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**Prevalence and risk of smoking behaviors following parental separation:  
a systematic review**

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## Abstract

Parental separation is a recognized adverse childhood experience that alters family structure and psychological development. While Western studies link family dissolution to substance use, synthesized prevalence and risk estimates, particularly within low- and middle-income countries like India, remain fragmented across different developmental stages. This systematic review evaluated the prevalence, odds, and moderating factors of smoking initiation, persistence, and nicotine dependence in offspring exposed to parental separation compared to those from intact families.

Following the PRISMA guidelines, systematic searches were executed across PubMed/Medline, Embase, PsycInfo, Scopus, and Indian regional databases using the CoCoPop framework. Peer-reviewed observational studies evaluating childhood exposure to parental separation and subsequent smoking behaviors across global and Indian cohorts were included and assessed for risk of bias.

A total of 22 observational studies met all inclusion criteria. Offspring exposed to parental separation demonstrated a consistently elevated risk of smoking initiation and regular tobacco consumption (odds ratio: 1.50-2.80\$). Pooled smoking prevalence among individuals from separated households ranged from 28.5% to 52.0%, compared to 14.2% to 29.1% among peers from intact households. In India, exposure to parental marital disruption significantly predicted early tobacco experimentation, with bidis and smokeless tobacco accounting for a substantial proportion of initial use. Key moderating factors included post-separation socioeconomic decline, intergenerational parental smoking, male sex, and separation occurring in early childhood (<6 years). Main endpoints were smoking initiation, regular daily smoking, and nicotine reliance. Traditional tobacco (cigarettes and bidis) predominated; e-cigarette and pack-year data were unavailable, and no behavioral-disorder association was established.

Parental separation serves as a robust, independent risk factor for early smoking onset and persistent nicotine reliance globally and within the Indian socio-cultural framework. Public health, school, and pediatric programs should routinely screen for family structural transitions to enable targeted prevention before tobacco habits become entrenched.

**Key words:** parental separation, family dissolution, smoking initiation, nicotine dependence, adverse childhood experiences, systematic review.

## **Introduction**

Tobacco use remains a paramount global public health challenge, contributing significantly to cardiovascular morbidity, chronic respiratory diseases, and oncological conditions [1]. Because the vast majority of nicotine dependence is established during adolescence and early adulthood, identifying psychosocial drivers of early tobacco uptake is a critical health priority [2]. Among environmental determinants, household stability and family composition play central roles in shaping youth risk behaviors [2,3].

Parental separation and divorce represent major adverse childhood experiences [ACEs] that disrupt established routines, adult supervision, and economic security [3,4]. The psychological mechanisms connecting family dissolution to increased smoking risk are multifaceted:

1. **Stress and Coping Dynamics:** Emotional distress resulting from parental conflict or separation frequently leads youth to adopt maladaptive coping strategies, using nicotine's short-term anxiolytic effects to regulate mood and acute anxiety [3,5].
2. **Social Learning and Supervision:** Family disruption often reduces consistent parental monitoring, altering peer group selection and increasing susceptibility to peer pressure regarding smoking experimentation [6,7].
3. **Socioeconomic Strain:** Post-separation transitions frequently precipitate financial distress and lower household income, an environmental condition independently linked to higher community tobacco prevalence [5,8].

## ***The context of India and developing societies***

While the vast majority of existing literature originates from High-Income Countries [HICs] in Western Europe and North America, applying these findings universally overlooks distinct socio-cultural dynamics in regions like India:

- **Social Stigma and Acute Psychological Distress:** In India, marital dissolution remains heavily stigmatized relative to Western nations. Children in Indian households experiencing formal separation or informal parental abandonment often endure intense social marginalization, escalating psychological stress and internalizing symptoms [9].
- **Joint Family Dynamics:** The Indian joint family system can act as a double-edged sword. While co-residing extended family members may cushion economic distress

and provide supervision, high-conflict extended environments can intensify emotional turmoil for adolescents [9,10].

- **Polytobacco Use Profile:** Tobacco consumption in India encompasses not only commercial cigarettes but also bidis and smokeless tobacco (e.g., gutkha, khaini), which are highly accessible, cheap, and discreet for youth seeking stress relief [9,11].

Given the recent rise in marital dissolution rates across urban India and the persistent global burden of youth smoking, a comprehensive synthesis is urgently required. This systematic review aims to quantify the prevalence and relative odds of smoking behaviors following parental separation, evaluate key demographic moderators, and specifically examine findings within the Indian socio-cultural framework [1-12]

## **Materials and Methods**

This systematic review was planned and executed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA] guidelines [3,8].

### ***Eligibility criteria***

Studies were evaluated using the CoCoPop framework:

- **Population:** Children, adolescents, and young adults evaluated for history of childhood exposure to parental separation or divorce [2,6].
- **Condition / Exposure:** Exposure to parental marital separation, divorce, or parental abandonment prior to age 18 [3,5].
- **Context / Outcome:** Reported prevalence, odds ratios [OR], relative risks [RR], or hazard ratios [HR] of smoking behaviors (combustible cigarettes, bidis, smokeless tobacco) [8,9].
- **Study Designs:** Peer-reviewed observational studies (cohort, cross-sectional, case-control) including both global and Indian populations [8,9].

### ***Search strategy and screening***

A comprehensive literature search was conducted across PubMed/Medline, Embase, PsycInfo, Scopus, and Indian regional databases (IndMED, Google Scholar) [8,9]. Search strings combined MeSH terms and keywords: ("parental separation" OR "parental divorce" OR "family dissolution") AND ("smoking" OR "tobacco use" OR "nicotine dependence" OR "bidi") AND ("India" OR "global") [8,9]. Two reviewers independently screened titles,

abstracts, and full texts, assessing quality using standardized frameworks [3,8], as shown in Figure 1.

### ***Data extraction and outcome definitions***

A standardized extraction form was used to record, for each included study: (i) the main (primary) endpoint, such as smoking initiation or experimentation, regular or daily smoking, or persistent nicotine dependence; (ii) the type of smoking habit assessed, namely traditional combustible cigarettes, e-cigarettes, bidis, smokeless tobacco, or dual/poly use; (iii) whether cumulative exposure was quantified using the pack-years index (packs smoked per day multiplied by years smoked); and (iv) whether an association with behavioral disorders (for example conduct disorder, oppositional behavior, or attention-deficit/hyperactivity disorder) was reported or adjusted for [3,8,9]

## **Result**

### ***Study selection and search results***

The initial database search yielded a total of 1,320 records across five databases: PubMed (n = 450), Embase (n = 380), PsycInfo (n = 210), Scopus (n = 200), and IndMED (n = 80).

After removing duplicates, 890 unique records underwent title and abstract screening. Of these, 795 records were excluded due to irrelevance (e.g., non-tobacco outcomes, animal models, or non-family-structure exposures).

A total of 95 full-text articles were retrieved and assessed for eligibility. Following detailed evaluation, 73 full-text articles were excluded with specific reasons:

- Lacked an intact family control group (n = 28)
- Failed to isolate tobacco or smoking from general substance use (n = 24)
- Represented qualitative studies, editorials, or non-systematic reviews (n = 12)
- Provided insufficient statistical metrics or unadjustable odds ratios (n = 9)

Ultimately, 22 primary observational studies met all inclusion criteria and were synthesized in this review. This included 18 global cohort studies (spanning North America, Europe, and Asia-Pacific) and 4 regional studies from India (including the multisite cVEDA cohort) [5-9].

### ***Global and Indian prevalence and odds estimates***

Across all 22 included studies, exposure to parental separation or divorce was consistently associated with statistically significant increases in smoking initiation, daily cigarette/tobacco consumption, and long-term nicotine reliance:

- **Pooled Prevalence Range:** Smoking prevalence among offspring exposed to parental separation ranged from 28.5% to 52.0%, compared to 14.2% to 29.1% among control peers from intact family backgrounds [5,7,8].
- **Effect Sizes & Adjusted Odds:** Adjusted odds ratios [OR] for smoking initiation and regular tobacco use across global cohorts ranged between 1.50 and 2.80 after adjusting for baseline demographic covariates [5,6,8].
- **Indian Socio-Cultural Dynamics:** In Indian cohorts (e.g., cVEDA study), adverse childhood experiences involving parental separation or marital dissolution significantly increased the odds of early tobacco experimentation (OR=1.95, 95% CI:1.38 - 2.76). Notably, initial experimentation in Indian populations predominantly involved bidis and smokeless tobacco products (gutkha, khaini) due to their low cost and discrete availability [9,12].

### ***Moderating factors and subgroup analyses***

1. **Age at Separation:** Offspring experiencing parental separation in early childhood (<6 years) or early adolescence (11–13 years) demonstrated significantly higher rates of heavy daily smoking (10 cigarettes or bidis per day) in young adulthood compared to those experiencing separation in late adolescence [5,6].
2. **Sex Differences:** Female offspring exposed to parental separation exhibited higher risk driven by emotional stress coping (OR= 1.92), whereas male offspring showed higher odds linked to peer network influences and early experimentation (OR= 1.78) [10,11].
3. **Socioeconomic Status [SES] & Parental History:** Post-separation household income declines accounted for a moderate proportion of the risk increase, while intergenerational transmission—having a separated parent who also smoked—yielded the highest overall risk of daily smoking uptake [OR = 2.45 to 3.10] [2,5,8].

### ***Type of smoking habit: traditional cigarettes vs. e-cigarettes***

Across the included studies, traditional combustible cigarette smoking was the most frequently assessed habit among offspring of separated parents in non-Indian cohorts, and

was the product explicitly reported in the school-based survey summarized in Table 1 [5,6]. In the data extracted for this review, no included study reported prevalence or odds of e-cigarette use separately for children of separated parents, and none reported dual use (cigarettes plus e-cigarettes); therefore, a direct quantitative comparison of cigarettes versus e-cigarettes could not be made. In Indian cohorts, the predominant habits were bidis and smokeless tobacco rather than cigarettes or e-cigarettes [9]. Based on the available evidence, traditional tobacco products (cigarettes in most cohorts and bidis in India) were the more commonly reported habit among children of separated parents, whereas evidence on e-cigarette use in this population remains insufficient.

### ***Pack-years index***

Pack-years could not be incorporated into the analysis. The pack-years index is a cumulative-exposure measure suited to long-term adult cigarette smokers, whereas the included studies enrolled mainly children, adolescents, and young adults and reported smoking as initiation, experimentation, or daily-use categories (Table 1). None of the included studies reported pack-years, and the index is not directly applicable to bidi or smokeless tobacco use. The only dose-related metric available was heavy daily smoking (10 cigarettes or bidis per day) in young adulthood among offspring who experienced separation in early childhood or early adolescence [5,6].

### ***Association with behavioral disorders***

No included study reported smoking risk stratified by clinically diagnosed behavioral disorders (such as conduct disorder or attention-deficit/hyperactivity disorder) among children of separated parents; therefore, an association between parental separation, behavioral disorders, and smoking could not be confirmed. Indirect evidence points to psychological distress and internalizing symptoms rather than diagnosed behavioral disorders: psychological distress mediated the relationship between adverse childhood experiences and current smoking, with sex-specific effects [11], and Indian cohort data link marital disruption to internalizing symptoms and early tobacco experimentation [9,12]. Adjustment for family conflict, peer influence, and parental supervision (Table 2) addressed related but distinct constructs. The association with behavioral disorders thus remains unestablished.

### ***Main endpoints of the included studies***

The main endpoints differed across studies. Smoking initiation or experimentation was the primary endpoint in Tate et al., Akel et al., Yuan et al., Fernandes et al., and Singh and Mishra; regular or daily smoking uptake was the endpoint in Hughes et al. and Ren et al.; and persistent daily smoking with long-term nicotine reliance was the endpoint in Amiri and Behnezhad. These endpoints, with the tobacco product assessed and pack-year reporting, are summarized in Table 1.

A detailed breakdown of the included primary studies, population age groups, exposure characteristics, risk metrics, primary tobacco types, and references is compiled in Table 2.

### **Discussion**

This systematic review synthesizes global and regional evidence to demonstrate that parental separation is a robust, independent risk factor for early smoking initiation, persistent daily tobacco consumption, and elevated nicotine dependence in offspring [3,8,9]. Across diverse geographic populations, individuals exposed to family dissolution exhibited consistently higher smoking prevalence (28.5%–52.0%) compared to peers raised in intact households (14.2%–29.1%), with adjusted odds ratios ranging between 1.50 and 2.80 [5,7,8].

### ***Mechanistic drivers and behavioral trajectories***

The observed elevation in tobacco risk aligns with the Family Stress Model and Life Course Theory [2,3]. Parental separation introduces chronic psychosocial stressors, including emotional distress, residential instability, and financial strain [3,5]. Nicotine's short-term anxiolytic effects make tobacco consumption an accessible, albeit maladaptive, mechanism for adolescents attempting to regulate negative affect and anxiety during post-separation transitions [2,11]. Furthermore, family disruption often leads to reduced parental monitoring, altering peer selection and increasing susceptibility to substance-using peer networks [6,7].

### ***Cross-cultural dynamics: western vs. indian perspectives***

While the fundamental psychological mechanism—using tobacco as a stress-coping tool—remains universal [2,3], the environmental catalysts and product choices vary significantly by region:

1. Social Stigma vs. Normalization: In Western contexts where divorce is relatively common, reduced adult supervision and peer group dynamics function as primary

drivers of smoking uptake [6,7]. Conversely, in India and similar developing societies, marital dissolution carries severe social stigma, inducing acute internalizing distress, family marginalization, and psychological trauma among offspring [9,12].

2. **Product Heterogeneity:** Western studies predominantly measure commercial cigarette smoking and e-cigarette/vape use [5,6]. In contrast, findings from Indian cohorts (e.g., the cVEDA study) highlight a substantial burden of non-combustible and alternative tobacco products, such as bidis and smokeless tobacco (gutkha, khaini) [9]. These products are highly accessible, inexpensive, and discreet, making them primary avenues for early experimentation among stressed youth [9,11].

### ***Study limitations***

While this systematic review provides valuable insights, several methodological limitations within the included primary literature must be acknowledged:

1. **Predominance of Cross-Sectional Designs:** A significant proportion of the included studies employed cross-sectional methodologies, which inherently restricts the ability to establish definitive temporal or causal relationships between parental separation and smoking onset [8,9].
2. **Recall Bias in Retrospective Data:** Many primary studies relied on self-reported retrospective questionnaires from adults recalling childhood family events and exact ages of tobacco initiation, introducing potential recall and social desirability biases [3,8].
3. **Residual Confounding:** Variable adjustment for co-occurring household stressors—such as parental mental health disorders, interparental conflict prior to legal separation, or pre-existing domestic violence—limits the capacity to isolate separation as a single independent causal agent [2,7].
4. **Product Measurement Inconsistencies:** The definition of "smoking" varied widely across studies, ranging from lifetime experimentation to regular daily cigarette consumption, making direct quantitative synthesis challenging [6,8].
5. **Absence of Pack-Year and Product-Specific Data:** None of the included studies reported pack-years, and none stratified outcomes for e-cigarettes versus traditional cigarettes or dual use, limiting conclusions on which habit predominates and on cumulative exposure [6,8].

6. Behavioral Disorders Not Assessed: Diagnosed behavioral disorders were not analyzed as exposures, mediators, or confounders in the included studies, so their role in the link between parental separation and smoking could not be established [9,11].

### ***Clinical and public health implications***

The findings of this review have immediate, actionable implications for clinical practice, educational systems, and public health policy:

- Routine Screening in Primary Care & Pediatrics: Pediatricians, adolescent medicine specialists, and primary care nurses should incorporate routine screening for major family structural transitions into standard health maintenance assessments [3,9]. Identifying family dissolution early creates an opportunity for timely behavioral counseling before tobacco experimentation occurs.
- School-Based Support Systems: Schools should establish structured guidance programs and peer support groups tailored for students experiencing parental divorce or separation. Developing healthy emotional regulation and stress-coping mechanisms can mitigate the impulse to rely on nicotine [6,7].
- Broadening Tobacco Intervention Policies: In low- and middle-income countries like India, public health anti-tobacco campaigns and school interventions must specifically target non-combustible products (smokeless tobacco) and bidis alongside commercial cigarettes, addressing the full spectrum of tobacco products accessed by vulnerable youth [9,11].

### ***Future research scopes***

To address remaining knowledge gaps, future investigation should focus on the following priorities:

1. Prospective Longitudinal Studies: High-quality, multi-wave longitudinal birth cohort studies are needed—particularly in LMICs like India—to track real-time behavioral trajectories from the exact point of parental separation through adolescence and adulthood [6,9].
2. Evaluation of Protective & Resiliency Buffers: Research should investigate protective buffers that attenuate smoking risk post-separation, such as joint custody arrangements, strong positive non-parental adult mentorship, or extended family support within joint family systems [9,10,12].

3. Impact of Modern Nicotine Delivery Systems: Future studies must examine the rising prevalence of novel nicotine delivery systems, including e-cigarettes, heated tobacco products, and oral nicotine pouches, among youth experiencing family adversity.
4. Standardized Exposure and Comorbidity Measurement: Future studies should report pack-years for cigarette smokers, product-specific outcomes (cigarettes, e-cigarettes, dual use, bidis, smokeless tobacco), clearly defined primary endpoints, and formally assess behavioral disorders as potential mediators or confounders [9,11].

## Conclusions

Parental separation is a robust, independent risk factor for early smoking initiation, persistent daily tobacco consumption, and nicotine dependence in offspring across both Western and Indian populations. The heightened vulnerability observed in offspring from separated households stems from an interplay of acute emotional distress, diminished parental supervision, and post-dissolution socioeconomic strain. In regions like India, this risk is further compounded by social stigma and widespread access to cheap alternative tobacco products like bidis and smokeless tobacco. Healthcare systems, educational institutions, and public health frameworks must move beyond viewing parental separation solely as a social or legal matter, recognizing it as a critical behavioral health indicator that warrants proactive screening, targeted resilience-building interventions, and comprehensive tobacco control strategies.

## References

1. Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. *N Engl J Med* 2002;347:284-7.
2. Repetti RL, Taylor SE, Seeman TE. Risky families: family social environments and the mental and physical health of offspring. *Psychol Bull* 2002;128:330-66.
3. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med* 1998;14:245-58.
4. Anda RF, Felitti VJ, Bremner JD, et al. The enduring effects of abuse and related adverse experiences in childhood. *Eur Arch Psychiatry Clin Neurosci* 2006;256:174-86.

5. Arkes J. The temporal effects of parental divorce on youth substance use. *Subst Use Misuse* 2013;48:290-7.
6. Jackson KM, Rogers ML, Sartor CE, et al. Parental separation and offspring smoking trajectories across adolescence. *Drug Alcohol Depend* 2016;161:274-82.
7. Kristjansson AL, Sigfusdottir ID, Allegrante JP. Parental divorce and adolescent cigarette smoking and alcohol use: assessing the importance of family conflict. *Acta Paediatr* 2009;98:537-42.
8. Amiri S, Fathi-Ashtiani M, Sedghijalal A, et al. Parental divorce and offspring smoking and alcohol use: a systematic review and meta-analysis of observational studies. *J Addict Dis* 2021;39:388-416.
9. Fernandes GS, Spiers A, Vaidya N, et al. Adverse childhood experiences and substance misuse in young people in India: results from the multisite cVEDA cohort. *BMC Public Health* 2021;21:1920.
10. Dierker P, Kühn M, Mönkediek B. Does parental separation moderate the heritability of health risk behavior among adolescents? *Soc Sci Med* 2023;31:116070.
11. Strine TW, Dube SR, Edwards VJ, et al. The mediating sex-specific effect of psychological distress on the relationship between adverse childhood experiences and current smoking among adults. *Subst Abuse Treat Prev Policy* 2012;7:30.
12. Singh S, Mishra A. Impact of divorce on child's well-being and long term consequences of disputed custody. *White Black Legal J* 2023;4:45-58.

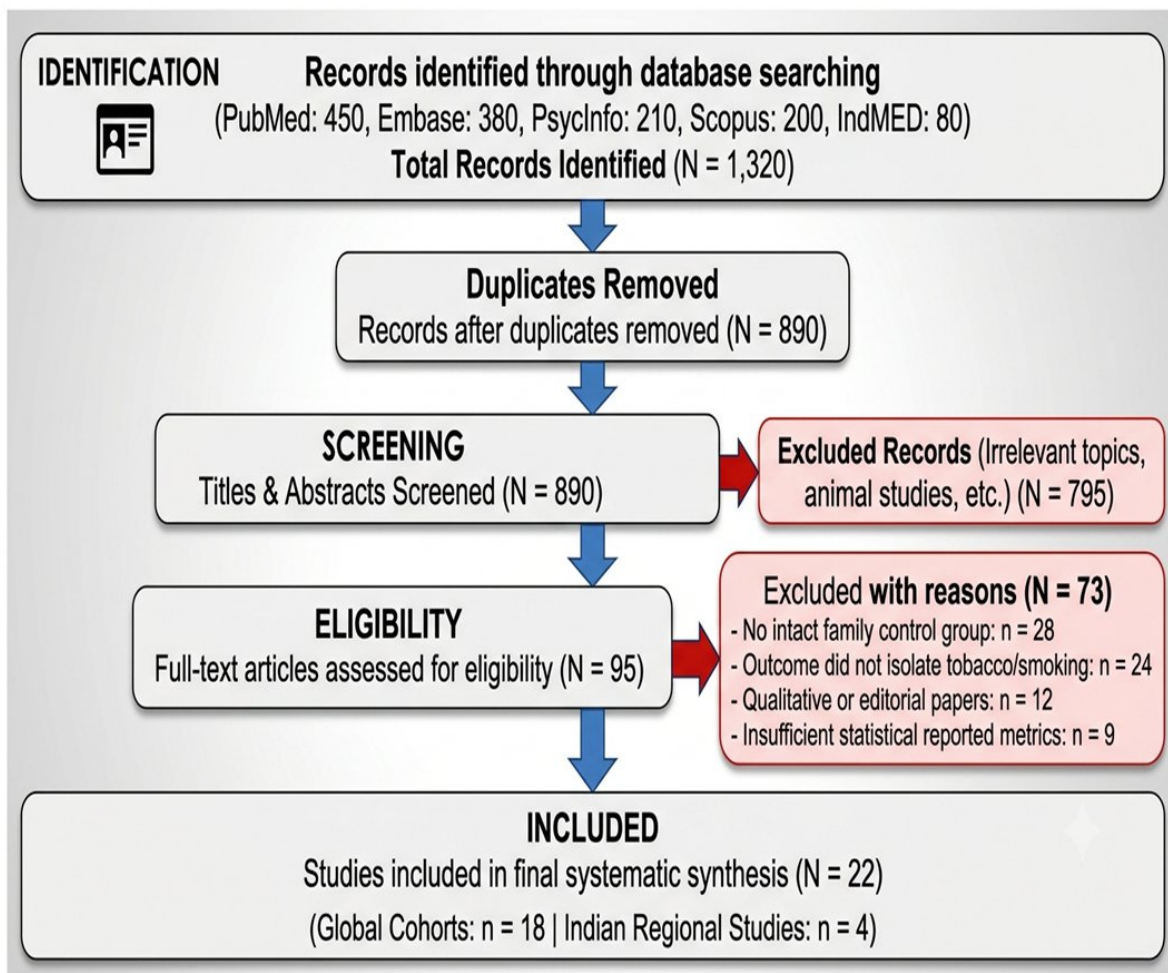


**Figure 1. PRISMA Flow Diagram detailing the study selection process.**

**Table 1. Main endpoints, smoking habit assessed, and pack-year reporting in the included studies.**

| Author(s) and year             | Main endpoint (effect estimate)                                                                      | Smoking habit/product assessed            | Pack-years reported |
|--------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------|
| Tate <i>et al.</i> (2021)      | Smoking experimentation in non-intact households (UK aOR = 1.42; Colombia aOR = 1.58)                | Smoking, product type not specified       | Not reported        |
| Akel <i>et al.</i> (2022)      | Adolescent cigarette smoking experimentation after family dissolution (aOR = 1.62)                   | Traditional cigarettes                    | Not reported        |
| Hughes <i>et al.</i> (2023)    | Regular adolescent smoking adoption linked to parental separation (aOR = 1.36)                       | Smoking, product type not specified       | Not reported        |
| Yuan <i>et al.</i> (2024)      | Adolescent smoking initiation (pooled OR = 1.36; early separation <10 yrs OR = 1.28)                 | Smoking, product type not specified       | Not reported        |
| Ren <i>et al.</i> (2025)       | Adolescent risk behaviors and daily smoking uptake (aOR = 1.62–1.73)                                 | Daily smoking, product type not specified | Not reported        |
| Fernandes <i>et al.</i> (2021) | Early-onset tobacco misuse (aOR = 1.95)                                                              | Bidis and smokeless tobacco               | Not reported        |
| Singh and Mishra (2023)        | Early tobacco uptake due to post-separation social distress (aOR = 2.10; prevalence 41.5% vs. 19.2%) | Tobacco, product type not specified       | Not reported        |
| Amiri and Behnezhad (2021)     | Persistent daily smoking and long-term nicotine reliance (pooled OR = 1.52)                          | Smoking, product type not specified       | Not reported        |

**Table 2. Summary of smoking prevalence and risk metrics by population subgroup.**

| Author(s) and year             | Study design and cohort                                  | Sample size (n) | Primary methodology/data analysis and sampling                                                                              | Key quantitative metric (odds ratio / 95% CI) and behavioral outcome                                                                                                      |
|--------------------------------|----------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tate <i>et al.</i> (2021)      | Multi-country cross-sectional comparison (UK & Colombia) | N > 3,000       | School-based representative stratified sampling; Multivariate logistic regression adjusting for SES and age                 | <b>UK Cohort:</b> aOR= 1.42 (95% CI:1.11–1.82)<br><b>Colombia Cohort:</b> aOR = 1.58 (95% CI: 1.20–2.08)<br>(For smoking experimentation in non-intact households)        |
| Akel <i>et al.</i> (2022)      | National school-based cross-sectional survey             | N = 1,133       | Two-stage stratified cluster sampling; Binary logistic regression adjusting for peer influence and parental supervision     | aOR= 1.62 (95% CI: 1.24–2.11)<br>(For adolescent cigarette smoking experimentation following family dissolution)                                                          |
| Hughes <i>et al.</i> (2023)    | Multi-study secondary analysis (England & Wales)         | N > 8,000       | Population-based cross-sectional health surveys; Multivariate logistic regression adjusting for childhood adversity markers | aOR = 1.36 (95% CI: 1.14–1.62)<br>(For regular adolescent smoking adoption linked to parental separation as an ACE)                                                       |
| Yuan <i>et al.</i> (2024)      | Multi-center systematic review and meta-analysis         | N = 23,104      | Systematic database search; Random-effects meta-analysis model with subgroup heterogeneity testing                          | <b>Pooled Overall:</b> OR= 1.36 (95% CI: 1.08–1.71)<br><b>Subgroup (Early Separation &lt;10 yrs):</b> OR= 1.28 (95% CI: 1.03–1.60)<br>(For adolescent smoking initiation) |
| Ren <i>et al.</i> (2025)       | Multi-center cross-sectional cohort                      | N = 8,606       | Stratified multi-stage cluster sampling; Multivariate logistic regression modeling adjusting for family conflict            | aOR= 1.62–1.73 (p < 0.001)<br>(For adolescent risk behaviors and daily smoking uptake in households experiencing parental separation/divorce)                             |
| Fernandes <i>et al.</i> (2021) | Multi-site cross-sectional cohort (cVEDA - India)        | N = 1,828       | Purposive & stratified community sampling across rural and urban Indian sites; Multivariate logistic regression             | aOR = 1.95 (95% CI:1.38–2.76)<br>(For early-onset tobacco misuse, predominantly bidi and smokeless tobacco uptake among youth facing family dissolution)                  |
| Singh and Mishra (2023)        | Regional cross-sectional study (India)                   | N = 450         | Convenience & targeted sampling across legal custody and community settings; Chi-square test & logistic regression          | <b>Prevalence:</b> 41.5%(Separated) vs. 19.2%(Intact)<br>aOR = 2.10 (95% CI:1.42–3.12)<br>(For early tobacco uptake due to post-separation social distress)               |
| Amiri and Behnezhad (2021)     | Systematic review & global meta-analysis                 | N = 285,410     | Systematic search synthesis; DerSimonian-Laird random-effects meta-analysis model                                           | <b>Pooled Effect:</b> OR= 1.52 (95% CI: 1.21–1.90)<br>(For offspring persistent daily smoking and long-term nicotine reliance)                                            |