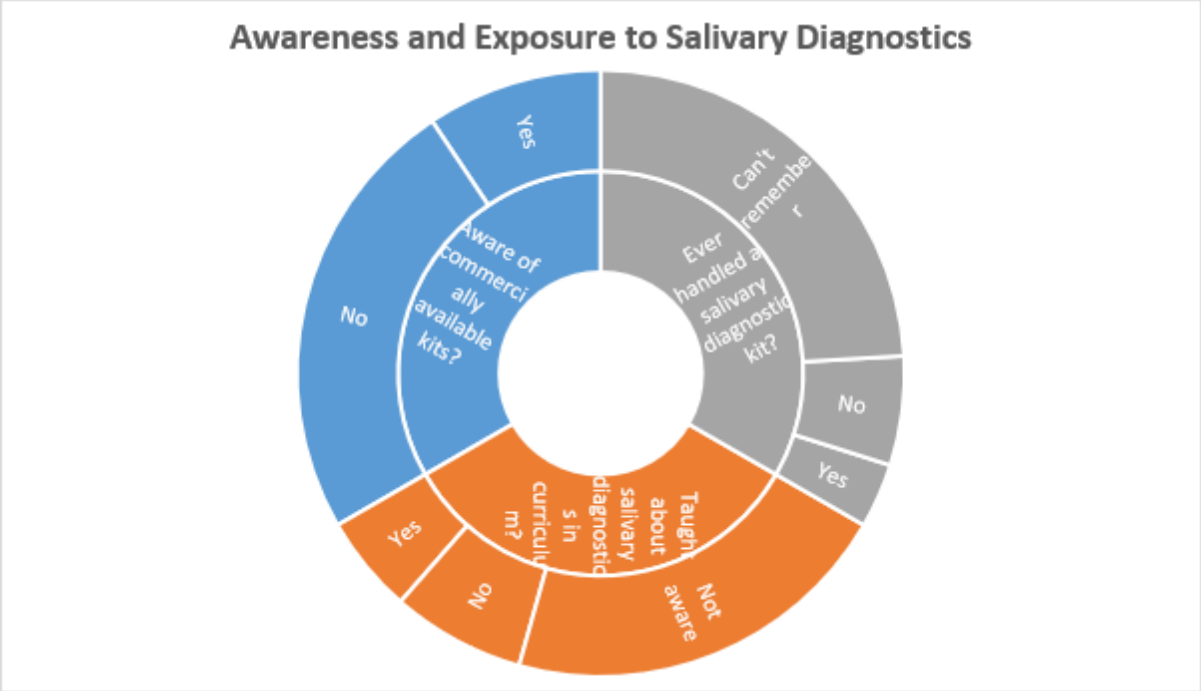
1. Knowledge Regarding Salivary Diagnostics (N = 281)

Question / Response Option	Frequency	Percent (%)	Correct/Wrong
What is Salivary Diagnostics?			
A. A method to evaluate dental plaque	1	0.4	Wrong
B. Use of saliva to detect health conditions	5	1.8	Wrong
C. A method using salivary substitutes	5	1.8	Wrong
D. All of the above	270	96.1	Correct
Which Components Can Be Detected in Saliva?			
A. Hormones	2	0.7	Wrong
B. Antibodies	7	2.5	Wrong
C. Drugs	2	0.7	Wrong
D. All of the above	269	95.7	Correct
E. None of the above	1	0.4	Wrong
Advantages of Saliva over Blood for Diagnosis			
A. Non-invasive	1	0.4	Wrong
B. Cost-effective	4	1.4	Wrong
C. Patient-friendly	5	1.8	Wrong
D. All of the above	271	96.4	Correct



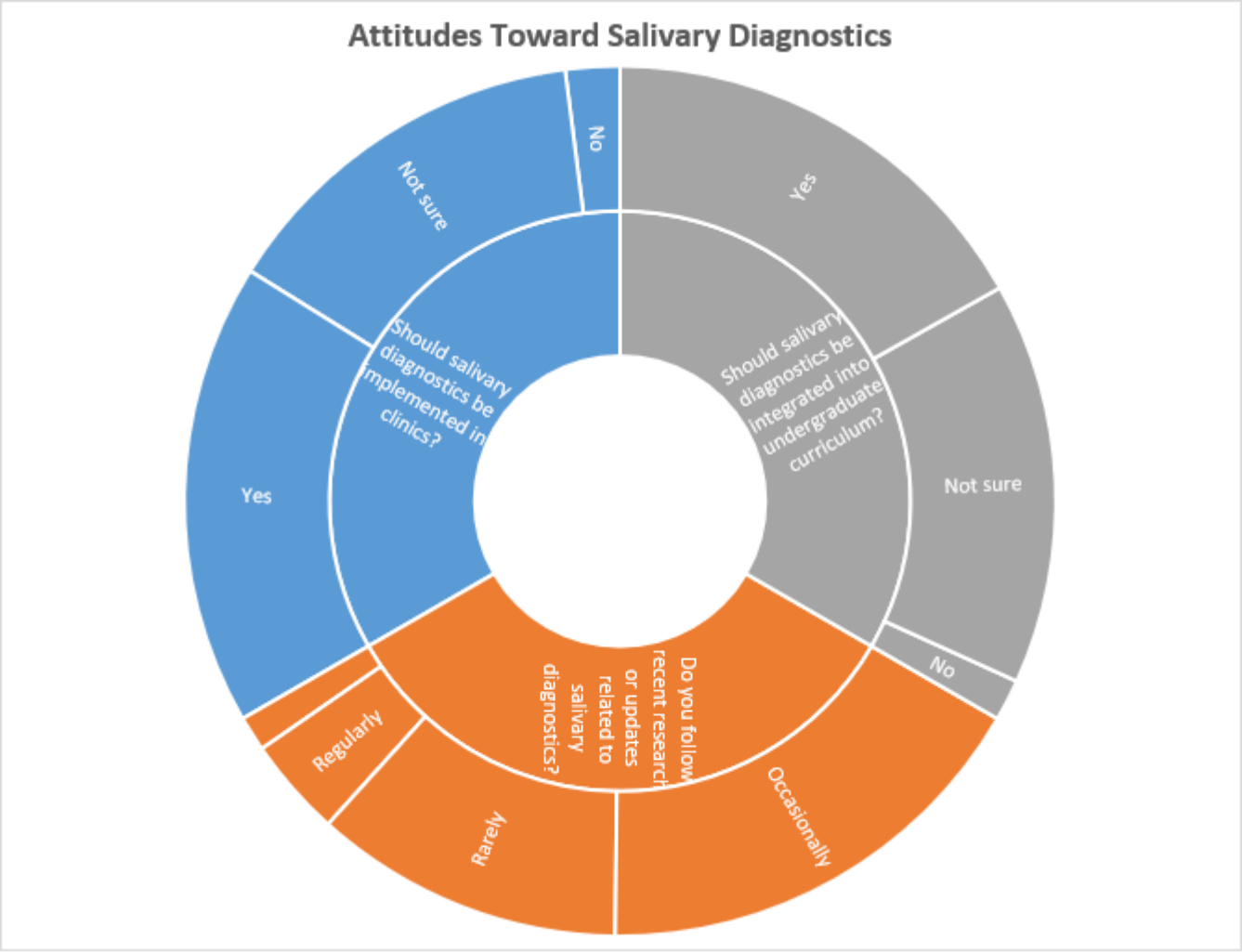
2. Awareness and Exposure to Salivary Diagnostics (N = 281)

Question	Response	Frequency	Percent (%)
Aware of commercially available kits?	Yes	79	28.1
	No	202	71.9
Taught about salivary diagnostics in curriculum?	Yes	44	15.7
	No	60	21.4
	Not aware	177	63.0
Ever handled a salivary diagnostic kit?	Yes	29	10.3
	No	49	17.4
	Can't remember	203	72.2



3. Attitudes Toward Salivary Diagnostics (N = 281)

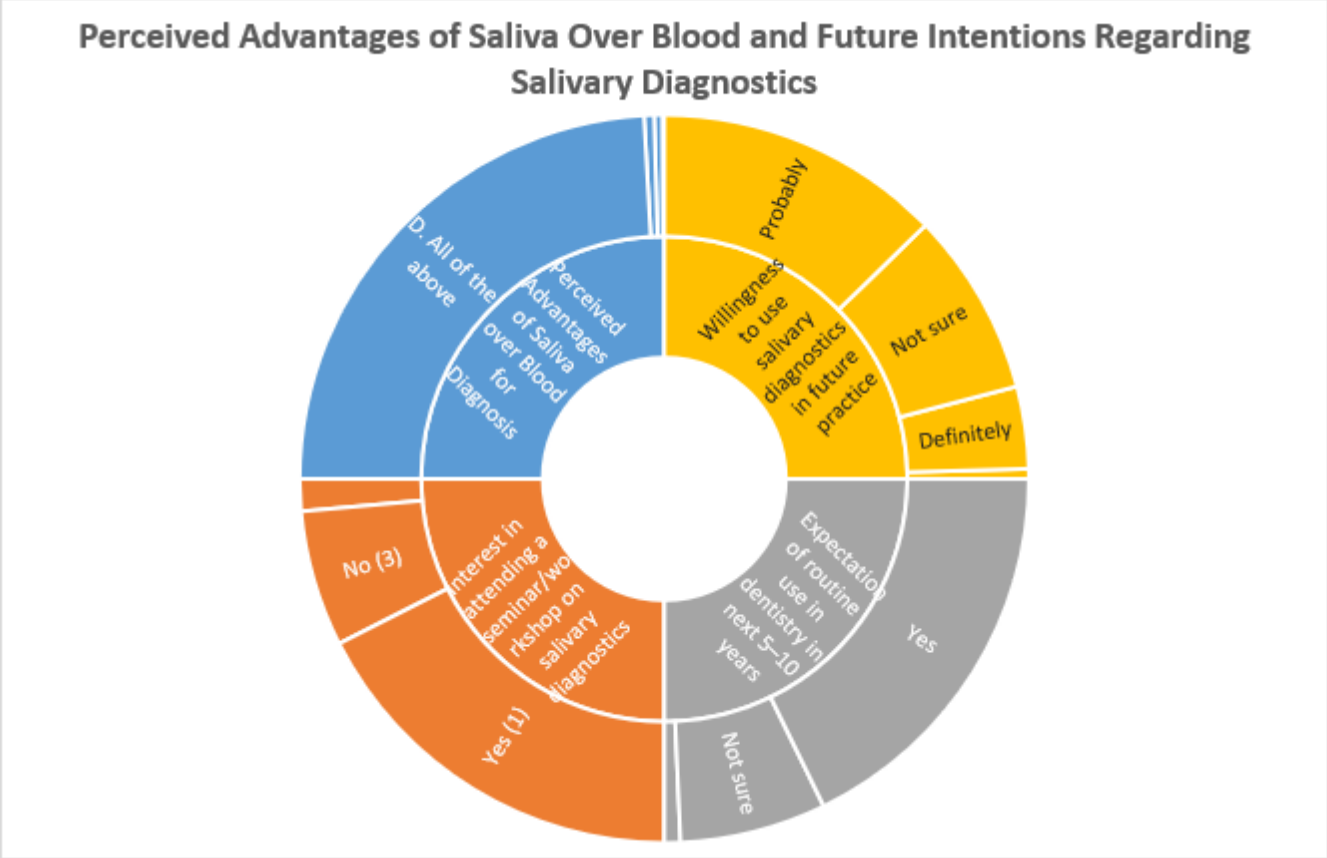
Question	Response	Frequency	Percent (%)
Should salivary diagnostics be implemented in clinics?	Yes	145	51.6
	No	17	6.0
	Not sure	119	42.3
Do you follow recent research or updates related to salivary diagnostics?	Rarely	97	34.5
	Occasionally	142	50.5
	Regularly	31	11.0
	Never	11	3.9
Should salivary diagnostics be integrated into undergraduate curriculum?	Yes	142	50.5
	No	13	4.6
	Not sure	126	44.8



4. Perceived Advantages of Saliva Over Blood and Future Intentions Regarding Salivary Diagnostics (N = 281)

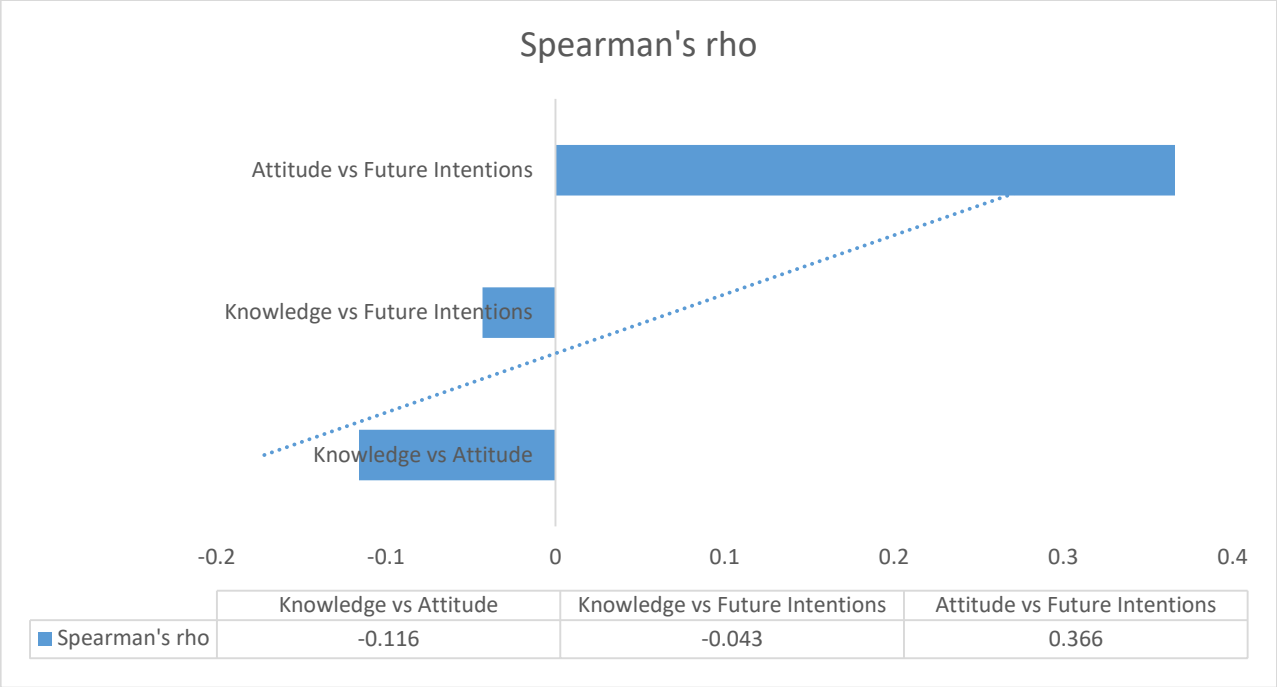
Category	Response	Frequency	Percent (%)
Perceived Advantages of Saliva over Blood for Diagnosis	A. Non-invasive	1	0.4
	B. Cost-effective	4	1.4
	C. Patient-friendly	5	1.8
	D. All of the above	271	96.4
Interest in attending a seminar/workshop on salivary diagnostics	Yes (1)	197	70.1
	Maybe (2)	16	5.7

	No (3)	68	24.2
Expectation of routine use in dentistry in next 5–10 years	Yes	200	71.2
	No	8	2.8
	Not sure	73	26.0
Willingness to use salivary diagnostics in future practice	Probably not	5	1.8
	Definitely	41	14.6
	Probably	143	50.9
	Not sure	92	32.7



5. Spearman's Rho Correlation Between Knowledge, Attitudes, and Future Intentions Regarding Salivary Diagnostics

Variable Pair	Spearman's rho	p-value	Interpretation
Knowledge vs Attitude	-0.116	0.052*	Weak negative correlation, not statistically significant.
Knowledge vs Future Intentions	-0.043	0.475	Very weak negative correlation, not statistically significant.
Attitude vs Future Intentions	0.366	<0.001*	Moderate positive correlation, statistically significant.



Spearman's rho correlation analysis was conducted to explore potential monotonic relationships between knowledge scores, attitudes, and future intentions.

Software tools used

The statistical analyses in this study were performed using **IBM SPSS Statistics Version 26** for data entry, management, and execution of statistical tests, including descriptive statistics, Pearson's Chi-Square tests, Spearman's rho correlation, and binary logistic regression. **Microsoft Excel** was utilized for data tabulation, calculation of percentage distributions, and generation of graphical representations to visually present the findings. **Microsoft Word** was employed for compiling, formatting, and presenting the results in tables, figures, and narrative form in line with academic manuscript requirements. These software tools collectively ensured accurate statistical computation, clear data visualization, and professional presentation of the study results