



## INFLUENCE OF DEPRESSION, ANXIETY, STRESS, SELF-EFFICACY AND SELF-ESTEEM ON SMOKING CESSATION ATTEMPTS AMONG HEAVY SMOKERS IN A SOUTH INDIAN ADULT POPULATION – A CROSS-SECTIONAL ANALYTICAL STUDY

### Dentistry

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### ABSTRACT

**Objectives** - Despite making considerable strides in smoking cessation intervention programs, the high failure rates of these cessation methods have raised concerns and asserted the need to re-strategize these programs. There is a dearth of evidence regarding the role of depression, anxiety, stress, self-esteem, and self-efficacy in the determination of successful cessation attempts. This study aimed to investigate this association among heavy smokers in a south Indian adult population.

**Materials And Methods-** A cross-sectional study was conducted on 557 heavy smokers, recruited from the OPD of KLE Institute of Dental Sciences, Bangalore over one year by convenience sampling. The Depression, Anxiety, and Stress status of the participants were assessed using the DASS-21 scale. Rosenberg Self-esteem Scale and General self-efficacy scale were used to assess the self-esteem and self-efficacy of the participants respectively. The Outcome variable was a self-reported Successful 24-hour abstinence from Smoking. The association between these variables was assessed using Multivariate logistic regression on SPSS 24 version, with a p-value set at 0.05

**Results-** Smokers with anxiety and stress were less likely to sustain a successful 24 hour quit attempt. Subjects with higher self-esteem were twice as likely to give a successful attempt at quitting the habit as opposed to those with low self-esteem.

**Conclusion** - Anxiety, Stress, and Self-esteem influence smoking cessation attempts in smokers, hence it warrants the need to factor in these variables while devising cessation therapies for better success.

### KEYWORDS

Smoking Cessation, Depression, Anxiety, Stress, Self-esteem, Self-efficacy

### INTRODUCTION

Tobacco consumption has increased the burden of potentially preventable morbidity and mortality due to non-communicable diseases (NCDs) with Smoking claiming more than a million deaths per year across the globe.<sup>1,4</sup> If the pattern of smoking persists, we may be looking at a grim picture of more than 8 million deaths from diseases related to tobacco use by 2030.<sup>5</sup> Tobacco stood fifth among the risk factors responsible for the most deaths and disabilities in India in 2017.<sup>6</sup> In India, the annual tobacco-related deaths were estimated to be 1 million deaths in the year 2018.<sup>5,6</sup>

Despite making general strides in smoking cessation interventions, the high rates of failure in these cessation programs raise alarming concerns.<sup>7</sup> The Smoking cessation process is complex and insurmountable with numerous factors that come into play, and the key to paving the way for a successful quitting process lies in the core of understanding and addressing these factors. The number of successful quit attempts it takes an average smoker to quit determines his motivation for change and can be instrumental in forging a path to quitting the habit.<sup>8</sup> The high concomitance of smoking and psychological illness is an added concern, as smoking accounts for much of the reduction in life expectancy associated with psychological illness. Studies have shown those afflicted with psychological illness tend to display greater frequency and intensity of the habit than the general population, and this might potentially alter the outcome of the quitting process. While cigarette consumption in the general population has shown a sustained decrease over the past 20 years, this habit among smokers with mental illness has remained relatively undeterred.<sup>9,11</sup> The current situation warrants the need to dig deeper into the psyche of a smoker to understand how psychological parameters can influence a smoker's cessation attempts.

Research on addictive behavior has made revelations on the possible role of Self-efficacy and self-esteem in the predisposing to detrimental

addictive behavior patterns. Self-efficacy is a cognitive variable that pertains to individuals' beliefs regarding control over events in their lives. In a risk-behavior context, low self-efficacy individuals are likely to engage in behavior deleterious to their health.<sup>12</sup> Self-esteem is an interpretation of one's self-worth and how one perceives himself in favorable or unfavorable environments. It plays an instrumental role in decision-making. Individuals with low self-esteem may experiment or self-inflict deleterious habits to negate negative feelings of rejection, pressure, and/or insecurities while those with high self-esteem engage in behaviors that protect or improve their health and wellbeing<sup>13</sup>. The affinity and correlation of low self-esteem and low self-efficacy variables with risky and detrimental behavior patterns present a potential landscape to explore their possible roles in influencing the smoking cessation process.

Hence, the present study aims to understand the influence of depression, anxiety and stress, self-efficacy and self-esteem on smoking cessation attempts among Heavy smokers in a South Indian adult demographic to understand the dynamics of the quitting process.

### MATERIALS AND METHODS

#### Study Setting And Population

This cross-sectional study included 557 participants that were recruited from the OPD of KLE Institute of Dental Sciences, Bangalore for a period of one year from January 1<sup>st</sup>, 2021 to December 31<sup>st</sup>, 2021 by convenience sampling method.

To be eligible to participate in the study, participants had to be between 18-50 years of age and smoking  $\geq 20$  cigarettes/day, had to consent to participate in the study, and were required to possess a basic understanding of English. Those with a history of Mental Disorders, history of Drug Abuse, systemic illnesses, pregnancy, on any antipsychotics, or on any medications intended to assist in smoking cessation were excluded.

**Survey Characteristics**

The following data was collected from the study subjects: Demographic details like Age, Gender, Marital Status, Employment Status, Socio-economic Status (evaluated via Modified Kuppaswamy's scale 2021)<sup>14</sup> were collected via self-reported questionnaires.

Successful Habit cessation attempts: were identified by a self-reported Successful 24-hour abstinence from smoking with the intent of quitting. This was by following the NHIS (National Health Interview Survey – CDC) glossary definition for a successful quit attempt.<sup>15</sup>

Psychological parameters (Depression, anxiety and stress) were assessed using the Depression, Anxiety and Stress (DASS-21) scale.<sup>16</sup> The DASS-21 is a 21-item self-report questionnaire designed to assess depression, anxiety and stress. Based on the cumulative scores of the items on the scale, those with mild to severe degrees of depression, anxiety, and stress were categorized as subjects with depression, anxiety and, stress. Those without such ailments formed a separate category of subjects without depression, anxiety, and stress.

Self-esteem was assessed using the Rosenberg self-esteem scale.<sup>17</sup> This validated scale is a 10-item scale that measures global self-worth by measuring both positive and negative feelings about the self. The scale ranges from 0 to 30. Scores below 15 suggest low self-esteem. Subjects were dichotomized based on the cumulative scores into those with high and low self-esteem.

Self-efficacy was assessed using the General Self-efficacy Scale.<sup>18</sup> The GSE is a one-dimensional self-report measure that features a 10-item questionnaire that assesses the optimistic self-beliefs of individuals, with cumulative scores ranging from 10 to 40. Higher scores indicate higher perceived general self-efficacy. Subjects were dichotomized into those with high and low self-efficacy based on the cumulative scores.

**Ethical Considerations:**

While collecting data, anonymity, and confidentiality was maintained. There were no risks, immediate benefits, or incentives for participation in the survey. All participants were informed about the study and provided written informed consent. Responses were then scrutinized and data was entered into Excel data Sheets (Microsoft Excel, 2013). This study was evaluated and approved by the Institutional Review Board Committee of K.L.E Society's Institute of Dental Sciences, Bangalore – 560022 (Ref/IRB/CODE –KLE/JAN 2022/12).

**Statistical Analysis**

SPSS version 24 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. An adjusted logistic regression model was fitted, controlling for age, gender, socio-economic status, Marital Status, and type of family to analyze for significant predictors of a successful smoking cessation attempt. A p-value < 0.05 was deemed statistically significant.

**RESULTS**

**Sample Characteristics**

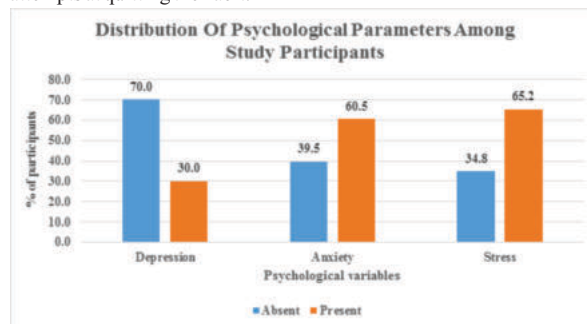
As evident from Table 1, among the study participants, more than 50% of the smokers were in the 18-30 years age bracket, and the majority were males (76.1%). Almost half (51.7%) of the smokers were Unmarried and from a Nuclear family (55.8%). Most of the smokers were in the Lower Middle Socio-economic Class (67.5%).

**Table 1- Sociodemographic Characteristics Of The Subjects**

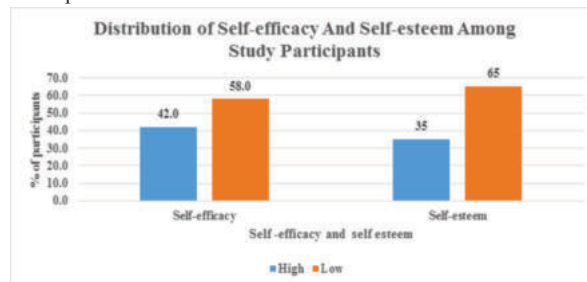
Independent variables	Percentage (%)	Frequency (N = 557)
<b>Age Groups</b>		
18-30 years	53	295
31-40 years	33.2	185
41-50 years	13.8	77
<b>Gender</b>		
Males	76.1	424
Females	23.9	133
<b>Marital Status</b>		
Unmarried	51.7	288
Married	48.3	269
<b>Type of Family</b>		
Joint Family	44.2	223

Nuclear Family	55.8	334
<b>Socio-economic status</b>		
Upper Middle Class	15.6	87
Lower Middle Class	67.5	376
Upper Lower class	16.9	94

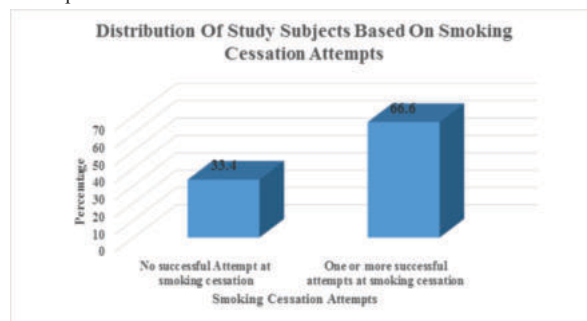
Fig. 1 shows that the prevalence of anxiety and stress was 60.5 % and 62.5% respectively among the study participants as opposed to depression with a comparatively lesser prevalence of 30 %. Fig 2 shows more than half of the subjects presented with low self-esteem (58%) and low self-efficacy (65%). Fig. 3 shows that more than 60 % of the participants were able to successfully give one or more successful attempts at quitting the habit.



**Fig. 1:** Distribution Of Psychological Parameters Among The Study Participants



**Fig 2:** Distribution Of Self-efficacy And Self- Esteem Among Study Participants



**Fig 3.** Distribution Of Study Participants Based On The Number Of Cessation Attempts Without Professional Assistance

**Regression Data:**

The Multivariate binary logistic regression revealed that those with Anxiety were 0.12 times less likely to undergo a successful smoking cessation attempt as opposed to those who weren't afflicted with anxiety. Stressed subjects were 0.19 times less likely to undergo a successful attempt as compared to those without stress. Those with High self-esteem were 2.53 times at greater odds of attempting to quit the habit as opposed to those with less self-esteem (Table 2). The model was fit with a Nagelkerke R<sup>2</sup> value of 43.9 %

**Table 2- Multivariate Logistic Regression Analysis Of The Association Of Sociodemographic Variables, Depression, Anxiety, Stress, Self-esteem And Self Efficacy With Successful Attempt/s At Smoking Cessation**

Independent Variables	B	S.E	Wald	p value	Odds Ratio	95 % CI	
						Lower	Upper
Age	-.18	.18	1.03	.31	.82	.57	1.19

Gender	.06	.34	.03	.85	1.06	.54	2.08
Marital S	-.18	.26	.49	.48	.83	.49	1.39
Socio -economic status	.07	.23	.11	.73	1.08	.68	1.70
Type of family	-.03	.21	.02	.88	.97	.64	1.46
Depression	.36	.25	2.14	.14	1.44	.88	2.35
Anxiety	-2.07	.31	42.28	.00*	.12	.06	.23
Stress	-2.31	.40	31.96	.00*	.09	.04	.22
High self-efficacy	.68	.48	1.96	.16	1.98	.76	5.18
High self esteem	.92	.46	4.05	.04*	2.53	1.02	6.24

\*p value < 0.05 statistically significant

## DISCUSSION

To the best of our knowledge, this study was a novel study that assessed the associations between depression, anxiety, stress, self-efficacy, and self-esteem with attempts to quit the smoking habit among heavy smokers in a metropolitan South Indian Adult population. The study revealed a higher prevalence of smoking among the young adult age bracket. These were consistent with a study by Barrington-Trimis et al that built on an emerging body of evidence that raise valid concerns about this increasing proportion of new initiates and daily smokers from adolescence to young adulthood.<sup>19</sup> The prevalence of smoking was higher among men in the sample which echoed the findings of a study by Dujrudee Chinwong et al that showed that males were more likely than females to smoke every day.<sup>20</sup> There was a high prevalence of smoking in the lower Socioeconomic class group which was consistent with the findings of Bridgette E. Garrett et al who found that low socioeconomic status was generally associated with increased cigarette smoking.<sup>21</sup> There were more unmarried subjects as opposed to married with the habit. This was similar to the results obtained in a Korean study where Smoking rates were higher for unmarried men and women compared to their married counterparts.<sup>22</sup>

Results from the multivariate regression analysis showed that among the psychological variables, Stress and Anxiety were negatively associated with the ability of a heavy smoker to successfully attempt to renounce the smoking habit. It has been widely reported among Smokers, that smoking helps to confront emotional conflicts, relax and ameliorate stress. Paradoxically, stress levels found in smokers exceed that in non-smokers. Nicotine dependence aggravates stress, and the apparent relaxing effect of smoking is transient; as soon as the nicotine has been metabolized, the feelings of stress and irritability resurface with the need to return to smoking to become relaxed again, resulting in a vicious cycle.<sup>23,24</sup>

The relationship between smoking and anxiety is quite complex. In comparison with the general population, individuals with anxiety disorders have been reported to have twice the odds of succumbing to the habit, with a higher prevalence of anxiety disorders being a common denominator among smokers as opposed to non-smokers, which resonates with our findings. The anxiolytic properties of nicotine from smoking have been hypothesized as one of the reasons for this association where smoking can be a perceived way a smoker self-medicates oneself to alleviate the symptoms of anxiety, which in the long run can impede the quitting process.<sup>25-27</sup>

High self-esteem was positively associated with the ability to undergo a successful attempt/s at quitting the habit. Similar observations were made by a study by Dorothy Szinay et al.<sup>28</sup> and Haukkala A et al<sup>29</sup> who found that lower self-esteem was positively associated with smoking status. A plausible reason behind the findings might be inherent in smoking being adopted as a coping mechanism to counter the negative well-being exhibited by those with low self-esteem. Conversely, according to the self-determination theory, those with higher self-esteem are less likely to show emotional vulnerability and instability, are more secure and highly motivated to bring about constructive changes in their life, with the willpower to renounce such habits.<sup>28,30</sup>

A limitation of this study was the implementation of a single-item measure to measure the construct of self-esteem that dichotomized the said outcome into high and low, precluding the measurement of the extreme deviations of this construct such as those with secure or fragile self-esteem. The cross-sectional design and convenience sampling of the study warrant the temporality and generalization of the results dictating the need for more multi-centric studies along similar lines on smokers.

## CONCLUSION

Supplementing the routine Tobacco Cessation Protocol with measures

to strengthen the self-esteem and provide psychological counselling for addressing Stress and Anxiety among heavy smokers may reduce their nicotine dependence, help regain self-control and motivate them to not only renounce the habit but also to retain abstinence from it. Our findings assert the need to optimize such a tailored approach to tackle nicotine dependence, thereby improving and increasing cessation attempts, and limiting relapses.

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**Conflict Of Interest - Nil**

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