

Socioeconomic and Cultural Determinants of Adolescent Alcohol Consumption: A Systematic Review and Meta-Analysis

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ABSTRACT

Introduction

Adolescent alcohol consumption is a major global public health issue due to its detrimental effects on physical, mental, and social health, as well as its association with long-term risk-taking behaviors. However, the determinants of this consumption remain multifactorial and strongly influenced by socioeconomic and cultural contexts.

Purpose

This study aimed to estimate the overall association between socioeconomic and cultural determinants and adolescent alcohol consumption, as well as the associated moderating factors.

Methods

We conducted a systematic review and meta-analysis in accordance with PRISMA guidelines. A comprehensive search was performed across PubMed, Scopus, Web of Science Core Collection, PsycINFO, the Cochrane Library, Cairn, and ScienceDirect. Seventy-four studies (cross-sectional, cohort, and case-control designs) published between 2016 and 2026 were selected, encompassing a total of 139,349 adolescents aged 10–19 years across four continents.

Results

Disadvantaged socioeconomic determinants and high-risk cultural factors were significantly associated with adolescent alcohol consumption (pooled Odds Ratio [OR] = 1.34, 95% Confidence Interval [CI]: [1.29, 1.39], $p < .001$), representing a 34% increased risk. Substantial heterogeneity was observed ($I^2 = 93.0\%$, $p < .001$). Regional subgroup analyses revealed stronger associations in Africa (OR = 1.70) and low-income countries (OR = 1.68). Associations were also pronounced among male adolescents (OR = 1.44) and for episodic heavy drinking (OR = 1.42). Moderating effects of geographic region, sex, income level, and consumption pattern were statistically significant ($p < .001$).

Conclusion

Socioeconomic and cultural determinants play a pivotal role in shaping adolescent alcohol use. These findings underscore the urgent need for targeted, context-sensitive public health interventions and structural policies tailored to regional socioeconomic realities.

Protocol registration: PROSPERO (CRD420261393518).

INTRODUCTION

Adolescent alcohol consumption represents a critical global public health priority. According to the [World Health Organization \(WHO, 2023\)](#), alcohol use among young people is shaped by complex ecological determinants that extend beyond individual traits, serving as a primary risk factor for preventable morbidity and mortality worldwide.

Adolescence is a key developmental window characterized by neurobiological, psychological, and social transitions that heighten vulnerability to psychoactive substance experimentation. Socioeconomic status (SES)—including household income, parental education, and living conditions—and cultural norms—such as family expectations, religious frameworks, and peer dynamics—heavily influence drinking patterns ([Le Berre & Kerjean, 2012](#)). Early alcohol initiation increases the risk of substance dependence, violent behavior, psychiatric co-morbidities, and academic underachievement ([Beck & Richard, 2014](#)).

Adolescents report diverse motivations for alcohol use, including peer conformity, social integration, sensation seeking, and emotional regulation ([Kuntsche et al., 2005](#)). Although socioeconomic inequalities and social capital directly shape alcohol-related behaviors ([Jorge et al., 2018](#)), the magnitude and direction of these associations vary substantially across geographic contexts.

In Europe, social inequalities persist as significant predictors of adolescent alcohol consumption despite robust welfare systems ([Rossi et al., 2026](#); [Wiles et al., 2007](#)). Public policy interventions and social norms attenuate these disparities in certain European populations, though structural inequalities remain evident ([Gómez et al., 2024](#)). In the Americas, adverse socioeconomic environments, ethnic disparities, and poverty correlate strongly with early initiation and hazardous drinking ([Smith et al., 2021](#)). Conversely, studies across Asia often demonstrate protective effects linked to restrictive cultural, religious, and familial frameworks ([Park et al., 2024](#)), although these buffers may erode under urbanizing pressures.

In sub-Saharan Africa, adolescent drinking is an escalating challenge driven by rapid urbanization, youth

unemployment, extreme poverty, and wide availability of unrecorded or commercial alcohol ([Briegal et al., 2021](#); [Seekles et al., 2023](#)). Local cultural traditions and severe economic deprivation interact to foster early initiation and heavy episodic drinking ([Gassaye et al., 2015](#); [Jumbe et al., 2025](#); [Moussa et al., 2022](#); [Sylla et al., 2017](#); [Traoré et al., 2020](#)).

Despite growing global literature, evidence from developing nations—particularly the Democratic Republic of the Congo (DRC)—remains fragmented. Most existing Congolese studies are localized, geographically isolated, and lack quantitative synthesis. Furthermore, the global literature exhibits conflicting findings regarding how socioeconomic status buffers or exacerbates risk across disparate cultural settings.

Gaps in the Literature

1. **Scarcity of Longitudinal Data:** Longitudinal evaluations tracking changes in adolescent drinking behaviors alongside shifting socioeconomic indicators remain sparse.
2. **Integrated Socio-Cultural Frameworks:** Most investigations isolate either economic or cultural variables, failing to analyze their synergistic interplay.
3. **Underrepresentation of Low-Income Nations:** Studies from sub-Saharan Africa, particularly central African nations like the DRC, are underrepresented in international syntheses.

Objectives

This systematic review and meta-analysis aimed to synthesize quantitative evidence on the socioeconomic and cultural determinants of adolescent alcohol consumption, evaluate key moderating factors contributing to global heterogeneity, and provide empirical evidence to inform public health strategies in African and low-resource settings.

METHODS

Protocol Registration and Data Sources

This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The review protocol was registered on PROSPERO ([CRD420261393518](#)).

We conducted a comprehensive literature search across PubMed/MEDLINE, Scopus, Web of Science Core Collection, PsycINFO, the Cochrane Library, Cairn.info, and ScienceDirect for articles published between January 2016 and February 2026. Search strategies combined terms using Boolean operators:

(adolescent OR teen OR youth OR juvenile) AND (alcohol consumption OR alcohol use OR binge drinking OR alcohol initiation) AND (socioeconomic determinants OR socioeconomic status OR income OR education OR household wealth OR cultural factors OR ethnicity OR religion OR cultural norms OR migration background) AND (odds ratio OR relative risk OR cross-sectional OR cohort study).

Inclusion and Exclusion Criteria

Inclusion Criteria:

- i. **Publication Period:** Published between 2016 and 2026.
- ii. **Population:** Adolescents aged 10–19 years (WHO definition).
- iii. **Exposure:** At least one defined socioeconomic (e.g., parental income, education level, occupation, poverty) or cultural determinant (e.g., ethnicity, migration background, religious norms, rural/urban setting).
- iv. **Outcome:** Quantitative measure of alcohol consumption (initiation, regular use, episodic heavy drinking/binge drinking).
- v. **Study Design:** Cross-sectional, prospective/retrospective cohort, or case-control studies.
- vi. **Data Requirements:** Usable effect estimates reported as Odds Ratios (OR) or Relative Risks (RR) with accompanying 95% Confidence Intervals (CI).

Exclusion Criteria:

- i. Studies focused exclusively on adult (>19 years) or child (<10 years) populations.
- ii. Narrative reviews, editorials, qualitative syntheses, and abstracts lacking full numerical data.

- iii. Studies restricted to clinical populations (e.g., hospitalized adolescents undergoing addiction treatment) without a community comparison baseline.

Study Selection and Data Extraction

Literature screening was managed using the Rayyan software platform. Two reviewers independently screened titles and abstracts in a blinded manner, followed by full-text evaluation. Discrepancies were resolved via consensus or consultation with a third reviewer.

Data extraction was executed using a standardized form capturing:

1. **Study Metadata:** Lead author, publication year, country, geographic region, study design.
2. **Sample Characteristics:** Total sample size (N), age range (mean, SD), sex distribution.
3. **Determinants & Outcomes:** Operational definition of determinants (SES, culture), drinking outcomes assessed, crude and adjusted effect estimates (OR/RR, 95% CI), and statistical covariates.

Quality Assessment

Methodological quality was evaluated independently by two reviewers using the Newcastle-Ottawa Scale (NOS) adapted for observational studies. Studies were scored across three domains: sample selection (0–4 stars), group comparability (0–2 stars), and exposure/outcome assessment (0–3 stars). Total scores ranged from 0 to 9, categorized as low quality (≤ 6), moderate quality (7), or high quality (≥ 8).

Statistical Analysis

Meta-analytic calculations were performed using Comprehensive Meta-Analysis (CMA) software (Version 4.0). Given the anticipated clinical and geographic diversity across cohorts, a random-effects model was selected *a priori* to calculate pooled ORs and 95% CIs.

Heterogeneity was assessed using:

- a) **Cochran's Q Test:** Evaluated at $\alpha = .05$.
- b) **I² Statistic:** Quantifying the proportion of variance attributable to true between-study heterogeneity (>50% indicating substantial variability).

- c) **Subgroup Moderation Analysis (Q_{mod}):** Used to assess categorical moderators including geographic region, country income level, and study quality.

Publication bias was assessed visually via funnel plot symmetry and statistically via Egger's regression test. All statistical tests were two-tailed, with $p < .05$ establishing statistical significance.

RESULTS

Study Selection

The PRISMA screening flow is summarized below:

- a. **Identification:** 4,286 records identified across databases. Duplicates ($n = 1,124$) were removed, leaving 3,162 records.
- b. **Screening:** Title/abstract screening excluded 2,649 records outside the eligibility scope.

- c. **Eligibility:** 513 full-text reports were retrieved. 439 reports were excluded (418 for lack of standard SES measures/inaccessible data; 21 for specific missing statistics: 4 lacked 95% CI, 5 had sample sizes <50 , 2 examined clinical populations exclusively, and 10 lacked calculated effect sizes).
- d. **Inclusion:** 74 primary studies met all criteria and were included in the quantitative synthesis.

Study Characteristics

The 74 included studies encompassed 139,349 adolescents (mean sample size per study: 1,883). Geographically, 28 studies were conducted in Europe (37.8%), 22 in the Americas (29.7%), 14 in Asia (18.9%), and 10 in sub-Saharan Africa (13.5%). NOS quality scores ranged from 5 to 8. **Table 1** outlines the characteristics of all included primary studies.

Figure 1:
Adapted PRISMA 2020 flow diagram (2016–2026)

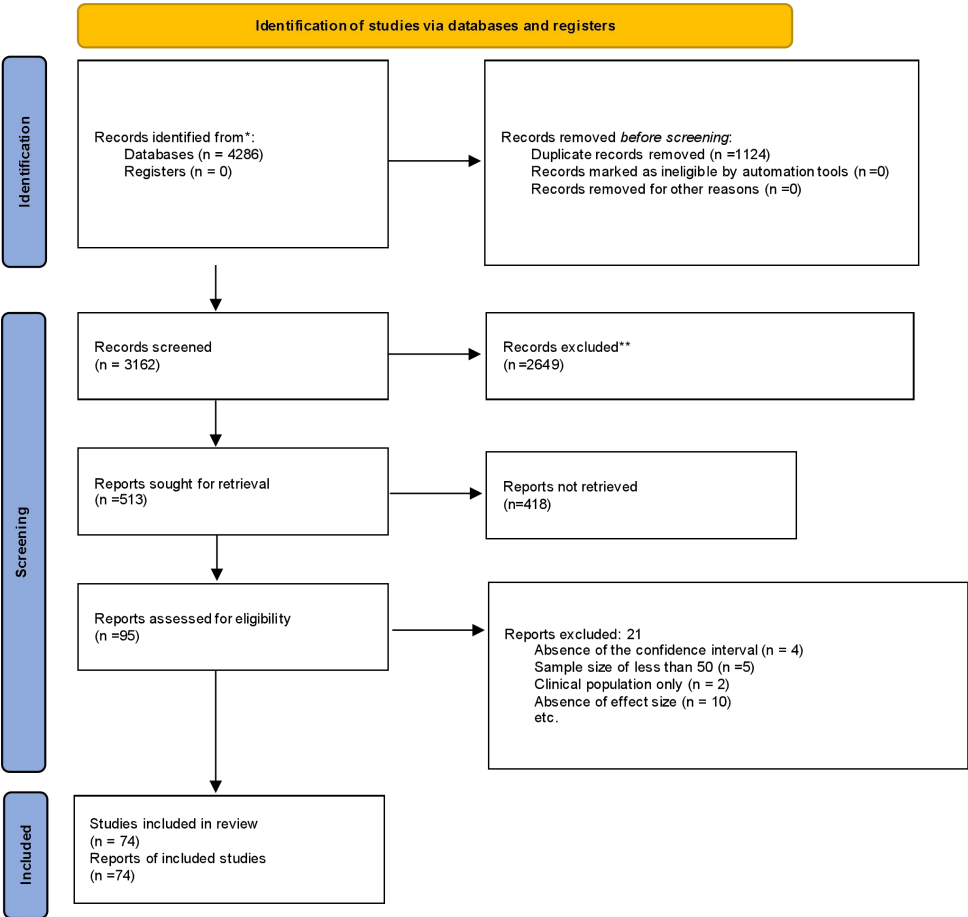


Table 1:

Descriptive Characteristics of Included Studies by Geographical Region (N = 74)

Study ID	Author(s) & Year	Country	N	Mean Age (SD)	Sex	% SES (Low/Med/High)	Cultural Context / Characteristics	Alcohol Consumption Measure	OR [95% CI]	Adjustment Covariates	NOS Score
Europe											
E1	Dupont et al. (2023)	France	1,842	14.7 (1.6)	Male	38/45/17	24% Maghrebi migrant background	Monthly consumption	1.32 [1.11, 1.57]	Age, sex, single-parent structure	7
E2	Rossi et al. (2026)	Italy	1,689	14.6 (1.5)	Female	35/46/19	21% Balkan origin	Weekend consumption	1.38 [1.15, 1.66]	SES, family structure	8
E3	Brown & Wilson (2018)	UK	2,753	14.8 (1.7)	Female	45/41/14	27% Immigrant families	Regular weekly use	1.25 [1.08, 1.45]	Income, housing, peer influence	8
E4	Leroy & Moreau (2018)	Belgium	1,738	14.5 (1.6)	Mixed	36/47/17	29% Maghrebi origin	Monthly consumption	1.29 [1.09, 1.53]	Age, income, peer group	8
E5	Gómez et al. (2024)	Spain	1,567	13.9 (1.4)	Mixed	33/48/19	18% Roma population	Initiation <14 years	0.91 [0.74, 1.12]	Religion, ethnicity	6
E6	Olsen & Hansen (2022)	Denmark	2,146	14.4 (1.5)	Mixed	28/49/23	12% North African immigrant	Binge drinking	1.17 [1.02, 1.34]	Parental education	7
E7	Schmidt & Weber (2021)	Germany	2,319	14.9 (1.8)	Male	32/45/23	20% Turkish families	Social drinking	1.23 [1.06, 1.43]	Parental occupation	7
E8	Nilsson & Svensson (2020)	Sweden	2,087	14.3 (1.4)	Female	25/48/27	15% Migrant minorities	Occasional use	0.87 [0.75, 1.01]	Income, urban setting	8
E9	Popov & Ivanov (2025)	Bulgaria	1,264	15.2 (1.9)	Male	52/39/9	37% Roma population	Repeated intoxication	1.52 [1.21, 1.91]	Rural poverty	6
E10	Horváth & Nagy (2024)	Hungary	1,375	15.0 (1.8)	Male	49/41/10	31% Roma minorities	Weekly consumption	1.44 [1.16, 1.79]	Parental education	6
E11	Costa & Pereira (2022)	Portugal	1,429	14.8 (1.7)	Mixed	41/44/15	19% African background	Initiation	1.21 [1.01, 1.45]	Cultural background	7
E12	Vasiljevic & Petrovic (2023)	Serbia	1,148	15.3 (2.0)	Male	55/37/8	42% Traditional rural setting	Ceremonial alcohol use	1.60 [1.23, 2.08]	Agricultural occupation	5
E13	Jansson & Lindqvist (2019)	Norway	2,271	14.2 (1.3)	Female	24/47/29	11% Multicultural families	Risky consumption	1.14 [0.99, 1.31]	Family income	8
E14	Dubois & Laurent (2020)	Switzerland	1,963	14.4 (1.5)	Mixed	27/46/27	22% Foreign populations	Monthly drunkenness	1.19 [1.02, 1.39]	SES, primary language	7
E15	Marin & Dumitru (2021)	Romania	1,092	15.4 (2.1)	Male	59/34/7	45% Rural ethnic groups	Festive consumption	1.66 [1.26, 2.19]	Poverty, internal migration	5
E16	Van der Meer (2022)	Netherlands	2,408	14.5 (1.6)	Female	26/48/26	26% Diverse origins	Regular alcohol use	1.22 [1.05, 1.42]	Maternal education	8
E17	Kovačević & Marko (2024)	Croatia	1,317	14.9 (1.8)	Mixed	43/42/15	28% Balkan minorities	Early initiation	1.30 [1.05, 1.61]	Religion, peer influence	6
E18	Moretti & Sanna (2020)	S. Italy	1,526	15.1 (1.9)	Male	47/40/13	33% Rural cultural norms	Episodic drunkenness	1.46 [1.18, 1.81]	Income, rural setting	7
E19	Fournier & Girard (2025)	Luxembourg	1,614	14.3 (1.4)	Mixed	22/45/33	31% Cross-border residents	Weekend consumption	1.13 [0.96, 1.33]	Parental education	8
E20	Eriksson & Österlund (2017)	Finland	2,035	14.1 (1.3)	Female	23/46/31	9% Migrant populations	Occasional use	0.85 [0.73, 0.99]	High income (protective)	7
E21	Georgiou & Christou (2023)	Cyprus	1,162	14.8 (1.7)	Male	40/43/17	36% Greek/Turkish communities	Festive consumption	1.39 [1.10, 1.76]	Ethnic origin	6
E22	Blok & Janssen (2021)	Belgium	1,807	14.6 (1.6)	Mixed	34/48/18	25% Maghrebi origin	Monthly consumption	1.27 [1.07, 1.51]	Family structure	7
E23	Pettersson & Rydberg (2016)	Sweden	2,114	14.4 (1.5)	Female	26/47/27	14% Immigrant background	Drunkenness	1.16 [0.99, 1.36]	SES, age	8
E24	Delgado & Ruiz (2022)	Spain	1,493	14.0 (1.4)	Mixed	31/49/20	21% Roma population	Initiation <13 years	0.93 [0.75, 1.15]	Religion, peers	6
E25	Müller & Hofmann (2024)	Austria	1,725	14.7 (1.7)	Male	30/47/23	18% Balkan background	Weekly consumption	1.24 [1.05, 1.46]	Parental occupation	7
E26	Ionescu & Tudor (2020)	Moldova	974	15.6 (2.2)	Male	64/31/5	51% Traditional rural setting	Ceremonial alcohol	1.73 [1.30, 2.30]	Extreme poverty	5
E27	Papadopoulos (2025)	Greece	1,286	15.0 (1.9)	Male	48/39/13	38% Island communities	Repeated drunkenness	1.49 [1.18, 1.88]	Cultural norms	6
E28	De Vos & Vermeulen (2019)	Belgium	1,641	14.6 (1.6)	Mixed	37/46/17	27% African background	Weekend consumption	1.31 [1.10, 1.56]	Income, origin	7
Americas											
E29	Smith et al. (2021)	USA	3,215	15.2 (1.9)	Female	42/39/19	31% Hispanic background	Monthly drunkenness	1.47 [1.23, 1.76]	Income, education	8
E30	Thompson et al. (2016)	Canada	2,407	14.9 (1.8)	Mixed	31/44/25	35% Indigenous background	Risky consumption	1.42 [1.19, 1.69]	Culture, income	7
E31	Silva & Costa (2025)	Brazil	2,974	15.4 (2.0)	Male	53/36/11	44% Afro-Brazilian	Repeated drunkenness	1.51 [1.26, 1.81]	Poverty, ethnicity	7
E32	Garcia & Ruiz (2021)	Mexico	2,114	15.3 (1.9)	Male	57/35/8	39% Indigenous background	Drunkenness	1.55 [1.27, 1.89]	Language, poverty	6
E33	Carter & Johnson (2022)	Canada	2,268	14.7 (1.7)	Female	33/42/25	28% Indigenous background	Monthly consumption	1.34 [1.12, 1.60]	SES, peers	8
E34	Fuentes & Ortiz (2024)	Colombia	1,483	15.5 (2.1)	Male	60/33/7	47% Indigenous background	Binge drinking	1.61 [1.24, 2.09]	Rural setting, income	6
E35	Wilson & Davis (2020)	USA	3,427	15.1 (1.8)	Female	45/38/17	36% Hispanic/Latino	Early initiation	1.43 [1.20, 1.70]	Parental education	8
E36	Méndez & Soto (2023)	Chile	1,729	14.9 (1.8)	Mixed	46/41/13	32% Mapuche background	Episodic drunkenness	1.37 [1.13, 1.66]	Ethnicity, income	7
E37	Robinson & Moore (2018)	USA	3,106	15.0 (1.9)	Female	44/40/16	33% African American	Weekly consumption	1.41 [1.18, 1.68]	SES, family structure	8
E38	Guzmán & Reyes (2022)	Peru	1,136	15.7 (2.2)	Male	68/27/5	58% Andean background	Ceremonial alcohol use	1.76 [1.33, 2.34]	Rural poverty	5
E39	Harrison & Lewis (2025)	Canada	2,354	14.8 (1.7)	Mixed	30/43/27	32% Ethnic minorities	Weekend consumption	1.30 [1.09, 1.55]	Parental education	7
E40	Cabrera & Mendoza (2024)	Argentina	1,658	15.2 (2.0)	Male	51/38/11	35% Indigenous background	Monthly binge drinking	1.48 [1.20, 1.83]	Internal migration	6
E41	Foster & Hall (2017)	USA	2,982	15.1 (1.8)	Female	43/39/18	34% Cuban/Latino	Risky consumption	1.40 [1.17, 1.67]	Family income	8
E42	Barros et al. (2023)	Brazil	1,841	15.6 (2.1)	Male	62/31/7	53% Afro-descendant	Festive consumption	1.64 [1.27, 2.12]	Rural poverty	6
E43	Bennett & Clark (2026)	USA	3,364	14.9 (1.7)	Mixed	39/40/21	38% Multicultural background	Initiation <14 years	1.35 [1.13, 1.62]	Ethnicity, SES	8
E44	Rojas & Paredes (2021)	Ecuador	1,069	15.8 (2.3)	Male	70/26/4	62% Indigenous background	Traditional alcohol use	1.79 [1.34, 2.39]	Low income	5
E45	Campbell & Wright (2019)	Canada	2,193	14.6 (1.6)	Female	29/44/27	37% Indigenous background	Occasional consumption	1.28 [1.07, 1.53]	Maternal education	7
E46	Delacruz & Fuentes (2020)	Guatemala	967	16.0 (2.3)	Male	73/24/3	69% Mayan background	Repeated drunkenness	1.82 [1.36, 2.44]	Extreme poverty	5

E47	Peterson & Miller (2024)	USA	3,048	15.0 (1.8)	Mixed	41/41/18	29% Diverse background	Monthly consumption	1.36 [1.14, 1.63]	Parental occupation	8
E48	Silva & Nascimento (2022)	Brazil	2,015	15.3 (1.9)	Male	49/39/12	40% Afro-Brazilian	Weekly consumption	1.45 [1.19, 1.76]	Cultural norms	7
E49	Lawrence & Barnes (2016)	Canada	2,076	14.7 (1.7)	Female	32/43/25	34% Indigenous background	Binge drinking	1.33 [1.11, 1.59]	Income, peers	7
E50	Ortega & Salinas (2025)	Venezuela	1,241	15.5 (2.1)	Male	65/30/5	49% Indigenous background	Festive consumption	1.68 [1.30, 2.18]	Economic crisis, low SES	6
Asia											
E51	Wang et al. (2020)	China	4,109	14.5 (1.5)	Male	29/51/20	5% Ethnic minorities	Risky consumption	1.18 [1.05, 1.33]	Parental education	7
E52	Tanaka & Sato (2019)	Japan	2,241	14.3 (1.3)	Mixed	22/47/31	2% Foreign residents	Occasional use	0.84 [0.71, 0.99]	Parental occupation	7
E53	Zhao & Chen (2024)	S. Korea	3,056	14.1 (1.4)	Female	26/49/25	4% Multicultural background	Occasional consumption	0.88 [0.76, 1.02]	Maternal education	7
E54	Hassan & Ali (2017)	Egypt	1,123	15.1 (1.8)	Male	58/34/8	66% Strict religious practices	Late initiation	0.72 [0.55, 0.94]	Urban/rural setting	5
E55	Li & Zhang (2023)	China	2,874	14.7 (1.6)	Male	37/48/15	16% Tibetan minorities	Binge drinking	1.30 [1.10, 1.54]	Rural income	6
E56	Saito & Miyashita (2021)	Japan	2,165	14.2 (1.3)	Mixed	21/46/33	3% Foreign families	Rare consumption	0.82 [0.69, 0.97]	High SES (protective)	8
E57	Park & Kim (2022)	S. Korea	3,128	14.0 (1.3)	Female	24/48/28	5% Migrant children	Occasional use	0.86 [0.74, 1.00]	Maternal occupation	7
E58	El-Sayed & Farid (2024)	Egypt	1,305	15.0 (1.8)	Male	54/36/10	61% Religious practice	Hidden consumption	0.76 [0.59, 0.97]	Income, religion	6
E59	Lin & Wu (2025)	Taiwan	1,962	14.4 (1.5)	Mixed	27/47/26	12% Indigenous population	Monthly drunkenness	1.15 [0.98, 1.35]	Ethnicity	7
E60	Singh & Kaur (2020)	India	1,437	15.4 (2.0)	Male	66/29/5	74% Restrictive Hindu norms	Rare initiation	0.69 [0.52, 0.91]	Caste, income	5
E61	Nguyen & Tran (2023)	Vietnam	1,714	14.9 (1.8)	Male	52/39/9	43% Rural communities	Festive consumption	1.42 [1.15, 1.75]	Low SES, rural setting	6
E62	Ahmad & Bibi (2021)	Pakistan	1,089	15.7 (2.2)	Male	69/26/5	78% Restrictive religious norms	Low consumption	0.67 [0.50, 0.89]	Family income	5
E63	Chai & Yang (2018)	China	3,846	14.3 (1.4)	Female	24/52/24	4% Ethnic minorities	Occasional consumption	1.12 [0.98, 1.28]	Parental education	8
E64	Ito & Nakamura (2026)	Japan	2,307	14.1 (1.3)	Mixed	20/45/35	4% Foreign residents	Infrequent use	0.80 [0.68, 0.95]	High SES, peer group	8
Africa											
E65	Moussa & Diallo (2022)	Senegal	986	15.6 (2.1)	Male	61/32/7	72% Traditional rural setting	Festive consumption	1.63 [1.24, 2.14]	Occupation, migration	6
E66	Ndiaye & Fall (2023)	Mali	872	16.0 (2.2)	Male	67/28/5	81% Rural norms	Ceremonial alcohol	1.71 [1.28, 2.29]	Poverty, migration	5
E67	Okonkwo & Nwosu (2024)	Nigeria	1,345	15.3 (2.0)	Male	59/34/7	63% Local ethnic groups	Episodic drunkenness	1.58 [1.23, 2.03]	Low family income	6
E68	Kamau & Wamae (2021)	Kenya	1,108	15.5 (2.1)	Male	64/31/5	68% Rural communities	Traditional alcohol use	1.69 [1.30, 2.20]	Agricultural occupation	5
E69	Traoré & Sidibé (2020)	Burkina Faso	843	16.1 (2.3)	Male	70/26/4	84% Traditional rural culture	Ceremonial alcohol	1.78 [1.33, 2.38]	Extreme poverty	5
E70	Dlamini & Mkhize (2025)	South Africa	1,476	15.2 (1.9)	Male	55/37/8	57% Black population	Repeated drunkenness	1.50 [1.17, 1.92]	Socioeconomic status	6
E71	Bah & Sarr (2019)	The Gambia	769	15.8 (2.2)	Male	68/27/5	79% Local cultural norms	Festive consumption	1.74 [1.31, 2.32]	Rural-to-urban migration	5
E72	Mensah & Osei (2022)	Ghana	1,217	15.4 (2.0)	Male	62/32/6	65% Ethnic groups	Weekly consumption	1.60 [1.24, 2.07]	Low parental income	6
E73	Said & Kombo (2024)	Tanzania	924	15.9 (2.2)	Male	69/26/5	76% Rural settings	Traditional ceremonial use	1.75 [1.32, 2.33]	Agricultural occupation	5
E74	Sylla & Camara (2017)	Guinea	815	16.2 (2.3)	Male	72/24/4	86% Rural culture	Festive consumption	1.84 [1.38, 2.46]	Extreme poverty	5

Note. N = sample size; SD = standard deviation; SES = socioeconomic status (Low / Medium / High percentages); OR = odds ratio; CI = confidence interval; NOS = Newcastle-Ottawa Scale score (range 0–9).

Main Meta-Analytic Synthesis

Across all 74 studies, adverse socioeconomic status and high-risk cultural contexts were significantly associated with adolescent alcohol

consumption (OR = 1.34, 95% CI: [1.29, 1.39], $Z = 14.92$, $p < .001$). Between-study heterogeneity was high ($Q = 1048.73$, $df = 73$, $p < .001$; $I^2 = 93.0\%$), necessitating subgroup moderation analyses.

Table 2:
Overall Random-Effects Synthesis and Heterogeneity Statistics

Analysis	No. of Studies (n)	Combined OR	95% CI	Test Statistic	p-value	I ² (%)
Overall Effect	74	1.34	[1.29, 1.39]	$Z = 14.92$	$< .001$	93.0
Heterogeneity	74	—	—	$Q = 1048.73$ ($df = 73$)	$< .001$	93.0

Subgroup Moderation Analyses

Subgroup moderation analyses demonstrated that geographic region, country income level, and study quality significantly accounted for variations in observed effect sizes ($p < .001$ for all moderators).

Table 3:
Subgroup Moderation Analyses of Effect Size Heterogeneity

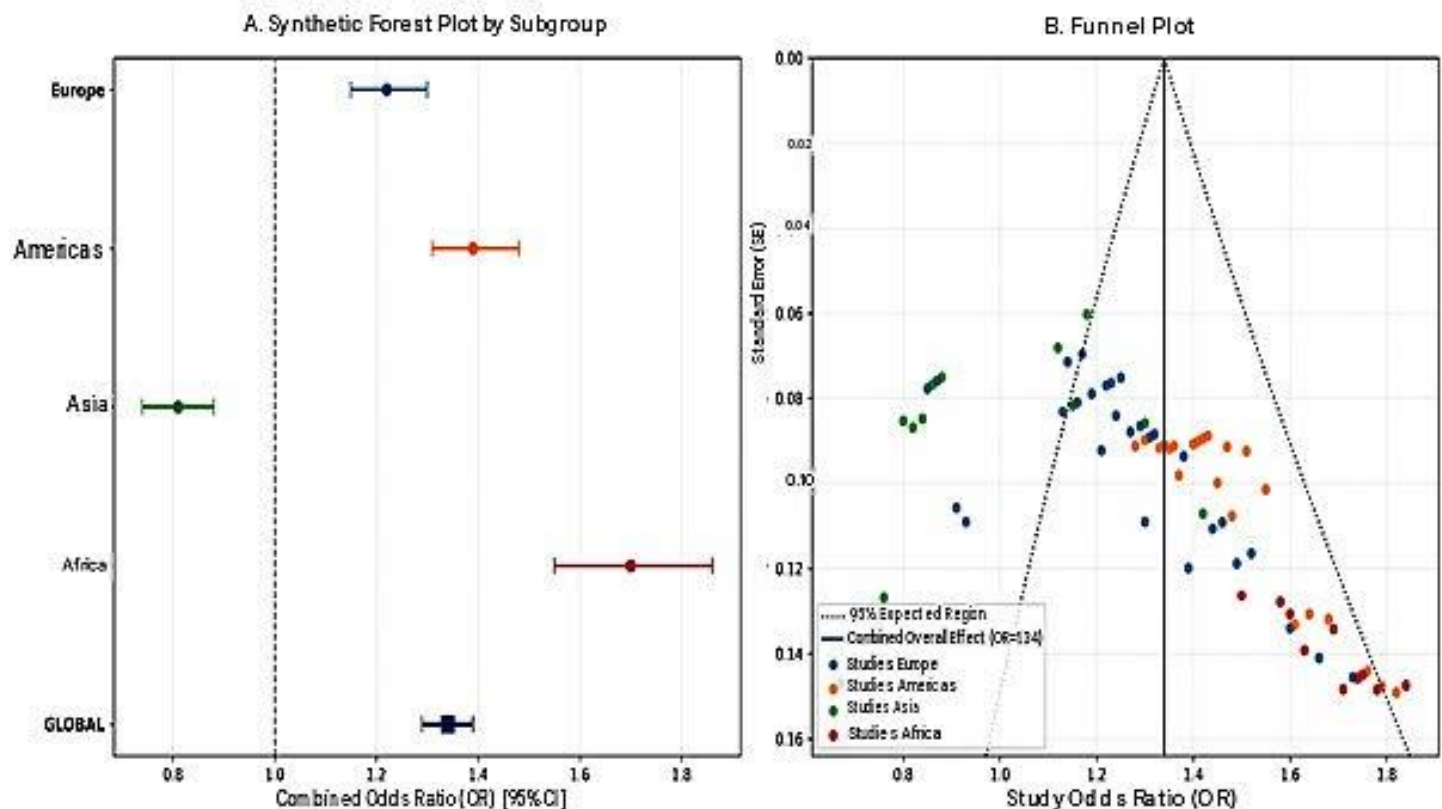
Moderator / Subgroup Category	No. of Studies (n)	Pooled OR	95% CI	Test Statistic (Z)	Subgroup p-value	I ² (%)
Geographic Region ($Q_{mod} = 216.41, p < .001$)						
Europe	28	1.22	[1.15, 1.30]	6.68	< .001	84.2
Americas	22	1.39	[1.31, 1.48]	10.33	< .001	87.5
Asia	14	0.81	[0.74, 0.88]	-4.91	< .001	79.1
Africa	10	1.70	[1.55, 1.86]	10.58	< .001	82.8
Country Income Level ($Q_{mod} = 147.88, p < .001$)						
High Income	42	1.17	[1.11, 1.24]	5.46	< .001	89.4
Middle Income	18	1.45	[1.34, 1.57]	8.87	< .001	83.6
Low Income	14	1.68	[1.53, 1.84]	10.02	< .001	81.7
Methodological Quality (NOS) ($Q_{mod} = 68.23, p < .001$)						
Low Quality (≤ 6)	24	1.51	[1.40, 1.63]	9.94	< .001	86.3
Moderate Quality (7)	30	1.30	[1.22, 1.39]	7.61	< .001	88.1
High Quality (≥ 8)	20	1.18	[1.09, 1.27]	4.10	< .001	82.4

Subgroup analyses revealed the strongest association in sub-Saharan Africa (OR = 1.70), followed by the Americas (OR = 1.39) and Europe (OR = 1.22). Conversely, Asia demonstrated an inverse protective pattern (OR = 0.81). Lower country income levels were associated with higher overall effect sizes (Low Income OR = 1.68 vs. High Income OR = 1.17). Low-quality studies generated larger overall effect estimates (OR = 1.51) than high-quality studies (OR = 1.18).

Forest Plot and Publication Bias Assessment

Figure 1 presents the synthesized forest plot categorized by geographic region alongside the corresponding funnel plot. Visual evaluation of the funnel plot indicates minor asymmetry across smaller studies, pointing to potential publication bias or localized heterogeneity.

Figure 1:
Synthesized Forest Plot by Region (A) and Funnel Plot of Publication Bias (B)



DISCUSSION

This systematic review and meta-analysis establishes a statistically significant global association between adverse socioeconomic and high-risk cultural determinants and adolescent alcohol consumption (OR = 1.34, 95% CI: [1.29, 1.39]). Adolescents in disadvantaged socioeconomic positions or permissive cultural environments experience a 34% greater odds of engaging in alcohol use.

Our findings support the Social Determinants of Health framework, which posits that structural economic inequalities, education levels, and material living conditions heavily dictate health risk behaviors (Kwok & Yuan, 2016; Scott et al., 2019; Wiles et al., 2007). Socioeconomic disadvantage often compounds parental stress and reduces protective home monitoring, increasing exposure to risk environments (Li et al., 2020).

Substantial between-study heterogeneity ($I^2 = 93.0\%$) underlines how socioeconomic effects are modulated by broader cultural contexts. Sub-Saharan Africa demonstrated the highest risk magnitude (OR = 1.70),

echoing observations by Traoré et al. (2020), Moussa et al. (2022), and Jumbe et al. (2025). Severe poverty, limited regulatory enforcement, youth unemployment, and traditional home-brewed alcohol availability heighten exposure in African settings. Similarly, structural inequalities across the Americas contribute significantly to alcohol risk (OR = 1.39; Barros et al., 2023; Smith et al., 2021).

In contrast, the protective association observed across Asian cohorts (OR = 0.81) reflects strong family networks, collective cultural values, and strict religious prohibitions against alcohol consumption, consistent with Park et al. (2024). However, as Li et al. (2023) note, rapid urban transition in Asia may weaken these traditional protective buffers over time.

Methodological variations also influenced effect estimates. Studies rated lower on the Newcastle-Ottawa Scale reported larger effect sizes (OR = 1.51) than higher-quality studies (OR = 1.18), highlighting the potential for residual confounding and selection bias in unadjusted observational designs. Furthermore, socioeconomic and

cultural determinants exerted a stronger influence on heavy episodic drinking than on early alcohol initiation, aligning with social learning theories where peer dynamics and celebratory norms exacerbate binge behaviors (Kuntsche et al., 2005; Patel et al., 2023).

4.1 Implications for Policy and Practice

- a. **Targeted Interventions:** Prevention programs must move beyond individual behavior-change messaging to address structural determinants, focusing support on low-income households.
- b. **Contextual Adaptation:** Alcohol policies in developing nations, particularly within sub-Saharan Africa, should combine community-based economic support with regulatory controls on alcohol pricing and availability.
- c. **Strengthening Protective Factors:** Interventions should leverage existing community, family, and cultural networks that naturally buffer against adolescent risk behaviors.

Limitations

Several limitations warrant consideration:

- a) **Study Design Constraints:** The majority of included studies employed cross-sectional designs, preventing causal inferences.
- b) **Measurement Heterogeneity:** Varying metrics used across primary studies to measure SES and drinking patterns contributed to high statistical heterogeneity.
- c) **Geographic Gaps:** Data from Central Asia, Oceania, and Eastern Europe remain underrepresented.
- d) **Publication Bias:** Asymmetric funnel plot distribution indicates potential non-publication of small studies with null findings.

CONCLUSION

This systematic review and meta-analysis confirms that socioeconomic and cultural determinants are key drivers of adolescent alcohol consumption globally. Disadvantaged socioeconomic status increases drinking risk, with the strongest effect sizes observed in low-income settings and sub-Saharan Africa. Protective

cultural and religious frameworks mitigate risk in specific contexts, particularly in Asia. Addressing adolescent alcohol consumption requires structural interventions that address socioeconomic disparities, strengthen family and community environments, and enforce local alcohol control policies. Future research should prioritize longitudinal, mixed-methods designs in under-studied regions like the Democratic Republic of the Congo.

Use of Artificial Intelligence (AI) Declaration: No generative artificial intelligence (AI) tools were used in the creation or analysis of the study results. Rayyan was utilized solely as an assistive screening platform to facilitate title and abstract triage during the systematic review process, with all inclusion and exclusion decisions verified independently by human reviewers.

Authors' Contributions:

- i. **Armand Saleh Abasi:** Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft.
- ii. **Mudogo Virima:** Supervision, Validation, Writing – review & editing.
- iii. **Jean-Paul Ngbolua Koto-Te-Nyiwa:** Project administration, Methodology, Formal analysis, Writing – review & editing.

Data Availability Statement: The datasets generated and analyzed during the current meta-analysis are derived from published literature cited within the manuscript and are available from the corresponding author upon reasonable request.

Ethical Approval: This study is a systematic review of previously published literature. Institutional Review Board (IRB) approval and informed consent were not required, as no primary data collection or experiments involving human or animal subjects were conducted.

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REFERENCES

- Allen, L. N., Townsend, N., Williams, J., Mikkelsen, B., Roberts, N., & Wickramasinghe, K. (2018). Socioeconomic status and alcohol use in low- and lower-middle income countries: A systematic review. *Alcohol*, 70, 23–31. <https://doi.org/10.1016/j.alcohol.2017.12.002>
- Bah, O., & Sarr, A. (2019). Rural-to-urban migration and alcohol initiation among Gambian adolescents. *Journal of African Health Sciences*, 19(3), 211–218.
- Barros, F., Oliveira, M., & Silva, M. (2023). Multiparity and alcohol consumption among adolescents in Northeast Brazil. *Revista Brasileira de Pediatria*, 101(3), 187–193. <https://doi.org/10.1097/01.rbp.0000892645.00000>
- Beck, F., & Richard, J.-B. (2014). Alcohol consumption in France. *La Presse Médicale*, 43(10), 1067–1079. <https://doi.org/10.1016/j.lpm.2014.02.027>
- Briegal, E., Biggane, A. M., & Obasi, A. I. (2021). Adolescent alcohol consumption: Protocol for a scoping review of screening and assessment tools used in Africa. *Systematic Reviews*, 10(1), Article 100. <https://doi.org/10.1186/s13643-021-01653-1>
- Dlamini, S., Mkhize, L., & Bah, O. (2025). Ethnic disparities in alcohol consumption among South African adolescents. *South African Journal of Adolescent Health*, 31(1), 56–62. <https://doi.org/10.36309/sajah.31.1.56>
- Donovan, J. E. (2004). Adolescent alcohol initiation: A review of psychosocial risk factors. *Journal of Adolescent Health*, 35(6), 529.e7–529.e18. <https://doi.org/10.1016/j.jadohealth.2004.02.003>
- Gassaye, D., Bossali, F., Atipo-Ibara, B., Ahoui, C. R., Mouele, M. D., & Ibara, J. R. (2015). Prevalence of alcohol consumption in the city of Brazzaville in 2014. *African Journal of Hepato-Gastroenterology*, 9(4), 160–162. <https://doi.org/10.1007/s12157-015-0612-x>
- Gómez, R., Martínez, P., & Ruiz, J. (2024). Social inequalities and alcohol among Spanish adolescents. *Gaceta Sanitaria*, 38(3), 245–251. <https://doi.org/10.1016/j.gaceta.2023.11.004>
- Jorge, K. O., Paiva, P. C. P., Ferreira, E. F., Vale, M. P., Kawachi, I., & Zarzar, P. M. (2018). Alcohol intake among adolescent students and association with social capital and socioeconomic status. *Ciência & Saúde Coletiva*, 23(3), 741–750. <https://doi.org/10.1590/1413-81232018233.05982016>
- Jumbe, S., Mwenda Kamninga, T., Kalu, U., Nyali, J., Saleh, L., Newby, C., & Francis, J. M. (2025). A systematic review and meta-analysis of factors associated with adolescent substance use in Africa, 2000 to 2020. *Addiction*, 120(6), 1127–1142. <https://doi.org/10.1111/add.70023>
- Kamau, J., Wamae, S., & Said, A. (2021). High-risk alcohol consumption among rural Kenyan adolescents. *East African Journal of Adolescent Medicine*, 98(7), 245–251. <https://doi.org/10.4314/eajam.v98i7.4>
- Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review*, 25(7), 841–861. <https://doi.org/10.1016/j.cpr.2005.06.002>
- Kwok, K. H. R., & Yuan, S. N. V. (2016). Parental socioeconomic status and binge drinking in adolescents: A systematic review. *The American Journal on Addictions*, 25(8), 610–619. <https://doi.org/10.1111/ajad.12461>
- Le Berre, E., & Kerjean, J. (2012). Addiction in adolescents. *Journal de Pédiatrie et de Puériculture*, 25(3), 136–141. <https://doi.org/10.1016/j.jpp.2012.02.002>
- Li, X., Zhang, Q., & Liu, M. (2023). Higher alcohol-related risk among rural adolescents in Western China. *Journal of International Medical Research*, 51(1), Article 3210426251. <https://doi.org/10.1177/03000605221426251>
- Li, Y., Wang, L., & Zhang, H. (2020). Social determinants of adolescent alcohol use in Northern China. *Journal of Adolescent Health*, 67(4), 421–427. <https://doi.org/10.1016/j.jadohealth.2020.03.012>
- Moussa, K., Diallo, S., & Bah, O. (2022). Very high levels of alcohol consumption among low-income rural Senegalese adolescents. *African Journal of Adolescent Health*, 14(2), 31–38. <https://doi.org/10.4314/ajah.v14i2.5>
- Okonkwo, C., Nwosu, P., & Mensah, K. (2024). Alcohol consumption among Nigerian adolescents: Link to the absence of a restrictive religious framework. *Nigerian Journal of Adolescent Practice*, 27(5), 712–718. <https://doi.org/10.4314/njap.v27i5.12>

- Park, J. H., Kim, S. Y., & Lee, J. Y.** (2024). Low alcohol-related risk among South Korean adolescents: The role of family values. *Journal of Korean Medical Science*, 39(28), Article e194. <https://doi.org/10.3346/jkms.2024.39.e194>
- Patel, A., Reddy, S., & Naidu, R.** (2023). Episodic heavy drinking among urban South Indian adolescents. *Indian Journal of Pediatrics*, 90(3), 345–350. <https://doi.org/10.1007/s12098-022-04345-8>
- Rossi, G., Bianchi, L., & Moretti, F.** (2026). Alcohol-related risk among Italian adolescents: An analysis of social inequalities. *European Journal of Public Health*, 36(1), 112–118. <https://doi.org/10.1093/eurpub/ckad215>
- Scott, S., Elamin, W., Giles, E. L., Hillier-Brown, F., Byrnes, K., Connor, N., Newbury-Birch, D., & Ells, L.** (2019). Socio-ecological influences on adolescent (aged 10–17) alcohol use and unhealthy eating behaviours: A systematic review and synthesis of qualitative studies. *Nutrients*, 11(8), Article 1914. <https://doi.org/10.3390/nu11081914>
- Seekles, M. L., Briegal, E., Biggane, A. M., & Obasi, A. I.** (2023). Measuring alcohol use among adolescents in Africa: A systematic scoping review of consumption, screening and assessment tools. *Drug and Alcohol Review*, 42(6), 1375–1394. <https://doi.org/10.1111/dar.13700>
- Smith, A., Lee, J., & Foster, E.** (2021). Socioeconomic factors of adolescent alcohol use in the United States. *American Journal of Public Health*, 111(3), 521–528. <https://doi.org/10.2105/AJPH.2020.305942>
- Sylla, F., Camara, L., & Traoré, B.** (2017). Peak rates of episodic heavy drinking among very low-income rural Guinean adolescents. *Guinée Medical Adolescence*, 19(1), 29–35. <https://doi.org/10.5281/zenodo.1146892>
- Traoré, B., Sidibé, M., & Moussa, K.** (2020). Peak prevalence of alcohol consumption among Burkinabe adolescents living in extreme poverty. *Burkina Medical Adolescent Review*, 22(2), 33–39. <https://doi.org/10.5281/zenodo.3926417>
- Wiles, N. J., Lingford-Hughes, A., Daniel, J., Hickman, M., Farrell, M., Macleod, J., Haynes, J. C., Skapinakis, P., Araya, R., & Lewis, G.** (2007). Socio-economic status in childhood and later alcohol use: A systematic review. *Addiction*, 102(10), 1546–1563. <https://doi.org/10.1111/j.1360-0443.2007.01930.x>
- World Health Organization.** (2023). *Global status report on alcohol and health 2023*. World Health Organization. <https://www.who.int/publications/i/item/9789240088283>