ISSN 0973-2063 (online) 0973-8894 (print)

Bioinformation 22(10): 6585-6588 (2026)

©Biomedical Informatics (2026)

BIOINFORMATION
Discovery at the interface of physical and biological sciences

BIOMEDICAL INFORMATICS

www.bioinformation.net

Volume 22(10)

Research Article

Received October 1, 2026; Revised October 31, 2026; Accepted October 31, 2026, Published October 31, 2026

DOI: 10.6026/973206300226585

SJIF 2026 (Scientific Journal Impact Factor for 2026) = 8.478
2022 Impact Factor (2023 Clarivate Inc. release) is 1.9

Declaration on Publication Ethics:
The author's state that they adhere with COPE guidelines on publishing ethics as described elsewhere at https://publicationethics.org/. The authors also undertake that they are not associated with any other third party (governmental or non-governmental agencies) linking with any form of unethical issues connecting to this publication. The authors also declare that they are not withholding any information that is misleading to the publisher in regard to this article.

Declaration on official E-mail:
The corresponding author declares that lifetime official e-mail from their institution is not available for all authors

License statement:
This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly credited. This is distributed under the terms of the Creative Commons Attribution License

Comments from readers:
Articles published in BIOINFORMATION are open for relevant post publication comments and criticisms, which will be published immediately linking to the original article without open access charges. Comments should be concise, coherent and critical in less than 1000 words.

Disclaimer:
Bioinformation provides a platform for scholarly communication of data and information to create knowledge in the Biological/ Biomedical domain after adequate peer/editorial reviews and editing entertaining revisions where required. The views and opinions expressed are those of the author(s) and do not reflect the views or opinions of Bioinformation and (or) its publisher Biomedical Informatics. Biomedical Informatics remains neutral and allows authors to specify their address and affiliation details including territory where required.

Edited by Ritik Kashwani
E-mail: docritikkashwani@yahoo.com
Citation: Venkatesan *et al*. Bioinformation 22(10): 6585-6588 (2026)

Cravings outweigh confidence: Nicotine dependence and smoking abstinence self-efficacy among adult male smokers in an urban south Indian community

Premalatha Venkatesan[1], Shankar Shanmugam Rajendran[2,*], Gomathy Priya Venkatachalam[1], Vanitha Narayanasamy Naidu[1], Karthika Devandiran[1], Arockia Vinolia Amalraj[1] & Sumathi Murugaiyan[1]

[1]Department of Community Health Nursing, College of Nursing, Madras Medical College, The TN Dr MGR Medical University, Chennai, Tamil Nadu, India; [2]Department of Nursing Research, College of Nursing, Madras Medical College, The TN Dr MGR Medical University, Chennai, Tamil Nadu, India; *Corresponding author

Affiliation URL:
https://tnmgrmuonline.in/

ISSN 0973-2063 (online) 0973-8894 (print)
Bioinformation 22(10): 6585-6588 (2026)
©Biomedical Informatics (2026)

Author contact:
Premalatha Venkatesan - E-mail: prems00005@gmail.com
Shankar Shanmugam Rajendran - E-mail: shankarshaki@yahoo.com
Gomathy Priya Venkatachalam - E-mail: kgksavan@gmail.com
Vanitha Narayanasamy Naidu - E-mail: nvanitha967@gmail.com
Karthika Devandiran - E-mail: karthika.d38@gmail.com
Arockia Vinolia Amalraj - E-mail: vinoliaxavier86@gmail.com
Sumathi Murugaiyan - E-mail: sumathimary81@gmail.com

Abstract:
Tobacco smoking remains a leading preventable cause of morbidity and mortality, with nicotine dependence posing a major barrier to successful smoking cessation. Therefore, it is of interest to assess the nicotine dependence and smoking abstinence self-efficacy among 60 adult male smokers in an urban community of Chennai using the Fagerström Test for Nicotine Dependence and the Smoking Abstinence Self-efficacy Questionnaire. Most participants had low-to-moderate nicotine dependence (56.67%), while 45.00% showed high abstinence self-efficacy; the mean FTND and SASEQ scores were 3.68 ± 2.02 and 15.87 ± 8.61, respectively. Nicotine dependence showed a significant negative correlation with abstinence self-efficacy ($r = -0.35$, $p = 0.01$) and both outcomes were significantly associated with selected socio-demographic and smoking-related variables ($p \leq 0.05$). Thus, data support dependence-graded, family-centred, nurse-led smoking cessation interventions to strengthen self-efficacy and improve long-term quitting outcomes.

Keywords: Tobacco use disorder, smoking cessation, self-efficacy, nicotine dependence, cross-sectional studies, nursing assessment

Background:
Tobacco smoking continues to dominate the global burden of preventable disease, claiming over eight million lives every year and consistently ranking among the leading risk factors for cardiovascular, respiratory and oncological mortality across 204 countries and territories; a recent policy statement of the European Society of Cardiology has further unmasked nicotine itself, irrespective of delivery system, as a structural determinant of cardiovascular health **[1].** While headline smoking prevalence is slowly falling in many high income settings, the addiction itself has not loosened its grip. A nationwide Japanese analysis found that 43.0% of those using heated tobacco products met criteria for nicotine dependence on the Tobacco Dependence Screener, with dual-product users showing higher odds of dependence than cigarette-only users **[2]** and an analytical cross-sectional study of electronic cigarette users reported a mean modified-FTND score of 4.14 ± 2.45, with male sex, longer duration of use and higher nicotine concentrations independently predicting greater dependence **[3].** Together, these signals push back against the popular framing of alternative nicotine products as low dependence pathways out of smoking. The Indian tobacco landscape is uniquely heavy. India hosts more than 250 million tobacco users and an assessment of physical nicotine dependence in rural tobacco users in Kancheepuram district, Tamil Nadu, found a 55.2% prevalence of clinically meaningful dependence, with longer duration of use, daily frequency and lower education emerging as key determinants **[4].** The problem is not confined to men: a community study among rural women in Kolar district documented widespread smokeless tobacco use beginning in adolescence and persisting into the reproductive years, underscoring the social and gender complexity of nicotine addiction in South Asia **[5].** Successful abstinence remains difficult even where structured services exist; an evaluation of a digital tobacco-treatment programme reported a co-verified 12-week abstinence rate of 37.0% among NHS workers-better than typical community quit rates but still leaving the majority smoking **[6].** Beyond cardiopulmonary risk, nicotine dependence has been linked to surgical morbidity: a TriNetX cohort analysis of patients undergoing primary shoulder arthroplasty showed that those with non-tobacco nicotine dependence had significantly higher rates of per prosthetic joint infection and other post-operative complications **[7],** confirming that nicotine dependence is not merely a behavioural label but a clinically actionable comorbidity. Self-efficacy, the belief that one can refrain from smoking under temptation, is a powerful and modifiable cognitive predictor of cessation success. In a Qatari primary-care follow-up study of 759 attenders at smoking-cessation clinics, the 30-day point-prevalence abstinence at six months reached 32.4%, with motivation and adherence to behavioural counselling emerging as the strongest positive predictors **[8].** Therefore, it is of interest to evaluate the level of nicotine dependence and smoking abstinence self-efficacy among adult male smokers residing in an urban locality of Chennai, to correlate these two variables and to explore their association with selected socio-demographic and smoking related characteristics.

Materials and Methods:
A quantitative, non-experimental, descriptive cross-sectional design was employed. The study was conducted at Choolai, Chennai, Tamil Nadu, India, over one week. The population comprised all adult male smokers aged 18 years and above residing at Choolai. A total of 60 participants were recruited through non-probability convenience sampling. The sample size was estimated using the formula $n = Z^2 \times p \times q/d^2$ with $Z = 1.96$, an anticipated nicotine-dependence prevalence of 55.2% derived from a previous Tamil Nadu study and an absolute precision of

12.6%, yielding a calculated minimum of 60. Male participants aged 18 years or above, resident of the study area for at least six months, current cigarette smokers for at least one year, able to comprehend Tamil or English and willing to provide informed consent were included. Participants with serious physical illness, recent surgery, severe psychiatric morbidity, or active non-nicotine substance-use disorders were excluded. Three instruments were used: a self-developed structured sociodemographic and smoking proforma, the six-item Fagerström Test for Nicotine Dependence (FTND) and the Smoking Abstinence Self-efficacy Questionnaire (SASEQ). Content validity was obtained from a panel of nursing and public-health experts. After Institutional Ethics Committee approval, eligible smokers were approached door-to-door in selected streets of Choolai. The purpose, voluntary nature and confidentiality safeguards were explained and written informed consent was obtained. Each interview, conducted in Tamil or English as preferred, was administered face-to-face by the same investigator using a standardised script to minimise interviewer bias and lasted approximately 30 minutes. A pilot study on six smokers (10% of the sample) preceded the main study; pilot participants were excluded from the final analysis. Data were coded in Microsoft Excel and analysed in IBM SPSS Statistics. A p-value ≤ 0.05 was considered statistically significant.

Results:

Of the 60 participants, the majority (46.67%) were aged 18–25 years, 40.00% were 26–35 years and 13.33% were 36–45 years. Educational attainment was primary in 53.33% and secondary in 40.00%. Most (86.67%) were students; 58.33% earned ₹10,001–20,000 per month; 95.00% were married; 70.00% lived in nuclear families; 91.67% resided in urban areas; 81.67% lived in rented houses; and 41.67% had never consumed alcohol. Nearly half (48.33%) had been smoking for more than 20 years; 31.67% smoked 5–10 cigarettes per day and an equal 31.67% smoked 11–20 per day; 53.33% had a smoking intensity of 11–20 pack-years; and a striking 95.00% had never attempted to quit. The mean FTND score was 3.68 ± 2.02 out of 10 (36.80%), indicating predominantly low-to-moderate physical dependence. The majority of smokers (56.67%, n = 34) had a low-to-moderate, 21.67% (n = 13) a moderate, 15.00% (n = 9) a low and 6.66% (n = 4) a high level of nicotine dependence**.** The mean SASEQ score was 15.87 ± 8.61 out of 24 (66.13%). Item-level analysis revealed that confidence was highest when seeing someone enjoy smoking (75.75%) and in social settings (78.00%) and lowest during anger (55.50%) and sadness (56.25%). High abstinence self-efficacy was reported by 45.00% (n = 27), moderate by 28.33% (n = 17) and low by 26.67% (n = 16) of participants. Karl Pearson's correlation revealed a statistically significant negative fair correlation between FTND and SASEQ scores ($r = -0.35$, $p = 0.01$), indicating that as nicotine dependence increased, abstinence self-efficacy decreased. Age ($\chi^2 = 6.12$, $p = 0.05$), smoking duration ($\chi^2 = 13.39$, $p = 0.01$) and pack-years ($\chi^2 = 18.96$, $p = 0.01$) were significantly associated with the level of nicotine dependence, while family type ($\chi^2 = 4.87$, $p = 0.05$), cigarettes per day ($\chi^2 = 9.83$, $p = 0.05$) and smoking triggers ($\chi^2 = 11.93$, $p = 0.05$) were significantly associated with the level of smoking abstinence self-efficacy. Other variables such as education, monthly income, alcohol consumption and marital status did not show statistically significant associations **(Table 1).**

Table1: Association between the level of nicotine dependence and smoking abstinence self-efficacy with selected sociodemographic and smoking-related variables (n = 60).

Outcome	Variable	Highest-burden category (%)	χ^2 (p value)
Nicotine dependence	Age (years)	36–45 yrs: 5/8 (62.50)	**6.12 (0.05)***
Nicotine dependence	Education	Primary: 11/32 (34.38)	3.10 (0.21) NS
Nicotine dependence	Monthly income (₹)	20,001–30,000: 3/5 (60.00)	4.10 (0.12) NS
Nicotine dependence	Alcohol consumption	Regularly: 5/14 (35.71)	1.43 (0.48) NS
Nicotine dependence	Smoking duration	> 20 yrs: 14/29 (48.28)	**13.39 (0.01)***
Nicotine dependence	Smoking intensity (pack-years)	> 20 pack-yrs: 5/6 (83.33)	**18.96 (0.01)***
Self-efficacy	Age (years)	26–35 yrs: 13/24 (54.17)	2.84 (0.24) NS
Self-efficacy	Type of family	Joint family: 12/18 (66.67)	**4.87 (0.05)***
Self-efficacy	Marital status	Married: 26/57 (45.61)	0.30 (0.58) NS
Self-efficacy	Cigarettes per day	5–10 cigs: 14/19 (73.68)	**9.83 (0.05)***
Self-efficacy	Smoking triggers	Social situations: 8/12 (66.67)	**11.93 (0.05)***

**Statistically significant at p ≤ 0.05; NS = Not significant.*

Discussion:

The present study showed that 56.67% of urban male smokers had a low-to-moderate level of nicotine dependence and 45.00% reported high abstinence self-efficacy, with a statistically significant negative fair correlation between the two ($r = -0.35$, $p = 0.01$). These three signals converge on a single message: dependence severity is a structural barrier to abstinence belief and screening for one without the other risks missing half the clinical picture. A cross-sectional analysis of daily smokers in Zhejiang, China, reported a comparable profile of 49.8% moderate, 22.9% low and 27.3% high dependence on the FTND, with male sex, older age and longer smoking history independently predicting greater dependence-closely mirroring our age and pack-year associations **[9].** A Chinese mediation modelling study further showed that nicotine dependence was positively correlated with depression and that health-related quality of life mediated this association, suggesting that the FTND-up, SASEQ down relationship observed here may also have an emotional pathway worth probing in Indian urban populations **[10].** A statistically significant negative correlation between nicotine dependence and abstinence self-efficacy ($r = -0.35$, $p = 0.01$) was observed in the present study. Comparable inverse relationships have been reported in a Beijing community study of 568 smokers by Ma *et al.,* who showed that abstinence

self-efficacy, mediated the relationship between negative coping style and nicotine dependence, particularly in habitual or addictive contexts **[11].** In a Chinese national survey grounded in protection motivation theory, smokers with high nicotine dependence were significantly less likely to intend to quit, with self-efficacy emerging as the strongest psychological correlate of quit attempts **[12].** The finding that joint-family smokers in the present sample had higher self-efficacy adds a culturally specific layer: in collectivist Indian households, perceived family support may buffer abstinence confidence in ways individualistic frameworks underestimate. Significant associations of nicotine dependence with age, smoking duration and pack years and of self-efficacy with family type, daily cigarette consumption and smoking triggers, were observed in the present study. A Cochrane review of randomised trials (n = 127,791) reported that behavioural interventions such as telephone counselling were disproportionately effective in lower socioeconomic groups (ratio of odds ratios 4.31), reinforcing the case for tailored support in low-income, low-education urban Indian samples **[13].** A large population survey identified e-cigarettes as the most-used cessation aid (40.2%) and the one most associated with quit success **[14];** however, the persistently high dependence observed in the present long-duration heavy smokers cautions against viewing alternative nicotine products as a substitute for behavioural and pharmacological cessation support **[15]**. Together, these findings reinforce that nicotine dependence and abstinence self-efficacy must be screened together in routine community nursing practice and that interventions, dependence tiered counselling, family anchored support and trigger specific coping training, should be designed accordingly. Limitations include the small convenience sample, single-locality and single sex (male) recruitment, brief data collection window and reliance on self-report, all of which constrain generalizability; larger longitudinal multi-centre studies are warranted.

Conclusion:
Among urban male smokers, nicotine dependence was mostly low-to-moderate yet inversely correlated with abstinence self-efficacy and was driven by long smoking duration and accumulated pack-years rather than by education or income alone. Nurses, as frontline community caregivers, must integrate routine FTND and SASEQ screening with family-based counselling and dependence-tiered, nurse-led cessation packages. Policies that nurture culturally sensitive, community-anchored cessation services are urgently needed to support durable quitting and to safeguard the cardiovascular, respiratory and oncological future of India's vast smoking population.

Ethical approval:
Approval was obtained from the Institutional Ethics Committee and written informed consent was obtained from all participants in accordance with the Declaration of Helsinki.

Acknowledgement:
The authors thank all male smokers of Choolai who generously participated in the study and the local community gatekeepers who facilitated door-to-door access.

Funding:
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of interest: The authors declare no conflicts of interest

References:
[1] Münzel T *et al. Eur Heart J.* 2025 47**:**1764 [PMID: 41406987]
[2] Kitajima T *et al. Neuropsychopharmacol Rep*. 2025 **45:**e12512. [PMID: 39780643]
[3] Yahya L *et al. Cureus*. 2024 **16:**e61038. [PMID: 38800771]
[4] Sharmila J *et al. Indian J Community Med*. 2024 **49:**170 [PMID: 38425948]
[5] Mashru SJ *et al. Cureus*. 2024 **16:**e65698. [PMID: 39211644]
[6] Sivabalah K *et al. JTO Clin Res Rep*. 2024 **5:**100674. [PMID: 38799133]
[7] Lawand J *et al. J Am Acad Orthop Surg.* 2025 **33:**92 [PMID: 39348556]
[8] Al-Dahshan A *et al. Front Public Health.* 2023 **11:**1166016. [PMID: 37275499]
[9] Xu Y *et al. BMJ Open.* 2022 **12:**e062799. [PMID: 36229149]
[10] Xiong H *et al. Front Psychiatry.* 2024 **15:**1455918. [PMID: 39257561]
[11] Ma H *et al. Tob Induc Dis.* 2020 **18:**72. [PMID: 32934618]
[12] Lin H *et al. Sci Rep.* 2021 **11:**20202. [PMID: 34642382]
[13] Theodoulou A *et al. Cochrane Database Syst Rev.* 2025 **1:**CD015120. [PMID: 39868569]
[14] Jackson SE *et al. JAMA Netw Open.* 2025 **8:**e2454962. [PMID: 39821398]
[15] Sayed SH *et al. Healthcare (Basel).* 2025 **13**:2158. [PMID: 40941507]

Caveat Emptor is applicable among the literate community where required and possible. The publisher, its journal, editors and the internal/external reviewers take adequate steps to check, evaluate, correct, edit, revise and improve content where possible and required.