**ISSN- 0301-1216**
*Indian J. Prev. Soc. Med. Vol. 55, No.4, 2024*

# Prevalence of Smokeless Tobacco Consumption among Auto-Rickshaw Drivers in Chennai City

Prasanna Prabhu D[1], Jayashree K[2]

## ABSTRACT

**Background:** Globally, smokeless tobacco usage as a public health concern was on the rise. In addition to being one of the main causes of chronic diseases, smokeless tobacco is dangerous and a serious carcinogen for users. **Aim:** The current study aimed to examine the use of smokeless tobacco (SLT) and to focus on the influences of social support among drivers of auto-rickshaws who use smokeless tobacco compared to those who do not. **Materials and Methods:** The study included a sample of 120 male auto-rickshaw drivers from in and around Chennai city, of which 70 were non-users and 50 used smokeless tobacco. An ex-post factor research design and Convenient sampling methodology were employed in this study. In this study, the tools utilized were, the Harmful Substance Use Screening Tool - Hnamte and Sasikala, 2020,Content-Based Media Exposure Scale (C-ME2) – A.H. Den Hamer, E.A. Konijn and B.J. Bushman, 2017 and Multidimensional Scale of Perceived Social Support (MSPSS) - Zimet GD, Dahlem NW, Zimet SG, Farley GK, 1988. The SPSS was used for the data analysis of the variables. To evaluate the data, an independent sample t-test and Pearson's Product Moment Correlation were employed. **Results and Conclusion:** The results of the study indicate that pro-social media exposure was higher among non-smoking tobacco users than among SLT users. Media coverage and social support for the use of smokeless tobacco among auto-rickshaw drivers did not correlate. Additionally, there was no difference in the social support and exposure to anti-social media among users and non-users of smokeless tobacco.

***Keywords:*** Smokeless tobacco, auto-rickshaw drivers, media exposure, social support.

## Introduction

Globally, smokeless tobacco usage as a public health concern was on the rise. In addition to being one of the main causes of chronic diseases, smokeless tobacco is dangerous and a serious carcinogen for users. The global tobacco epidemic is a serious public health alarm that impacts millions of individuals. Many people still smoke even though it is recognized to pose a health illness, which contributes to higher rates of morbidity and death [1]. Nearly1.2 million non-smokers are exposed to second-hand smoke every year. The majority of tobacco-related health issues are concentrated in low- and middle-income countries, home to an estimated 1.1 billion smokers. Because tobacco is so addicting, quitting is tough for those who use it. As a result, household expenses are diverted, which causes families to go without necessities like food and shelter[2].

Research indicates a correlation between the type of work and increased tobacco product use. Workers on a daily pay and drivers are particularly susceptible to rising tobacco product use. In India, auto-rickshaws are an essential mode of transportation.

---

1. Prasanna Prabhu . D, Research Scholar, Centre for Educational Management and Applied Science, NITTTR, Chennai – 113. **Email:** prasannaprabu2010@gmail.com; Contact number: +91 Mob. 9176171537
2. Jayashree .K, M.Phil Research Scholar, Department of Psycho-Oncology, Cancer Institute (WIA) Adyar, Chennai – 22. , **Email:** jayashree721997@gmail.com; Mob. +91 8939209822

**Corresponding Author:** Prasanna Prabhu.D, Research Scholar, Centre for Educational Management and Applied Science, NITTTR, Chennai – 113. **Email:** prasannaprabu2010@gmail.com; Contact number: +91 Mob. 9176171537

| Submission | 18.10.2024 | Revision | 25.10.2024 | Accepted | 21.11.2024 | Printing | 31.12.2024 |
|---|---|---|---|---|---|---|---|

***Prior Publication*: Nil*; Source of Funding:* Nil; *Conflicts of Interest*: None, *Article #519/ 690***

Due to their demanding work schedules, late night shifts, financial worries, lengthy workdays in traffic, and extremely polluted environments, auto-rickshaw drivers are likely to experience stress at work. Additionally, the extra time they have during work hours puts them at risk for increased tobacco use[3, 4, 5, 6, 7].

Tobacco's widespread usage and disastrous effects on people and communities have led the World Health Organization (WHO) to classify it as an epidemic. Whether a person uses a smokeless product or not, tobacco usage kills half of its users, which is one of the most concerning statistics.8 million deaths each year are caused by tobacco usage, of which over 7 million are directly related to it. The main causes of these deaths include cancer, respiratory disorders, and cardiovascular diseases. Notably, 80% of tobacco users come from low- and middle-class families, indicating that the burden of tobacco use is not evenly distributed[2]. Furthermore, a 2020 survey discovered that men made up 22.3% of tobacco smokers worldwide. This emphasizes the necessity of focused interventions to lower tobacco use, especially in more vulnerable populations[8]. The WHO created the Framework Convention on Tobacco Control (FCTC) in 2003 in response to the tobacco epidemic. It is a legally binding agreement that employs evidence-based policies and initiatives to mitigate tobacco consumption and its detrimental effects on health. It comprises provisions for raising tobacco product taxes, outlawing tobacco sponsorship and advertising, establishing smoke-free areas, and offering quitting assistance. These policies are successful in lowering tobacco usage and enhancing the general public's health. The FCTC from the WHO offers a charter for tackling this problem with evidence-based interventions and policies. By putting these strategies into practice, we can lower tobacco use and stop the harmful effects it has on people's health both individually and collectively[9].

The use of smokeless tobacco may be more common in certain societies or cultures where it is seen as socially acceptable, if not encouraged. Individuals may begin using smokeless tobacco due to peer pressure, or they may feel compelled to conform to social norms to fit in the history of family members who are smokeless tobacco users is more likely to start using it themselves if their family members do. According to the Centers for Disease Control and Prevention, Smokeless tobacco is influenced by several factors, including a family history of substance use, positive parental attitudes toward the behaviour, inadequate parental supervision, parental substance use, family rejection of gender identity or sexual orientation, association with peers who use drugs or alcohol, lack of school connectedness, low academic achievement, childhood sexual abuse, and mental health issues.[10, 11, 12].

Marketing and advertising on smokeless tobacco companies and their strategies used to target particular demographics, such as youth or athletes. Nicotine, an addictive substance included in tobacco products, can lead to physical dependence and withdrawal symptoms in users who attempt to stop using smokeless tobacco[13]. The availability and accessibility of items containing smokeless tobacco may potentially promote their use[14]. Public perception and awareness can be significantly impacted by media exposure. A particular individual or organization's profile can be raised by media exposure, which can have both positive and negative effects on their visibility, credibility, and impact[14, 15].

The frequency of exposure to content on different media platforms, such as pro- and anti-social media content, can be defined as content-based media exposure.[16] The media has an impact on teenage development because it gives them access to knowledge on gender roles, sociocultural norms, stereotypical behaviour, etc. as they prepare to become adults.[17] Adolescents are more sensitive to approval or rejection on social media, and peer pressure can also happen on these channels.[18] Additionally, there could also be a correlation between exposure to specific types of media content and an increase in aggressive conduct, drug abuse, risky sexual behaviour, obesity, or other behavioural issues [19, 20]. Slater and Henry (2013) discovered that listening to music on media channels like television, and the Internet had a direct impact on teenage initiation of alcohol and cigarette use in a long-term study on popular music and substance use. Furthermore, there was an indirect impact on the usage of marijuana, cigarettes, and alcohol.[21]

Adult tobacco usage behaviour can be significantly influenced by media exposure. Research has repeatedly demonstrated that teenagers and young adults are more likely to start smoking if they are exposed to tobacco advertising and promotion, smoking in motion pictures and television shows, and pro-tobacco statements on social media. However, media campaigns opposing tobacco use are successful in lowering tobacco usage. It is crucial to understand that minority

and low-income areas frequently experience higher rates of tobacco advertising and promotion, which exacerbates health inequities. Thus, tactics to restrict media exposure to tobacco use raise public awareness of anti-tobacco media campaigns, and address health inequities associated with tobacco marketing should all be included in attempts to reduce tobacco use[22].

Both nationally and internationally, tobacco product use is still more common than it should be. The risks associated with tobacco use are also rising. Therefore, it is critical to comprehend how tobacco products are used and how the vulnerable population views tobacco use. Therefore, the researchers decided that it was necessary to survey auto-rickshaw drivers to learn more about the perception of tobacco use and the patterns surrounding the use of tobacco products. Healthcare professionals will be able to plan intervention programs for tobacco cessation among the population with the help of this study, which will give them insight into the availability, and usage patterns of various tobacco products, and their perceptions regarding tobacco consumption.

In light of this, the current investigation was conducted to ascertain the patterns of tobacco product usage and the perceptions of tobacco consumption among adult tobacco product users.

**Aim:** The present study aims to examine the use of smokeless tobacco (SLT) and to focus on the influences of social support among drivers of auto-rickshaws who use smokeless tobacco in comparison to those who do not.

**Statement of the Problem:** Do media exposure and social support influence auto-rickshaw drivers' usage of smokeless tobacco?

**Objectives of the Study**

1. To identify the relationship of media exposure with social support among smokeless tobacco use among auto drivers.
2. To identify the difference in media exposure and social support between smokeless tobacco users and non-users among auto drivers.

**Hypotheses**

**$H_a$1 – $H_a$3–**Anti-social media exposure, Pro-social media exposure, and Social support would be related to smokeless tobacco users among auto drivers.

**$H_a$4 - $H_a$5 –** Anti-social media exposure and Pro-social media exposure would be related to social support among smokeless tobacco users and non-users.

**$H_0$6 -** There will be no significant difference in media exposure and social support between smokeless tobacco users and non-users.

## Materials and Methods

**Size of the Study:** A total of 120 auto drivers, ranging in age from 30 to 65, who were all male and comprised of 70 non-users and 50 users of smokeless tobacco, expressed reservations about taking part in the study.

**Study setting:** Around Chennai city, the survey was carried out.

**Research Design:** An ex-post factor research design was employed in this investigation.

**Sampling Technique:** A Convenient sampling approach was employed to gather information regarding the researcher's familiarity and closeness.

**Procedure for data collection:** The technique of collecting data was through questionnaires. The data were gathered in the auto-rickshaw stands. Due to the population's lack of education, the tool has been translated into Tamil, and part of the data was collected by explaining the questions to the population.

## Variables

**Independent variable -** Media Exposure and Social support

**Dependent variable -** Smokeless tobacco usage (SLT)

**Demographic variables -** Age, Education, Religion, Family type, Family members, Home type, Children, Income, Habit of smoking, Habit of drinking, Family members using SLT, and Friends using SLT.

## Questionnaires

### Part – I: Harmful Substance Use Screening Tool - Hnamte and Sasikala, 2020.[23]

There are three sections to the tool (A, B, and C). The demographic information is included in Part A and covers things like age, gender, family history, and the kind of substance used. The background information on the use of dangerous substances is contained in Part B. Twelve items in Part C have a "yes" or "no" response option. 'Yes' is marked as '1' and 'no' is coded as '0'. For Part C of the screening test, the results are added up to produce a single overall score that ranges from 0 to 12. The screening tool's split-half reliability was determined to be 0.776 and the test-retest reliability to be 0.932.

### Part – II: Content-Based Media Exposure Scale (C-MES2) –A.H. Den Hamer, E.A. Konijn and B.J. Bushman, 2017.[16]

An expanded version of the original scale is the C-MES2. The C-ME2 has been expanded to incorporate pro-social media content, whereas the initial scale measured exposure to antisocial media content. As a result, the C-ME2 is composed of two subscales: pro- and anti-social media material, with 10 and 12 items respectively. The scale calculates how frequently a user is exposed to various forms of pro- and antisocial media-related content on different sites. The response scale had a 5-point rating system with 1 denoting never and 5 denoting always. Prosocial media content ratings range from 10 to 50, whereas antisocial media content values span from 12 to 60. Higher scores suggest more media material exposure. The internal consistency for pro-social media was 0.88 and anti-social media was 0.89. For the entire score, the Cronbach's alpha was 0.90.

### Part – III: Multidimensional Scale of Perceived Social Support (MSPSS) - Zimet GD, Dahlem NW, Zimet SG, Farley GK, 1988. [24]

There are twelve items on the scale. They are grouped into factor groups based on the social support source - Family, Friends, and Significant Others. A five-point rating system, including options for "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree," must be used to indicate the response to each topic, 48 is the highest score that can be earned, and 0 is the lowest. The following items fall under the "Significant Others" dimension: 1, 2, 5, and 10, the "Family" dimension: 3, 4, 8, and 11, and the "Friends" dimension: 6, 7, 9, and 12. The overall scale's dependability and internal consistency were 0.88. Friends (0.75), Family (0.85), and Significant Others (0.72) are the reliability scores for each dimension. MSPSS established construct validity and showed excellent internal reliability, with coefficient alpha levels that were similar to those seen in the initial study. [32]

**Translation:** Since the study sample consisted of auto-rickshaw drivers, reliability and validity were established for each instrument by translating it into Tamil, the regional language. The tool's split-half reliability and face validity were determined to be valid.

**Statistical Analysis:** The SPSS was used for the data analysis of the variables. The data was analyzed using Pearson's Product Moment Correlation and Independent sample t-test. The association between drivers who use smokeless tobacco and those who do not was determined using Pearson's correlation. The difference in social support, pro- and anti-media exposure, and between SLT users and non-users was determined using an independent sample t-test.

## Results

To determine the significant association between social support with smokeless tobacco, pro- and anti-social media exposure, and social support, the aforementioned Tables -1 & 2 display Pearson's product-moment correlation coefficient. Among the aforementioned research factors, the obtained value demonstrates no significance. Consequently, the framed hypothesis (Ha1–Ha6) was disproved.

**Table –1:** Shows the relationship between anti-social and pro-social media exposure and social support with smokeless tobacco users among auto-rickshaw drivers.

| Variables | Smokeless Tobacco (SLT) Users |
|---|---|
| Anti-Social Media Exposure | $0.11^{(NS)}$ |
| Pro-Social Media Exposure | $0.112^{(NS)}$ |
| Social Support | $0.071^{(NS)}$ |

NS= Not Significant

**Table –2:** Shows the relationship between anti-social and pro-social media exposure and social support among SLT users and non-users of auto-rickshaw drivers.

| Variables | Smokeless Tobacco (SLT) Users |
|---|---|
| Anti-Social Media Exposure | $0.06^{(NS)}$ |
| Pro-Social Media Exposure | $0.161^{(NS)}$ |

NS= Not Significant

**Table – 3:** The Mean Difference in Anti-social and Pro-social Media Exposure and Social support between Smokeless Tobacco Users and Non-Users among auto-rickshaw drivers.

| Variables | SLT | No. | Mean ± SD | T and P value |
|---|---|---|---|---|
| **Anti-Social Media Exposure** | Users | 50 | 22.02±5.54 | $T=0.49^{(NS)}$ P=0.96 |
| | Non-users | 70 | 21.97±5.28 | |
| **Pro-Social Media Exposure** | Users | 50 | 18.44±5.09 | $T=6.53^{(NS)}$ P=0.001 |
| | Non-users | 70 | 25.07±5.79 | |
| **Social Support** | Users | 50 | 33.44±9.91 | $T=0.78^{(NS)}$ P=0.044 |
| | Non-users | 70 | 31.84±7.07 | |

NS= Not Significant

From the aforementioned Table 3 Independent sample t-test between the research variables and the non-users of smokeless tobacco and the users of auto-rickshaw drivers revealed no significant difference, which led to the acceptance of the framed hypothesis (H06).

## Discussion

Media exposure does not have any relation to SLT users. The pro-social media exposure and the anti-social media exposure do not have any social relations with SLT users; this may be because the SLT users were reported to be fully scheduled with their daily routine and don't have any time to watch TV or any social media but the SLT users and non SLT users were having the habit of reading newspaper even though their education background is litter lower compared to other working professions. This may be the cause of SLT users' lack of a discernible link between exposures to pro- and anti-social media. The majority of auto-rickshaw drivers stated that they use SLT in the afternoon since it reduces their workload and they get bored at the time. A few non-SLT users mentioned that they enjoy watching and listening to vintage music. Most drivers of auto-rickshaws don't watch TV or use social media regularly. This may be because the majority of auto-rickshaw drivers are middle-aged or older, and since they support their families primarily through their work, they may be more focused on their careers and income than on social media. This would explain why there isn't a significant correlation between the pro- and anti-social media exposure of SLT users. In addition, cultural norms, personal preferences, and habits might have an impact on the association between SLT use and media exposure. The amount of anti-social media exposure that SLT users and non-users experience is the same. This might occur as everyone in the population is middle-aged and has the maturity to know what is good and wrong. As a result, their workload or unfavourable content on anti-social media may influence what they watch or prevent them from seeing anti-social media content.

There is no significant relationship between social support and SLT usage. This might occur as a result of the fact that they serve as the primary pillars supporting their family's needs for moral support, financial assistance, and decision-making. The SLT users reported that they have trouble discussing their problems with others and family because if they tell their wives or children about their problems, they may fear or panic, so they generally avoid sharing their personal and social support. The auto drivers reported that they completed their work on their own without expecting assistance from others. According to the SLT users, they don't seek out their friends' help because they began using SLT at a younger age and don't want to talk to their friends about their problems or accept advice from them. SLT users tend to have more SLT-using friends. A single SLT user may become an obstacle to another SLT user wanting to break the habit of utilizing a friend.

Social support does not differ between SLT users and non-users. This might occur as a result of the fact that both groups indicated their wives and kids as their social supports, which is similar. Thus, the group does not appear to have a particularly distinct social support network.

## Conclusion

The relationship between social media exposure, smokeless tobacco use, and social support among auto-rickshaw drivers were studied. The results indicate that there is no significant correlation between social media exposure and social support among both smokeless tobacco users and non-smokers. Interestingly, the research did not find a distinction between social media exposure and SLT users and non-users. In conclusion, the tobacco epidemic is a global public health challenge that requires urgent action. The study indicates that cultural norms and attitudes must be appropriately and effectively addressed to prevent, control, and mitigate the impacts of using smokeless tobacco. Additionally, to lower consumption among people, more effective intervention programs in this area must be designed.

## Limitations of the Study

1. As a convenience sample approach was employed, it is not feasible to draw broad conclusions.
2. To thoroughly evaluate the study and determine the factors influencing the results, the interview approach may be utilized in place of the questionnaire method.
3. Since it is against the law to sell smokeless tobacco products in Tamil Nadu, consumers of these items were reluctant to respond to the questionnaires.

## Implications of the Study

The differences in social support between smokeless tobacco users and non-users among drivers suggest that tobacco use may have distinct effects on social support networks. This emphasizes how crucial it is to design targeted interventions that cater to the unique social support requirements of smokeless tobacco users, especially within certain demographics like drivers of auto-rickshaws.

The comprehension of the relationship between social media exposure, usage of smokeless tobacco, and social support depends on individual factors. It was shown that among smokeless tobacco users who started using tobacco on their own, there were significant differences in anti-social media exposure, pro-social support, social support from others, and family-social support. This highlights the significance of considering personal characteristics and experiences in the development of therapies and policies related to tobacco control and social support.

**Ethical Consent:** According to the guidelines of the institutional ethical committee, no ethical statement or permission is needed for this investigation.

**Sponsorship and Financial Assistance:** None.

**Conflict of Interest:** There are no conflicts of interest, according to the authors.

## List of Abbreviations

SLT : Smokeless Tobacco

WHO : World Health Organization

FCTC : Framework Convention on Tobacco Control

C-MES2: Content-Based Media Exposure Scale

MSPSS : Multidimensional Scale of Perceived Social Support

## References

1. Mahnaz Solhi, Esmaeil Fattahi, Zahra Sadat Manzari, Prakash C Gupta, Mehdi Kargar, Parisa Kasmaei and Hadis Barati. The Reason for using smokeless tobacco: A Review. Iran Journal of Public Health. 2021 Mar; 50 (3): 492-501.
2. World Health Organization (WHO), Tobacco, World Health Organization, Geneva (26 July 2021).
3. Subendiran S. Socio-economic and lifestyle problems of auto drivers in Palani. Int J Adv Res Computer Sci Manag Stud. 2014; 2: 165-172.
4. Ray N.K, Awate R, Narasannavar A, et al. A cross-sectional study on pattern of tobacco consumption and effects on health among auto rickshaw drivers in Nehru Nagar, Belagavi city. Int J Healthc Biomed Res. July 2017; 5: 102-108
5. Kaul S, Gupta A.K, Sarkar T, Ahsan S.K, Singh N.P. Substance abuse and depression among auto-rickshaw drivers: a study from the national capital region of Delhi, India. Indian J Med Specialties. 2019; 10: 143-148.
6. Arora P, Kaur G, Khokar A, Jindal A.V. Prevalence and pattern of tobacco use among auto rickshaw drivers of South Delhi: a cross-sectional study. Int J Community Med Publ Health (IJCMPH). 2018; 5: 3464-3468
7. Shakeel Mohan, Binu Margaret, Manjula. Perception towards tobacco consumption and its usage among auto rickshaw drivers of Udupi District, Karnataka, India: A cross-sectional study. Clinical Epidemiology and Global Health, 2002.Volume 15, 2022, 101005, ISSN 2213-3984.
8. WHO Report on the Global Tobacco Epidemic. Addressing new and emerging products. eISBN 2021, 978-92-4-003209-5
9. WHO Framework Convention on Tobacco Control & World Health Organization [Editors]. WHO Framework Convention on Tobacco Control. 2003. ISBN: 9241591013
10. Han BH, Wyatt LC, Sherman SE, Islam NS, Trinh-Shevrin C, Kwon SC. Prevalence and Correlates of Cultural Smokeless Tobacco Products among South Asian Americans in New York City. J Community Health. 2019 Jun;44(3):479-486.
11. National Center for Chronic Disease Prevention and Health Promotion (US) Office on Smoking and Health. Atlanta (GA): Centers for Disease Control and Prevention (US); 2012.

12. Sharma R, Martins N, Tripathi A, Caponnetto P, Garg N, Nepovimova E, Kuca K, Prajapati PK. Influence of Family Environment and Tobacco Addiction: A Short Report from a Post-Graduate Teaching Hospital, India. Int J Environ Res Public Health. 2020 Apr 21;17 (8):2868.
13. Institute of Medicine (US) Committee on Preventing Nicotine Addiction in Children and Youths; Lynch BS, Bonnie RJ, editors. Washington (DC): National Academies Press (US); 1994.
14. Liao CH. Exploring the Influence of Public Perception of Mass Media Usage and Attitudes towards Mass Media News on Altruistic Behavior. Behav Sci (Basel). 2023 Jul 26; 13 (8):621.
15. Liao, Chi-Horng. Exploring the Influence of Public Perception of Mass Media Usage and Attitudes towards Mass Media News on Altruistic Behaviour. Behavioural Science. 2023.
16. Den Hamer AH, Konijn EA, Plaisier XS, Keijer MG, Krabbendam LC, Bushman BJ. The Content-based Media Exposure Scale (C-ME): Development and Validation. Computers in Human Behavior. 2017; Volume 72, Pages 549-557. ISSN 0747-5632.
17. Beyens Ine, Frison, Eline, Eggermont Steven. I don't want to miss a thing: Adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook-related stress. Computers in Human Behavior. 2016; 64.
18. Crone EA, Konijn EA. Media use and brain development during adolescence. Nat Commun 9, 588 (2018).
19. Agarwal, Vivek & Dhanasekaran, Saranya. Harmful effects of media on children and adolescents. Journal of Indian Association for Child and Adolescent Mental Health. 2012, 8, 38-45.
20. Villani, S. Impact of media on children and adolescents: A 10-year review of the research. Journal of the American Academy of Child & Adolescent Psychiatry, 2001; 40(4), 392–401.
21. Slater, Michael. Reinforcing Spirals Model: Conceptualizing the Relationship Between Media Content Exposure and the Development and Maintenance of Attitudes. Media Psychology. 2014; 18. 1-26.
22. Donaldson SI, Dormanesh A, Perez C, Majmundar A, Allem JP. Association between Exposure to Tobacco Content on Social Media and Tobacco Use: A Systematic Review and Meta-analysis. JAMA Pediatr. 2022 Sep 1;176 (9):878-885.
23. Hnamte, Lalbiaknii, Sasikala S. Validation of the Harmful Substance Use Screening Tool for Adolescents - Mizo version. Indian Journal of Psychology. 2020; 202-209.
24. Zimet GD, Dahlem NW, Zimet SG, & Farley GK. The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment, 1988; 52 (1), 30–41.

**Citation:** D. Prasanna Prabhu, K. Jayashree. Prevalence of smokeless tobacco consumption among auto-rickshaw drivers in Chennai City. Indian J Prev Soc Med, 2024; 55 (3): **316-323.**