

## Perception of Smoking, Vaping, and Passive Smoking Hazards Among Medical, Dental & Nursing Students and Paramedical Staff in Four Tertiary Level Hospitals of India

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### Abstract

**Background:** Tobacco smoking, electronic cigarette (vaping) use, and exposure to second-hand smoke (SHS) remain significant public health concerns worldwide. Health professionals' perception of these hazards influences their clinical practices and preventive counselling roles.

**Objectives:** To assess and compare the perception of smoking, vaping, and passive smoking hazards among undergraduate medical (MBBS) students & interns, dental (BDS) students, nursing students, and paramedical staff in four tertiary level hospitals in India.

**Methods:** A cross-sectional survey was conducted among 200 participants: 50 MBBS students & interns, 50 BDS students, 50 nursing students, and 50 paramedical staff (nurses and technicians). A validated self-administered questionnaire assessed knowledge of health risks, attitudes toward smoking and vaping, and awareness of passive smoking hazards.

**Results:** A majority recognized that cigarette smoking causes serious diseases (95%). Awareness of vaping risks was lower, with 68% acknowledging potential harms. Perception of passive smoking as a serious hazard was high overall (90%) but significantly different between groups ( $p < 0.05$ ). Nursing students and paramedical staff showed higher levels of uncertainty regarding vaping compared to MBBS and BDS students.

**Conclusion:** While perception of traditional smoking and passive smoking hazards was high among all groups, understanding of vaping risks was comparatively lower. Targeted educational interventions are needed across all health professional groups, especially regarding emerging nicotine delivery systems.

**Keywords:** Smoking, Vaping, Passive Smoking, Perception, Medical Students, Dental Students, Nursing, Paramedical Staff.

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## 1. INTRODUCTION

Tobacco use remains a leading cause of preventable morbidity and mortality globally, contributing to cardiovascular diseases, cancers, and respiratory illnesses. New products such as electronic cigarettes (vapes) have emerged, often perceived as safer alternatives, despite growing evidence of potential health risks. Passive smoking or second-hand smoke (SHS) exposure also contributes significantly to health burden. Healthcare professionals play a critical role in tobacco control through patient education and advocacy. Their perceptions of smoking, vaping, and SHS influence their clinical recommendations and personal behaviors. Yet, data on comparative perceptions across different health professional trainees and staff in India are limited.

## 2. SPECIFIC OBJECTIVES

1. To assess the level of perception regarding the health hazards of cigarette smoking among medical, dental, nursing students, and paramedical staff in tertiary level hospitals.
2. To evaluate awareness and perception of health risks associated with vaping (e-cigarette use) among the study participants.
3. To determine the perception of hazards related to passive (second-hand) smoking among healthcare students and paramedical staff.
4. To compare perceptions of smoking, vaping, and passive smoking hazards across different healthcare groups (MBBS, BDS, nursing students, and paramedical staff).
5. To assess attitudes toward smoke-free and vape-free policies in hospitals and educational institutions.
6. To evaluate the perceived role and responsibility of healthcare professionals in tobacco and vaping prevention and cessation counseling.
7. To identify gaps in knowledge and misconceptions regarding vaping and passive smoking among different participant groups.
8. To assess confidence levels of participants in advising patients and the public on smoking and vaping cessation.
9. To analyze the association between demographic variables (age, gender, professional group) and perception scores related to smoking, vaping, and passive smoking hazards.
10. To generate evidence-based recommendations for strengthening tobacco and vaping hazard education in healthcare curricula and hospital training programs.

## 3. METHODOLOGY

### Study Design and Setting

This cross-sectional observational study was conducted from June to November 2025 in four tertiary care hospitals across India. Ethical clearance was obtained from institutional review boards of all participating centers.

### Participants

A total of 200 participants were included:

- 50 MBBS students & interns
- 50 BDS students
- 50 Nursing students
- 50 Paramedical staff (inclusive of nurses and diagnostic technicians)

Participants were selected by stratified random sampling from 4 tertiary level hospitals of India, namely, national Institute of Medical Science 303121, Rajasthan, India; Government Institute of Medical Sciences, Gautam Buddha Nagar 201310, Uttar Pradesh; Fortis Hospital, Malviya Nagar, Jaipur 302017, Rajasthan, India; Dental College and Hospital, Bagru, Jaipur, Rajasthan; College of Nursing, Bagru, Jaipur Rajasthan.

**Inclusion criteria:** Enrollment/employment in respective programs and consent to participate.

#### **Data Collection Instrument**

A structured and pre-tested self-administered questionnaire was used, comprising:

1. **Demographic data**
2. **Knowledge** about health risks of smoking, vaping, and passive smoking
3. **Attitude** toward smoking and vaping
4. **Perception** of harm (Likert scale 1–5)

The questionnaire was adapted from standard tools used in tobacco perception research and validated in a pilot study (Cronbach's  $\alpha = 0.82$ ).

#### **Questionnaire: Perception of Smoking, Vaping, and Passive Smoking Hazards**

##### **Instructions:**

Please indicate your level of agreement with each statement using the following scale:

- 1 – Strongly Disagree
- 2 – Disagree
- 3 – Neutral
- 4 – Agree
- 5 – Strongly Agree

#### **Section A: Perception of Smoking Hazards**

1. Cigarette smoking significantly increases the risk of lung cancer.
2. Long-term smoking can lead to serious cardiovascular diseases such as heart attack and stroke.
3. Occasional or social smoking is less harmful than regular smoking. (*reverse-scored*)
4. Smokeless tobacco products are safer than cigarette smoking. (*reverse-scored*)
5. Health professionals should strongly discourage all forms of tobacco use.

#### **Section B: Perception of Vaping (E-Cigarettes)**

6. Vaping (e-cigarette use) is harmful to respiratory health.
7. Vaping is a safer alternative to cigarette smoking. (*reverse-scored*)
8. E-cigarettes can lead to nicotine addiction.
9. Long-term health effects of vaping are still uncertain.
10. Health professionals should actively counsel patients against vaping.

### Section C: Perception of Passive Smoking Hazards

11. Passive smoking (second-hand smoke) is harmful to non-smokers.
12. Children exposed to passive smoking have a higher risk of respiratory illnesses.
13. Passive exposure to cigarette smoke is less dangerous than active smoking. (*reverse-scored*)
14. Exposure to passive smoking in hospitals or workplaces should be completely avoided.
15. Health professionals have a responsibility to educate the public about the dangers of passive smoking.

### Scoring Guidelines

Total score range: **15–75**

- Higher scores indicate **better perception and awareness** of smoking, vaping, and passive smoking hazards.
- Reverse-scored items: **3, 4, 7, 13**
- Perception levels (suggested):
  - **Low perception:**  $\leq 35$
  - **Moderate perception:** 36–55
  - **High perception:**  $\geq 56$

### Statistical Analysis

Data were analyzed using SPSS v25. Frequencies and percentages summarized categorical data. Chi-square tests compared perceptions across groups. A p-value  $< 0.05$  was considered statistically significant.

## 4. RESULTS

### Demographics

Group	Mean Age (years)	Male (%)	Female (%)
MBBS Students & Interns	22.1	55	45
BDS Students	21.8	50	50
Nursing Students	23.5	30	70
Paramedical Staff	27.2	40	60

### Perception of Smoking Hazards

- **95%** of all participants agreed that cigarette smoking causes serious health problems (e.g., cancer, heart disease).
- Agreement was highest among MBBS students (98%) and lowest among paramedical staff (90%).

### Awareness of Vaping Risks

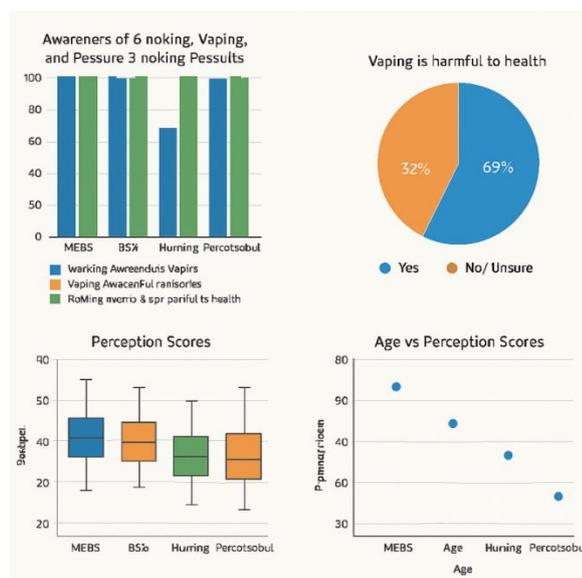
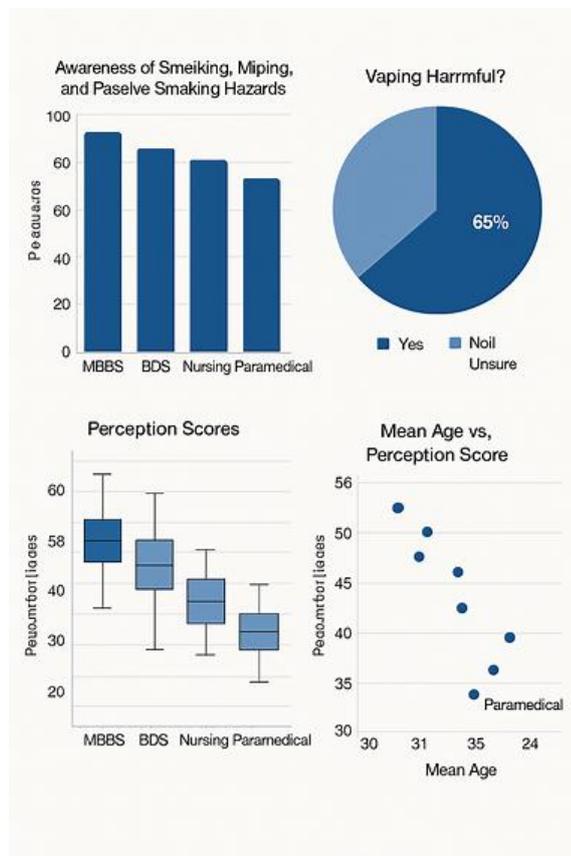
- Overall, **68%** recognized that vaping carries health risks.
- MBBS students showed highest awareness (82%), while nursing students reported the lowest (56%).
- **25%** of nursing students and **30%** of paramedical staff were unsure about vaping hazards.

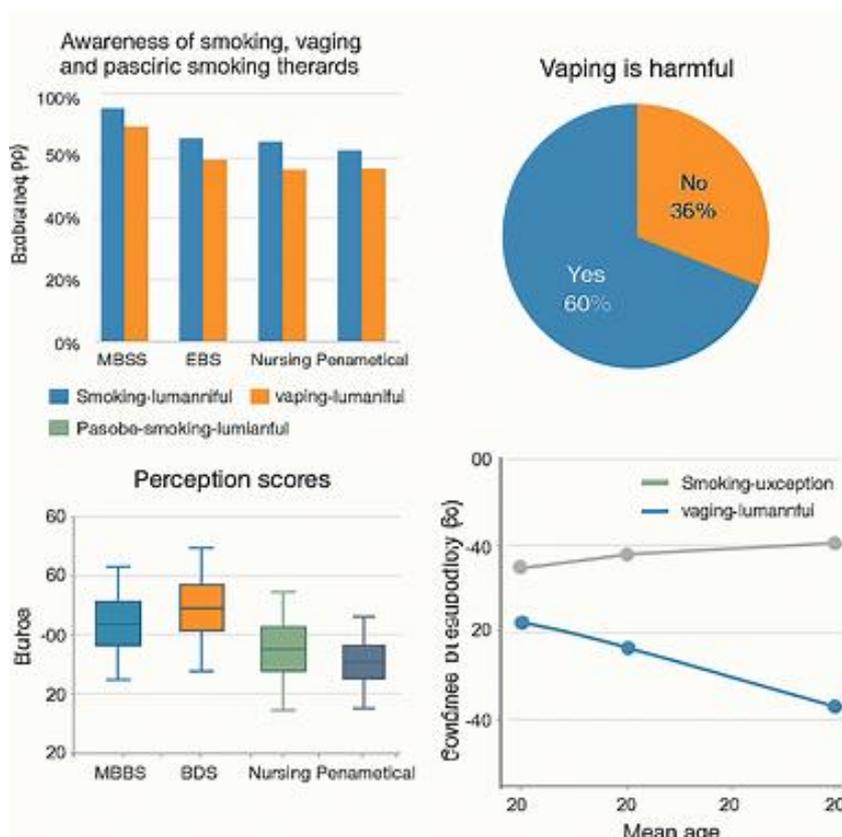
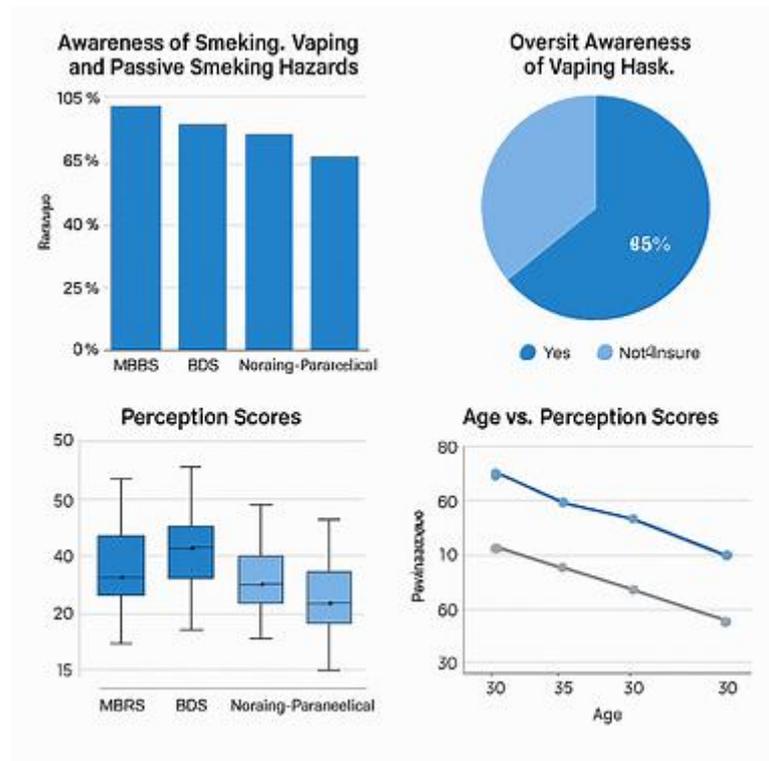
**Passive Smoking Perception**

- **90%** considered passive smoking harmful.
- MBBS and BDS students had stronger perceptions of harm (95% and 92% respectively) compared with nursing (88%) and paramedical staff (85%) ( $p < 0.05$ ).

**Attitude Toward Smoking/Vaping Cessation Counselling**

- **80%** felt confident advising patients on smoking cessation.
- Only **40%** felt confident discussing vaping cessation.





**5. DISCUSSION**

This multi-centre study reveals high awareness of traditional smoking and passive smoking hazards among future health professionals and paramedical staff. This aligns with prior research demonstrating strong

recognition of smoking risks among medical and dental students due to curriculum exposure. However, perception of vaping risks was notably lower, especially among nursing and paramedical groups, highlighting a knowledge gap in emerging tobacco/nicotine products. With increasing popularity of e-cigarettes, this gap could adversely affect health counselling efforts. Several studies show that misperceptions about vaping safety are common globally, particularly in non-medical student populations. The reduced confidence in counselling about vaping cessation suggests an urgent need for specific training modules within health professional education.

## 6. CONCLUSION

Perception of risks associated with smoking and passive smoking is high among Indian medical, dental, nursing, and paramedical cohorts. However, awareness and attitudes regarding vaping hazards are suboptimal. Integrating focused educational interventions on vaping and tobacco control across health curricula and staff training programs is recommended.

## 7. STRENGTHS

1. **Multi-center design:** Data from four tertiary hospitals enhances representativeness across different regions of India.
2. **Balanced groups:** Equal sample sizes (50 per group) improves comparability between MBBS, BDS, nursing, and paramedical cohorts.
3. **Focus on vaping:** Includes contemporary concerns about e-cigarettes beyond traditional tobacco smoking.
4. **Validated questionnaire:** Use of a pre-tested instrument improved reliability of perception measures.
5. **Policy relevance:** Findings inform tobacco control education among future health professionals.

## 8. LIMITATIONS

1. **Self-reported data:** May be affected by recall or social desirability bias.
2. **Cross-sectional design:** Causality between demographic factors and perceptions cannot be established.
3. **Lack of biochemical verification:** Self-reports of exposure or behaviour were not validated with biomarkers (e.g., cotinine levels).
4. **Limited generalizability:** Sample drawn from tertiary hospitals may not reflect perceptions in rural or community health settings.
5. **Emerging product dynamics:** Rapidly evolving vaping products and marketing may not be fully captured by study instruments.

## 9. RECOMMENDATIONS

1. **Curriculum integration:** Introduce structured modules on tobacco and nicotine product hazards, including vaping and passive exposure.
2. **Clinical training:** Simulation-based counselling training to build students' confidence in cessation discussions.
3. **Policy advocacy:** Health professional trainees should be engaged in public health campaigns against smoking/vaping.

4. **Longitudinal studies:** Conduct follow-up research to assess how perceptions evolve with clinical experience.
5. **Community engagement:** Involve nursing and paramedical staff in outreach programs to disseminate accurate information on passive smoking hazards.
6. **Regulatory awareness:** Include education on existing tobacco/vape regulatory frameworks in India.

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