RESEARCH ARTICLE

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Comparative Analysis of Mouth Self-Examination Awareness Amongst Tobacco Users in Urban and Rural Populations

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Abstract

Background: Oral cavity cancer is a growing concern, especially in developing countries like India, due to risk factors such as tobacco use, alcohol consumption, nutritional deficiencies, and spicy food intake. Early detection through screening and Mouth Self-examination (MSE) can significantly improve outcomes, but limited awareness and pain in advanced stages lead to delayed detection. This study aimed to assess the knowledge and practice of MSE among tobacco users in urban and rural populations. **Materials And Methods:** A comparative cross-sectional study was conducted involving tobacco users (smoking, smokeless, or both). An observational questionnaire-based approach was employed, with informed consent obtained from participants. A questionnaire in Hindi and English was used, consisting of demographic details and 13 close-ended questions. **Results:** The analysis revealed that individuals from urban areas (71.9%) exhibited significantly higher awareness of Mouth self- examination (MSE) compared to those from rural areas (1.9%). Chi-square analysis demonstrated that urban residents exhibited significantly higher awareness, understanding, confidence, desire for information, and positive attitudes towards Mouth Self-Examination (MSE) compared to rural residents. Multivariate analysis showed that education had a consistent and substantial impact on both knowledge and practice scores. **Conclusion:** The study highlights substantial urban-rural disparities in mouth self- examination (MSE) awareness and attitudes, with urban residents demonstrating significantly higher levels. Targeted interventions and awareness campaigns are vital to bridge this gap and improve oral health practices, especially in rural areas.

Keywords: Mouth Self-Examination- Rural- Urban- Smokeless Tobacco

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Introduction

Oral cavity cancer is one of the most common cancers in the world. The number of new cases of oral cavity cancer in the world is 3,77,713 in 2020 which is equivalent to an estimated risk of 2.0 per 1,00,000. Similarly, the number of deaths and estimated risk were 1,77,757 and 1.8 per 1,00,000 respectively. The prevalence of oral cavity cancer is on the rise in developing countries, particularly in South Asia [1]. The illness manifests with a diverse array of symptoms, including a variety of lesions or swellings that can appear as white, red, proliferative, or ulcerated areas [2]. Engaging in risky behaviors such as tobacco consumption, with or without alcohol, as well as facing nutritional deficiencies and regularly consuming spicy foods, can contribute to the development of these lesions. Detecting and addressing these conditions at an early stage can help prevent their progression towards malignancy [3-8]. Limited awareness of oral cancer symptoms and pain manifesting only in advanced stages often lead to delayed detection. Early-stage identification through screening significantly enhances patient prognosis, reducing mortality by 34% [6,9]. Asymptomatic and high-risk individuals benefit most, detecting disease earlier than symptomatic counterparts. It is economically viable when targeted at high-risk groups [10-15]. As oral cancer incidence rises among younger individuals, screening programs must extend beyond elderly high-risk patients. Low socioeconomic status (SES) individuals are also vulnerable. In resource-limited settings like India, mouth self-examination (MSE) serves as a practical, cost-effective alternative for early detection of oral cavity cancer, potentially improving outcomes by enabling timely intervention. Mouth self-exam (MSE) is a practical method in low socioeconomic regions like India to detect such lesions. Mouth self-examination is a personal check of oral structures for signs of abnormalities. It involves inspecting lips, gums, tongue, and other areas to detect early warning signs of oral health issues [16]. MSE enables high-risk individuals to self-assess using a mirror, promoting timely medical intervention upon detecting abnormalities [17-21]. The Global Adult Tobacco Survey (GATS-2) in 2017 reviews that tobacco is consumed by 28.6% of Indian population

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including 10.7% smoke form and 21.4% use smokeless tobacco (SLT) [22]. Tobacco is used in a wide variety of ways in India, both in smoking and smokeless forms [23]. According to the Union Ministry of Health and Family Welfare's, Global Adult Tobacco Survey 2 (GATS 2), 35.5% of adults in Uttar Pradesh who are 15 years of age or older use tobacco in some way. 42.6% of men, 15.2% of women and 29.4% of all adults currently use smokeless tobacco [24]. Uttar Pradesh, known for its large population and diverse regions, has a substantial number of tobacco users. With the high prevalence of tobacco consumption in the region, there is a growing concern about oral cavity cancer in the rural and urban population. In light of the aforementioned statistics, a study was deemed necessary to ascertain the level of awareness and practice of mouth self-examination (MSE) among tobacco users in both urban and rural populations. This study aims to facilitate targeted behavioral modifications and knowledge dissemination, thereby enabling effective interventions. Hence a comparative study was devised to evaluate the awareness of mouth self-examination (MSE) amongst tobacco users in urban and rural populations.

Materials and Methods

A comparative cross-sectional study was conducted among the outpatient department of Faculty of Dental Sciences, King George's Medical University, Lucknow (Urban) and Banthra Satellite Centre, Lucknow (Rural). This study implements an observational, cross-sectional study design about the knowledge and practices towards mouth-self-examination among tobacco users in urban and rural population. The study was carried out after obtaining ethical clearance from the Ethical Committee at King George's Medical University, Lucknow, UP. Participants included tobacco users, whether they smoked, used smokeless tobacco, or both, who expressed a willingness to take part in the investigator-administered questionnaire study. All study participants provided written consent. In cases where participants were illiterate, the consent form was read out to them. Individuals who, even with assistance from the investigator, were unable to understand the questions were excluded from the study.

Questionnaire details

The questionnaire underwent cross-cultural adaptation into the Hindi language. It comprised demographic information about the patients and 13 closed-ended questions. Participants were directed to answer all questions within a 15-minute time frame. The initial section of the questionnaire included general socio-demographic details of the participant, which were subsequently utilized for qualitative analysis. The latter portion addressed different aspects of awareness regarding Mouth Self-Examination. The knowledge section consists of 6 items and practice section consists of 7 items.

Questionnaire validation

Content validity of the MSE awareness questionnaire was rigorously examined by a panel of ten public health experts, ensuring relevance and appropriateness of each item. The Item Content Validity Index (ICVI) scores were calculated, providing quantitative measures of expert agreement on the questionnaire's ability to capture the targeted constructs. Questionnaire reliability was assessed using Cronbach's Alpha for three components: "Knowledge" (α = .903), "Practice" (α = .711), and the overall questionnaire (α = .911). This indicates strong internal consistency and reliability.

Sample Size Calculation

The sample size was calculated based on the prevalence from previous study and data values are imputed in G power software version 3.1.9.7.

Sample Size was calculated using the formula:

$$p = \frac{p_1 + rp_2}{1+r}$$

$$n \geq \frac{\left[Z_{1-\alpha/2}\sqrt{(r+1)p(1-p)} + Z_{1-\beta}\sqrt{rp_1(1-p_1)+p_2(1-p_2)}\right]^2}{r(p_2-p_1)^2}$$

Where, α= 0.05, β= 0.8, P_1= 0.36, P_2= 0.175, r= 1

Therefore, N=200. But it was decided to take a total sample size of 300. As it will enhance the precision of estimates, allowing for more reliable and accurate findings by reducing the margin of error in statistical analyses. Participants were selected based on convenience sampling technique to actively participate in the study.

Statistical analysis

After data collection it was analyzed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive analysis (Frequency, Percentage) and Inferential analysis (Chi square, Multivariate Analysis and correlation) was performed. In the multivariate analysis, the first crude odds ratio (OR) was obtained using independent variables age, sex, habitat, education, and tobacco type, and the dependent variables were knowledge percentage scores and practice percentage scores. This was followed by adjusting the models with age, sex, habitat, education, and tobacco type variables to obtain adjusted estimates of OR. This adjustment was made assuming an effect size of 0.05 and a significance level (p-value) of 0.05. The effect model used is a multivariate regression analysis. This type of analysis allows for the examination of the relationship between multiple independent variables (such as age, sex, habitat, education, and tobacco type) and one or more dependent variables (knowledge percentage scores and practice percentage scores). The model estimates the effect of each independent variable on the dependent variable(s) while controlling for the effects of other variables in the model. The multivariate regression model constructed for our study aimed to predict the knowledge and practice percentage scores based on the sociodemographic characteristics of the participants. Each independent variable was considered in relation to the dependent variables, with coefficients indicating the strength and direction of their respective effects. Additionally, the standard errors of coefficients provided insights into the precision of the estimates, while p-values determined the statistical significance of each variable's contribution to

the prediction.

Results

A total of 300 responses from tobacco users were obtained out of which 161 were from Rural and 139 from Urban. The Sociodemographic characteristics of the respondents are depicted in (Table 1).

Table 1. Demographic Distribution of Respondents

Variable		n (%)
Age	20 - 30 yr	144 (48.0%)
	30 - 40 yr	156 (52.0%)
Sex	Female	159 (53.0%)
	Male	141 (47.0%)
Place	Rural	161 (53.7%)
	Urban	139 (46.3%)
Education	10^{th}	27 (9.0%)
	12^{th}	158 (52.7%)
	Graduate	90 (30.0%)
	Post Graduate	25 (8.3%)
Tobacco type	Smoking	62 (20.7%)
	Smokeless	238 (79.3%)

n (%), Number of respondents (percentage)

Awareness (Knowledge and Practice) about Mouth Self-Examination

A significant portion of respondents demonstrated awareness of MSE. Over a third (34.3%) had heard of MSE, and a similar percentage (36.7%) knew that it involved examining one's oral cavity for suspicious lesions (Table 2). A considerable number were aware that MSE includes examining various areas in the mouth, such as the gums, tongue, and throat (41.0%). There was a good understanding of the potential benefits of MSE. A substantial portion believed that regular MSE could help identify early signs of oral cancer (44.0%) and recognized the increased risk due to tobacco use (84.0%). A notable number of participants reported being educated about the importance of MSE (39.7%). However, actual practice rates were slightly lower, with 37.3% having performed MSE. Confidence in recognizing abnormal signs during MSE was reported by 39.3% of respondents. The majority of participants were willing to incorporate MSE into their regular oral health routine (92.0%), and a similar proportion recommended it to others for better oral health (91.7%). This highlights a positive attitude towards MSE. A significant majority expressed a desire for more information or guidance on how to effectively perform MSE (92.3%). The chi-square analysis was performed to investigate the association between awareness (Knowledge and Practice) towards Mouth Self-Examination (MSE) and the place of residence (rural or urban) (Table 3). The analysis revealed that individuals from urban areas (71.9%) exhibited significantly higher awareness of MSE compared to those from rural areas (1.9%). This difference was highly significant ($p < 0.001$). The study found substantial disparities between rural and urban residents regarding their understanding of MSE. For various aspects, such as examining one's oral cavity for suspicious lesions, examining different areas inside the mouth, understanding the role of MSE in identifying early signs of oral cancer, and recognizing the importance of MSE in relation to tobacco use, urban residents consistently displayed better understanding than rural residents. All these differences were highly significant ($p < 0.001$). The analysis also indicated that urban residents (77.7%) were more confident about recognizing abnormal signs during MSE compared to their rural counterparts (6.2%). Additionally, urban residents (80.6%) were more likely to differentiate different patches during MSE than rural residents (7.5%). These differences were highly significant ($p < 0.001$). Residents of urban areas (87.1%) expressed a stronger desire to receive more information or guidance on performing MSE effectively compared to those in rural areas (96.9%). This difference was statistically significant ($p < 0.001$). Urban residents

Table 2. Distribution of Respondents According to Mouth Self-Examination (MSE) Awareness

MSE Item	Yes	No	Don't know
	n (%)	n (%)	n (%)
Ever heard of Mouth self-examination	103 (34.3%)	194 (64.7%)	3 (1.0%)
MSE examines own oral cavity for suspicious lesions.	110 (36.7%)	172 (57.3%)	18 (6.0%)
MSE examines inside of mouth, gums, tongue, and throat for unusual signs & symptoms.	123 (41.0%)	160 (53.3%)	17 (5.7%)
Regular MSE helps in identifying early signs of oral cancer	132 (44.0%)	158 (52.7%)	10 (3.3%)
Tobacco use increase the risk of oral cancer, making MSE important	252 (84.0%)	42 (14.0%)	6 (2.0%)
Educated about the importance of MSE	119 (39.7%)	171(57.0%)	10 (3.3%)
Ever done mouth self-examination	112 (37.3%)	182 (60.7%)	6 (2.0%)
Feel confident about recognizing abnormal signs during MSE	118 (39.3%)	170 (56.7%)	12 (4.0%)
Can differentiate different white or red patches during practice of MSE	124 (41.3%)	167 (55.7%)	9 (3.0%)
Think MSE should be performed/practiced often in every 2 months	274 (91.3%)	20 (6.7%)	6 (2.0%)
Willing to incorporate MSE as part of regular oral health routine	276 (92.0%)	19 (6.3%)	5 (1.7%)
Recommend MSE to others for better oral health	275 (91.7%)	22 (7.3%)	3 (1.0%)
Like to receive more information or guidance on performing MSE effectively	277 (92.3%)	20 (6.7%)	3 (1.0%)

n (%), Number of respondents (percentage)

Table 3. Awareness about Mouth Self-Examination (MSE) between Urban and Rural Area

MSE Item	Place		chi sq	p-value
	Rural	Urban		
	n (%)	n (%)		
Ever heard of Mouth self-examination	3 (1.9%)	100 (71.9%)	165.18	<0.001
MSE examines own oral cavity for suspicious lesions.	5 (3.1%)	105 (75.5%)	174.18	<0.001
MSE examines inside of mouth, gums, tongue, and throat for unusual signs & symptoms.	10 (6.2%)	113 (81.3%)	181.78	<0.001
Regular MSE helps in identifying early signs of oral cancer	16 (9.9%)	116 (83.5%)	177.18	<0.001
Tobacco use increase the risk of oral cancer, making MSE important	129 (80.1%)	123 (88.5%)	3.88	0.143
Educated about the importance of MSE	9 (5.6%)	110 (79.1%)	173.52	<0.001
Ever done mouth self-examination	6 (3.7%)	106 (76.3%)	178.53	<0.001
Feel confident about recognizing abnormal signs during MSE	10 (6.2%)	108 (77.7%)	162.89	<0.001
Can differentiate different white or red patches during practice of MSE	12 (7.5%)	112 (80.6%)	167.72	<0.001
Think MSE should be performed/practiced often in every 2 months	157 (97.5%)	117 (84.2%)	17.79	<0.001
Willing to incorporate MSE as part of regular oral health routine	159 (98.8%)	117 (84.2%)	21.74	<0.001
Recommend MSE to others for better oral health	159 (98.8%)	116 (83.5%)	22.96	<0.001
Like to receive more information or guidance on performing MSE effectively	156 (96.9%)	121 (87.1%)	10.4	<0.001

n (%), Number of respondents (percentage); chi sq, Chi-square value

were more inclined to support MSE practices. They were more likely to believe that MSE should be performed regularly every two months, to incorporate MSE into their regular oral health routines, and to recommend MSE to others for better oral health. All of these differences were highly significant ($p < 0.001$).

Correlations between Knowledge & Practice of Mouth Self-Examination

The correlation between the percentage of knowledge and percentage of practice score was found to be quite strong ($r=0.748$, $p= < 0.001$), indicating a positive relationship between the participant's knowledge and their corresponding practices. The study employed a multivariate analysis to understand how various sociodemographic factors influence the knowledge and practice percentage scores of the participants. The effects of different factors were assessed using a multivariate model, and the results are summarized in (Table 4). The analysis, with an R^2 of 0.754, unveiled significant effects on knowledge percentage scores. Education had the most substantial impact ($F = 9.51$, $p < 0.001$, effect size = 0.099), followed by Age ($F = 9.03$, $p = 0.003$, effect size = 0.034) and Place ($F = 10.57$, $p = 0.001$, effect size = 0.039). The interaction between Age and Tobacco Type was also significant ($F = 5.87$, $p = 0.016$,

Table 4. Multivariate Analysis to Estimate Effects of Sociodemographic Factors Over Knowledge & Practice Percentage Scores

Effect Source	Knowledge % score (Model fit R^2=0.754)			Practice % score (Model fit R^2=0.421)		
	F	p-value	effect size	F	p-value	effect size
Age	9.03	0.003	0.034	2.92	0.088	0.011
Sex	3.57	0.06	0.014	0.1	0.753	0
Place	10.57	0.001	0.039	0.28	0.596	0.001
Education	9.51	<0.001	0.099	6.91	<0.001	0.074
Tobacco Type	8.05	0.005	0.03	2	0.158	0.008
Age * Sex	1.56	0.213	0.006	0.26	0.612	0.001
Age * Place	1.43	0.233	0.005	3.72	0.055	0.014
Age * Education	0.68	0.567	0.008	2.74	0.044	0.031
Age * Tobacco Type	5.87	0.016	0.022	6.32	0.013	0.024
Sex * Place	4.44	0.036	0.017	1.18	0.278	0.005
Sex * Education	1.44	0.232	0.016	0.3	0.827	0.003
Sex * Tobacco Type	0.22	0.642	0.001	1.15	0.285	0.004
Place * Education	4.83	0.009	0.036	4.46	0.012	0.033
Place * Tobacco Type	25.86	<0.001	0.091	8.01	0.005	0.03
Education * Tobacco Type	0.67	0.57	0.008	0.81	0.487	0.009

F, F-value from ANOVA; p-value, Probability value indicating statistical significance; effect size, Measure of the strength of the relationship; Model fit R^2, Coefficient of determination indicating model fit

Table 5. Multivariate Regression Analysis to Estimate Effect Model of Sociodemographic Factors over Knowledge Percentage Scores

Dependent: Practice %	B	SE	t	p-value	Effect Size
Intercept	91.67	8.43	10.87	0	0.313
20 - 30 yrs.	-2.78	14.6	-0.19	0.849	0
30 - 40 yrs.	Ref.				
Male	-2.78	14.6	-0.19	0.849	0
Female	Ref.				
Rural	-70	13.06	-5.36	<0.001	0.1
Urban	Ref.				
10^{th}	-91.67	22.31	-4.11	<0.001	0.061
12^{th}	-50	11.92	-4.19	<0.001	0.064
Graduate	-1.67	12.5	-0.13	0.894	0
Post Graduate	Ref.				
Smoking	-25	22.31	-1.12	0.263	0.005
Smokeless	Ref.				

B, Unstandardized regression coefficient; SE, Standard error of the coefficient; t, t-value; p-value, Probability value indicating statistical significance; Effect Size, Measure of the strength of the effect

Table 6. Multivariate Regression Analysis to Estimate Effect Model of Sociodemographic Factors over Practice Percentage Scores

Dependent: Practice %	B	SE	t	p-value	Effect Size
Intercept	100	8.24	12.14	0	0.363
20 - 30 yrs.	-33.33	14.26	-2.34	0.02	0.021
30 - 40 yrs.	Ref.				
Male	-4.76	14.26	-0.33	0.739	0
Female	Ref.				
Rural	-37.14	12.76	-2.91	0.004	0.032
Urban	Ref.				
10^{th}	-57.14	21.79	-2.62	0.009	0.026
12^{th}	-47.62	11.65	-4.09	<0.001	0.061
Graduate	0	12.22	0	1	0
Post Graduate	Ref.				
Smoking	0	21.79	0	1	0
Smokeless	Ref.				

B, Unstandardized regression coefficient; SE, Standard error of the coefficient; t, t-value; p-value, Probability value indicating statistical significance; Effect Size, Measure of the strength of the effect

effect size = 0.022). For practice percentage scores (R^2 = 0.421), education remained significant (F = 6.91, p < 0.001, effect size = 0.074), while Age had a small effect (F = 2.92, p = 0.088, effect size = 0.011). Place and Tobacco Type did not significantly affect practice scores. Interactions had smaller effects on practice compared to education. In summary, this multivariate analysis demonstrates that education has a substantial and consistent impact on both knowledge and practice percentage scores. Age, habitat, and tobacco type also play a role in influencing knowledge scores, with the type of tobacco use interacting significantly with age. For practice scores, education is the primary driver, while the other sociodemographic factors have less prominent effects. These findings provide valuable insights into how sociodemographic characteristics relate to health knowledge and practices among the participants. In the multivariate regression analysis conducted to estimate the effect model of sociodemographic factors on knowledge percentage scores, several key findings emerged (Table 5). Participants between 20 and 30 years old (the reference category) showed no significant difference in knowledge scores compared to those aged 30-40 years. Males had knowledge scores similar to those of females, and both were considered as reference categories. Participants residing in rural areas had significantly lower knowledge scores, with a substantial effect (B = -70.00, SE = 13.06, t = -5.36, p < 0.001, Effect Size = 0.100). This implies that rural residents had a knowledge deficit compared to their urban counterparts. Educational levels had a significant influence on knowledge scores. Participants with a 10^{th}-grade education exhibited notably lower knowledge scores (B = -91.67, SE = 22.31, t = -4.11, p < 0.001, Effect Size = 0.061). Similarly, those with a 12^{th}-grade education

had reduced knowledge scores (B = -50.00, SE = 11.92, t = -4.19, p < 0.001, Effect Size = 0.064) compared to the reference group. Graduates and postgraduates did not significantly differ from the reference group (participants with a 30-40 years age range and no specific gender mentioned). Participants who reported smoking had slightly lower knowledge scores compared to those who used smokeless tobacco (B = -25.00, SE = 22.31, t = -1.12, p = 0.263, Effect Size = 0.005). However, this difference was not statistically significant. The multivariate regression analysis aimed at estimating the effect model of sociodemographic factors on practice percentage scores revealed several key findings (Table 6). Participants aged between 20 and 30 years exhibited significantly lower practice percentage scores compared to those aged 30-40 years, with a moderate effect (B = -33.33, SE = 14.26, t = -2.34, p = 0.020, Effect Size = 0.021). No significant differences were found between males and females in terms of their practice scores. Participants residing in rural areas had significantly lower practice scores compared to those in urban areas, with a moderate effect (B = -37.14, SE = 12.76, t = -2.91, p = 0.004, Effect Size = 0.032). This suggests that rural residents had a practice deficit compared to urban residents. Individuals with a 10^{th}-grade education exhibited significantly lower practice scores compared to the reference group, with a moderate effect (B = -57.14, SE = 21.79, t = -2.62, p = 0.009, Effect Size = 0.026). Participants with a 12th-grade education also had significantly lower practice scores, with a moderate effect (B = -47.62, SE = 11.65, t = -4.09, p < 0.001, Effect Size = 0.061). Graduates and postgraduates did not significantly differ from the reference group. Tobacco use, whether smoking or smokeless, did not have a significant impact on practice scores, as the coefficients were zero and the p-values were 1.000.

Discussion

This study first of its kind explores the awareness and practice of Mouth Self-Examination (MSE) among tobacco users in both urban and rural populations of Lucknow, Uttar Pradesh. The study objectives included assessing sociodemographic factors, knowledge, and practice of MSE in these populations. The study presents an in-depth analysis of the survey results, highlighting significant findings related to awareness, understanding, attitudes, and demographics. The study showed that a substantial number of participants had heard of MSE, indicating a reasonable level of awareness. Over one-third of the participants were aware of MSE, and this awareness varied significantly based on gender, education, and the type of tobacco use. Males, individuals with higher education levels, and those using smoking tobacco were more likely to be aware of MSE. This gender- based difference may be attributed to variations in educational and social opportunities between genders in the study region. Participants demonstrated a good understanding of the potential benefits of MSE, particularly regarding the early identification of oral cancer. It is encouraging that a large proportion of the population recognized the connection between tobacco use and oral cancer, emphasizing the importance of MSE for high-risk individuals. The differences in understanding between urban and rural populations were striking, with urban residents consistently showing better comprehension. This discrepancy could be attributed to differences in access to healthcare facilities, educational resources, and awareness campaigns in urban areas. The findings underscore the need for targeted awareness programs in rural regions. The analysis revealed that younger participants (20-30 years) had a slightly better awareness and understanding of MSE compared to those aged 30-40 years. This suggests the potential for better MSE awareness among younger individuals. The influence of education was evident, as participants with higher education levels displayed greater awareness, understanding, and willingness to practice MSE. This association is not surprising, as education often correlates with access to information and healthcare resources. This was in accord to another Indian study who reported that compliance to health education pertaining to MSE was more in individuals having higher education, no risk factors, in the younger age group, and among males [25]. The most significant disparities were observed between urban and rural populations. Urban residents exhibited significantly higher awareness, better understanding, confidence, willingness to practice MSE, and a stronger desire for information. This urban-rural divide could be attributed to disparities in access to healthcare services and the influence of urban lifestyle factors, which often lead to increased awareness and understanding of health-related issues. The study emphasizes the need for tailored awareness campaigns in rural areas to bridge this gap. There is a critical link between regular mouth self-examination and successful tobacco cessation efforts. According to Amarasinghe et al. [26], interventions aimed at quitting tobacco use significantly benefit patients seeking treatment at oral health institutes, demonstrating improved outcomes in tobacco cessation. Moreover, Medawela et al. [27] highlight that enhancing the attitudes, confidence, and practices of clinical dental undergraduates towards tobacco cessation is essential for overcoming perceived barriers and promoting effective tobacco cessation strategies. Therefore, regular mouth self-examination can serve as a vital component of these interventions, helping to identify early signs of oral health issues related to tobacco use and reinforcing the importance of quitting tobacco for maintaining oral health. The analysis revealed that individuals using smoking tobacco were more aware of MSE, demonstrated better understanding, displayed higher confidence, and were more willing to incorporate MSE into their oral health routines compared to those using smokeless tobacco. This difference could be due to variations in the perception of health risks associated with different types of tobacco use. It is essential to focus on both groups, as both are at risk of oral cancer, and MSE can be beneficial for all tobacco users. The majority of participants expressed a willingness to incorporate MSE into their oral health routines and recommended it to others for better oral health. The positive attitude towards MSE is encouraging and suggests the potential for effective interventions through educational programs.

A notable finding was the widespread desire for more information or guidance on performing MSE effectively. This suggests that individuals are open to learning and improving their MSE skills. Healthcare authorities should consider providing comprehensive educational materials and training to meet this need. The study's findings have several important implications for public health interventions. It highlights the need for targeted awareness campaigns on MSE, especially in rural areas, and among individuals with lower education levels and those using smokeless tobacco. These campaigns should focus on increasing awareness, understanding, and confidence in MSE. Additionally, educational materials and training programs should be made available to address the expressed desire for more information on MSE. The study has several limitations, including the relatively small sample size and the use of a questionnaire-based survey, which can be subject to recall bias. Additionally, the study's cross-sectional design does not allow for causal inferences.

In conclusion, this Study provides valuable insights into the awareness and practice of Mouth Self-Examination among tobacco users in urban and rural populations of Lucknow, Uttar Pradesh. The findings emphasize the importance of targeted awareness programs, especially in rural areas, to improve the early detection of oral health issues and reduce the burden of oral cancer in the region. By addressing these disparities, healthcare authorities can work towards more effective prevention and intervention strategies.

Author Contribution Statement

Below is list the individual contributions of each author to the research. - Dr Aman Rajput, Dr Vinay Kumar Gupta: Conceptualization, Methodology. Dr Aman Rajput, Dr Mohit Kumar Kanoujia, Dr Deepak S: Data curation, Investigation. Dr Aman Rajput, Dr Vinay Kumar Gupta, Dr Sonal Bhatia, Dr Atrey J. Pai Khot: Writing - original draft preparation, Visualization. Dr Gaurav Mishra, Dr Sumit Kumar: Supervision, Project administration. Dr Vinay Kumar Gupta, Dr Sonal Bhatia, Dr Atrey J. Pai Khot: Formal analysis, Validation

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Availability Of Data

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Scientific Approval

This research obtained ethical approval from the Institute Ethics Committee (King George's Medical University, Lucknow, UP Ref. Code. - XXII-PGTSC-IIA/P28) ensuring compliance with established ethical standards throughout the study. No ethical issues were encountered, and the research strictly adhered to the approved ethical guidelines.

Conflict Of Interest

There authors declare no conflict of interest.

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