

Table 1: Eligible studies published from January 1989 to December 2019, reporting risk estimates regarding GBD and smoking: the 30 published case-control, cross-sectional, and cohort studies that were considered for data synthesis.

Study	Design	Region	Endpoint	Outcome measures	Sex	Case/Total	OR (Smokers vs non-smokers)	OR (Ex-smokers vs non-smokers)	OR (Ever smokers vs non-smokers)	Adjusted confounders
Jorgensen, 1989 ¹⁸	CS	Denmark	Cholelithiasis	Medical history, questionnaire, ultrasound	M/F	308/3417			M: 3.01 (2.07-3.95) F: 1.24 (0.89-1.59) M/F, pooled: 1.92 (0.81-4.59) †	Slimming treatment, physical exercise, coffee
Pastides, 1990 ¹⁹	CC	Greece	GBD	Medical history, questionnaire, ultrasound	M/F	100/271	0.5 (0.2-0.9)	1.472 (0.781-2.733)	1.19 (0.87-1.63) †	Alcohol, eye color, dietary pattern
La Vecchia, 1991 ²⁰	CC	Italy	Cholelithiasis	Hospital records, questionnaire	M/F	195/1317	1.114 (0.781-1.858)			Sex, age, BMI, area of residence, coffee, alcohol, history of liver disease
McMichael, 1992 ²¹	CC	Australia	GBD	Hospital records, questionnaire	F	267/508	1.7 (0.9-3.2) 1-14 cig.: 1.10 (0.93-1.31) 15-24 cig.: 1.03 (0.90-1.19) 25-34 cig.: 1.33 (1.09-1.61) 35+ cig.: 1.53 (1.21-1.94) Pooled: 1.21 (1.02-1.43) †	1.4 (0.7-3.0)	1.57 (0.97-2.54) †	Parity, age, BMI, alcohol, sugar intake, oral contraceptive use
Stampfer, 1992 ²²	PrC	USA	Cholelithiasis	Medical history, questionnaire, ultrasound	F	2610/90302		1.06 (0.96-1.17)		Parity, age, BMI, alcohol, weight change, calorie intake, PUFA intake, postmenopausal hormone use
Kato, 1992 ²³	PrC	USA	Cholelithiasis	Medical history, questionnaire, ultrasound	M	471/7831		1.656 (1.000-2.120)		Age, BMI, alcohol, height, calorie intake, physical activity, serum glucose, triglycerides and uric acid levels, blood pressure
Murray, 1994 ²⁴	PrC	UK	GBD	GP reports	F	1087/46377	1.196 (1.062-1.352)			Parity, age, social class
Grodstein, 1994 ²⁵	CS	USA	Cholelithiasis	Medical history, questionnaire	F	425/96211	1.302 (1.000-1.705)			Parity, age, BMI, alcohol, weight change, oral contraceptive use, postmenopausal hormone use
Kono, 1995 ²⁶	CS	Japan	Cholelithiasis	Medical history, questionnaire, ultrasound, laboratory tests	M	72/2228	0.9 (0.6-1.4)	0.9 (0.3-2.3)	0.9 (0.62-1.31) †	BMI, alcohol, hospital, rank exercise, glucose tolerance
Miscignaci, 1996 ²⁷	PrC	Italy	Cholelithiasis	Medical history, questionnaire, ultrasound	M/F	226/2472	1.89 (1.18-3.03)			Sex, age, BMI
Kratzer, 1997 ²⁸	CS	Germany	Cholelithiasis	Medical history, questionnaire, ultrasound	M/F	67/1116			1.381 (0.82-2.331)	Age
Martinez de Pancorbo, 1997 ²⁹	CS	Spain	Cholelithiasis	Medical history, questionnaire, ultrasound, laboratory tests	M/F	67/894	1.492 (1.097-2.209)			Sex, age, BMI, alcohol, dyspeptic symptoms, hypolipidemic drugs, total cholesterol
Sahi, 1998 ³⁰	PrC	USA	GBD	Personal contact with physician, questionnaire	M	685/16785	1-19 cig.: 1.457 (1.00-2.157) ≥20 cig.: 1.554 (1.031-2.365) Pooled: 1.50 (1.14-1.98) †	1.295 (0.886-1.919)	1.42 (1.14-1.77) †	Age
Okamoto, 2002 ³¹	CS	Japan	Cholelithiasis	Questionnaire, ultrasound, laboratory tests	M/F	483/9946	M: 1.19 (0.65-1.38) M, 1-19 cig.: 1.55 (0.66-3.67) M, ≥20 cig.: 1.36 (0.63-2.90) F: 1.36 (0.84-2.19) M/F, pooled: 0.90 (0.64-1.27) †	M: 0.95 (0.65-1.38) F: 0.68 (0.29-1.56)	1.10 (0.86-1.41) †	Age, BMI, alcohol, % of body fat, HDL-C, LDL-C, fasting blood sugar, HbA1c
Völzke, 2005 ³²	CS	Germany	Cholelithiasis	Medical history, questionnaire, ultrasound, laboratory tests	F	586/2150	0.76 (0.56-1.02)			Age, BMI, waist-to-hip ratio, parity, physical activity, cholesterol levels
Yamada, 2005 ³³	PrC	Japan	Cholelithiasis	Medical history, questionnaire, ultrasound	M/F	1136/11982			1.214 (1.022-1.461)	Sex, age, alcohol, residence, radiation dose, duodenal and gastric ulcer, liver disease
González-Perez, 2007 ³⁴	PrC	Spain	GBD	GP reports, medical history of cholecystectomy	M/F	2353/12353	1.05 (0.94-1.19)	1.18 (0.99-1.41)	1.09 (0.98-1.21) †	Sex, age, BMI, alcohol, diabetes, heart failure, hyperlipidemia, hypertension, ischemic heart disease, stroke, osteoarthritis, rheumatoid arthritis
Abu-Eshy, 2007 ³⁵	CS	Saudi Arabia	Cholelithiasis	Medical history, questionnaire, ultrasound	M/F	34/291	1.61 (0.29-8.95)			Sex, age, BMI, education, coffee, family history of gall stones, history of diabetes, hypertension, pancreatitis
Katsika, 2007 ³⁶	PrC	Sweden	Cholelithiasis	Hospital records, questionnaire	M/F	1666/58402	0.99 (0.78-1.27)	1.15 (0.95-1.39)	1.08 (0.93-1.25) †	Sex, age, BMI, alcohol
Panpimanmas, 2009 ³⁷	CC	Thailand	Cholelithiasis	Hospital records, medical history, questionnaire, ultrasound	M/F		1.8 (0.7-4.6)	2.4 (1.1-5.2)	2.14 (1.17-3.91) †	Sex, age
Haldestam, 2009 ³⁸	PrC	Sweden	Cholelithiasis	Medical history, questionnaire, ultrasound, laboratory tests, death certificates	M/F	42/503			1.18 (0.43-3.25)	Sex, age, BMI, alcohol, family history of gall stones, occupation, diabetes mellitus, HDL-C, LDL-C, triglycerides and Lp(a) levels, NSAID use
Liu, 2009 ³⁹	PrC	UK	GBD	Hospital records, questionnaire	F	23989/1290413	1-9 cig.: 1.19 cig.: 1.126 (1.06-1.196) 10-19 cig.: 1.255 (1.202-1.310) ≥20 cig.: 1.308 (1.238-1.382) Pooled: 1.23 (1.14-1.33) †	1.138 (1.106-1.171)	1.20 (1.12-1.29) †	Age, BMI, residence, socioeconomic status, alcohol
Walcher, 2010 ⁴⁰	CS	Germany	Cholelithiasis	Medical history, questionnaire, ultrasound	M/F	170/1967	0.89 (0.57-1.38)	1.36 (0.88-2.11)	1.10 (0.72-1.68) †	Sex, age, BMI, education, coffee, alcohol, family history of gall stones
Etimian, 2011 ⁴¹	RetroC	USA	GBD	Medical history of cholecystectomy	F	27087/2721014			2.072 (2.002-2.154)	Age, obesity, diabetes, inflammatory bowel disease, pancreatitis, sickle cell anemia, statin use, fibrate use, oral contraceptives use
Palermo, 2013 ⁴²	CS	Argentina	Cholelithiasis	Medical history, questionnaire, ultrasound	M	276/1336	2.83 (1.81-4.42)			Age, family history, pain, sedentary habits
Shabanzadeh, 2016 ⁴³	PrC	Denmark	Cholelithiasis	Medical history, questionnaire, ultrasound, laboratory tests	M/F	256/2592			0.84 (0.63-1.12)	Sex, age, BMI, alcohol, coffee, type of diet, physical activity level, blood lipids, benign gallbladder findings, female sex hormones use
Figueredo, 2017 ⁴⁴	PrC	USA	GBD	Medical history, hospital records, questionnaire	M/F	13437/144409	M, 1-19 cig.: 1.1682 (1.04-1.31) M, 20+ cig.: 1.2320 (1.09-1.39) F, 1-19 cig.: 1.1646 (1.08-1.26) F, 20+ cig.: 1.3562 (1.24-1.49) M/F, pooled: 1.23 (1.14-1.33) †	M, 1-19 cig.: 1.0944 (1.01-1.18) M, 20+ cig.: 1.1682 (1.07-1.28) F, 1-19 cig.: 1.1028 (1.04-1.17) F, 20+ cig.: 1.3111 (1.18-1.46) M/F, pooled: 1.16 (1.08-1.24) †	1.19 (1.13-1.25) †	Age, BMI, alcohol, ethnicity, education, diabetes
Kang, 2018 ⁴⁴	CS	China	GBD	Medical history, questionnaire, ultrasound, laboratory tests	M/F	1876/21435	1.15 (1.01-1.31)	1.37 (1.13-1.65)	1.24 (1.04-1.48) †	Sex, age, residence, dietary habits regarding fish and soya
Chang, 2019 ⁴⁵	PrC	Taiwan	Cholelithiasis	Medical examination, questionnaire, laboratory tests	M/F	106/4839	M: 0.78 (0.44-1.54) F: 2.93 (0.68-12.35) M/F, pooled: 1.29 (0.36-4.54)			Sex, age, BMI, educational level, alcohol, sport habits, vegetarian diet, cholesterol levels, diabetes, kidney disease, lipid-lowering medications, menopause
Kim, 2019 ⁴⁶	PrC	Korea	GBD	Questionnaire, ultrasound, laboratory tests	M/F	10673/69568	1.00 (0.90-1.11)			BMI, waist and thigh circumference, alcohol, Cholesterol, HDL, LDL

CC: Case-control, CS: Cross-sectional, RetroC: Retrospective cohort, PrC: Prospective cohort, GBD: gallbladder disease, M: males, F: females, cig: cigarettes per day, †: pooled odds ratio, BMI: body mass index, HDL: high-density lipoprotein, LDL: low-density lipoprotein, NSAID: nonsteroidal anti-inflammatory drug.