# A CROSS-SECTIONAL STUDY ON EPIDEMIOLOGICAL FEATURES OF HEALTH WITH TOBACCO USAGE IN RURAL AREAS OF GUNTUR

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## ABSTRACT

This cross-sectional study examines the epidemiological aspects of health concerning tobacco usage among adults. It seeks to clarify the prevalence and health effects of tobacco consumption, including both smoking and smokeless forms, in a diverse demographic. Data were collected from 1,097 participants aged 10 to over 45 years through structured questionnaires, focusing on tobacco use patterns, socio-demographic factors, and health outcomes. Key health metrics evaluated included respiratory function, cardiovascular health, and the occurrence of tobacco-related diseases such as chronic obstructive pulmonary disease (COPD) and cancer. Additionally, tobacco users exhibited a higher incidence of cardiovascular conditions, including hypertension and ischemic heart disease. The study highlights the significant public health implications of tobacco use and emphasizes the need for targeted interventions to reduce tobacco consumption and its adverse health effects.

**KEYWORDS:** Tobacco, Health, smoking, disease, incidence, prevalence.

## INTRODUCTION

Cigarette smoking poses a significant global health challenge, persisting despite increased awareness of its dire consequences. The inhalation of thousands of chemicals in cigarette smoke inflicts severe health implications, necessitating urgent intervention strategies. Chronic exposure to these toxic compounds correlates strongly with respiratory ailments such as chronic obstructive pulmonary disease (COPD), emphysema, and bronchitis, as well as a heightened risk of lung cancer, which accounts for approximately 85% of all lung cancer cases.[5]

In addition to respiratory disorders, cigarette smoking engenders cardiovascular complications, including coronary artery disease, hypertension, and stroke. Nicotine, the addictive component, constricts blood vessels and elevates heart rate, precipitating cardiovascular dysfunction. Moreover, it adversely affects reproductive health, contributing to infertility, erectile dysfunction, and complications during pregnancy.[3][4]

The impact of smoking extends beyond the smoker alone; second hand smoke exposure poses significant risks to bystanders, particularly vulnerable groups like children. Non-smokers exposed to second hand smoke are susceptible to similar health risks, including respiratory ailments and cardiovascular diseases. Children, in particular, face heightened risks, with passive smoking increasing the likelihood of sudden infant death syndrome (SIDS), asthma, and respiratory infections.[1][6]

Economically, cigarette smoking imposes a substantial burden on individuals and society. Direct healthcare expenditures for smoking-related illnesses strain healthcare systems globally, diverting resources from other pressing healthcare needs. Additionally, productivity losses stemming from smoking-related morbidity and premature mortality exacerbate socioeconomic disparities.[7][8]

Addressing the scourge of cigarette smoking necessitates multifaceted intervention strategies encompassing legislative, regulatory, and educational initiatives. Effective tobacco control measures, such as taxation,

smoking bans in public spaces, and comprehensive tobacco cessation programs, have proven instrumental in curbing smoking prevalence and mitigating its associated health consequences. Public health campaigns aimed at raising awareness of the hazards of smoking and promoting smoking cessation resources are indispensable in fostering a tobacco-free society.[9]

The detrimental effects of smoking extend to various internal organs and systems. Chronic exposure to cigarette smoke irritates the airways, leading to inflammation, mucus production, and airway constriction, resulting in conditions such as chronic bronchitis. Moreover, smoking destroys the cilia, compromising the lung's ability to expel harmful substances, thereby escalating the risk of respiratory infections and exacerbating pre-existing respiratory conditions, such as asthma.[13]

Smoking also exerts deleterious effects on the cardiovascular system, predisposing individuals to a spectrum of cardiovascular disorders. Nicotine and other chemicals in cigarette smoke instigate endothelial dysfunction, fostering the development of atherosclerosis and predisposing individuals to hypertension, coronary artery disease, and peripheral artery disease. Furthermore, smoking precipitates the formation of blood clots, heightening the risk of myocardial infarction and stroke.[14]

**MATERIALS AND METHODS**
The study was a cross-sectional study conducted in Tadikonda, Lam, Ponnekallu, Gorantla, and Jonnalagadda over a period of 5 months. The sample population comprised individuals from these areas who were willing to participate. The inclusion criteria were adults and older individuals with current or past tobacco usage habits. Exclusion criteria included individuals not willing to participate, non-tobacco users, and pregnant women. Data collection was conducted using Google Forms.

The study methodology was divided into different phases. In phase one, the scope of work was identified, followed by a literature review that was collected and analyzed. A comprehensive protocol was then prepared, detailing the study's inclusion and exclusion criteria, sampling technique, study sites, study period, and statistical methods. Data collection was structured based on the requirements of the study.

In phase two, subjects were selected based on the inclusion and exclusion criteria. Prior to administering the data collection forms, participants' socio-demographic details—including age, education, occupation, economic status, social habits, present and past medical history, and medication history—were gathered using a validated data collection form. Participants also received counseling on lifestyle and dietary habits.

At the end of the study, all collected data were analyzed using statistical methods, including mean, standard deviation, and two-way ANOVA. The results were then compiled and reported.

**RESULTS**
The final cross-sectional study consisted of 1097 subjects from the rural areas of Guntur. The following results are tabulated and analyzed by using specific statistical tools. Descriptive data were expressed as a percentage, mean and standard deviation, and for continuous data Pearson correlation coefficient and two-way ANOVA was calculated for demographic data. The test level of significance was set at $p < 0.05$ with a 95% confidence interval.
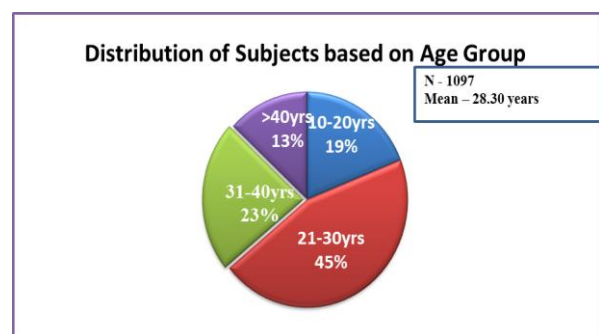


**Figure 1: Distribution of Subjects Based on Age Group.**

From the above figure-01 it was found that there is a total of 1097 subjects' data has been collected from the Guntur rural areas. The Maximum number of age group is 21-30 years-496 subjects (45%) and the least number of age group is >40 years- 145 subjects (13%). The number of subjects in the age group of 31-40years-248 subjects (23%) and in 10-20years-208 subjects (19%) with the mean of 28.30yrs and standard deviation of 10.055.

The subjects were distributed based on gender, with 77% of the subjects being male and the remaining population among the 1097 subjects being female. Among female participants, tobacco use was commonly observed in the age group of above 40 years, where they commonly used the chutta. This traditional form of tobacco consumption was prevalent among older women in rural areas of Guntur as shown in figure-02.
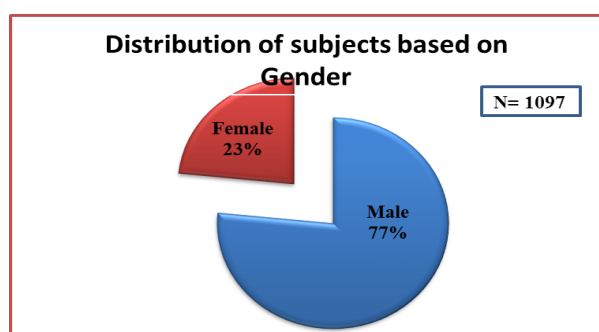


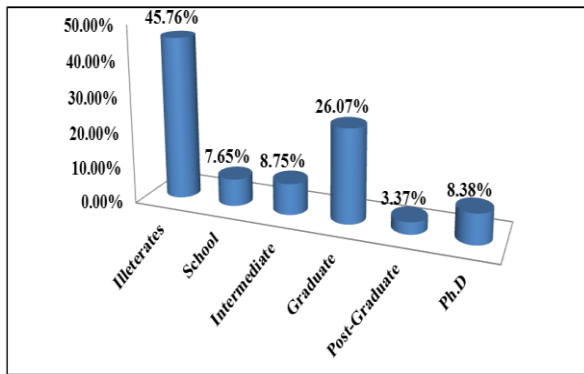**Figure 2: Distribution of Subjects Based on Gender.**

**Figure 3: Distribution of Subjects Based on Qualification.**

It was found that the maximum number of subjects were illiterate, accounting for 502 (45.76%) of the total. Schooling subjects were found to be 84 (7.65%), while those with intermediate/diploma qualifications were 96 (8.75%). Undergraduate subjects comprised 286 (26.07%) of the total, while subjects who completed their Ph.D. were 92 (8.38%). The least number of subjects, 37 (3.37%), were found to have completed post-graduation, as shown in Figure-03. The association between tobacco use in different age groups and occupations showed there was not significant association with a p-value of 0.2535 in Two-way ANOVA, as shown in Table-01.

**Table 1: Association between Age Group And Medical Conditionsof Subjects.**

| Qualification | 10-20 years | 21-30 years | 31-40 years | >40 years | P value |
|---|---|---|---|---|---|
| **Illeterates** | 28 | 162 | 199 | 113 | |
| **Schooling** | 84 | 0 | 0 | 0 | |
| **Intermediate/Diploma** | 96 | 0 | 0 | 0 | 0.2533 |
| **Graduation** | 0 | 286 | 0 | 0 | |
| **PG** | 0 | 37 | 0 | 0 | |
| **Ph.D Scholars** | 0 | 11 | 49 | 32 | |
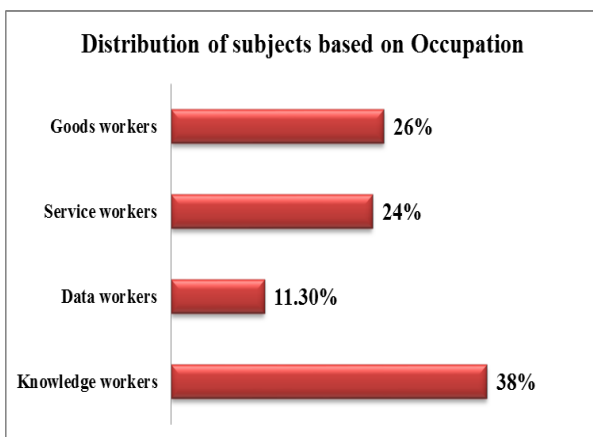


**Figure 4: Distribution of Subjects Based on Occupation.**

In the study, the majority of subjects were identified as knowledge workers, comprising 421 (38.37%) of the total sample. Conversely, the least represented occupational category was goods workers, with only 116 (25.83%) subjects falling into this group. Service workers and data workers accounted for 242 (24.43%) and 272 (11.30%) subjects, respectively. These findings suggest a diverse occupational distribution among the participants, reflecting various sectors of employment within the rural areas of Guntur as depicted in Figure-04.

The study found that the majority of subjects belonged to the middle class, with 567 (51.68%) falling into this category, followed by lower-middle-class subjects, accounting for 407 (37.10%) of the total. A smaller proportion of subjects, 29 (2.64%), were categorized as upper class, while lower-class subjects comprised 73
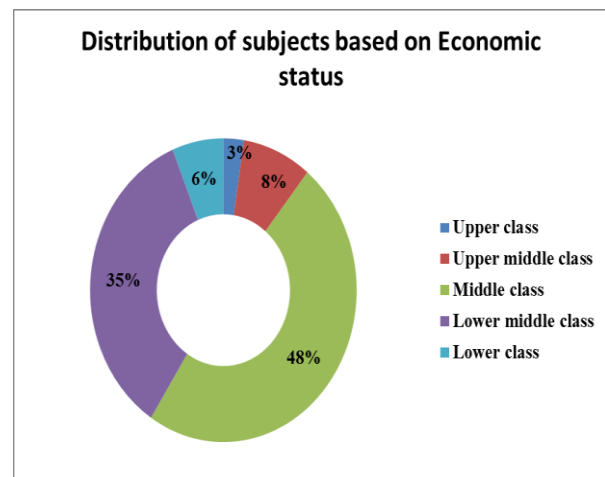
(6.65%) of the sample. Upper-middle-class subjects were the least represented at 55 (9%) as shown in figure-04.

Furthermore, statistical analysis revealed a significant association between age group and socioeconomic status, with a p-value of 0.007279 in the two-way ANOVA test. This suggests that the distribution of socioeconomic status varied significantly across different age groups among the subjects in the study as shown in table-02.



**Figure 5: Distribution of Subjects Based on Economic Status.**

**Table 2: Association between Economic Status and Age Conditions of Subjects.**

| Economic status | 10-20 years | 21-30 years | 31-40 years | >40 years | P value |
|---|---|---|---|---|---|
| Upper class | 2 | 7 | 9 | 11 | |
| Upper middle class | 4 | 12 | 28 | 31 | |
| Middle class | 91 | 274 | 121 | 81 | 0.007279 |
| Lower middleclass | 83 | 192 | 61 | 17 | |
| Lower class | 28 | 11 | 29 | 5 | |

In the study, 619 subjects (56.4%) were found to be unmarried, while 478 subjects (43.6%) were married. These findings reflect the marital status distribution among the participants in the study population as shown in figure-06.

In the study, it was observed that 747 subjects were taking a mixed diet, while 350 subjects were following a vegetarian diet. This dietary information provides insight into the nutritional habits of the participants in the study as shown in figure-07.
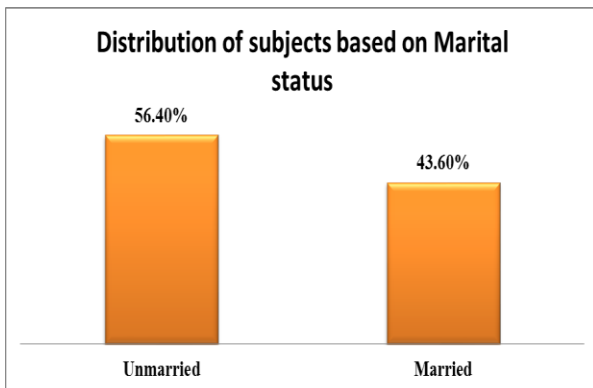


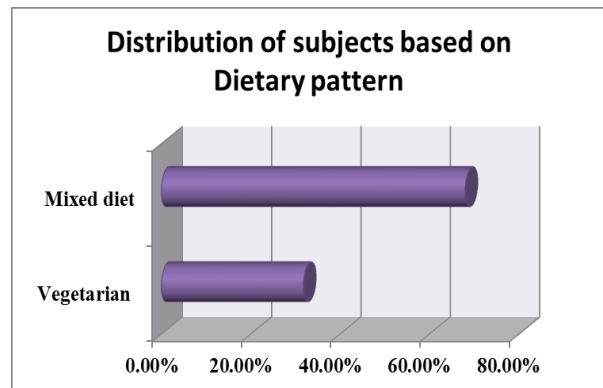**Figure 6: Distribution of Subjects Based on Marital Status.**



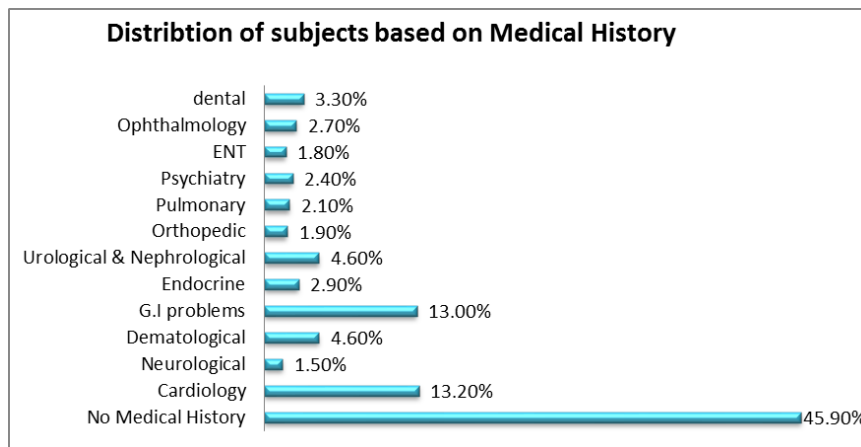**Figure 7: Distribution of Subjects Based on Dietary Pattern.**



**Figure 8: Distribution of Subjects Based on Medical History.**

**Table 2: Comparison And Analyzing of Subjects Based on Occupation & Medical History.**

| S.NO | Subjects Medical Conditions | No of subjects(n=605) | | | | p- Value |
|---|---|---|---|---|---|---|
| | | 10-20 years | 21-30 years | 31-40 years | >40 years | |
| 1. | No Medical history (492) | 110 | 232 | 129 | 21 | |
| 2. | Cardiology (85) | 00 | 07 | 37 | 41 | |
| 3. | Neurology (159) | 00 | 18 | 25 | 116 | |
| 4. | Dermatology (321) | 51 | 192 | 61 | 17 | |
| 5. | Endocrinology (216) | 00 | 19 | 106 | 91 | 0.006078 |
| 6. | Urological & Nephrology (93) | 00 | 15 | 61 | 17 | |
| 7. | Gastroenterology (375) | 59 | 122 | 92 | 102 | |
| 8. | Orthopaedic (14) | 04 | 17 | 61 | 58 | |
| 9. | Pulmonology (45) | 11 | 08 | 09 | 17 | |

| 10. | Psychiatry (39) | 01 | 11 | 08 | 19 | |
|-----|-----------------|-----|-----|-----|-----|--|
| 11. | ENT (135) | 16 | 29 | 41 | 47 | |
| 12. | Ophthalmology (409) | 34 | 135 | 71 | 169 | |
| 13. | Dental (225) | 49 | 37 | 41 | 96 | |

In the study, it was found that the highest number of subjects, 491 (45.8%), did not have any medical history, while the least number, 1 (0.09%), suffered from neurological problems. Cardiology problems affected 145 (13.2%) subjects, while gastroenterology issues were reported by 160 (14.6%) subjects. Dermatological problems affected 50 (4.6%) subjects, whereas endocrinological problems were present in 41 (3.7%) subjects. Urological and nephrological problems were reported by 49 (4.5%) subjects, while orthopedic issues affected 26 (2.4%) subjects. Pulmonology problems were observed in 26 (2.4%) subjects, and psychiatry issues affected 21 (1.9%) subjects. ENT problems affected 23 (2.1%) subjects, ophthalmology issues affected 29 (2.6%) subjects, and dental problems were reported by 36 (3.2%) subjects as shown in figure-08. Additionally, the association between occupation and medical history was analyzed using Two-way ANOVA, which was statistically significant at p-0.0000165 as shown in table-03.
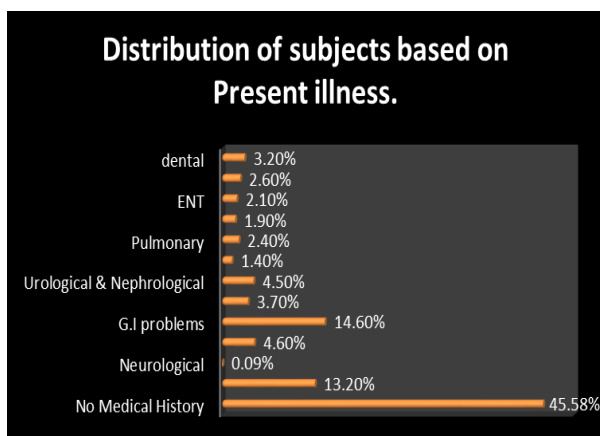


**Figure 9: Distribution of Subjects Based on Present Illness.**

In the study, the majority of subjects, 491 (45.8%), had no medical history, while the fewest subjects, only 1 (0.09%), were suffering from neurological problems. Additionally, 145 (13.2%) subjects were suffering from cardiology problems, and 160 (14.6%) were experiencing gastroenterology issues. Dermatological problems affected 50 (4.6%) subjects, while 41 (3.7%) were dealing with endocrinological problems. Furthermore, 49 (4.5%) subjects were facing urological and nephrological issues, and 26 (1.4%) were grappling with orthopedic problems. Pulmonology problems were observed in 26 (2.4%) subjects, while 21 (1.9%) were coping with psychiatry issues. Moreover, 23 (2.1%) subjects had ENT problems, 29 (2.6%) had ophthalmology issues, and 36 (3.2%) were dealing with dental problems as shown in figure-09.

The distribution of subjects based on the smoking habits of family members was as follows:

A majority of subjects, accounting for 619 (56.4%), reported having family members who smoked, while 478 subjects (43.6%) reported no smoking habits among their family members.
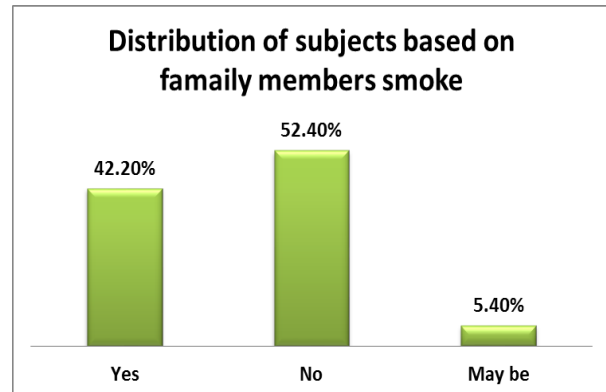


**Figure 10: Distribution of Subjects Based on Family Members Smoking.**

In the study, the majority of subjects, 549 (52.4%), reported that their family members did not have any smoking habits. Conversely, the least number of subjects reported that they did not know about the smoking habits of their family members, while 462 (42.2%) subjects indicated that their family members did have smoking habits as shown in figure 10.
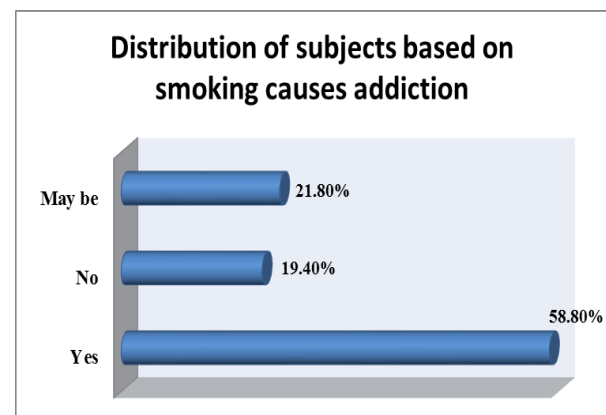


**Figure 11: Distribution of Subjects Based on Smoking Causes Addiction.**

In the study, the majority of subjects, 645 (58.8%), stated that smoking is highly addictive. Conversely, the least number of subjects, 213 (19.4%), believed that smoking is not very addictive, while 239 (21.8%) subjects indicated that smoking may be addictive as shown in figure-11.
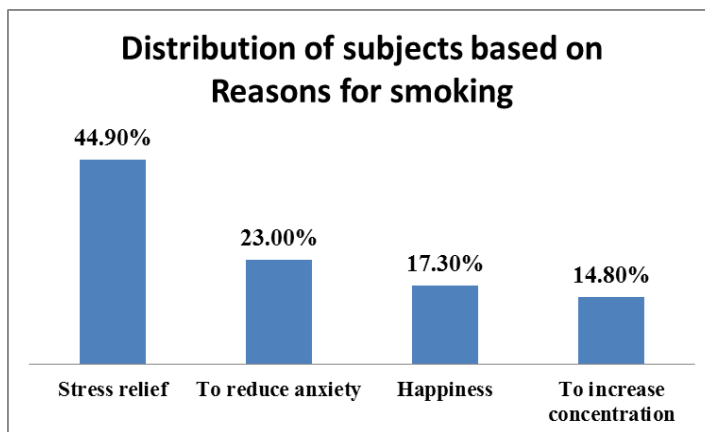
**Figure 12: Distribution of Subjects Based on Reasons for Smoking.**

**Table 3: Comparison of Subjects Age Groups with Reasons of Smoking.**

| Var A/var B | Stress relief (484) | Reduce anxiety (258) | Happiness (194) | Concentration (161) |
|---|---|---|---|---|
| 10-20Yrs (208) | 96 | 51 | 49 | 12 |
| 21-30Yrs (496) | 221 | 132 | 122 | 21 |
| 31-40Yrs (248) | 96 | 69 | 57 | 26 |
| >40Yrs (145) | 42 | 39 | 41 | 23 |
| Two-way ANOVA | | | F-5.9714 | P- 0.01593 |

In the study, the majority of subjects, comprising 493 (44.9%), believed that people become addicted to tobacco products for stress relief. Conversely, the least number of subjects, 162 (14.8%), stated that people become addicted to tobacco products to increase concentration. Additionally, 252 (23%) subjects mentioned that people become addicted to tobacco products to reduce anxiety, while 190 (17.3%) subjects indicated that people become addicted to tobacco products for their happiness as shown in figure-12. The statistical evidence with two-way ANOVA was significant with p-0.01593 as shown in table-03.

In the study, the majority of subjects, comprising 977 (89.1%), knew that smoking causes cancer, while the least number of subjects, 120 (10.9%), stated that they did not know this fact. Additionally, 581 (53%) subjects reported that they did not have any habit of smoking or chewing tobacco products, while 52 (4.7%) subjects indicated that they may have had such a habit. However, 464 (42.3%) subjects admitted to having a habit of smoking or chewing tobacco products. Furthermore, the majority of subjects, 875 (79.8%), believed that chewing tobacco products is not safer, while the least number of subjects, 222 (20.2%), stated that they believed chewing tobacco products to be safer.
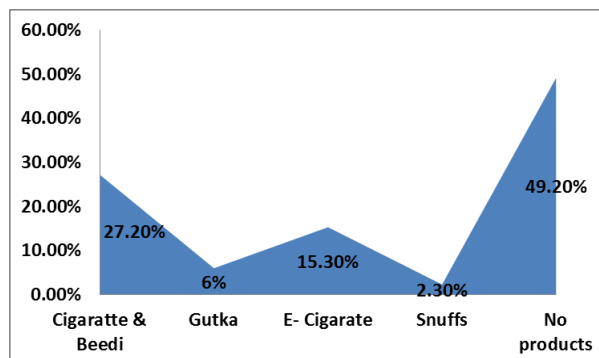


**Figure 13: Distribution Of Subjects Based on Type of Tobacco Product Used.**

In the study, the majority of subjects, comprising 540 (49.2%), reported that they did not use any type of tobacco products, while the least number of subjects, 25 (2.3%), stated that they used snuffs. Additionally, 298 (27.2%) subjects reported using cigarettes and beedi type of tobacco products, while 168 (15.3%) subjects reported using E-cigarettes. Furthermore, 66 (6%) subjects admitted to using gutka type of tobacco products as shown in figure-14.

In the study, the majority of subjects, comprising 508 (45.6%), reported that they don't smoke, so they haven't experienced these effects. Conversely, the least number of subjects, 20 (1.8%), reported experiencing a decrease in appetite. Additionally, 130 (11.7%) subjects reported experiencing pleasure feelings, while 88 (7.9%) subjects reported experiencing a buzz sensation. Furthermore, 67 (6.0%) subjects reported experiencing a good taste in their mouth, and 124 (11.1%) subjects reported experiencing a relaxed feeling. Moreover, 123 (11.0%)

subjects reported experiencing a decrease in stress as        shown in figure-15.
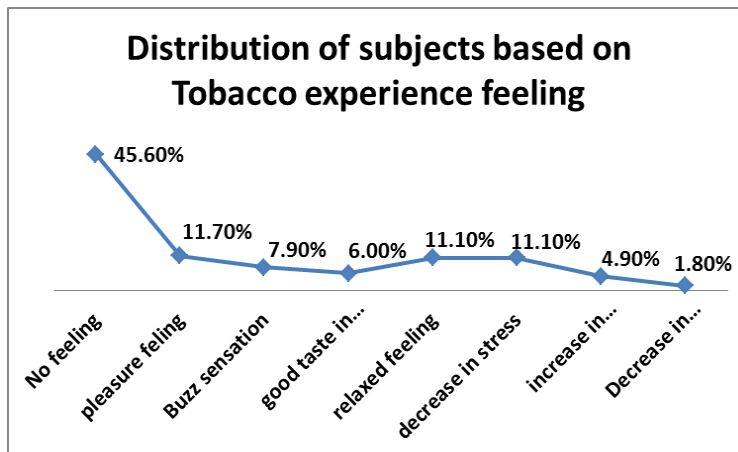


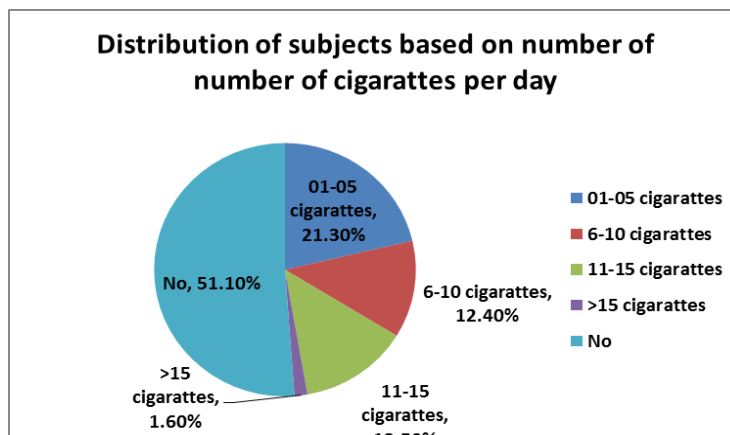**Figure-14: Distribution of Subjects Based on Tobacco Experience Feeling.**



**Figure 15: Distribution of Subjects Based on Number of Cigarettes Per Day.**

In the study, the majority of subjects, comprising 227 (20.7%), stated that most people find it difficult to quit smoking due to nicotine addiction. Conversely, the least number of subjects, 100 (9.1%), believed that emotional attachment was the reason most people find it difficult to quit smoking as shown in figure-16.
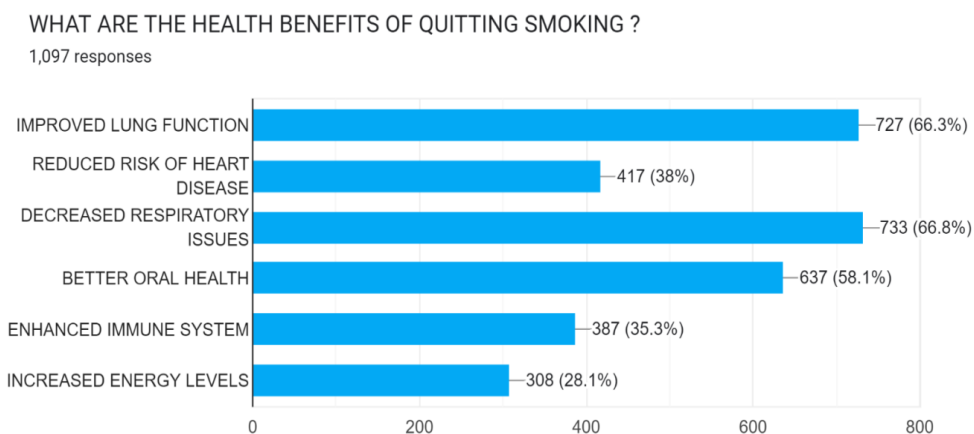


**Figure 16: Distribution of Subjects Based on Health Benefits Upon Quitting of Smoking.**

**DISCUSSION**
Tobacco consumption is a significant global health concern. Our research demonstrates that tobacco use increases the risk for various health conditions, including gastric problems, stroke, hypertension, coronary artery disease, type 2 diabetes, and kidney issues. Most adults in our study were tobacco users.

In a cohort study by Gro Askgaard, Morten Grønbæk, and Mette S. Kjær, out of 55,917 participants, 393 men and 229 women were diagnosed with either tobacco-related or unspecified cirrhosis. The study found a link between smoking frequency and cirrhosis risk in men, though the pattern was unclear in women. In our study of 605 subjects, 259 (42.8%) reported gastroenterological issues, including liver cirrhosis.

JQ Lew, W-H Chow, and AR Hollenbeck conducted a study over nine years, identifying 1,814 RCC cases. They found an inverse relationship between tobacco intake and RCC risk in men. Our study found that 175 (29%) of tobacco consumers had a schooling education level.

Elke S. Schaeffner et al.'s study with 11,023 participants reported varying levels of tobacco consumption. In our study, 204 (33%) subjects used tobacco occasionally, 132 (22%) twice a week, 126 (21%) daily, and 72 (12%) three times weekly. A study by B. Rasouli et al. reported a low type 2 diabetes risk in participants who used tobacco 5-10 times in the last 14 days. We found 183 subjects (30.2%) with endocrinological issues, including diabetes.

Sheldon W. Tobe et al. reported 91% of participants with post-school education, 12% consuming more than 10 tobacco drinks per week. In our study, 177 subjects (29%) smoked 1-5 cigarettes/day, 90 (15%) smoked 6-10 cigarettes/day, 21 (4%) smoked 11-15 cigarettes/day, 32 (5%) smoked more than 15 cigarettes/day, and 285 (47%) did not smoke.

Alemu Lemma et al. found that a small number of participants reported a history of mental illness. In our study, 259 (42.8%) subjects had a hereditary history of gastroenterological problems.

R. Dinesh Kumar et al. studied different age groups' drinking habits. In our study, the majority of tobacco users, 210 (35%), were aged 19-30 years.

Dr. Anuj Jangra and Dr. J S Malik reported a higher diabetes prevalence among tobacco users. Our study similarly found high rates of gastroenterological (259, 42.8%) and endocrinological (183, 30.2%) issues among tobacco users.

## CONCLUSION
In summary, our study of 1097 rural subjects in Guntur highlights several key findings. Most notably, tobacco use is prevalent among younger individuals aged 21-30, with males showing higher usage rates than females, especially among older age groups. Illiteracy is associated with higher tobacco use, while knowledge workers represent the largest employment group. Socioeconomic status influences tobacco habits, with unmarried individuals comprising the majority. Family smoking habits and perceptions of addiction play crucial

roles in shaping individual behaviors. Various tobacco products are used, warranting tailored cessation strategies. While many subjects report no smoking, those who do experience a range of effects. Finally, recognizing the benefits of smoking cessation underscores the importance of targeted interventions to combat tobacco-related health risks in rural areas.

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