SSM - Population Health 6 (2018) 195–244

Contents lists available at ScienceDirect

SSM - Population Health

journal homepage: www.elsevier.com/locate/ssmph

Blue-collar work and women's health: A systematic review of the evidence from 1990 to 2015

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ARTICLE INFO

Keywords:
Women's health
Occupational health
Blue-collar
Systematic review

ABSTRACT

Despite the implications of gender and sex differences for health risks associated with blue-collar work, adverse health outcomes among blue-collar workers has been most frequently studied among men. The present study provides a "state-of-the-field" systematic review of the empiric evidence published on blue-collar women's health. We systematically reviewed literature related to the health of blue-collar women published between January 1, 1990 and December 31, 2015. We limited our review to peer-reviewed studies published in the English language on the health or health behaviors of women who were presently working or had previously worked in a blue-collar job. Studies were eligible for inclusion regardless of the number, age, or geographic region of blue-collar women in the study sample. We retained 177 studies that considered a wide range of health outcomes in study populations from 40 different countries. Overall, these studies suggested inferior health among female blue-collar workers as compared with either blue-collar males or other women. However, we noted several methodological limitations in addition to heterogeneity in study context and design, which inhibited comparison of results across publications. Methodological limitations of the extant literature, alongside the rapidly changing nature of women in the workplace, motivate further study on the health of blue-collar women. Efforts to identify specific mechanisms by which blue-collar work predisposes women to adverse health may be particularly valuable in informing future workplace-based and policy-level interventions.

1. Introduction

The term "blue-collar work" is frequently used to describe working class jobs that require manual labor. These jobs are often both physically and psychologically demanding, and have been linked with various adverse health outcomes. Evidence suggests, however, that men's and women's exposures and health outcomes in blue-collar jobs may vary considerably. Differences in mortality are consistently noted between men and women in the general population, whereby women outlive men in almost every country in the world and with lower mortality rates observed among women throughout the lifecourse (Catalano and Bruckner, 2006; Cullen, Baiocchi, Eggleston, Loftus, & Fuchs, 2015; Rieker and Bird, 2005). Yet women on average exhibit higher rates of morbidity, report inferior self-rated health, and use more health services as compared with men (Case and Paxson, 2005).

Theories explaining the "gender paradox" in morbidity and mortality suggest that biological characteristics and social pressures operating across the lifecourse—both independently and synergistically—contribute to inequalities in men and women's health (Krieger, 2003; Rieker and Bird, 2005). Within the context of the relationship between work and health, differences in biological susceptibility to workplace hazards can result from differences in toxicokinetic responses (i.e., absorption, metabolism, and excretion) to occupational chemicals, dust, and other hazardous substances (Arbuckle, 2006). The consequences of nontraditional work hours (e.g., swing shifts, night shifts) can also manifest differently in men and women due to differences in circadian rhythms (Santhi et al., 2016). Lastly, anthropometric differences between men and women can mediate the effects of blue-collar work on health risks: spaces, equipment, and tools that are optimized for the average male worker may be ill-suited for female workers (Blue, 1993; Courville, Vézina, & Messing, 1991; Messing and Stevenson, 1996).

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https://doi.org/10.1016/j.ssmph.2018.08.002
Received 29 January 2018; Received in revised form 6 August 2018; Accepted 13 August 2018

Non-biological differences in susceptibility to health risks include behavioral differences, such as in smoking habits, diet, and use of medications, as well as differences in psychosocial stressors. Women in blue-collar workplaces, for example, are especially vulnerable to experiencing gender discrimination, sexual harassment, social isolation, and work-life conflict (Clougherty, Souza, & Cullen, 2010; Frankenhaeuser, Lundberg, Fredrikson, Toumisto, & Myrsten, 1989; Frone, 2000; Hocschild and Machung, 2012; Lederer, 1981; Messing and Ostlin, 2018; Zahm, Pottern, Lewis, Ward, & White, 1994).

Despite the implications of gender and sex differences for health risks associated with blue-collar work, adverse health outcomes among blue-collar workers has been most frequently studied among men (Clougherty et al., 2010; House, 1980; Karasek, 1979). The present study provides a "state-of-the-field" systematic review of the empiric evidence published on blue-collar women's health from 1990 to 2015. This 25-year period captures major trends in the global economy that may be salient to the health and well-being of contemporary working women, including industry deregulation, computerization and automation of working-class jobs, union decline and weakened institutional protections for workers, and the rise in production in lower income countries (Arnold and Bongiovi, 2012; Berman, Bound, & Griliches, 1994; Kalleberg, 2009; Kalleberg, 2012; Navarro, 1982).

Our specific objectives were to assess: the extent and strength of the existing empiric evidence on the health of blue-collar women; discernable patterns in publication over time, across countries, and among various health outcomes; and the degree to which study findings converge. Our review includes studies that evaluated specific risk factors for morbidity and mortality among blue-collar women, as well as studies that compared the health of blue-collar women with women in other industries or men in blue-collar jobs. Although we provide some analysis of the studies by place, time, and health outcome, differences in study design and specific exposures/outcomes studied inhibited us from offering a quantitative synthesis of the direction and magnitude of associations between work and health. We discuss instead general trends and themes, as well as general methodological limitations of the extant literature. We conclude with future directions for research.

2. Materials and methods

2.1. Identification of papers

In the present study, we systematically reviewed the peer-reviewed literature related to the health of blue-collar women published between January 1, 1990 and December 31, 2015. We conducted our preliminary search across three major research databases (Google Scholar, Web of Science, and PubMed) for literature relevant to blue-collar women's health, using combinations of the terms "blue-collar," "health," and "women" or "female."

We subsequently employed a second, more flexible, targeted search strategy among these same three databases that integrated synonyms and related terms (e.g. MeSH terms). We additionally expanded our second search to incorporate findings from several smaller research databases from the biomedical, social science, and humanities fields, including: Medline (PubMed), Scopus (Elsevier), Gender Watch (ProQuest), Social Sciences Citation Index (Clarivate), LGBT Life Full Text (EBSCO), CINAHL (EBSCO), Cochrane Library of Systematic Reviews (Cochrane), SafetyLit (SafetyLit Foundation), and Women's Studies Quarterly. Search algorithms were developed specifically for each database by a medical librarian. A complete list of search terms used for identification of papers is provided in Appendix A.

2.2. Selection criteria

We initially identified articles for full-text review based on the contents of the abstract. Studies were deemed eligible for inclusion if they met the following criteria: the study was peer-reviewed and published in the English language; the dependent variable was a health outcome or health behavior (e.g., diet, physical activity, smoking and other substance use); the study population included women who were presently working or had previously worked in a blue-collar job; and the results included a multivariate-adjusted point estimates specific to female blue-collar workers. We defined blue-collar work, consistent with the United States Bureau of Labor Statistics, to include precision production, craft, and repair occupations; machine operators and inspectors; transportation and moving occupations; and handlers, equipment cleaners, helpers, and laborers (U.S. Bureau of Labor Statistics, 2018). Studies were eligible for inclusion regardless of the number, age, or geographic region of blue-collar women in the study sample.

Studies were excluded if there was no empirical quantitative analysis (i.e. qualitative research), if only descriptive and summary statistics were presented (i.e. not multivariate adjusted), if they were not peer reviewed, or if the outcome was deemed unrelated to health. We additionally excluded studies that included blue-collar women in the overall study population but failed to specify results or an exposure unique to blue-collar women. Lastly, we excluded those studies for which we were unable to discern whether blue-collar women were grouped with office and clerical workers in their analyses (Applebaum et al., 2013; Gold et al., 2006).

2.3. Data extraction

Two researchers independently assessed and extracted data from the selected articles. The first researcher examined studies published between 1990 and 2002 (A.F.), while the second examined studies published between 2003 and 2015 (H.E.). The researchers cross-checked a random subset of each other's studies in order to ensure that selection criteria were consistently and accurately applied.

We extracted and recorded the following study characteristics from each study: study author(s) and year of publication; title; country of the study subjects; years over which study data were collected; sample size, number of women, and number of blue-collar women; industry subsector; study design (cross-sectional, longitudinal, case-control, or quasi-experimental); independent variable(s); specific health outcome (s); the referent group (i.e., to whom authors compared blue-collar women); a summary of the study's main findings; a brief description of the study population; and country classification.

We classified the country of origin for study subjects as high-, middle- or low-income based on World Bank Country and Lending Groups classification (World Bank, 2018). We classified industry subsector based on the North American Industry Classification System (NAICS). Where insufficient detail was provided to identify industry subsector, we list the industry supersector (e.g., manufacturing). If five or more industry subsectors were represented in the study population or if the study was population-based, we specified "Multiple Industries." (US Census Bureau, 2017) For a subset of studies that compared the health of male and female blue-collar workers, gender was not considered as a main effect. Similarly, for a subset of studies that compared the health of blue-collar women and women in other industries or job types, occupational class was not considered as a main effect. We use superscripts in the "referent group" column in Table 2 to identify these papers, and we also note which papers were exploratory in nature and considered several independent variables simultaneously.

We organized studies by the following health outcome categories: BMI and metabolism, cancer, cardiovascular disease, disability and absenteeism, health behaviors, mental health, mortality (all-cause and cause-specific), musculoskeletal disorders, reproductive and sexual health, respiratory diseases, self-rated health, and smoking and other substance use. Studies reporting on multiple health outcomes were listed under each relevant health outcome.

We did not attempt meta-analysis because the majority of studies

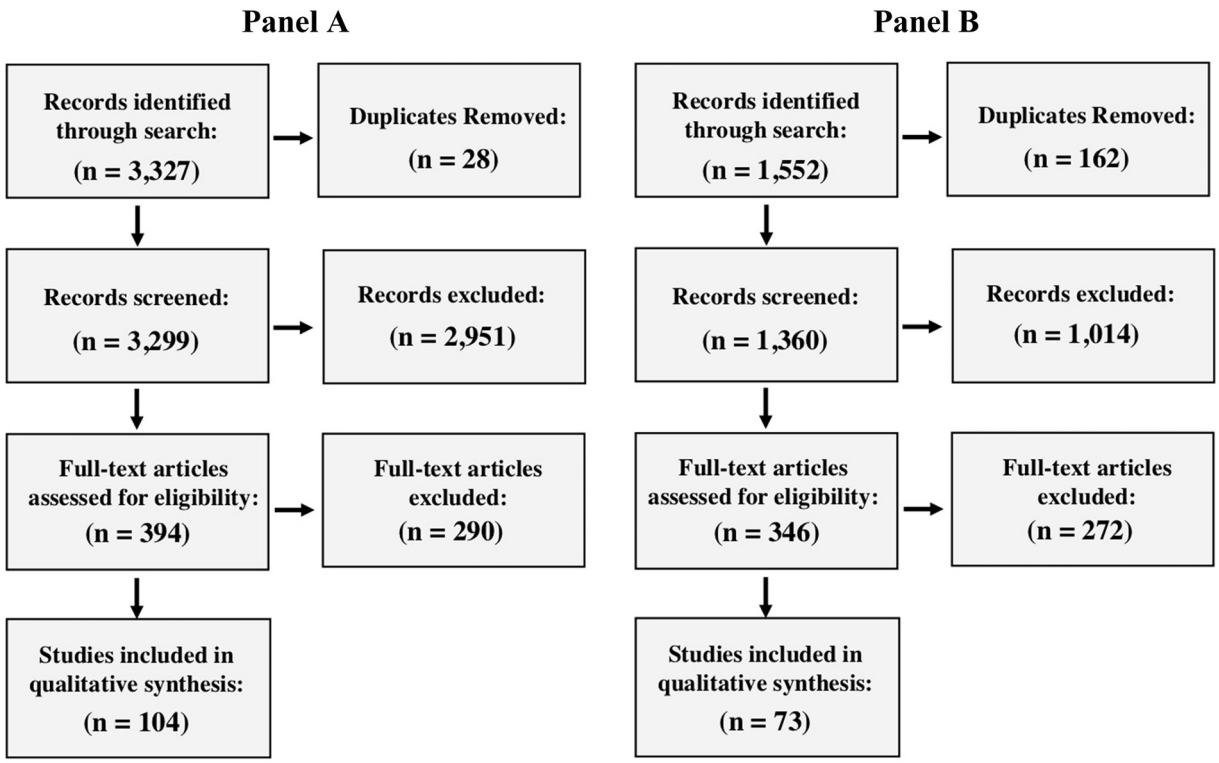

Fig. 1. PRISMA flow diagram. The first search (Panel A) was conducted between January and June 2016 in three major databases (Google Scholar, Web of Science, and Pub Med) with combinations of the terms "blue-collar," "health," and "women" or "female." The second search (Panel B) was conducted between March and June of 2017 using integrated synonyms and related terms of major concepts. This search was expanded to include several additional databases: Medline (PubMed); Scopus (Elsevier); Gender Watch (ProQuest); Social Sciences Citation Index (Clarivate); LGBT Life Full Text (EBSCO); CINAHL(EBSCO); Cochrane Library of Systematic Reviews (Cochrane); SafetyLit (SafetyLit Foundation); and Women's Studies Quarterly.

either lacked raw data, used the same or similar data sources, and because substantial variability in study design precluded meaningful quantitative synthesis. We did not attempt a formal assessment of risk of bias due to heterogeneity in study design, analytic method, and scientific question. Data extracted and summarized in Table 2 (e.g. sample size and study design), however, provides a preliminary indication of whether study findings may be subject to various biases.

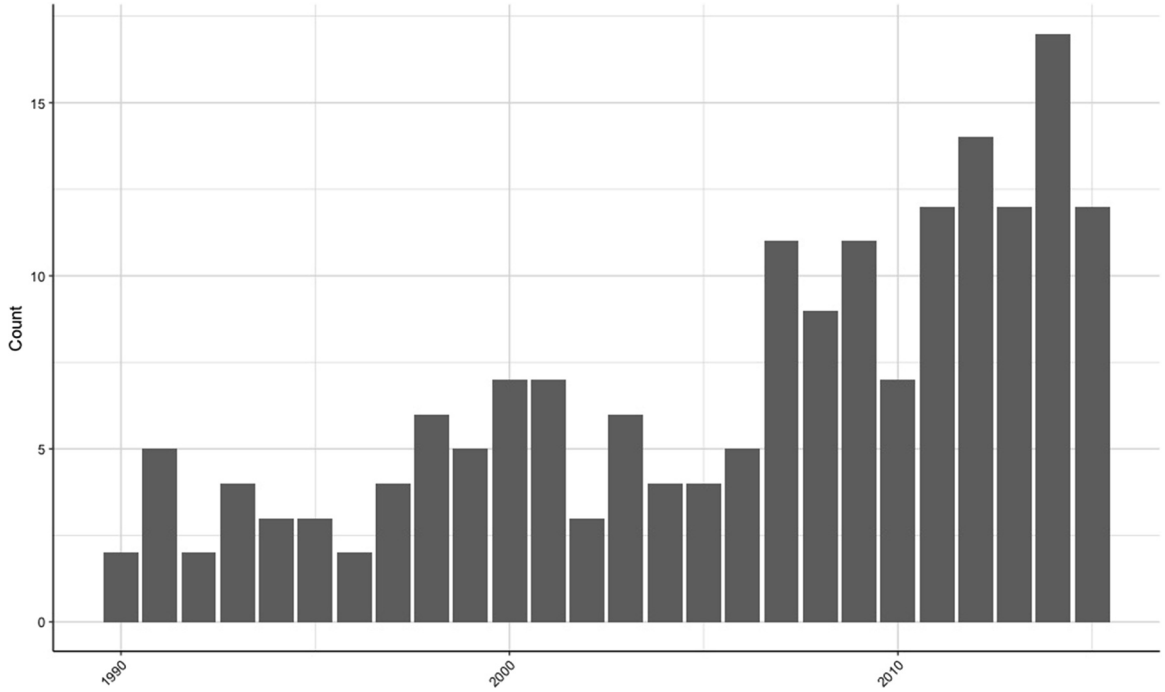

Fig. 2. Number of studies published per year, 1990–2015.

3. Results

We identified 3327 records through our first search, assessed 394 full articles, and retained and extracted data from 104 studies. We identified 1522 records through our second search, assessed 346 full articles and retained and extracted data from 73 studies. (Fig. 1) We included 177 articles in our review in total and note an increase in the number of articles published each year between 1990 and 2015 (Fig. 2).

Two patterns related to the publication of studies are worth noting. First, the study of specific cohorts occasionally predominated findings from a given country. For example, of the 14 studies from Australia, five were studies onphysical activity. Of the 11 studies from South Korea, five used data from KNHANES, and four recruited study participants from the City of Incheon. Of the five studies from Israel, four used data from the CORDIS study and were published prior to 2001. Both studies from Mexico evaluated the helath of female maquiladoras in Tijuana. Of the 16 studies on smoking and other substance use, 10 were from the U.S. and four of these studies used baseline data from the MassBUILT study. Of the seven U.S. studies on musculoskeletal disorders, six used data from the American Manufacturing Cohort.

Second, although studies were included from 40 different countries across North and South America, Europe, Asia, and Australia (Table 1A), these were primarily from high-income nations (N = 24, 60.0%). The majority of studies were based either in the United States (N = 45, 25.4%) or in Scandinavian Countries (N = 52, 29.4%). Only 21 studies (11.8%) were based in middle- or low-income countries (Table 1B). Fourteen of these studies were in middle income countries. Upper-middle income countries included China, the Dominican Republic, Iran, Mexico, Peru, Romania, Russia, Serbia, Thailand, Turkey; and lower-middle income countries included Bangladesh, India, Vietnam, and Sri Lanka. One low-income country, Nepal, was included as well. These studies generally included fewer blue-collar women (Median = 286, 203.8 – 671.8) relative to the studies from high-income countries. With the exception of one quasi-experimental study, all studies conducted in low- and middle-income countries were cross-sectional in design. The most commonly studied health outcomes were those related to sexual and reproductive health, musculoskeletal disorders, and mental health outcomes.

Table 1A
Descriptive Statistics for Study Sample (N = 177).

Countries included in study sample - N	40
Country classification – N (%)[a]	
High-Income	24 (60.0)
Upper-Middle income	11 (27.5)
Low-Middle income	4 (10.0)
Low-Income	1 (2.5)
Most frequently studied countries – N (%)[b]	
United States	45 (25.4)
Sweden	23 (13.0)
Finland	16 (9.0)
Australia	12 (6.8)
Japan	10 (5.6)
Health outcomes[c]	
BMI & metabolism	13 (7.3)
Cancer	12 (6.8)
Cardiovascular diseases	19 (10.7)
Disability & absenteeism	13 (7.3)
Health behaviors	16 (9.0)
Mental health	17 (9.6)
Mortality	20 (11.3)
MSK	30 (16.9)
Other	15 (8.5)
Reproductive & sexual health	14 (7.9)
Respiratory	14 (7.9)
Self-Rated health	5 (2.8)
Smoking & other substance use	16 (9.0)
Study design	
Cross-sectional	85 (48.0)
Case-Control	18 (10.2)
Longitudinal	71 (40.1)
Quasi-Experimental	3 (1.7)
Type of point estimate presented – N (%)	
Blue-collar women vs. blue-collar men	31 (17.5)
Blue-collar women vs. other women	91 (51.4)
Exposure-outcome among blue-collar women	55 (31.1)
Number of women included – Median (IQR)[d]	946 (305–4,580)
Number of blue-collar women included – Median (IQR)[e]	422.5 (100–1,196)

[a] Percentages are calculated based on the number of unique countries.
[b] Percentages are calculated based on the number of studies.
[c] Percentages do not sum to 100% because several studies report for multiple health outcomes.
[d] Missing for 4 studies.
[e] Missing for 25 studies.

Table 1B
Descriptive Statistics for Lower and Middle-Income Countries (N = 21).

Countries included in study sample - N	16
Most frequently studied countries – N (%)[a]	
China	5 (23.8)
Mexico	2 (9.5)
Turkey	2 (9.5)
Vietnam	2 (9.5)
Health outcomes[b]	
BMI & metabolism	1 (4.8)
Cancer	3 (14.3)
Cardiovascular	1 (4.8)
Disability & Absenteeism	1 (4.8)
Health behaviors	1 (4.8)
Mental health	3 (14.3)
Mortality	1 (4.8)
MSK	5 (23.8)
Other	3 (14.3)
Reproductive & sexual health	5 (23.8)
Respiratory	2 (9.5)
Self-Rated health	2 (9.5)
Smoking and other substance use	1 (4.8)
Study design	
Cross-sectional	19 (90.5)
Case-Control	1 (4.8)
Quasi-Experimental	1 (4.8)
Type of point estimate presented – N (%)	
Blue-collar women vs. blue-collar men	4 (19.0)
Blue-collar women vs. other women	6 (28.6)
Exposure-outcome among blue-collar women	11 (52.3)
Number of women included – Median (IQR)[c]	360 (263–1,058)
Number of blue-collar women included – Median (IQR)[d]	286 (203.8–671.8)

[a] Percentages are calculated based on the number of studies.
[b] Percentages do not sum to 100% because several studies report for multiple health outcomes.
[c] Missing for 1 study.
[d] Missing for 2 studies.

3.1. Study design and analysis

Summary statistics related to study design and analysis are reported in Table 1A. Approximately half of studies were cross-sectional (N = 85, 48.0%). The remainder employed a longitudinal, case-control, or quasi-experimental study design. The median number of blue-collar women included across studies was 422.5 (IQR 100–1,196).

Across studies, authors characterized the health of blue-collar women to one or more of three different referent groups: (1) studies compared the health of blue-collar women and blue-collar men; (2) studies compared the health of blue-collar women to women in other industries or job types, including white-collar women, office and clerical workers, and women in the general population; (3) studies examined independent risk factors for disease among blue-collar women. The minority of studies included in this review compared the health of blue-collar women and blue-collar men (N = 31, 17.5%). Approximately half of studies compared the health of blue-collar women to a female referent group, and nearly one-third of studies reported a specific exposure-outcome association among blue-collar women (N = 55, 31.1%).

Table 2
Empirical studies of blue-collar women's health, organized by health outcome category (n = 177)*.

Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
BMI & metabolism	Melamed et al. (1995)	Objective and subjective work monotony: effects on job satisfaction, psychological distress, and absenteeism in blue-collar workers	Israel	1985–1987	1278	393	393	Manufacturing
	Nakamura, Nakamura, and Tanaka (2000)	Increased risk of coronary heart disease in Japanese blue-collar workers	Japan	1993	1145	492	492	Computer and Electronic Product Manufacturing
	Santos and Barros (2003)	Prevalence and determinants of obesity in an urban sample of Portuguese adults	Portugal	NR	1424	868	254	Multiple Industries
	Maty et al. (2005)	Education, income, occupation, and the 34-year incidence (1965 -99) of Type 2 diabetes in the Alameda County Study	United States	1965–1999	6147	3293	417	Multiple Industries
	Bennett, Wolin, and James (2007)	Lifecourse socioeconomic position and weight change among Blacks: the Pitt County Study	United States	1988–2001	1167	751	573	Multiple Industries
	Forman-Hoffman et al. (2008)	Retirement and weight changes among men and women in the Health and Retirement Study	United States	1994–2002	3725	1759	994	Multiple Industries
	Yang et al. (2008)	Emergence of socioeconomic inequalities in smoking and overweight and obesity in early adulthood: the National Longitudinal Study of Adolescent Health	United States	1995–1996, 2001–2002	9542	4580	NR	Multiple Industries
	Cho and Lee (2012)	The relationship between cardiovascular disease risk factors and gender	South Korea	2005	4556	2596	NR	Multiple Industries
	Duffy et al. (2012)	Predictors of Obesity in Michigan Operating Engineers	United States	2008	498	37	37	Specialty Trade Contractors
	Eshak et al. (2013)	Soft drink, 100% fruit juice, and vegetable juice intakes and risk of diabetes mellitus	Japan	1990–2000	27585	15448	6565	Multiple Industries
	Miura and Turrell (2014)	Reported consumption of takeaway food and its contribution to socioeconomic inequalities in body mass index	Australia	2009	903	480	40	Multiple Industries
	Lewin et al. (2014)	Residential neighborhood, geographic work environment, and work economic sector: associations with body fat measured by electrical impedance in the RECORD study	France	2007–2008	4331	NR	NR	Multiple Industries
	Hwang and Lee (2014)	Effect of psychosocial factors on metabolic syndrome in male and female blue-collar workers	South Korea	2010	234	80	80	Chemical Manufacturing; Computer and Electronic Product Manufacturing; Fabricated Metal Product Manufacturing; Transportation Equipment Manufacturing;
Cancer	van Loon, Goldbohm, and van den Brandt (1994)	Socioeconomic status and breast cancer incidence: a prospective cohort study	Netherlands	1986–1989	1716	1716	457	Multiple Industries
	van Loon, van den Brandt, and Golbohm (1995)	Socioeconomic status and colon cancer incidence: a prospective cohort study	Netherlands	1986–1989	3658	1871	494	Multiple Industries
	Cocco, Dosemeci, and Heineman (1998)	Occupational risk factors for cancer of the central nervous system: a case-control study on death certificates from 24 U.S. States	United States	1984–1992	142,080	64,900	NR	Multiple Industries
	Pollán & Gustavsson (1999)	High-risk occupations for breast cancer in the Swedish female working population	Sweden	1971–1989	1,101,669	1,101,669	NR	Multiple Industries
	Richardi et al. (2004)	Occupational risk factors for lung cancer in men and women: a population-based case-control study in Italy	Italy	1990–2002	2724	476	476	Multiple Industries
	Thompson et al. (2005)	Occupational exposure to metalworking fluids and risk of breast cancer among female autoworkers	United States	1941–1994	4680	4680	4680	Transportation Equipment Manufacturing
	Hrubá et al. (2009)	Socioeconomic indicators and risk of lung cancer in Central and Eastern Europe	Czech Republic, Hungary, Poland, Romania, Slovakia, Russia, and the United Kingdom	1998–2001	5979	1469	617	Multiple Industries
	Colt et al. (2011)	Occupation and bladder cancer in a population-based case-control study in Northern New England	United States	2001–2004	2560	634	47	Multiple Industries
	Betenia, Costello, and Eisen (2012)	Risk of cervical cancer among female autoworkers exposed to metalworking fluids	United States	1985–2004	4374	4374	4374	Transportation Equipment Manufacturing
	Oddone et al. (2013)	Female breast cancer in Lombardy, Italy (2002 - 2009): a case-control study on occupational risks	Italy	2002–2009	78349	78349	36517	Multiple Industries
	Pudrovska et al. (2013)	Higher-status occupations and breast cancer: a life-course stress approach	United States	1951–2011	3682	3682	NR	Multiple Industries
	Oddone et al. (2014)	Female breast cancer and electrical manufacturing: results of a nested case-control study	Italy	2002–2009	216	216	145	Computer and Electronic Product Manufacturing

(*continued on next page*)

Table 2 (*continued*)

Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
Cardiovascular disease	Zhao et al. (1991)	A dose response relation for noise induced hypertension	China	1985	1101	1101	1101	Textile Product Mills
	Hall, Johnson, and Tsou (1993)	Women, occupation, and risk of cardiovascular morbidity and mortality	Sweden	1977, 1979, 1980, 1981	5921	5921	NR	Multiple Industries
	Hammar, Alfredsson, and Theorell (1994)	Job characteristics and the incidence of myocardial infarction	Sweden	1970, 1985, 1976–1981, 1976–1984.	35396	4667	2283	Multiple Industries
	Melamed et al. (1995)	Objective and subjective work monotony: effects on job satisfaction, psychological distress, and absenteeism in blue-collar workers	Israel	1985–1987	1278	393	393	Manufacturing
	Jousilahti et al. (1996)	Symptoms of chronic bronchitis and the risk of coronary disease	Finland	1972–1985, 1977–1990	19444	10102	766	Multiple Industries
	Melamed et al. (1997)	Industrial noise exposure, noise annoyance e, and serum lipid levels in blue-collar workers–the CORDIS study	Israel	NR	2079	624	624	Manufacturing
	Wamala et al. (1997)	Lipid profile and socioeconomic status in health middle aged women in Sweden	Sweden	1991–1994	300	300	64	Multiple Industries
	Östlin et al. (1998)	Myocardial infarction in male and female dominated occupations	Sweden	1969–1970, 1970–1990, 1971–1992, 1976–1984	140520	36708	NR	Multiple Industries
	Baigi, Marklund, and Fridlund (2001)	The association between socio-economic status and chest pain focusing on self-rated health in a primary health care area of Sweden	Sweden	NR	1145	492	404	Multiple Industries
	Tsutsumi et al. (2001)	Association between job strain and prevalence of hypertension: a cross sectional analysis in a Japanese working population with a wide range of occupations: the Jichi Medical School cohort study	Japan	1992–1994	6587	3400	1931	Multiple Industries
	Wamala, Lynch, and Kaplan (2001)	Women's exposure to early and later life socioeconomic disadvantage and coronary heart disease risk: the Stockholm Female Coronary Risk Study	Sweden	1991–1994	585	177	177	Multiple Industries
	Gallo et al. (2003)	Occupation and subclinical carotid artery disease in women: are clerical workers at greater risk?	United States	1983–1985	362	362	27	Multiple Industries
	Honjo et al. (2010)	Socioeconomic indicators and cardiovascular disease among Japanese community residents: The Jichi Medical School Cohort Study	Japan	1992–2005	10640	6511	2084	Multiple Industries
	Clougherty et al. (2011)	Gender and sex differences in job status and hypertension	United States	1996–2002	14618	2016	793	Primary Metal Manufacturing; Fabricated Metal Product Manufacturing
	Tsutsumi, Kayaba, and Ishikawa (2011)	Impact of occupational stress on stroke across occupational classes and genders	Japan	1992–2005	6553	3363	1867	Multiple Industries
	Cho and Lee (2012)	The relationship between cardiovascular disease risk factors and gender	South Korea	2005	4556	2596	NR	Multiple Industries
	Stokholm et al. (2013)	Occupational noise exposure and the risk of hypertension	Denmark	2001–2007	145190	36788	15728	Multiple Industries
	Won et al. (2013)	Actual cardiovascular disease risk and related factors: a cross-sectional study of Korean blue-collar workers employed by small businesses	South Korea	2010	238	82	82	NR
	Fujishiro et al. (2015)	Occupational characteristics and the progression of carotid artery intima-media thickness and plaque over 9 years: the Multi-Ethnic Study of Atherosclerosis (MESA)	United States	2000–2011	3109	1610	166	Multiple Industries
Disability & absenteeism	Arber (1991)	Class, paid employment and family roles: making sense of structural disadvantage, gender and health status	United Kingdom	1985–1986	26060	13283	NR	Multiple Industries
	Guendelman and Silberg (1993)	The health consequences of maquiladora work: women on the US-Mexican border	Mexico	1990	480	480	241	Computer and Electronic Products Manufacturing; Apparel Manufacturing; Accommodation and Food Services
	Vahtera et al. (1999)	Workplace as an origin of health inequalities	Finland	1991–1993	2793	1875	NR	Multiple Industries
	Korda et al. (2002)	The Health of the Australian workforce: 1998-2001	Australia	1998–2001	9167	4107	595	Multiple Industries
	Aittomäki, Lahelma, and Roos (2003)	Work conditions and socioeconomic inequalities in work ability	Finland	2000	1827	1398	161	Multiple Industries
	Väänänen et al. (2004)	Role clarity, fairness, and organizational climate as predictors of sickness absence: a prospective study in the private sector	Finland	1995–1998	3850	937	385	Forestry and Logging
	Strong & Zimmerman (2005)	Occupational injury and absence from work among African American, Hispanic, and non-Hispanic White workers in the National Longitudinal Survey of Youth	United States	1988–2000	35710	16839	1890	Multiple Industries

(*continued on next page*)

Table 2 (*continued*)

Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
	Christensen et al. (2008)	Explaining the social gradient in long-term sickness absence: a prospective study of Danish employees	Denmark	2000–2002	5221	2562	671	Multiple Industries
	Niedhammer et al. (2008)	The contribution of occupational factors to social inequalities in health: findings from the national French SUMER survey	France	2003	24468	10245	1409	Multiple Industries
	Väänänen et al. (2008)	Work-family characteristics as determinants of sickness absence: a large-scale cohort study of three occupational grades	Finland	2000–2002	18366	13971	1802	Multiple Industries
	von Bonsdorff et al. (2011)	Work ability in midlife as a predictor of mortality and disability in later life: a 28-year prospective follow-up study	Finland	1981–2009	5971	3261	1692	Multiple Industries
	Gupta et al. (2014)	Face validity of the single work ability item: comparison with objectively measured heart rate reserve over several days	Denmark	NR	127	53	53	Multiple Industries
	Heo et al. (2015)	Job stress as a risk factor for absences among manual workers: a 12-month follow-up study	South Korea	2009–2010	2349	542	542	Manufacturing
Health behaviors	Burton and Turrell (2000)	Occupation, hours worked, and leisure-time physical activity	Australia	1995	24454	11029	1972	Multiple Industries
	Wu and Porell (2000)	Job characteristics and leisure physical activity	United States	1992	6443	2881	871	Multiple Industries
	Gang et al. (2002)	Physical activity during leisure and commuting in Tianjin, China	China	1996	3976	1974	809	Multiple Industries
	Takao et al. (2003)	Occupational class and physical activity among Japanese employees	Japan	1996–1998	20,654	3,017	1585	Computer and Electronic Products Manufacturing; Fabricated Metal Product Manufacturing; Primary Metal Manufacturing; Transportation Equipment Manufacturing
	McCormack, Giles-Corti, and Milligan (2006)	Demographic and individual correlates of achieving 10,000 steps/day: use of pedometers in a population-based study	Australia	**NR**	428	223	19	Multiple Industries
	Ericson et al. (2007)	Dietary intake of heterocyclic amines in relation to socioeconomic, lifestyle, and other dietary factors: estimates in a Swedish population	Sweden	1991–1994	490	490	43	Multiple Industries
	Kuiack, Irving, and Faulkner (2007)	Occupation, hours worked, caregiving, and leisure time physical activity	Canada	2000	490	490	43	Multiple Industries
	Harley et al. (2010)	Multiple health behavior changes in a cancer prevention intervention for construction workers, 2001 - 2003	United States	2002–2003	582	17	17	Construction of Buildings
	Mäkinen et al. (2010)	Occupational class differences in leisure-time physical inactivity - contribution of past and current physical workload and other working conditions	Finland	2000	3355	1788	273	Multiple Industries
	Cleland et al. (2011)	Correlates of pedometer-measured and self-reported physical activity among young Australian adults	Australia	2004–2006	2017	923	NR	Multiple Industries
	Cho and Lee (2012)	The relationship between cardiovascular disease risk factors and gender	South Korea	2005	4556	2596	NR	Multiple Industries
	Miura and Turrell (2014)	Reported consumption of takeaway food and its contribution to socioeconomic inequalities in body mass index	Australia	2009	903	480	40	Multiple Industries
	Oliveira, Maia, and Lopes (2014)	Determinants of inadequate fruit and vegetable consumption amongst Portuguese adults	Portugal	1999–2003	2362	1455	NR	Multiple Industries
	Uijtdewilligen et al. (2014)	Biological, socio-demographic, work and lifestyle determinants of sitting in young adult women: a prospective cohort study	Australia	2000, 2003, 2006, 2009	11676	11676	NR	Multiple Industries
	Hwang et al. (2015)	Predictors of health-promoting behavior associated with cardiovascular diseases among Korean blue-collar workers	South Korea	NR	234	80	80	NR
	Uijtdewilligen et al. (2015)	Determinants of physical activity in a cohort of young adult women. Who is at risk of inactive behaviour?	Australia	2000, 2003, 2006, 2009	11695	11695	NR	Multiple Industries
Mental health	Loscocco & Spitze (1990)	Working conditions, social support, and the well-being of female and male factory workers	United States	1982	2222	649	649	Multiple Industries
	Parkinson et al. (1990)	Health effects of long-term solvent exposure among women in blue-collar occupations	United States	NR	567	567	567	Computer and Electronic Product Manufacturing
	Bromet et al. (1992)	Effects of occupational stress on the physical and psychological health of women in a microelectronics plant	United States	NR	552	552	552	Computer and Electronic Product Manufacturing
	Guendelman and Silberg (1993)	The health consequences of maquiladora work: women on the US-Mexican border	Mexico	1990	480	480	241	Computer and Electronic Products Manufacturing; Apparel Manufacturing; Accommodation and Food Services

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Table 2 (*continued*)

Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
	Melamed et al. (1995)	Objective and subjective work monotony: effects on job satisfaction, psychological distress, and absenteeism in blue-collar workers	Israel	1985–1987	1278	393	393	Manufacturing
	Kivimäki and Kalimo (1996)	Self-esteem and the occupational stress process: testing two alternative models in a sample of blue-collar workers	Finland	NR	5450	927	927	NR
	Goldenhar et al. (1998)	Stressors and adverse outcomes for female construction workers	United States	NR	211	211	211	Construction of Buildings
	Rydstedt, Johansson, and Evans (1998)	A longitudinal study of workload, health and well-being among male and female urban drivers	Sweden	1991–1992	56	32	32	Transit and Ground Passenger Transportation
	Soares, Grossi, and Sundin (2007)	Burnout among women: associations with demographic/socioeconomic, work, life-style and health factors	Sweden	NR	6000	6000	745	Multiple Industries
	Andrés, Collings, and Qin (2009)	Sex-specific impact of socio-economic factors on suicide risk: a population-based case-control study in Denmark	Denmark	1981–1997	328608	109410	19922	Multiple Industries
	Cohidon et al. (2009)	Mental health of workers in Toulouse 2 years after the industrial AZF disaster: first results of a longitudinal follow-up of 3,000 people	France	2003–2008	2847	1514	53	Multiple Industries
	Asztalos et al. (2009)	Specific associations between types of physical activity and components of mental health	Belgium	2002–2004	1919	901	140	Multiple Industries
	Brunette, Smith, and Punnett (2011)	Perceptions of working and living conditions among industrial male and female workers in Perú	Perú	2002	1066	305	305	Multiple Industries
	Moon and Park (2011)	Risk factors for suicidal ideation in Korean middle-aged adults: the role of socio-demographic status	South Korea	2005	7301	4087	991	Multiple Industries
	Ahlgren, Olsson, and Brulin (2012)	Gender analysis of musculoskeletal disorders and emotional exhaustion: interactive effects from physical and psychosocial work exposures and engagement in domestic work	Sweden	2008	1373	515	253	Food Manufacturing; Professional, Scientific and Technical Services
	Minh (2014)	Work-related depression and associated factors in a shoe manufacturing factory in Haiphong City, Vietnam	Vietnam	2012	420	327	227	Leather and Allied Product Manufacturing
	Yoon et al. (2014)	Occupational noise annoyance linked to depressive symptoms and suicidal ideation: a result from nationwide survey of Korea	South Korea	2007–2009	10020	4610	1934	Multiple Industries
Mortality	Hall, Johnson, and Tsou (1993)	Women, occupation, and risk of cardiovascular morbidity and mortality	Sweden	1977, 1979, 1980, 1981	5921	5921	NR	Multiple Industries
	Pekkanen et al. (1995)	Social class, health behaviour, and mortality among men and women in Eastern Finland	Finland	1970, 1972, 1975, 1977–1987	18661	9694	6376	Multiple Industries
	Chenet et al. (1998)	Deaths from alcohol and violence in Moscow: socio-economic determinants	Russia	1994–1995	86121	22619	NR	Multiple Industries
	Arena et al. (1999)	Issues and findings in the evaluation of occupational risk among women high nickel alloys workers	United States	1948–1988	2877	2877	2877	Primary Metal Manufacturing
	Kareholt (2001)	The relationship between heart problems and mortality in different social classes	Sweden	1968, 1974, 1981, 1991, 1992, 1968–1996	4585	2285	1170	Multiple Industries
	Baigi et al. (2002)	Cardiovascular mortality focusing on socio-economic influence: the low-risk population f Halland compared to the population of Sweden as a whole	Sweden	1980–1990	3247211	1592467	1250828	Multiple Industries
	Prescott et al. (2003)	Social position and mortality from respiratory diseases in males and females	Denmark	1976, 1978, 1981–1983, 1992–1993, 1964–1992	29392	13992	NR	Multiple Industries
	Akerstedt, Kecklund, and Johansson (2004)	Shift work and mortality	Sweden	1979–2000	22411	8401	4163	Multiple Industries
	Mamo et al. (2005)	Factors other than risks in the workplace as determinants of socioeconomic differences in health in Italy	Italy	1981–2001	377828	136212	NR	Multiple Industries
	Bentley et al. (2007)	Area disadvantage, individual socio-economic position, and premature cancer mortality in Australia 1998 to 2000: a multilevel analysis	Australia	1998–2000	5998961	2602424	382266	Cross-Sectional
	Hein et al. (2007)	Follow-up study of chrysotile textile workers: cohort mortality and exposure-response	United States	1916–2001	3072	1265	1256	Textile Product Mills
	Lipton, Cunradi, and Chen (2008)	Smoking and all-cause mortality among a cohort of urban transit operators	United States	1983–2000	1785	161	161	Transit and Ground Passenger Transportation
	Brockmann, Müller, and Helmert (2009)	Time to retire - time to die? A prospective cohort study of the effects of early retirement on long-term survival	Germany	1990–2004	129675	41276	26803	Multiple Industries
	von Bonsdorff et al. (2011)	Work ability in midlife as a predictor of mortality and disability in later life: a 28-year prospective follow-up study	Finland	1981–2009	5971	3261	1692	Multiple Industries

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Table 2 (*continued*)

Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
	Dasgupta et al. (2012)	Multilevel determinants of breast cancer survival: association with geographic remoteness and area-level socioeconomic disadvantage	Australia	1997–2006	18568	18568	715	Multiple Industries
	von Bonsdorff et al. (2012)	Job strain among blue-collar and white-collar employees as a determinant of total mortality: a 28-year population-based follow-up	Finland	1981–2009	5731	3261	1688	Multiple Industries
	Hirokawa et al. (2013)	Mortality risks in relation to occupational category and position among the Japanese working population: the Jichi Medical School (JMS) cohort study	Japan	1992–2005	6929	3596	1524	Multiple Industries
	Mattisson, Horstmann, and Bogren (2014)	Relationship of SOC with sociodemographic variables, mental disorders, and mortality	Sweden	1947, 1957, 1972, 1997–2011	1164	625	325	Multiple Industries
	Costello et al. (2014)	Social disparities in heart disease risk and survivor bias among autoworkers: an examination based on survival models and g-estimation	United States	1941–1995	39412	4797	4797	Transportation Equipment Manufacturing
	Zhang et al. (2015)	Occupation and risk of sudden death in a United States community: a case-control analysis	United States	2006–2013	1268	332	62	Multiple Industries
Musculoskeletal	Vingard et al. (1991)	Occupation and osteoarthrosis of the hip and knee: a register-based cohort study	Sweden	1960, 1970, 1980, 1981–1983	250217	42549	42549	Multiple Industries
	Westgaard and Jansen (1992)	Individual and work related factors associated with symptoms of musculoskeletal complains. II Different risk factors among sewing machine operators	Norway	NR	245	245	210	Textile Product Mills
	Iverson and Erwin (1997)	Predicting occupational injury: the role of affectivity	Australia	NR	362	65	65	Manufacturing
	Fredriksson et al. (1999)	Risk factors for neck and upper limb disorders: results from 24 years of follow-up	Sweden	1969–1993	484	252	37	Multiple Industries
	Kaergaard and Andersen (2000)	Musculoskeletal disorders of the neck and shoulders in female sewing machine operators: prevalence, incidence and prognosis	Denmark	1994–1997	243	243	243	Textile Product Mills
	Murata, Kawakami, and Amari (2000)	Does job stress affect injury due to labor accident in Japanese male and female blue-collar workers?	Japan	1989–1999	168	76	63	Chemical Manufacturing
	Björkstén et al. (2001)	Reported neck and shoulder problems in female industrial workers: the importance of factors at work and at home	Sweden	NR	173	173	173	Fabricated Metal Product Manufacturing; Food Manufacturing
	Khatun, Ahlgren, and Hammarström (2004)	The influence of factors identified in adolescence and early adulthood on social class inequities of musculoskeletal disorders at age 30: a prospective population-based cohort study	Sweden	1981–1995	1044	497	NR	Multiple Industries
	Kaila-Kangas et al. (2006)	How consistently distributed are the socioeconomic differences in severe back morbidity by age and gender? A population based study of hospitalisation among Finnish employees	Finland	1995–1996	1517897	773936	193088	Multiple Industries
	Nakata et al. (2006)	The prevalence and correlates of occupational injuries in small-scale manufacturing enterprises	Japan	2002	1298	385	138	Manufacturing
	Pollack et al. (2007)	Use of employer administrative databases to identify systematic causes of injury in aluminum manufacturing	United States	2002–2004	9101	835	835	Primary Metal Manufacturing
	Wang et al. (2007)	Work-organisational and personal factors associated with upper body musculoskeletal disorders among sewing machine operators	United States	2003–2005	520	335	335	Textile Product Mills
	Niedhammer et al. (2008)	The contribution of occupational factors to social inequalities in health: findings from the national French SUMER survey	France	2003	24468	10245	1409	Multiple Industries
	Taiwo et al. (2008)	Sex differences in injury patterns among workers in heavy manufacturing	United States	1996–2005	9527	692	692	Primary Metal Manufacturing
	Roquelaure et al. (2008)	Work increases the incidence of carpal tunnel syndrome in the general population	France	2002–2004	1168	819	194	Multiple Industries
	Kim et al. (2009)	Depressive symptoms and self-reported occupational injury in small and medium-sized companies	South Korea	2006–2007	1350	501	404	Manufacturing
	Mattioli et al. (2009)	Risk factors for operated carpal tunnel syndrome: a multicenter population-based case-control study	Italy	1997–1998, 2001	477	401	172	Multiple Industries
	Roquelaure et al. (2009)	Attributable risk of carpal tunnel syndrome in the general population: implications for intervention programs in the workplace	France	2002–2004	388078	194276	24090	Multiple Industries
	Nag, Vyas, and Nag (2010)	Gender differences, work stressors, and musculoskeletal disorders in weaving industries	India	2007	516	263	263	Textile Product Mills
	Brunette, Smith, and Punnett (2011)	Perceptions of working and living conditions among industrial male and female workers in Perú	Perú	2002	1066	305	305	Multiple Industries
	Motamedzade and Moghimbeigi (2011)	Musculoskeletal disorders among female carpet weavers in Iran	Iran	NR	626	626	626	Textile Product Mills

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Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
	Ahlgren, Olsson, and Brulin (2012)	Gender analysis of musculoskeletal disorders and emotional exhaustion: interactive effects from physical and psychosocial work exposures and engagement in domestic work	Sweden	2008	1373	515	253	Food Manufacturing; Professional, Scientific and Technical Services
	Andersen et al. (2012)	Cumulative years in occupation and the risk of knee osteoarthritis in men and women: a register-based follow-up study	Denmark	1981–2006	2117298	1100979	38485	Construction of Buildings
	Lombardo et al. (2012)	Musculoskeletal symptoms among female garment factory workers in Sri Lanka	Sri Lanka	NR	1058	1058	1000	Apparel Manufacturing
	Kubo et al. (2013)	Associations between employee and manager gender: impacts on gender-specific risk of acute occupational injury in metal manufacturing	United States	2002–2007	2645	2322	2322	Primary Metal Manufacturing; Fabricated Metal Product Manufacturing
	Lipscomb, Schoenfisch, and Cameron (2013)	Work-related injuries involving a hand or fingers among union carpenters in Washington state, 1989 - 2008	United States	1989–2008	24,830	646	646	Specialty Trade Contractors
	Hanklang et al. (2014)	Musculoskeletal disorders among Thai women in construction-related work	Thailand	2011	272	272	272	Specialty Trade Contractors
	Tessier-Sherman (2014)	Occupational injury risk by sex in a manufacturing cohort	United States	2001–2010	23956	5063	5063	Primary Metal Manufacturing; Fabricated Metal Product Manufacturing
	Cantley et al. (2015)	Expert ratings of job demand and job control as predictors of injury and musculoskeletal disorder risk in a manufacturing cohort	United States	2004–2005	9260	946	946	Primary Metal Manufacturing; Fabricated Metal Product Manufacturing
	Hallman et al. (2015)	Association between objectively measured sitting time and neck-shoulder pain among blue-collar workers	Denmark	2011–2012	202	84	84	Multiple Industries
Other	Parkinson et al. (1990)	Health effects of long-term solvent exposure among women in blue-collar occupations	United States	NR	567	567	567	Computer and Electronic Product Manufacturing
	Bromet et al. (1992)	Effects of occupational stress on the physical and psychological health of women in a microelectronics plant	United States	NR	552	552	552	Computer and Electronic Product Manufacturing
	Grimmer (1993)	Relationship between occupation and episodes of headache that match cervical origin pain patterns	Australia	NR	417	202	42	Multiple Industries
	Tsai et al. (1997)	Neurobehavioral effects of occupational exposure to low-level organic solvents among Taiwanese workers in paint factories	Taiwan	1992–1993	298	85	32	Chemical Manufacturing
	Goldenhar, Swanson, & Hurrell (1998)	Stressors and adverse outcomes for female construction workers	United States	NR	211	211	211	Construction of Buildings
	Nguyen et al. (1998)	Noise levels and hearing ability of female workers in a textile factory in Vietnam	Vietnam	NR	69	69	69	Textile Mills
	Rydstedt, Johansson, and Evans (1998)	A longitudinal study of workload, health and well-being among male and female urban drivers	Sweden	1991–1992	56	32	32	Transit and Ground Passenger Transportation
	Juutilainen et al. (2000)	Nocturnal 6-hydroxymelatonin sulfate excretion in female workers exposed to magnetic fields	Finland	NR	60	60	39	Apparel Manufacturing
	Shirom, Melamed, and Nir-Dotan (2000)	The relationships among objective and subjective environmental stress levels and serum uric acid: the moderating effect of perceived control	Israel	1985–1987	3680	1176	1176	Manufacturing
	Korda et al. (2002)	The Health of the Australian workforce: 1998-2001	Australia	1998–2001	9167	4107	595	Multiple Industries
	Kovacevic and Belojevic (2006)	Tooth abrasion in workers exposed to noise in the Montenegrin Textile Industry	Serbia	NR	225	225	111	Textile Mills
	Potula and Kaye (2006)	The impact of menopause and lifestyle factors on blood and bone lead levels among female former smelter workers: the Bunker Hill Study	United States	1994, 2000	73	73	NR	Primary Metal Manufacturing
	Cobankara et al. (2011)	The prevalence of fibromyalgia among textile workers in the city of Denizli in Turkey	Turkey	2005	655	523	523	Textile Mills
	Choi et al. (2013)	Factors associated with sleep quality among operating engineers	United States	2008	498	37	37	Specialty Trade Contractors
	Lin et al. (2015)	Risk for work-related fatigue among the employees on semiconductor manufacturing lines	Taiwan	2007	1545	428	428	Computer and Electronic Product Manufacturing
Reproductive & sexual health	Eskenazi, Guendelman, and Elkin (1993)	A preliminary study of reproductive outcomes of female maquiladora workers in Tijuana, Mexico	Mexico	1990	360	360	241	Computer and Electronic Products Manufacturing; Apparel Manufacturing; Accommodation and Food Services
	Luoto, Kaprio, and Uutela (1994)	Age at natural menopause and sociodemographic status in Finland	Finland	1989	1505	1505	511	Multiple Industries

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Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
	Evans et al. (2003)	Predictors of seropositivity to herpes simplex virus type 2 in women	United Kingdom	1992	520	520	88	Multiple Industries
	Gissler et al. (2009)	Trends in socioeconomic differences in Finnish perinatal health 1991 - 2006	Finland	1991–2006	931285	931285	154359	Multiple Industries
	Jakobsson and Mikoczy (2009)	Reproductive outcome in a cohort of male and female rubber workers: a registry study	Sweden	1973–2001	NR	NR	NR	Plastics and Rubber Products Manufacturing; Food Manufacturing
	Lalive & Zweimüller (2009)	How does parental leave affect fertility and return to work? Evidence from two natural experiments	Austria	1985, 1987, 1990, 1993, 1996	6180	6180	NR	Multiple Industries
	Sakr et al. (2010)	Reproductive outcomes among male and female workers at an aluminum smelter	United States	2006	419	76	38	Primary Metal Manufacturing
	Sayem et al. (2010)	An assessment of risk behaviours for HIV/AIDS among young female garment workers in Bangladesh	Bangladesh	2007	300	300	300	Apparel Manufacturing
	Yingying, Smith, and Suiming (2011)	Changes and correlates in multiple sexual partnerships among Chinese adult women–population based surveys in 2000 and 2006	China	2000, 2006	4525	4525	922	Multiple Industries
	del Bono, Weber, and Winter-Ebmer (2012)	Clash of career and family: fertility decisions after job displacement	Austria	1990–1998	227199	227199	NR	Multiple Industries
	Pant et al. (2013)	Knowledge of and attitude towards HIV/AIDS and condom use among construction workers in the Kathmandu Valley, Nepal	Nepal	2013	317	33	33	Construction of Buildings
	Räisänen et al. (2014)	Influence of delivery characteristics and socioeconomic status on giving birth by caesarean section - a cross sectional study during 2000–2010 in Finland	Finland	2000–2010	620463	620463	90032	Multiple Industries
	von Ehrenstein et al. (2014)	Preterm birth and prenatal maternal occupation: the role of Hispanic ethnicity and nativity in a population-based sample in Los Angeles, California	United States	2003	2543	2,543	186	Multiple Industries
	Wang et al. (2015)	Sulfur dioxide exposure and other factors affecting age at natural menopause in the Jinchuan cohort	China	2012	3167	3167	2657	Primary Metal Manufacturing
Respiratory	Kongerud and Soyseth (1991)	Methacholine responsiveness, respiratory symptoms, and pulmonary function in aluminum potroom workers	Norway	1988	337	38	38	Primary Metal Manufacturing
	Love et al. (1991)	The characteristics of respiratory ill health of wool textile workers	United Kingdom	NR	620	145	145	Textile Mills
	Raza et al. (1999)	Ventilatory function and personal breathing zone dust concentrations in Lancashire textile weavers	United Kingdom	NR	302	NR	NR	Textile Mills
	Seldén et al. (2001)	Exposure to tremolite asbestos and respiratory health in Swedish dolomite workers	Sweden	1996	130	16	16	Mining (except oil and gas); Nonmetallic Mineral Product Manufacturing
	Takezaki et al. (2001)	Dietary factors and lung cancer risk in Japanese: with special reference to fish consumption and adenocarcinomas	Japan	1988–1997	5198	1486	178	Multiple Industries
	Bakirci et al. (2007)	Natural history and risk factors of early respiratory responses to exposure to cotton dust in newly exposed workers	Turkey	NR	157	74	74	Textile Mills
	Heikkilä et al. (2008)	Asthma incidence in wood-processing industries in Finland in a register based population study	Finland	1986–1998	170963	25148	16937	Wood Product Manufacturing; Forestry and Logging
	Thilsing et al. (2012)	Chronic rhinosinusitis and occupational risk factors among 20- to 75-year-old Danes–a GA2LEN-based study	Denmark	2008	2531	1331	550	Multiple Industries
	Storaas et al. (2015)	Incidence of rhinitis and asthma related to welding in Northern Europe	Iceland, Norway, Sweden, Denmark, Estonia	1990–1994, 1999–2001	16191	8398	219	Fabricated Metal Product Manufacturing
	Wang et al. (2015)	Synergistic impaired effect between smoking and manganese dust exposure on pulmonary ventilation function in Guangxi Manganese-Exposed Workers Healthy Cohort (GXMEWHC)	China	2011–2012	1658	620	620	Primary Metal Manufacturing
Self-Rated health	Korda et al. (2002)	The Health of the Australian workforce: 1998-2001	Australia	1998–2001	9167	4107	595	Multiple Industries
	Niedhammer et al. (2008)	The contribution of occupational factors to social inequalities in health: findings from the national French SUMER survey	France	2003	24468	10245	1409	Multiple Industries
	Brunette, Smith, and Punnett (2011)	Perceptions of working and living conditions among industrial male and female workers in Perú	Perú	2002	1066	305	305	Multiple Industries
	Hammarström, Stenlund, and Janlert (2011)	Mechanisms for the social gradient in health: results form a 14-year follow-up of the Northern Swedish Cohort	Sweden	1981–1995	1083	495	NR	Multiple Industries
	Landefeld et al. (2014)	The association between a living wage and subjective social status and self-rated health: a quasi-experimental study in the Dominican Republic	Dominican Republic	2011	204	134	134	Apparel Manufacturing

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Outcome Category	Author (Year)	Title	Country	Years Observed	Sample Size (N)	Women (N)	Blue-Collar Women (N)	Industry Subsector
Smoking & Other Substance Use	Cunradi, Lipton, and Banerjee (2007)	Occupational correlates of smoking among urban transit operators: a prospective study	United States	1983–1985; 1993–1995	654	54	54	Transit and Ground Passenger Transportation
	Radi, Ostry, and LaMontagne (2007)	Job stress and other working conditions: relationships with smoking behaviors in a representative sample of working Australians	Australia	NR	1101	575	74	Multiple Industries
	Yang et al. (2008)	Emergence of socioeconomic inequalities in smoking and overweight and obesity in early adulthood: the National Longitudinal Study of Adolescent Health	United States	1995–1996, 2001–2002	9542	4580	NR	Multiple Industries
	Okechukwu, Nguyen, and Hickman (2010)	Partner smoking characteristics: associations with smoking and quitting among blue-collar apprentices	United States	NR	1767	88	88	Construction of Buildings
	Sayem et al. (2010)	An assessment of risk behaviours for HIV/AIDS among young female garment workers in Bangladesh	Bangladesh	2007	300	300	300	Apparel Manufacturing
	Biron, Bamberger, and Noyman (2011)	Work-related risk factors and employee substance use: insights from a sample of Israeli blue-collar workers	Israel	NR	569	NR	NR	Manufacturing
	Hammarström et al. (2011)	Mechanisms for the social gradient in health: results form a 14-year follow-up of the Northern Swedish Cohort	Sweden	1981–1995	1083	495	NR	Multiple Industries
	Chin et al. (2012)	Cigarette smoking in building trades workers: the impact of work environment	United States	2004–2007	1817	88	88	Construction of Buildings
	Chin et al. (2012)	Occupational factors and smoking cessation among unionized building trades workers	United States	2004– 2007	763	44	44	Construction of Buildings
	Chin et al. (2013)	Heavy and light/moderate smoking among building trades construction workers	United States	NR	763	63	63	Construction of Buildings
	Cho and Lee (2012)	The relationship between cardiovascular disease risk factors and gender	South Korea	2005	4556	2596	NR	Multiple Industries
	Fujishiro et al. (2012)	Occupational gradients in smoking behavior and exposure to workplace environmental tobacco smoke: the Multi-Ethnic Study of Atherosclerosis (MESA)	United States	2000–2002	6355	3249	373	Multiple Industries
	Noonan and Duffy (2012)	Smokeless tobacco use among operating engineers	United States	2008	498	37	37	Specialty Trade Contractors
	Okechukwu et al. (2012)	Smoking among construction workers: the nonlinear influence of the economy, cigarette prices, and antismoking sentiment	United States	1992–1993, 1995–1996, 1998–1999, 2001–2002, 2003, 2006–2007	52418	1479	1479	Construction of Buildings
	Cunradi, Ames, and Xiao (2014)	Binge drinking, smoking and marijuana use: the role of women's labor force participation	United States	2006–2007	956	956	104	Construction of Buildings
	Maron et al. (2015)	Occupational inequalities in psychoactive substance use: a question of conceptualization	Germany	2012	9084	5155	994	Multiple Industries

Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
BMI & metabolism	Cross-Sectional	Age, sex, education, ethnic origin, repetitive work (short, medium, and long-cycle), work underload, subjective monotony	Serum glucose levels	Exposure-outcome among blue-collar women	Among blue-collar women, short-cycle repetitive work was associated with higher serum glucose ($p = 0.05$) levels.	Cardiovascular Occupational Risk Factors Determination in Israel Study (CORDIS)	High-Income	(Melamed et al., 1995)
	Cross-Sectional	Occupational class, marital status	Waist circumference, waist-to-hip ratio	Blue-collar women vs. other women	Among blue-collar women, waist circumference (ß = -2.40, SE = 8.19) and waist to hip ratio (ß = -0.0294, SE = 0.0065) were lower as compared with white-collar women.	Employees from a single Japanese computer and printing manufacturing company	High-Income	(Nakamura et al., 2000)
	Cross-Sectional	Age, education, occupational class, marital status, smoking status, regular physical exercise, physical activity tertiles, total energy intake quartiles	Obesity	Blue-collar women vs. other women[C]	The odds of obesity among blue-collar women were increased as compared with white-collar women (OR = 3.5, 95% CI 2.21– 5.55).	Adults living in Porto, Portugal recruited with random digit-dialing	High-Income	(Santos & Barros, 2003)
	Longitudinal	Education, log-income, occupational class	Type 2 Diabetes	Blue-collar women vs. other women	The hazard of type 2 diabetes among blue-collar women was increased as compared with white-collar women (HR = 0.86, 95% CI 0.53 –1.41).	Alameda County Study	High-Income	(Maty et al., 2005)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
	Longitudinal	Parental occupation; childhood household deprivation (public assistance, no plumbing, no electricity, food scarcity); adult SEP index; education; occupational class; lifecourse SEP	Weight Change	Blue-collar women vs. other women[C]	Blue-collar women demonstrated larger 13- year increases in BMI as compared with white-collar women (5.8 vs. 4.8 kg/m2, p 0.05).	Pitt County Study	High-Income	(Bennett et al., 2007)
	Longitudinal	Recent Retirement	Weight loss of 5% or greater; weight gain of 5% or greater	Exposure-outcome among blue-collar women	Among blue-collar women, retirement was inversely associated with a weight loss of 5% or greater (OR = 0.88, 95% 0.57–1.37). Retirement was positively associated with a weight gain of 5% or greater (OR = 1.58, 95% CI 1.13–2.21).	Health and Retirement Study (HRS)	High-Income	(Forman-Hoffman et al., 2008)
	Longitudinal	Young adult socioeconomic position (education and occupational class); family socioeconomic position; family structure; family connectedness; smoker in home; easy access to cigarettes; high school; CES-D; number of friends who smoke; BMI during adolescence	Overweight, Obesity	Blue-collar women vs. other women[C]	Odds of overweight (OR = 1.04, 0.49–2.21) or obesity (OR = 0.74, 0.29 –1.85) were not increased among blue-collar women as compared to women with further education.	National Longitudinal Study of Adolescent Health	High-Income	(Yang et al., 2008)
	Cross-Sectional	Occupational class, education, poverty-income ratio	Obesity	Blue-collar women vs. other women[C]	The odds of obesity among blue-collar women were increased as compared with white-collar women (OR = 2.08, 95% CI = 1.43–3.05).	Third Korean National Health and Nutrition Examination Survey (KNHANES III)	High-Income	(Cho and Lee, 2012)
	Cross-Sectional	Age, female, white, married, high-school or less, SF-36 pain, self-reported medical comorbidities, depression, smoking, alcohol problem, vegetable intake, fruit intake, fried food intake, physical activity	Obesity	Male vs. female blue-collar workers[C]	The odds of obesity among female operating engineers were decreased as compared with male operating engineers (OR = 0.283, 95% CI 0.083–0.827).	Convenience sample of operating engineers recruited during a three-day safety training course	High-Income	(Duffy et al., 2012)
	Longitudinal	Soft drinks intake, 100% fruit juice intake, vegetable juice intake, age, sports activity, education, occupational class, BMI, Menopausal status	Diabetes Mellitus	Exposure-outcome among blue-collar women	Among blue-collar women, the odds of type 2 diabetes were increased among those who drank soda every day (OR = 2.57, 95% CI 1.25–5.29); those who drank soda 3-4 times per week (OR = 125, 95% CI 0.66–2.35); and those who drank soda two times or less per week (OR = 1.18, 95% CI 0.77–1.80) as compared with those who rarely drank soda.	Japan Public Health Center Study (JPHC)	High-Income	(Eshak et al., 2013)
	Cross-Sectional	Education, household income, occupational class	Healthy takeaway food; less healthy takeaway food	Blue-collar women vs. other women	Blue-collar women had increased BMI as compared with professionals and managers (ß = 2.83, SE = 0.99).	Adults randomly selected form the electoral roll of the Brisbane statistical subdivision.	High-Income	(Miura and Turrell, 2014)
	Cross-Sectional	Age, individual education, parental education, HDI of country of birth, residential education level, residential density of population, occupational class, home work distance	Fat Mass Index	Blue-collar women vs. other women	There was no significant association between work economic sector and fat mass index (FMI) for women in the manufacturing industry (ß = 0.31, 95% CI 0.04–1.73); construction (ß = 0.18, 95% CI - 2.44 to 2.81); or commercial repair of motor vehicles and motorcycles (ß = 0.43, 95%CI - 0.60 to 1.46) as compared with women in transport and communications.	Residential Environment and Coronary Heart Disease Cohort Study (RECORD)	High-Income	(Lewin et al., 2014)
	Cross-Sectional	Overtime work (≥ 60 hours/week), social support, job stress, risk perception, physical exercise (≥ 30 min, ≥ 3 per week)	Metabolic Syndrome	Exposure-outcome among blue-collar women	Among blue-collar women, low job stress (OR = 0.05, p = 0.04), low social support (OR = 1.51, p = 0.009), and risk perception (OR = 1.27, p = 0.023) were associated with metabolic syndrome.	Blue-collar workers at small companies recruited from occupational health centers or worksites during annual health	High-Income	(Hwang and Lee, 2014)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
						checkups in South Korea.		
Cancer	Longitudinal	Highest level of education, highest level of education (household), EPG score: last profession, U&S score: last profession	Breast Cancer	Blue-collar women vs. other women	There was no difference in breast cancer risk in blue-collar women and lower white-collar women (RR = 1.01, 95% CI 0.69–1.49); the risk of breast cancer was increased among upper white-collar women as compared with blue-collar women (RR = 1.19, 95% CI 0.80 –1.76).	The Netherlands Cohort Study (NLCS)	High-Income	(Van Loon et al., 1994)
	Longitudinal	Highest level of education, occupational class, social standing (U&S) score	Colon Cancer	Blue-collar women vs. other women	As compared with blue-collar women, the risk of colon cancer was increased among lower white-collar women (RR = 1.30, 95% CI 0.76–2.22) but decreased among upper white-collar women (RR = 0.63, 95% CI 0.30–1.29)	The Netherlands Cohort Study (NLCS)	High-Income	(Van Loon et al., 1995)
	Case-Control	Occupation	Cancer of the CNS	Blue-collar women vs. other women	Industries showing consistent increases in risk for cancer of the CNS by gender and race included textile mills, paper mills, printing and publishing industries, petroleum refining, motor vehicles manufacturing, telephone and electric utilities, department stores, health care services, elementary and secondary schools, and colleges and universities.	United States Vital Statistics Records	High-Income	(Cocco et al., 1999)
	Longitudinal	Occupation	Breast Cancer	Blue-collar women vs. other women	Excess risk for breast cancer was found for pharmacists, teachers of theoretical subjects, schoolmasters, systems analysts and programmers, telephone operators, telegraph and radio operators, metal platers and coaters, and hairdressers and beauticians.	All living Swedish women ages 25–64 who were employed at the time of the 1970 census and present in the country during the 1960 census.	High-Income	(Pollán and Gustavsson, 1999)
	Case-Control	Exposure to known and suspected lung carcinogens.	Lung Cancer	Exposure-outcome among blue-collar women	Lung cancer risk was increased among female rubber workers exposed to suspected carcinogens versus those unexposed (OR = 2.2, 95% CI = 0.6–7.9); among female glass workers exposed to suspected carcinogens versus those unexposed (OR = 2.8, 95% CI 0.4–22); and among laundry and dry cleaners exposed to suspected carcinogens versus those unexposed (OR = 2.1, 95% CI = 0.8–5.6).	Incident lung cancer cases and population controls in Northern Italy	High-Income	(Richiardi et al., 2004)
	Case-Control	Metalworking fluid (MWF)	Breast Cancer	Exposure-outcome among blue-collar women	There was an increase in the odds of breast cancer associated with every mg/m3-year increase of cumulative exposure to soluble MWF over the ten-year study period (OR = 1.18, 95% CI 1.02–1.35).	Female hourly automobile production workers from three large manufacturing plants in Michigan	High-Income	(Thompson et al., 2005)
	Case-Control	Occupational class, education	Lung Cancer	Blue-collar women vs. other women	The odds of lung cancer among blue-collar women were decreased as compared with white-collar women (OR = 0.96, 95% CI 0.74–1.25).	Incident lung cancer cases and hospital-based controls in seven Eastern European countries.	High-Income and Upper-Middle-Income	(Hrubá et al., 2009)
	Case-Control	Occupation of first employment	Bladder Cancer	Exposure-outcome among blue-collar women	Among women, bladder cancer risk was significantly elevated and increased significantly with duration of employment in the electronic components and accessories industry (OR = 2.2, 95% CI 1.1 to 4.7) and the transportation equipment industry (OR = 8.7, 95% CI 2.0–37).	Incident bladder cancer cases and population controls in Maine, Vermont, and New Hampshire.	High-Income	(Colt et al., 2011)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
	Longitudinal	Metalworking fluid (MWF)	Cervical Cancer	Exposure-outcome among blue-collar women	There was no difference in cervical cancer risk among blue-collar women exposed or not exposed to straight MWF (RR = 1.0, 95% CI 0.46–2.19). Risk of cervical cancer among blue-collar women exposed to soluble MWF increased as compared with unexposed workers (RR = 1.55, 95% CI 0.66–3.61). Risk of cervical cancer among blue-collar women exposed to synthetic MWF increased as compared with unexposed women (RR = 1.14, 95% CI 0.50–2.60).	Female hourly automobile production workers from three large manufacturing plants in Michigan	High-Income	(Betenia et al., 2012)
	Case-Control	Duration of Employment	Breast Cancer	Exposure-outcome among blue-collar women	The odds of breast cancer among women with 20+ years of employment versus those with 0 to 4 years of employment were increased in the iron and steel industry (OR = 1.22, 95% CI 0.72–2.07); mechanical manufacturing (OR = 1.11, 95% CI 0.92–1.34); electrical manufacturing (OR = 1.37, 95% CI 1.10–1.71); the food industry (OR = 1.13, 95% CI 0.83–1.19); the textile industry (OR = 1.13, 95% CI 0.98–1.29); the garment industry (OR = 1.16, 95% CI 1.01–1.34); the wood industry (OR = 1.22, 95% CI 0.80–1.85); the rubber industry (OR = 2.71, 95% CI 1.25–5.87); the building industry (OR = 1.45, 95% CI 0.28–7.59); the transport industry (OR = 1.15, 95% CI 0.34–3.93); the chemical industry (OR = 1.52, 95% CI 0.96–2.42); the alcoholic beverages and wine production industry (OR = 1.46, 95% CI 0.26–8.10); the pharmaceutical industry (OR = 1.31, 95% CI 0.70–2.43); and the dry cleaning sector (OR = 2.29, 95% CI 0.97–5.41) but not for women in healthcare and veterinarian services, the plastic industry, the pottery industry, agriculture, the paper industry, the leather and shoe industry, or the press industry.	Incident cases of female breast cancer and population controls in Lombardy, Italy	High-Income	(Oddone et al., 2013)
	Longitudinal	Occupational class in 1993 and 1975; high job authority in 1975; adiposity in 1957; reproductive history in 1975 and 1993; job characteristics in 1975; health behaviors in 1993; work under pressure of time, responsibility outside control, high job autonomy; job satisfaction; high job authority; life-course estrogen cycle; family history of breast cancer	Breast Cancer	Blue-collar women vs. other women	The risk of breast cancer was increased among female crafts/operatives laborers as compared with housewives (HR = 0.87, 95% CI 0.51–1.48).	Wisconsin Longitudinal Survey (WLS)	High-Income	(Pudrovska et al., 2013)
	Case-Control	Exposure to lead and lead alloys, chlorinated solvents, lubricant oils, non-ionizing radiation, epoxy resins, and job title	Breast Cancer	Blue-collar women vs. other women	The odds of breast cancer were increased among blue-collar women exposed to chlorinated solvents as compared with unexposed women (OR 1.65, 95% CI 1.04 − 2.62). There was a two-fold increase among blue-collar women exposed for at least 10 years as compared with unexposed women (OR 2.10, 95% CI 1.21 − 3.66).	Incident cases of female breast cancer and controls selected from a single, large electrical manufacturing plant near Milan, Italy.	High-Income	(Oddone et al., 2014)
Cardiovascular disease	Cross-Sectional	Sound pressure level, age, working years, salt (high), salt (normal), family history	Hypertension	Exposure-outcome among blue-collar women	Among female textile mill workers, sound pressure levels (SPL) were associated with the prevalence of hypertension (ß = 0.03, SE = 0.015).	Female workers in a textile mill in Beijing, China	Upper-Middle-Income	(Zhao et al., 1991)
	Longitudinal	Occupational class, work control, work social support, psychological job demand, physical job demand	Cardiovascular morbidity	Exposure-outcome among blue-collar women	Among blue-collar women, cardiovascular morbidity was more prevalent among those with low work social support (OR = 1.19, 95% CI 1.01–1.14) and high physical job demand (OR =	Survey of Living Conditions	High-Income	(Hall et al., 1993)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					1.15, 95% CI 0.97–1.35). Cardiovascular disease was less prevalent among blue-collar women with high psychological job demand (OR = 0.76, 95% CI = 0.60–0.97). There was no association between work control and cardiovascular morbidity (OR = 1.02, 95% CI 087–1.20).			
	Case-Control	Job characteristics	Myocardial Infarction	Exposure-outcome among blue-collar women	Among blue-collar women, increased risk of first MI was associated with monotony (RR = 1.4, 95% CI 0.3–6.9) few possibilities to learn new things (RR = 2.1, 95% CI = 0.9–4.9), long working hours (RR = 1.1, 95% CI 0.7–1.7), low influence on planning of work (RR = 2.0, 95% CI = 0.3–15.6), low influence on working hours (RR = 1.1, 95% CI 0.8–1.7), and noise (RR = 1.4, 95% CI 0.9–2.1). Decreased risk of MI was associated with hectic work (RR = 0.7, 95% CI 0.5–1.1) and low influence on work tempo (RR = 0.7, 95% CI 0.4–1.3)	Incident cases of myocardial infarction and population-based controls in four rural Swedish Counties and Stockholm County.	High-Income	(Hammar et al., 1994)
	Cross-Sectional	Age, sex, education, ethnic origin, repetitive work (short, medium, and long-cycle), work underload, subjective monotony	Systolic blood pressure, diastolic blood pressure, total cholesterol, LDL, HDL, triglycerides	Exposure-outcome among blue-collar women	Among blue-collar women, short-cycle repetitive work was associated with higher mean systolic (p = 0.003) and diastolic (p = 0.01) blood pressure; and total cholesterol (p = 0.03).	Cardiovascular Occupational Risk Factors Determination in Israel Study (CORDIS)	High-Income	(Melamed et al., 1995)
	Longitudinal	Symptoms of chronic bronchitis	First coronary event	Exposure-outcome among blue-collar women	Among blue-collar women, the risk of first coronary event was increased among those with Grade 1 symptoms (RR = 1.98, 95% CI 0.56–7.01) and those with Grade 2 symptoms (RR = 1.93, 95% CI 0.69–5.39) as compared with blue-collar women with no symptoms.	A random sample of the population of the eastern Finnish provinces of North Karelia and Kuopio.	High-Income	(Jousilahti et al., 1996)
	Cross-Sectional	Noise-exposure level, noise annoyance	Cholesterol, LDL, HDL, Cholesterol/HDL, triglycerides	Exposure-outcome among blue-collar women	Among blue-collar women with high noise-exposure and high noise-annoyance, the mean-adjusted cholesterol level was 207 mg/dl (SE = 9.4); LDL levels were 125 mg/dl (SE = 8.6); HDL levels were 57 mg/dl (SE = 3.1); the ratio of Cholesterol to HDL was 4.1 (SE = 0.3) and the mean-adjusted triglyceride level was 126 mg/dl (SE = 14.0).	Cardiovascular Occupational Risk Factors Determination in Israel Study (CORDIS)	High-Income	(Melamed et al., 1997)
	Case-Control	Education, occupational level, decision latitude at work	Cholesterol, triglycerides, HDL, Cholesterol/HDL, LDL/HDL, ApoB, ApoA1	Blue-collar women vs. other women	As compared with white-collar women, cholesterol levels (difference = 0.11, p = 0.42), triglyceride levels (difference = 0.07, p = 0.78), HDL levels (difference = 0.09, p = 0.23), the cholesterol to HDL ratio (difference = 0.36, p = 0.17), the LDL to HDL ratio (difference = 0.31, p = 0.18), and the Apolipoprotein B to apolipoprotein A1 ratio (difference = 0.06, p = 0.63) were higher among blue-collar women.	Stockholm Female Coronary Risk Study (FemCorRisk)	High-Income	(Wamala et al., 1997)
	Case-Control	Occupational class, male- or female-dominated occupation	Myocardial Infarction	Blue-collar women vs. other women	Increased risk of MI was found among blue-collar women (RR = 1.41, 95%CI 1.15–1.73) in jobs where men predominate as compared with other women.	Population aged 30-74 residing in one of five Swedish counties including Stockholm.	High-Income	(Ostlin et al., 1998)
	Cross-Sectional	Age, occupational class	Pain or discomfort in the chest when excited; pain or discomfort in the chest after a substantial meal;	Blue-collar women vs. other women	As compared with blue-collar women, white-collar women experienced less pain or discomfort in the chest when excited (OR = 0.42, 95% CI 0.26–0.68). There was no difference in the odds of pain or discomfort in the chest after a substantial meal (OR = 1.05, 95% CI 0.45–2.44) or palpitations of the	A stratified sample of residents aged 18 to 74 in the four primary health care areas of Halland County, Sweden.	High-Income	(Baigi et al., 2001)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
			Palpitation of the heart or irregular heartbeat		heart or irregular heartbeat (OR = 0.99, 95% CI 0.71–1.38).			
	Cross-Sectional	Job strain	Hypertension	Exposure-outcome among blue-collar women	There was no association between job strain and hypertension among blue-collar women (OR = 1.01, 95% CI 0.87–1.17).	The Jichi Medical School Cohort Study (JMS)	High-Income	(Tsutsumi et al., 2001)
	Case-Control	Short stature, early life socioeconomic disadvantage (large early life family size, singletons, born last, low education), adult life socioeconomic disadvantage (occupational class at labour force entry, blue-collar occupation at examination, economic hardship prior to CHD event).	Coronary heart disease	Blue-collar women vs. other women	The odds of CHD were increased among women whose occupation at labor force entry was blue-collar as compared with women whose occupation at labor force entry was white-collar (OR = 1.80, 95% CI 1.12–3.12). The odds of CHD among women whose occupation at examination was blue-collar as compared to women whose occupation at examination was white-collar (OR = 1.69, 95% CI 0.95–2.88).	Stockholm Female Coronary Risk Study (FemCorRisk)	High-Income	(Wamala et al., 2001)
	Cross-Sectional	Age, behavioral risk factors, occupational class	Average carotid intima-media thickness	Blue-collar women vs. other women	Carotid intima-media thickness was reduced among blue-collar women as compared with female clerical workers (ß = -0.064, SE = 0.027).	Healthy Women Study (HWS)	High-Income	(Gallo et al., 2003)
	Longitudinal	Occupational class	Total stroke, intraparanchymal hemorrhage, subarachnoid hemorrhage, ischemic stroke, coronary heart disease	Blue-collar women vs. other women	As compared with blue-collar women, white-collar women had lower risk of total stroke (HR = 0.93, 95% CI 0.58–1.51), intraparenchymal hemorrhage (HR = 0.34, 95% CI 0.09–1.21), ischemic stroke (HR = 0.72, 95% CI 0.36–1.47), and coronary heart disease (HR = 0.66, 95% CI 0.20–2.21). Risk of subarachnoid hemorrhage was increased among white-collar women compared with blue-collar women (HR = 2.68, 1.03–6.94).	The Jichi Medical School Cohort Study (JMS)	High-Income	(Honjo et al., 2010)
	Longitudinal	Occupational class	Hypertension	Blue-collar women vs. other women	Among women, there was an association between hourly (i.e. blue-collar) status and hypertension among those predicted to be hourly workers based on propensity scores (OR = 1.78, 95% CI 1.34–2.35).	The American Manufacturing Cohort Study (AMC)	High-Income	(Clougherty et al., 2011)
	Longitudinal	Job characteristics	Stroke	Exposure-outcome among blue-collar women	Among blue-collar women, there was no association between risk of incident stroke among women with active jobs (HR = 0.9, 95% CI 0.3–24), passive jobs (HR = 1.0, 95% CI 0.4–2.4), or high strain jobs (HR = 1.04, 95% CI 0.4–2.5) as compared to those with low-strain jobs.	The Jichi Medical School Cohort Study (JMS)	High-Income	(Tsutsumi et al., 2011)
	Cross-Sectional	Occupational class, education, poverty-income ratio	Hypertension, non-HDL Cholesterol	Blue-collar women vs. other women	The odds of hypertension among blue-collar women were increased (OR = 1.30, 95% CI = 1.04–1.61) and the odds of NHDLC were decreased (OR = 0.74, 95% CI = 0.51–1.09) as compared with white-collar women.	Third Korean National Health and Nutrition Examination Survey (KNHANES III)	High-Income	(Cho and Lee, 2012)
	Longitudinal	Cumulative noise exposure, duration of exposure, first year of exposure	Hypertension	Blue-collar women vs. other women	The risk of hypertension among female industrial workers is increased as compared with female financial workers (RR = 1.17, 95% CI 1.09–1.26).	Workers employed in one of 625 companies in the industrial trades and 100 companies in the financial services in Aarhaus County, Denmark.	High-Income	(Stokholm et al., 2013)
	Cross-Sectional	Age, gender, education, knowledge of CVD risk, CVD risk perception, waist-to-hip ratio, social support, ERI ratio (job stress), exposure to chemicals or noise, shift work, overtime work	Actual CVD Risk	Male vs. female blue-collar workers[C]	Actual cardiovascular disease risk among blue-collar women was decreased as compared with blue-collar men (ß = - 0.092, p = 0.709).	Blue-collar workers from companies with fewer than 300 employees	High-Income	(Won et al., 2013)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
						recruited through an occupational health center in South Korea.		
	Longitudinal	Occupational class	Annual and baseline differences in common carotid intima-media thickness (IMT), carotid plaque score, and prevalence of carotid plaque showing.	Blue-collar women vs. other women	Compared with professional women at baseline, the common carotid IMT was increased (0.005, 95% -0.026 to 0.035), the carotid plaque score was decreased (-0.04, 95% CI - 22.7 to 28.3) and the prevalence of carotid plaque showing was decreased (-12.6, 95% CI - 41.7 to 31.2) in blue-collar women. Compared with professionals, the annual change in common carotid IMT was smaller (-0.001, 95% CI -0.003 to 0.002), the annual change in carotid plaque score was greater (0.03, 95% CI - 2.0 to 2.7) and the annual change in the prevalence of carotid plaque showing was greater (2.0, 95% CI - 2.9 to 7.1) in blue-collar women.	Multi-Ethnic Study of Atherosclerosis (MESA)	High-Income	(Fujishiro et al., 2015)
Disability & Absenteeism	Cross-Sectional	Occupational class and material circumstances; unemployment and labor force participation; and family roles	Limiting Long-Standing Illness	Blue-collar women vs. other women	The odds of limiting, longstanding illness were increased among unskilled manual (OR = 2.24, $p < 0.05$); semi-skilled manual (OR = 1.70, $p < 0.05$); and skilled manual women (OR = 1.79, $p < 0.05$) as compared with professional women.	British General Household Survey	High-Income	(Arber, 1991)
	Cross-Sectional	Occupation, months on the job, decision latitude, social supports at work, work dissatisfaction, does not have enough money, economic tensions, family tensions, negative self-image, perceived health status, age, education, number of children < 15 years, number of utilities	Functional impediments	Blue-collar women vs. other women	Female electronics workers reported fewer functional impediments than service workers (ß = - 0.72, 95% CI - 1.39, to 0.03) and female garment workers reported fewer functional impediments than service workers (ß = - 0.21, 95% CI - 0.84,0.42).	Women in Tijuana working as electronic maquiladora workers; garment maquiladora workers; service workers; and those with no labor force history	Upper-Middle-Income	(Guendelman and Silberg, 1993)
	Longitudinal	Occupational class	Short periods of sick leave; long periods of sick leave; sick leave because of an infection; sick leave because of musculoskeletal disorder; sick leave because of trauma	Blue-collar women vs. other women	As compared with higher grade white-collar women, the risk of short periods of sick leave (RR = 1.13, 95% CI 0.99 - 1.29), long periods of sick leave (RR = 2.80, 95% CI 2.55–3.06), sick leave because an infection (RR = 1.58, 95% CI 1.34–1.87), sick leave because of a musculoskeletal disorder (RR = 6.90, 95% CI 5.67–8.41), and sick leave because of trauma (RR = 3.42, 95% CI 2.59–4.50) were increased among blue-collar women.	Employees of the local governments in the Finnish towns of Raisio, Valkeakoski, and Nokia.	High-Income	(Vahtera et al., 1999)
	Cross-Sectional	Occupational class	Reduced activity days, time off work	Blue-collar women vs. other women[C]	As compared with professional women, the odds of having a long-term condition (OR = 0.80, 95% CI 0.62–1.04), a short-term condition (OR = 0.89, 95% CI 0.62–1.04), reduced activity days (OR = 0.87, 95% CI 0.66–1.15), and time off work (OR = 0.95, 95% CI 0.66–1.39) were decreased among blue-collar women.	Campbell National Health Monitor	High-Income	(Korda et al., 2002)
	Cross-Sectional	Occupational class	Work ability	Blue-collar women vs. other women	As compared with white-collar women, blue-collar women had increased odds of lowered work ability (OR = 1.11, 95% CI 0.67–1.84). As compared with upper white-collar workers, odds of lowered work ability were also increased among blue-collar women (OR = 2.11, 95% CI 1.06–4.21).	Helsinki Health Study	High-Income	(Aittomäki et al., 2003)
	Longitudinal	Role clarity, fairness, organizational climate	Short sickness absence; long		Among blue-collar women, the rate of short absence spells for those exposed to poor organizational	All employees of a forest industry	High-Income	(Väänänen et al., 2004)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
			sickness absence; very long sickness absence	Exposure-outcome among blue-collar women	climate were 1.6 times the rate of short absence spells for those with a favorable organizational climate (HR = 1.6, 95% CI 1.0–2.5).	corporation in Finland		
	Longitudinal	Race/ethnicity, age, education, occupation, shift worked, tenure, hourly rate of pay, full-time employment, having 2 jobs	Lost-Worktime Injury or Illness	Blue-collar women vs. other women[C]	Among women, the odds of reporting a lost-worktime injury or illness were decreased among machine operators (OR = 0.73, 95% CI 0.38–1.41) and craftswomen (OR = 0.57 (0.24, 1.33) as compared with laborers. The rates of lost-worktime injury or illness were increased among machine operators (IRR = 2.41, 95% CI 0.86–6.74) and decreased among craftswomen (IRR = 0.58, 95% CI 0.19–1.78) as compared with laborers.	National Longitudinal Survey of Youth 1979 (NLSY)	High-Income	(Strong and Zimmerman, 2005)
	Longitudinal	Occupational class	Sickness absence	Blue-collar women vs. other women	As compared with female executive managers and academics, the rates of long-term sickness absence were increased among skilled blue-collar women (RR = 2.06, 95% CI 0.69–6.17) and among semiskilled and unskilled women (RR = 2.76, 95% CI 1.00–7.65).	Danish Work Environment Cohort Study (DWECS)	High-Income	(Christensen et al., 2008)
	Cross-Sectional	Occupational class	Long sickness absence	Blue-collar women vs. other women	Odds of long-term sickness absence (OR = 2.45, 1.90–3.15) and work injury (OR = 5.63, 3.13-10.16) were higher among blue-collar women as compared to professionals/managers.	SUMER Study	High-Income	(Niedhammer et al., 2008)
	Longitudinal	Family type, domestic responsibilities, negative work-family spillover	Sickness absence	Exposure-outcome among blue-collar women	Among blue-collar women, the rates of sickness were increased for those with no children (RR = 1.11, 95% CI 0.96–1.30) and those with children 0–6 years old (RR = 1.11 (0.955–1.3) as compared to those with children 7–18 years old. Rates of sickness absence were increased if domestic responsibilities were the woman's duty alone (RR = 1.08, 0.93-12.4) or shared equally (RR = 1.15, 1.00–1.33) as compared to when they were somebody else's. Rates of sickness absence were increased for high negative work-family spillover (RR = 1.44, 1.25–1.66) and moderate work-family spillover (RR = 1.10, 0.95-1.27) as compared to low work-family spillover.	Finnish 10-Town Study	High-Income	(Väänänen et al., 2008)
	Longitudinal	Work ability in midlife	Disability	Blue-collar women vs. other women	As compared with white-collar women in excellent health, the odds of disability were increased among blue-collar women with excellent health (OR = 1.40, 95% CI 0.96–2.05), moderate health (OR = 2.41, 95% CI 1.78–3.26), and poor health (OR = 3.91, 95% CI 2.68–5.70).	Finnish Longitudinal Study on Municipal Employees (FLAME)	High-Income	(von Bonsdorff et al., 2011)
	Cross-Sectional	Heart rate reserve	Reduced work ability	Exposure-outcome among blue-collar women	Among blue-collar women, reduced work ability was inversely associated with increased heart rate reserve (OR = 0.30, 95% CI 0.04–2.30).	New method for Objective Measurements of physical Activity in Daily living (NOMAD) study	High-Income	(Gupta et al., 2014)
	Longitudinal	Job demand, job control, social support, job insecurity, organizational injustice, lack of reward, discomfort in occupational climate	Absence due to Accident	Exposure-outcome among blue-collar women	Among blue-collar women, the odds of absence due to accidents were increased for women with insufficient job control (OR = 1.95, 95% CI 0.63–6.11), high job insecurity (OR = 1.55, 95% CI 0.48–5.10), high organizational injustice (OR = 1.79, 95% CI 0.54–5.87), lack of reward (OR = 1.54, 95% CI 0.48–4.95), and discomfort in occupational climate (OR = 1.79, 95% CI	Workers at 23 manufacturing companies in the Incheon area of South Korea registered for health examinations with	High-Income	(Heo et al., 2015)

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Table 2 (*continued*)

Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					0.54–5.87). The odds of absence due to accidents among blue-collar women were decreased among those with high job demand (OR = 0.41, 95% CI 0.12–1.39) and high levels of inadequate social support (OR = 0.81, 95% CI 0.22–2.92).	the department of occupational and environmental medicine at a university hospital.		
Health Behaviors	Cross-Sectional	Occupational class, hours worked per week, living arrangement, smoking status, MI, self-reported health	Insufficient physical activity for health	Blue-collar women vs. other women	The odds of insufficient physical activity for health among blue-collar women were 1.55 times the odds of insufficient physical activity for health among professional women (OR = 1.55, 95% CI 1.4–1.8).	Australian National Health Survey (ANHS)	High-Income	(Burton and Turrell, 2000)
	Cross-Sectional	Physical requirement, stress level, age, education, gender, race (white or black), drinking, smoking, self-reported health, workhours, any children younger than 18, have spouse, spouse working, spouse exercise level	Vigorous Physical Activity	Male vs. female blue-collar workers[B]	Male blue collar workers were more likely to engage in light physical activity than female blue-collar workers (ß = 0.03, p > 0.05). Male blue-collar workers were significantly more likely to engage in vigorous physical activity as compared with female blue-collar workers (ß = 0.11, p < 0.001).	Health and Retirement Study (HRS)	High-Income	(Wu and Porell, 2000)
	Cross-Sectional	Age, education, income, married, occupation, current smoker, commuting physical activity	Leisure-time physical activity	Blue-collar women vs. other women[C]	Blue-collar women were less likely to engage in leisure-time physical activity (OR = 0.52, 95% CI = 0.38–0.73), engage in commuting time physical activity (OR = 0.93, 95% CI 0.69–1.26) as compared with blue-collar women.	Residents of Tianjin, China randomly selected using local population registers for 14 randomly selected communities.	Upper-Middle-Income	(Gang et al., 2002)
	Cross-Sectional	Age, Education, Occupation	Daily energy expenditure (DEE); weekly physical activity (WPA); leisure-time physical activity (LTPA)	Blue-collar women vs. other women	Among female laborers and machine operators, daily energy expenditures were lower and weekly physical activity was higher as compared with female managers and professionals. Leisure time physical activity was similar in female laborers, machine operators, and managers.	Workers at nine companies or factories located in the east (Kanto) and central (Chubu) areas of Japan.	High-Income	(Takao et al., 2003)
	Cross-Sectional	Age, education, occupational class, geographical location, BMI, workplace activity, physical activity level	Achieving 10,000 Steps per Day	Blue-collar women vs. other women[C]	Odds of reaching 10,000 steps among blue-collar women are 0.81 times the odds among female managers and professionals (OR = 0.81, 95% CI 0.21–3.06).	Adults in Western Australia randomly selected from the White Pages telephone directory using proportional sampling.	High-Income	(McCormack et al., 2006)
	Longitudinal	Age, education, occupational class, smoking status, leisure-time physical activity, BMI	Heterocyclic Amine (HCA) Intake	Blue-collar women vs. other women[C]	As compared to blue-collar women, the likelihood of falling in the highest quintile of HCA intake was lower among medium-status white-collar women (OR = 0.81, 95% CI 0.69-0.96), high-status white-collar women (OR = 0.76, 95% CI 0.59-0.97) and among self-employed women (OR = 0.97, 95% CI 0.78–1.21). No differences were found between low-status white-collar women and blue-collar women (OR = 1.00, 95% CI 0.89–1.14).	The Malmö Diet and Cancer (MDC) Study	High-Income	(Ericson et al., 2007)
	Cross-Sectional	Occupational class, hours at job, hours on unpaid care, dependents (< 18 years) in the home, smoking status, weight status, perceived physical health	Physical activity	Blue-collar women vs. other women	The odds of leisure-time physical activity among blue-collar women were 2.25 times the odds of leisure-time physical activity among women in professional jobs (OR = 2.25, 95% CI 0.92–5.50).	2000 Kings County Genuine Progress Indicators Survey	High-Income	(Kuiack et al., 2007)
	Longitudinal	Sex, education, native language, eating at work to cope with stress, intention to change fruit and vegetable intake, smoking status	Change in fruit and vegetable consumption	Exposure-outcome among blue-collar women	Female construction workers participating in the Tools for Health cancer prevention intervention decreased their fruit and vegetable consumption (ß = -0.36, 95% CI - 2.18 to1.46) over the course of follow-up.	Tools for Health (TFH)	High-Income	(Harley et al., 2010)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
	Cross-Sectional	Occupational Class	Leisure-time physical inactivity	Blue-collar women vs. other women	Blue-collar women were more likely be inactive during leisure time as compared with white-collar women (OR = 1.50, 95% CI 1.12–2.00).	Finnish Health 2000 Survey	High-Income	(Mäkinen et al., 2010)
	Longitudinal	Age, education, employment, occupational class, live births, smoking status, alcohol intake, extra foods, self-rated health, SF12 physical and mental health measures	Pedometer- and self-reported physical activity	Blue-collar women vs. other women[C]	Blue-collar women engaged in 2.85 more minutes per week of physical activity as compared with white-collar women (ß = 2.85, 95% CI = - 0.10 - 5.81).	Childhood Determinants of Adult Health (CDAH) Study	High-Income	(Cleland et al., 2011)
	Cross-Sectional	Occupational class, education, poverty-income ratio	Physical inactivity	Blue-collar women vs. other women	The odds of physical inactivity were decreased among blue-collar women as compared with white-collar women (OR = 0.64, 95% CI 0.57–0.72).	Third Korean National Health and Nutrition Examination Survey (KNHANES III)	High-Income	(Cho and Lee, 2012)
	Cross-Sectional	Education, household income, occupational class	Healthy takeaway food; less healthy takeaway food	Blue-collar women vs. other women	Blue-collar women were less likely to eat healthy takeaway food (ß = 0.73, SE = 2.02) and more likely to eat less healthy takeaway food (ß = 3.67 (1.49) as compared with female managers and professionals.	Adults randomly selected from the electoral roll of the Brisbane statistical subdivision in Australia.	High-Income	(Miura and Turrell, 2014)
	Cross-Sectional	Age, education, occupational class, marital status, smoking status, regular exercise, BMI, energy intake, alcohol intake	Inadequate fruit and vegetable consumption (< 5 servings per day)	Blue-collar women vs. other women[C]	The odds of inadequate fruit and vegetable intake among female blue-collar women were 1.56 times the odds of inadequate fruit and vegetable intake among white-collar women (OR = 1.56, 95% CI 1.20–2.02).	The EPIPorto Study	High-Income	(Oliveira et al., 2014)
	Longitudinal	BMI, country of birth, area of residence, educational qualification, marital status, number of children, occupational class, hours worked per week, being active, smoking status, alcohol consumption, being somewhat stressed	Week-day sitting, Weekend-day sitting	Blue-collar women vs. other women[C]	Blue-collar women engaged in less weekday sitting as compared with professional women (ß = - 1.30, 95% CI - 1.48, to 1.13). Weekend-day sitting was comparable among blue-collar women and professional women (ß = 0.06, 95% CI - 0.21, 0.10).	Australian Longitudinal Study on Women's Health (ALSWH)	High-Income	(Uijtdewilligen et al., 2014)
	Cross-Sectional	Actual CVD risk, age, gender, education, knowledge of CVD risk, perceived general health, family function, social support, decision latitude, exposure to chemicals/noise, shift work	Health-promoting behaviors	Male vs. female blue-collar workers[C]	Health risk scores among blue-collar women were increased as compared with blue-collar men (ß = 0.116, p = 0.120).	Blue-collar workers at small companies recruited from occupational health centers or worksites during annual health checkups in South Korea.	High-Income	(Hwang et al., 2015)
	Longitudinal	BMI, country of birth, area of residence, educational qualification, marital status, number of children, occupational class, hours worked per week, smoking status, alcohol status	Physically Active	Blue-collar women vs. other women[C]	Odds of being physically active among blue-collar women were 0.94 times the odds of being physically active among professional women (OR = 0.94, 95% CI 0.83–1.05).	Australian Longitudinal Study on Women's Health (ALSWH)	High-Income	(Uijtdewilligen et al., 2015)
Mental Health	Cross-Sectional	Job demands, job characteristics, physical environment, work-related social support, marriage, children, age, race, education	Distress, happiness	Exposure-outcome among blue-collar women	Distress was inversely associated with substantive complexity of the job (ß = -0.048, p > 0.05); autonomy (ß = -0.013, p > 0.05); income (ß = -0.008, p > 0.05); satisfaction with co-workers (ß = -0.132, p < 0.01); company programs (ß = -.101, p > 0.05); being married (ß = -0.059, p > 0.05); age (p = -0.008, p > 0.05); race (ß = -0.108, p < 0.01); and education (ß = -0.002, p > 0.05). There was no association between distress and overtime or span of control.	Employees at plants in seven manufacturing industries in south central Indiana	High-Income	(Loscocco and Spitze, 1990)
	Cross-Sectional	Age, current smoker, moderate/heavy alcohol, sever obesity, chronic disease, clean room, current chemical exposure	Depression	Exposure-outcome among blue-collar women	The odds of depression among blue-collar with current chemical exposure were 1.46 times the odds of depression among blue-collar women without	Female workers at a semi-conductor manufacturing	High-Income	(Parkinson et al., 1990)

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Table 2 (*continued*)

Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					current chemical exposure (OR = 1.46, p > 0.05). There was no association between working in the clean room and depression among blue-collar women (OR = 1.00, p > 0.05	plant in Pennsylvania represented by the International Brotherhood of Electrical Workers (IBEW).		
	Cross-Sectional	Age, education, marriage, income, smoking, obesity, major illness, life events, solvent exposure, job demands, job conflict, co-worker support, supervisor support, friend/relative support	Depression	Exposure-outcome among blue-collar women	The odds of depression were increased among blue-collar women who smoked (ß = 0.21, p > 0.05); had a major illness (ß = 0.46, p < 0.05); had a life event (ß = 0.44, p < 0.001); were exposed to solvents (ß = 0.27, p < 0.05); or experienced increased job demands (ß = 0.19, p > 0.05) or job conflict (ß = 0.62, p < 0.001). Odds of depression were decreased among blue-collar women who were obese (ß = - 0.31, p > 0.05); and among those with support from co-workers (ß = -0.35, p < 0.05), supervisors (ß = -0.02, p > 0.05), or friends and relatives (ß = -0.50, p < 0.01).	Female workers at a semi-conductor manufacturing plant in Pennsylvania represented by the International Brotherhood of Electrical Workers (IBEW).	High-Income	(Bromet et al., 1992)
	Cross-Sectional	Occupation, months on the job, decision latitude, social supports at work, work dissatisfaction, does not have enough money, economic tensions, family tensions, negative self-image, perceived health status, age, education, number of children < 15 years, number of utilities	Depression, nervousness, sense of control	Blue-collar women vs. other women	The odds of depression were increased among garment workers as compared with service workers (ß = 0.77, 95% CI - 0.93 to 2.46) and decreased among electronic workers as compared with service workers (ß = -0.88, 95% CI - 2.57, 0.81).	Women in Tijuana working as electronic maquiladora workers; garment maquiladora workers; service workers; and those with no labor force history	Upper-Middle-Income	(Guendelman and Silberg, 1993)
	Cross-Sectional	Age, sex, education, ethnic origin, subjective monotony	Psychological Distress	Exposure-outcome among blue-collar women	Among blue-collar women, psychological distress is associated with subjective monotony (ß = 0.49, p < 0.005).	Cardiovascular Occupational Risk Factors Determination in Israel Study (CORDIS)	High-Income	(Melamed et al., 1995)
	Cross-Sectional	Monotony, lack of control, self-esteem	Psychological Distress	Exposure-outcome among blue-collar women	Among blue-collar women ≤ 35 years, psychological distress was positively associated with monotony (ß = 0.23, p > 0.05); lack of control (ß = 0.009, p > 0.05) and self-esteem (ß = 0.066, p > 0.05). Among blue-collar women > 35 years old, psychological distress was positively associated with monotony (ß = 0.050, p < 0.05) and self-esteem (ß = 0.099, p < 0.05), but inversely associated with lack of control (ß = -0.003, p > 0.05).	Blue-collar workers at 37 factories of an industrial company in Finland	High-Income	(Kivimäki and Kalimo, 1996)
	Cross-Sectional	Responsibility for the safety of others, skill underutilization, sexual harassment and discrimination, overcompensation at work	Psychological symptoms	Exposure-outcome among blue-collar women	Among female construction workers, having responsibility for the safety of others (ß = 0.456, p < 0.001), skill underutilization (ß = 0.399, p < 0.001), experiencing sexual harassment and discrimination on the job (ß = 0.258, p < 0.001), and having to overcompensate at work (ß = 0.254, p < 0.001).	Female members of the Laborers' International Union of North America (LIUNA) in Seattle, Washington and Portland, Oregon.	High-Income	(Goldenhar et al., 1998)
	Longitudinal	Gender, workload score	Psychosomatic complaints, intake of stress-related drugs	Male vs. female blue-collar workers	Intake of stress-related drugs was less frequent among female bus-drivers as compared with male bus drivers (ß = - 0.05, p > 0.05) and there was a negative interaction between gender and workload	Full-time, employed urban bus drivers working at the	High-Income	(Rydstedt et al., 1998)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					score (ß = - 0.03, p > 0.05). Psychosomatic complaints were less frequent among female bus-drivers as compared with male bus-drivers (ß = - 0.08, p > 0.05), and there was a positive interaction between gender and workload (ß = 0.18, p > 0.05).	same terminal in central Stockholm, Sweden.		
	Cross-Sectional	Age, marital status, foreign background, education, occupational class, current financial support, weekly working hours, financial strain, work stress, drinking, smoking, psychoactive medication, somatic medication, cardiovascular disease, gastro-intestinal diseases, other diseases, pain, depression	Burnout	Blue-collar women vs. other women[C]	Odds of burnout among blue-collar women were 0.795 times the odds of burnout among women in other occupations (OR = 0.795, 95% CI 0.324–1.95).	Adult women randomly selected from the general population resident in Stockholm County, Sweden.	High-Income	(Soares et al., 2007)
	Case-Control	Occupational class and labor market status; gross income; marital status; parenthood; place of residence; ethnicity	Suicide	Blue-collar women vs. other women	Odds of suicide were among skilled blue-collar women were 1.1 times the odds of suicide among salaried female employees (OR = 1.1, 95% 0.8–1.5) and the odds of suicide among unskilled blue-collar women were 0.9 times the odds of suicide among salaried female employees (OR = 0.9, 95% CI 0.8–1.0).	Incident cases of suicide and population controls drawn from a 5% random subsample of the total Danish population in the IDA database.	High-Income	(Andrés et al., 2010)
	Longitudinal	Distance from site; saw people dead or injured; participation in rescue operations; physical injuries; history of depression; harm to close friend or family member (injured or died); job relocation or temporary layoff; sick-leave; lives alone; occupational class	Psychological distress	Blue-collar women vs. other women[A]	The odds of psychological distress among female workers at the Toulouse industrial AZF disaster were 1.24 times the odds of psychological distress among female managers and professionals (OR = 1.24, 95% CI 0.48–3.41).	Workers in the metropolitan area of Toulouse, France	High-Income	(Cohidon et al., 2009)
	Cross-Sectional	Housework, leisure active transport, biking to/from work, walking to/from work, sports	Stress, distress	Exposure-outcome among blue-collar women	The risks of stress (RR = 2.661, 95% CI 1.098 - 6.447) and distress (RR = 2.911, 95% CI 1.055–8.031) were increased among blue-collar women engaging housework versus those not not. The risks of stress (RR = 1.114, 95% CI 0.478–2.597) and distress (RR = 1.008, 95% CI 0.478–2.344) were increased among blue-collar women engaging in leisure active transport versus those not. The risk of stress was decreased (RR = 0.714, 95% CI 0.266–1.918) and the risk of distress was increased (RR = 2.366, 95% CI 0.863–6.487) among blue-collar women walking to and from work versus those not. The risks of stress (RR = 1.564, 95% CI 0.607–4.030) and distress (RR = 2.202, 95% CI 0.793–6.115) were increased among blue-collar women participating in sports versus those not.	Adults randomly selected from 46 randomly chosen Flemish municipalities.	High-Income	(Asztalos et al., 2009)
	Cross-Sectional	Work hours per day, overtime, salary; exposure to chemicals and toxic vapors/substances, exposure to vibration and dangerous equipment, high temperatures, physical dangers/unhealthy conditions at work, poor air/ventilation, crowded workstations and uncomfortable working postures, having a safe work environment, adequate protective clothing and equipment, adequate work-related welfare facilities; psychological job demands/workload, work is interesting, company informs about its	Mental distress	Exposure-outcome among blue-collar women	Multiple associations reported between various measures of working hours and salary; safety and health; tasks and organizational aspects; extra-organizational factors and mental distress among blue-collar women.	Blue-collar workers from 12 manufacturing companies in Lima, Perú.	Upper-Middle-Income	(Brunette et al., 2011)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
		achievements, on-site training courses, resources/help and equipment availability, supervisor-related, discrimination - intimidation or threats; household income inadequacy, social and family working hours fit, adequate sanitary living conditiolns/potable water, children under 18.						
	Cross-Sectional	Marital status, occupational category, household income, alcohol use, functional limitations, level of stress, experience of depressed feelings	Suicidal Ideation	Blue-collar women vs. other women[C]	Suicidal ideation was more prevalent among middle-aged women engaged in manual labor (OR = 2.77, 95% CI 1.20–6.42) as compared with female non-manual workers.	Seoul Citizens Health and Social Indicators Survey	High-Income	(Moon and Park, 2012)
	Cross-Sectional	Age, smoking, company's gender equality index, employment hours, occupational class, high engagement in domestic work, number of children < 18 years, work demands, work control, work support, constrained physical heavy work load, work-home imbalance	Emotional exhaustion	Blue-collar women vs. other women	Multiple point estimates reported for the association between emotional exhaustion and exposure to engagement in domestic work and exposure to psychosocial and physical work factors and work-home imbalance.	Employees at 9 companies in computer science and 12 companies in the food industry in Sweden.	High-Income	(Ahlgren et al., 2012)
	Cross-Sectional	Psychological demand, social support, sex, marital status, age, education level, duration of employment, perceived work conditions, perceived work protection materials, work absenteeism	Depression	Male vs. female blue-collar workers[C]	The odds of depression were increased among blue-collar women as compared with blue-collar men (OR = 2.1, 95% CI 0.7–5.2).	Workers at the Le Lai II Shoe Manufacturing Factory in Haiphong City, Vietnam.	Lower-Middle-Income	(Minh, 2014)
	Cross-Sectional	Noise annoyance, sleeping time, education, occupational class, household income, smoking, alcohol drinking	Depressive symptoms, suicidal ideation	Blue-collar women vs. other women[A]	The odds of suicidal ideation were increased among blue-collar women as compared with white-collar women (OR = 1.27, 95% CI 0.96–1.67), and the odds of depressive symptoms were similar in blue- and white-collar women (OR = 1.02, 95% CI 0.76–1.37).	Third Korean National Health and Nutrition Examination Survey (KNHANES III)	High-Income	(Yoon et al., 2014)
Mortality	Longitudinal	Occupational class, work control, work social support, psychological job demand, physical job demand	Cardiovascular mortality	Exposure-outcome among blue-collar women	Among blue-collar women, odds of cardiovascular mortality were increased for those with high physical job demand (OR = 1.23, 95% CI 0.87–1.73) and decreased for those with high psychological demand (OR = 0.71, 95% CI 0.41–1.24). There was no association between work control (OR = 1.07, 95% CI 0.74–1.47) or work social support (OR = 1.04, 95% CI 0.74–1.47) and cardiovascular mortality among blue-collar women.	Survey of Living Conditions	High-Income	(Hall et al., 1993)
	Longitudinal	Social class	All-cause mortality, mortality from cardiovascular disease	Blue-collar women vs. other women	As compared with white-collar women, the risks of CHD mortality were higher among skilled (HR = 1.25, 95% CI 0.73–2.13) and unskilled (HR = 1.85, 95% CI 1.11–3.09) blue-collar women. The risks of all-cause mortality were higher for skilled (HR = 1.34, 95% CI 1.04–1.73) and unskilled (HR = 1.50, 95% CI 1.15–1.94) blue-collar women. The risks for all-cause mortality were increased among skilled (HR = 1.34, 95% CI 1.04–1.73) and unskilled (HR = 1.50, 95% CI 1.15–1.94).	A random sample of the population of the eastern Finnish provinces of North Karelia and Kuopio.	High-Income	(Pekkanen et al., 1995)
	Case-Control	Occupational Class	Deaths from Accidents, Violence, and Alcohol	Blue-collar women vs. other women	Alcohol-related deaths were more common in blue-collar women as compared with women in non-manual occupations (OR = 3.97, 2.86–5.52); deaths due to accidents and violence were more common in blue-collar women as compared with women in non-manual occupations (OR = 2.07, 95% CI 1.77–2.41).	Incident cases of (i) alcohol-related deaths and (ii) deaths from accidents or violence in Moscow, Russia and controls with	Upper-Middle-Income	(Chenet et al., 1998)

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Outcome Category	Study Design	Independent Variable(s)[**]	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
						cancer-related causes of death.		
	Longitudinal	Occupational Class	All-cause mortality; mortality due to malignant neoplasms (various), diabetes mellitus, cerebrovascular disease, all heart disease, ischemic heart disease, nonmalignant respiratory disease, cirrhosis of the liver, and external causes	Blue-collar women vs. other women	Relative risks for all causes (0.98), all cancers (0.90), lung cancer (1.34), and breast cancer (0.96) were nonsignificant when mortality was compared to the US female population. No relationship between mortality and length of time employed in the industry or work area was identified.	Workers from 13 high nickel alloys plants located throughout the United States.	High-Income	(Arena et al., 1999)
	Longitudinal	Age, occupational class, heart problems	All-cause mortality	Blue-collar women vs. other women	The risk of mortality was increased among female workers as compared with female white-collar workers (RR = 1.16, p = 0.07).	Level of Living Survey (LLS)	High-Income	(Kåreholt, 2001)
	Longitudinal	Occupational class	Cardiovascular mortality	Blue-collar women vs. other women	The risk of observed mortality from cardiovascular disease was decreased among white-collar women as compared with blue-collar women (RR = .56, 95% CI 0.50–0.63).	All residents of Halland, Sweden registered in the Population and housing censuses (FoB)	High-Income	(Baigi et al., 2002)
	Longitudinal	Education, housing, occupational class, gross income, family type, smoking	Mortality due to respiratory disease	Blue-collar women vs. other women[C]	As compared with blue-collar women, mortality from respiratory diseases was lower among white-collar women (HR = 0.68, 95% CI 0.47–0.99) and women outside of the workforce (HR = 0.94, 95% CI 0.63–1.39).	The Copenhagen City Heart Study (CCHS) and the Glostrup Population Studies (GPS)	High-Income	(Prescott et al., 2003)
	Longitudinal	Shift work	All-cause mortality	Exposure-outcome among blue-collar women	Among blue-collar women, the risk of all-cause mortality was decreased among those exposed to shift work as compared with those working day shifts (HR = 0.79, 0.50–1.26).	National Survey of Living Conditions (ULF)	High-Income	(Åkerstedt et al., 2004)
	Longitudinal	Occupational class	All-cause mortality	Blue-collar women vs. other women	As compared with high and middle bourgeoisie women, the risk of all-cause mortality was increased among unskilled blue-collar women (RR = 1.14, 95% CI 1.08–1.21) and skilled blue-collar women (RR = 1.06, 95% CI 1.00–1.12).	Turin Longitudinal Study	High-Income	(Mamo et al., 2005)
	Cross-Sectional	Occupational class	All-cause cancer mortality; lung cancer mortality	Blue-collar women vs. other women	There was no difference in cancer mortality risk among blue-collar women as compared with professional women (RR = 1.03, 95% CI 0.96–1.11). As compared with professional women, the risk of cancer mortality was increased among blue-collar women when breast cancer was excluded (RR = 1.12, 95% CI 1.02–1.22) and the risk of lung cancer mortality was increased among blue-collar women (RR = 1.12, 95% CI 1.02–1.22).	The adult population of Australia nested within Statistical Local Areas (SLA)	High-Income	(Bentley et al., 2008)
	Longitudinal	Gender, race, age, exposure to chrysotile fibers	Lung cancer mortality; Asbestosis Mortality; Pneumoconiosis and other	Exposure-outcome among blue-collar women	As compared with women whose cumulative exposure to chrysotile fibers was less than 1.5 fibre-years/ml, the risk of lung cancer mortality was decreased among those exposed to between 1.5 and 5 fibre-years/ml (RR = 0.59, 95% CI 0.22–1.61); but was increased among those exposed to between	Workers exposed to chrysotile in a South Carolina asbestos textile plant.	High-Income	(Hein et al., 2007)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
			respiratory diseases mortality		5 and 15 fibre-years/ml (RR = 1.51, 95% CI 0.69–3.33), between 15 and 60 fibre-years/ml (0.69–3.33), between 60 and 120 fibre-years/ml (RR = 3.40, 95% CI 1.52–7.60), and more than 120 fibre-years/ml (RR = 3.84, 95% CI 1.41–10.5).			
	Longitudinal	Years smoked, drinks per week, age, male gender, race/ethnicity	All-cause mortality	Male vs. female blue-collar workers[C]	All-cause mortality risk was increased among male urban transit operators as compared with female urban transit operators (HR = 1.464, 95% CI 0.767–2.795).	San Francisco MUNI Health and Safety Study	High-Income	(Lipton et al., 2008)
	Longitudinal	Age of retirement for old-age pensioners, age of retirement for reduced earning capacity pensioners, year, age, family status, occupational class	All-cause mortality	Blue-collar women vs. other women[A]	As compared with blue-collar women, the all-cause mortality rate is lower among white-collar women (HR = 0.83, 95% CI 0.73–0.93).	All insured embers of the Gmünder Ersatzkasse (GEK) compulsory health insurance fund who retired between the ages of 50 and 65	High-Income	(Brockmann et al., 2009)
	Longitudinal	Work ability in midlife	All-cause mortality	Blue-collar women vs. other women	As compared with white-collar women in excellent health, the rate of all-cause mortality was increased among blue-collar women with excellent health (HR = 1.30, 95% CI 0.97–1.74), moderate health (HR = 1.15, 95% CI 0.89–1.46), and poor health (HR = 1.44, 95% CI 1.10–1.89).	Finnish Longitudinal Study on Municipal Employees (FLAME)	High-Income	(von Bonsdorff et al., 2011)
	Longitudinal	Area-remoteness index of Australia, index of relative socio-economic disadvantage (IRSD), time (years after diagnosis) and time squared, age, indigenous status, occupational class, marital status, cancer stage	Breast Cancer Mortality	Blue-collar women vs. other women[C]	The odds of breast cancer mortality were increased among blue-collar women as compared with professional women (OR = 1.27, 95% CI 1.08–1.51).	Queensland Cancer Registry (QCR)	High-Income	(Dasgupta et al., 2012)
	Longitudinal	Job strain	All-cause mortality	Exposure-outcome among blue-collar women	Among blue-collar women the odds of all-cause mortality were decreased for active work versus low strain work (OR = 0.77, 95% 0.56–1.07) and increased for passive work versus low strain work (OR = 1.17, 95% CI 0.89–1.55). There was no difference in the odds of all-cause mortality among blue-collar women engaged in high- versus low-strain work (OR = 0.97, 95% CI 0.73–1.29).	Finnish Longitudinal Study on Municipal Employees (FLAME)	High-Income	(von Bonsdorff et al., 2012)
	Longitudinal	Occupational class, occupational position (manager vs. non-manager)	All-cause mortality; CVD mortality; Cancer mortality	Blue-collar women vs. other women	The rates of all-cause mortality among blue-collar women were decreased as compared with white collar women (HR = 0.73, 95% CI 0.43–1.25), the rates of cardiovascular mortality were decreased among blue-collar women as compared with white-collar women (HR = 0.78, 95% CI 0.22–2.81) and the rates of cancer mortality were decreased among blue-collar women as compared with white-collar women (HR = 0.76, 95% CI 0.37–1.56).	The Jichi Medical School Cohort Study (JMS)	High-Income	(Hirokawa et al., 2013)
	Longitudinal	Age; marital status; occupational class; SOC (comprehensibility, manageability, meaningfulness); psychiatric diagnoses (organic disorder, psychotic, dementia, alcohol use disorder)	All-cause mortality	Blue-collar women vs. other women[A]	The rate of all-cause mortality among blue-collar women was 1.63 times the rate of all-cause mortality among white-collar women (HR = 1.63, 95% CI 1.06–2.52).	The Lundby Study Cohort	High-Income	(Mattisson et al., 2014)
	Longitudinal	Metalworking fluid	Ischaemic Heart Disease Mortality	Exposure-outcome among blue-collar women	Among white female auto-workers, the risk of ischemic heart disease mortality was increased among those with cumulative exposure to soluble metalworking fluid of more than 3.44 mg/m3-year (HR = 1.89, 95% CI 0.74–4.86); between 1.81 and 3.44 mg/m3-year (HR = 2.44, 95% CI 0.96–6.22); between 0.77–1.80 mg/m3-year (HR = 2.40, 95% CI 0.97–5.9); and between 0–0.76 mg/m3-year (HR	Female hourly automobile production workers from three large manufacturing plants in Michigan	High-Income	(Costello et al., 2014)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					= 1.84, 95% CI 0.76–4.50) as compared with white female autoworkers with no exposure to soluble metalworking fluids. Risk was increased among those with cumulative exposure to synthetic metalworking fluid greater than 0.65 mg/m3-year (HR = 1.37, 95% CI 0.82–2.29) and between 0–0.65 mg/m3-year (HR = 1.29, 95% CI 0.80–2.07) as compared with white female autoworkers with no exposure to synthetic metalworking fluids.			
	Case-Control	Occupational class, current smoking, African American	Sudden Cardiac Death	Blue-collar women vs. other women	Odds of sudden cardiac among white-collar women were 1.49 times the odds of sudden cardiac death among blue-collar women (OR = 1.49, 95% CI 0.81–2.75).	Oregon Sudden Unexpected Death Study	High-Income	(Zhang et al., 2015)
Musculoskeletal	Longitudinal	Physical Workload	Occupation and osteoarthrosis of the hip and knee	Exposure-outcome among blue-collar women	Among blue-collar women born in 1905–1924, the risks were increased for hospitalization due to osteoarthrosis of the hip (RR = 1.6, 95% CI 0.9–3.1) and knee (RR = 1.4, 95% CI 0.6–3.2) among those with high versus low exposure occupations. Among blue-collar women born in 1925–1945, the risk was increased for hospitalization for osteoarthrosis of the hip (RR = 1.1, 95% CI 0.9–1.5) and knee (RR = 1.9, 95% CI 1.3–2.9) among those with high versus low exposure occupations.	Residents of one of 13 Swedish counties who reported the same occupation in the 1960 and 1970 census.	High-Income	(Vingård et al., 1991)
	Cross-Sectional	Previous pain symptoms, muscle tension, age, psychological problems, working hours, family relationship	Pain symptoms of the head, neck, shoulders/upper arms, lower arms, low back, hip, thighs, knee and ankles	Exposure-outcome among blue-collar women	The main individual risk factor identified was experience of previous similar symptoms in the same body region. Other individual factors were signs of psychological problems and tendency of muscle tension.	Female production workers employed by a single Norwegian clothing manufacturing companies.	High-Income	(Westgaard and Jansen, 1992)
	Cross-Sectional	Positive affectivity, negative affectivity, age, sex, education, tenure, alcohol involvement, autonomy, routinization, job hazards, role ambiguity, role conflict, work overload, supervisory support, co-worker support	Occupational injury	Male vs. female blue-collar workers[B]	Blue-collar men were less likely to experience occupational injury than blue-collar women (ß = -0.29, $p < 0.05$).	Blue-collar unionized employees at a single manufacturing plant in Victoria, Australia	High-Income	(Iverson and Erwin, 1997)
	Longitudinal	High mental load at work, monotonous work, overtime work, dissatisfactory leisure time, high mental load at work + dissatisfactory leisure time	Disorders of the neck; disorders of the shoulder	Exposure-outcome among blue-collar women	Among blue-collar women, reported medical treatment or consultation for disorders of the shoulder were associated with high mental load at work (PR = 1.2, 95% CI 0.3–4.4), overtime work, (PR = 2.7, 95% CI 1.1–6.9), and high mental load at work with unsatisfactory leisure time (PR = 1.7, 95% CI 0.6–4.8) relative to potential risk factors in 1969. Unsatisfactory leisure time was associated with decreased reported medical treatment or consultation for disorders of the shoulder (PR = 0.7, 95% CI 0.3–1.7).	The REBUS Study	High-Income	(Fredriksson et al., 1999)
	Longitudinal	Duration of exposure, age, smoking, BMI, living alone with children, job strain, social support, stress	Shoulder Disorders	Exposure-outcome among blue-collar women	Among female sewing machine operators, the risk of developing a shoulder disorder for those wit high versus low shoulder support (RR = 3.72, 95% CI 1.22–11.30), increased neck-shoulder pain scores (RR = 1.02, 95% CI 1.00–1.05), smoking (RR =	Danish Project on Research and Intervention in Monotonous Work (PRIM Study)	High-Income	(Kaergaard and Andersen, 2000)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					3.93, 95% CI 1.33–11.58), and living alone with children (RR 3.58, 95% CI 0.87–14.68).			
	Longitudinal	Job demand, job control, supervisor support, coworker support, age, work duration	Work injury	Exposure-outcome among blue-collar women	The odds of work injury among blue-collar were increased among those with high job demand (OR = 1.30, SE = 0.08331). Odds of work injury were decreased among those with high job control (OR = 0.94, SE = 0.03650) and high coworker support (OR = 0.71, SE = 0.18003). There was no association between work injury and supervisor support (OR = 1.02, SE = 0.12049), age (OR = 1.02, SE = 0.04177), and working duration (OR = 1.03, SE = 0.05987).	Employees of a small aerosol products manufacturing plant in Japan	High-Income	(Murata et al., 2000)
	Case-Control	Stature; body weight; sitting with neck bent forward; arms, hands at/above shoulder height; decision latitude index, precision movements required; fixed working postures; uncomfortable work postures; civil status	Neck and shoulder problems	Exposure-outcome among blue-collar women	Increased odds of neck and shoulder problems among blue-collar women were associated with the number of hours per day spent with the arms or hands at or above shoulder height (OR = 1.087, 95% CI 1.031–1.365), decision latitude index (OR = 1.175, 95% CI 1.040 1.327), required precision movement (OR = 1.714, 95% CI 0.589–4.989), fixed work postures (OR = 1.947, 95% CI 0.796–4.766), uncomfortable work postures (OR = 1.700, 95% CI 0.697–4.149), and partnership with children under 13 years (OR = 3.357, 95% CI 0.996–11.31), partnership with no children under 13 years (OR = 3.473, 95% CI 1.019–11.84), and being single with children under 13 years (OR = 4.278, 95% CI 0.823–22.25). Decreased odds of neck and shoulder problems were associated with increased stature (OR = 0.784, 95% CI 0.563–1.092). Body weight (OR = 0.991, 95% CI 0.817–1.202) and hours per day spent with arms or hands at or above shoulder height (OR = 1.039, 95% CI 0.879–1.229) were not associated with neck and shoulder problems.	Women employed at one of 26 companies in the metal and food industries from three Swedish counties.	High-Income	(Björkstén et al., 2001)
	Longitudinal	Occupational class at age 30; parents' occupational class, school grade, smoking, and physical activity at age 16; being single at age 21; job control and physical working condition at age 30.	Musculoskeletal Disorders	Blue-collar women vs. other women	The odds of a musculoskeletal disorder at age 21 among blue-collar women were 1.43 times the odds of a musculoskeletal disorder at age 21 among white-collar women (OR = 1.43, 95% CI 0.97–2.11).	Follow-up of a baseline survey of 16 year old pupils in their last year of compulsory schooling in the industrial Northern Swedish town of Lulea.	High-Income	(Khatun et al., 2004)
	Cross-Sectional	Years of formal education, occupational class	Hospitalization because of back disorders	Blue-collar women vs. other women	The risk of hospitalization because of back disorders were increased among blue-collar women age 25-34 (RR = 1.6, 95% CI 1.2–2.2), age 35-44 (RR = 1.4, 95% CI 1.2–1.6), age 45-54 (RR = 1.3, 95% CI 1.1–1.4), and age 55–64 (RR = 1.3, 95% CI 1.1–1.5) as compared to their white-collar counterparts.	Population of Finland	High-Income	(Kaila-Kangas et al., 2006)
	Cross-Sectional	Gender, age, smoking, insomnia symptoms, job type, industrial sector, work experience	Occupational injuries	Blue-collar women vs. other women[C]	Odds of occupational injuries among female manufacturers were 4.26 times the odds of occupational injury among female managers and clerical workers (OR = 4.26, 95% CI 2.23-8.13).	Workers of small-scale manufacturing factories (those with less than 50 workers) in Yashio	High-Income	(Nakata et al., 2006)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
						city, Saitama prefecture, Japan.		
	Longitudinal	Sex, age category, education, time since hire, time in current job, physical demand, race, plant type	Traumatic Injury; OSHA Recordable Injuries	Male vs. female blue-collar workers[C]	The odds of traumatic injury among blue-collar women were increased as compared with blue-collar men (OR = 1.57, 95% CI 1.33–1.85). The odds of OSHA recordable injuries among blue-collar women were increased as compared with blue-collar men (OR = 1.72, 95% CI 1.34–2.20).	The American Manufacturing Cohort Study (AMC)	High-Income	(Pollack et al., 2007)
	Cross-Sectional	Gender, age group, ethnicity, education level, marital status, living with children, supporting families outside of household, BMI, physical activity, smoking behavior, physician diagnosed systemic illness, years of employment in garment industry	Neck, Shoulder, and Distal Upper Extremity Pain	Male vs. female blue-collar workers[C]	The odds of neck and shoulder pain were decreased among blue-collar men as compared with blue-collar women (OR = 0.5, 95% CI 0.28–0.90). The odds of distal upper extremity pain among blue-collar men were decreased as compared with blue-collar women (OR = 0.55, 95% CI 0.28–1.09).	Sewing machine operators working at one of 13 garment shops in Los Angeles selected using convenience sampling.	High-Income	(Wang et al., 2007)
	Cross-Sectional	Occupational class	Work Injury	Blue-collar women vs. other women	Odds of poor self-rated health were increased among blue-collar women as compared to female professionals managers (OR = 2.02, 95% CI 1.57–2.61). Among blue-collar women, odds of long-term sickness absence (OR = 2.45, 95% CI 1.90–3.15) and work injury (OR = 5.63, 95% CI 3.13-10.16) were also increased as compared to female managers and professionals.	SUMER Study	High-Income	(Niedhammer et al., 2008)
	Longitudinal	Sex	Acute Injuries; MSD-Related Injuries	Male vs. female blue-collar workers	The odds of acute injuries among female smelters were increased as compared with male smelters (OR = 1.201, 95% CI 1.151–1.295). The odds were also increased for total recordable acute injuries (OR = 1.158, 95% CI 1.012–1.326) lost-work-day acute injuries (OR = 1.097, 95% CI 0.512–2.348); MSD-related injuries (OR = 1.119, 95% CI 1.097–1.311); total recordable MSD-related injuries (OR = 1.334, 95% CI 1.174–1.515) and lost-work-day MSD-related injuries (OR = 1.285, 95% CI 0.783–2.109) among female smelters as compared with male smelters.	The American Manufacturing Cohort Study (AMC)	High-Income	(Taiwo et al., 2008)
	Longitudinal	Occupational class	Carpal tunnel syndrome	Blue-collar women vs. other women	The risk of carpal tunnel syndrome was increased among blue-collar women as compared with non-working person (RR = 3.0, 95% CI 2.5–3.6). Risk was increased among women in agriculture (RR = 2.5, 95% CI 2.0–3.2), construction (RR = 4.7, 95% CI 1.0–13.0) and manufacturing (RR = 2.1, 95% CI 1.7–2.5) as compared to non-working women.	Adult residents of the Maine and Loire (M&L) region in west-central France.	High-Income	(Roquelaure et al., 2008)
	Longitudinal	Depressive symptoms	Occupational injury	Exposure-outcome among blue-collar women	Among blue-collar women, risk of occupational injury was increased among those with depressive symptoms (RR = 2.04, 95% CI 1.41–2.95).	Workers at 35 small- or medium-sized manufacturing companies in the Incheon area of South Korea in the Group Occupational Health Service at Inha University Hospital.	High-Income	(Kim et al., 2009)
	Case-Control	Occupational class, BMI, height, parity	Surgically treated CTS	Blue-collar women vs. other women	The odds of surgically-treated carpal tunnel syndrome among blue-collar women were increased	Cases of surgically-treated CTS and	High-Income	(Mattioli et al., 2009)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					as compared with white-collar women (OR = 9.1, 95% CI 4.8–17.4).	controls selected among blue- and white-collar workers, other workers, and housewives living in the Region of Tuscany, Italy.		
	Longitudinal	Occupational class, industrial sector	Carpal tunnel syndrome	Blue-collar women vs. other women	The risk of carpal tunnel syndrome (CTS) among blue-collar women was increased as compared with female farmers (RR = 2.9, 95% CI 2.5–3.4). The risk of CTS among women in construction was increased as compared with women in manufacturing (RR = 2.0, 95% CI 1.7–2.4).	Adult residents of the Maine and Loire (M&L) region in west-central France.	High-Income	(Roquelaure et al., 2009)
	Cross-Sectional	Pain severity, weaver's selection of remedial measures, weaver's perception to the cause of pain, age, working hours, marital status, job tenure, literacy, psychosocial variables	Musculoskeletal Disorders	Exposure-outcome among blue-collar women	The odds of musculoskeletal disorders were increased among female handloom workers older than 25 (OR = 2.9, 95% CI 1.2–7.4), with more than 10 years of tenure (OR = 2.1, 95% CI 1.1–4.6), with mental overload (OR = 3.7, 95% CI 1.0–13.8) and among those who were literate (OR = 2.2, 95% CI 1.2–3.9).	Weavers working at handloom or powerloom units in the Ahmedabad district of India.	Lower-Middle-Income	(Nag et al., 2010)
	Cross-Sectional	Work hours per day, overtime, salary; exposure to chemicals and toxic vapors/substances, exposure to vibration and dangerous equipment, high temperatures, physical dangers/unhealthy conditions at work, poor air/ventilation, crowded workstations and uncomfortable working postures, having a safe work environment, adequate protective clothing and equipment, adequate work-related welfare facilities; psychological job demands/workload, work is interesting, company informs about its achievements, on-site training courses, resources/help and equipment availability, supervisor-related, discrimination - intimidation or threats; household income inadequacy, social and family working hours fit, adequate sanitary living conditions/potable water, children under 18.	Musculoskeletal Pain	Exposure-outcome among blue-collar women	Multiple associations reported between various measures of working hours and salary; safety and health; tasks and organizational aspects; extra-organizational factors, and musculoskeletal pain among blue-collar women.	Blue-collar workers from 12 manufacturing companies in Lima, Perú.	Upper-Middle-Income	(Brunette et al., 2011)
	Cross-Sectional	Age, marital status, type of carpet-weaving loom, weaving style, stature, work hours, work experience	Elbow pain; Forearm pain; Wrist pain	Exposure-outcome among blue-collar women	Among female carpet-weavers, type of carpet weaving loom (fixed vs. moving vertical) was significantly associated with shoulder pain (OR = 3.422, 95% CI 2.026-6.124); elbow pain (OR = 2.439, 95% CI 1.565-3.801); forearm pain (OR = 2.621, 95% CI 1.715-4.006); and wrist pain (OR = 2.299, 95% CI 1.539-3.433).	Stratified random sample of carpet weavers in urban and rural regions within the Kerman, Esfahan, and East Azerbaijan provinces.	Upper-Middle-Income	(Motamedzade and Moghimbeigi, 2012)
	Cross-Sectional	Age, smoking, company's gender equality index, employment hours, occupational class, high engagement in domestic work, number of children < 18 years, work demands, work control, work support, constrained physical heavy work load, work-home imbalance	Neck and shoulder disorders; low back disorders	Blue-collar women vs. other women[A]	There was no evidence of a difference between blue- and white-collar women's risk for neck and shoulder disorders (OR = 1.0, 95% CI = 0.5–1.7)	Employees at 9 companies in computer science and 12 companies in the food industry in Sweden.	High-Income	(Ahlgren et al., 2012)
	Longitudinal	Occupation	Surgically treated osteoarthritis in the hip or knee	Blue-collar women vs. other women	Among female construction workers, the rate for surgically-treated osteoarthritis of the hip as compared with female office workers (HR = 1.21,	Danish residents employed in one of five occupational	High-Income	(Andersen et al., 2012)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					95% CI 1.03–1.43), and the rates of surgically-treated osteoarthritis of the knee were increased as compared with female office workers (HR = 1.37, 95% CI 1.14–1.64).	groups: floor- and bricklayers, construction workers, farmers, healthcare assistants, and office workers.		
	Cross-Sectional	Age, BMI, job type, education, time in industry, monthly income	Musculoskeletal complaints of the back, knee, and upper limb	Blue-collar women vs. other women[C]	As compared with female sewing machine operators, the odds were decreased for back complaints (OR = 0.62, 95% CI 0.28–1.39) and knee complaints (OR = 0.70, 95% CI 0.21–2.34), and increased for upper limb complaints (OR = 1.28, 95% CI 0.36–4.50) as compared with female quality control assistants.	Female garment workers employed in factories in the Koggala FTZ in Sri Lanka.	Lower-Middle-Income	(Lombardo et al., 2012)
	Longitudinal	Gender, manager type, location, year, race/ethnicity, age when started in department, tenure when started in department, department is high demand	First-aid injury, reportable injury	Male vs. female blue-collar workers	The rates for first acute injury were increased among blue-collar women as compared with blue-collar men (HR = 1.21, 95% CI 1.06, 1.39).	The American Manufacturing Cohort Study (AMC)	High-Income	(Kubo et al., 2013)
	Longitudinal	Age, sex, time in the union, predominant work	Hand and Finger Injuries	Male vs. female blue-collar workers[C]	Among those with or paid lost time, the rates of hand and finger injuries among blue-collar women is increased as compared with blue-collar men (RR = 1.2, 95% CI 1.0–1.5). Among those with paid lost time, the rates of hand and finger injuries is also increased among blue-collar women as compared with blue-collar men (RR = 1.8, 95% CI 1.1–3.0).	Union carpenters working in Washington State.	High-Income	(Lipscomb et al., 2013)
	Cross-Sectional	Work experience, prolonged working hours, awkward posture, perceived high job demand	Musculoskeletal Disorders	Exposure-outcome among blue-collar women	Among blue-collar women, the odds of musculoskeletal disorders were increased among those with five or more years of work experience (OR = 1.79, 95% CI 0.72–4.44), with prolonged working yours (OR = 7.63, 95% CI 2.06, 28.31), with awkward work postures (OR = 43.79, 95% CI 17.09–112.20), and perceived high job demand (OR = 1.16, 95% CI 0.34–3.98).	Randomly sampled female workers using hand-operated rebar benders in a northeast province of Thailand.	Upper-Middle-Income	(Hanklang et al., 2014)
	Longitudinal	Gender	Injury	Male vs. female blue-collar workers	The odds of injury among blue-collar women were increased as compared with blue-collar men (OR = 1.58, 95% CI 1.48–1.67).	The American Manufacturing Cohort Study (AMC)	High-Income	(Tessier-Sherman et al., 2014)
	Longitudinal	Physical demand, exposure to heat, psychological demand, job control, race/ethnicity, job tenure, age, sex	First aid injury and first aid MSD; Serious injury and serious MSD; First aid MSD only; Serious MSD only	Male vs. female blue-collar workers[B]	Among blue-collar women, the risk was increased for first aid injury (RR = 1.51, 95% CI 1.31–1.73), serious injury and serious musculoskeletal disorder (RR = 1.55, 95% CI 1.23–1.93), first aid musculoskeletal disorder only (RR = 1.26, 95% CI 1.00–1.59) and serious musculoskeletal disorder only (RR = 1.75, 95% CI 1.25–2.46) as compared with blue-collar men.	The American Manufacturing Cohort Study (AMC)	High-Income	(Cantley et al., 2016)
	Cross-Sectional	Total sitting time per day	Neck and shoulder pain intensity	Exposure-outcome among blue-collar women	Among blue-collar women, the odds of NSP were increased for high total sitting time vs. moderate total sitting time (OR = 1.19, 95% CI 0.31–4.15) and the decreased for low total sitting time vs. moderate total sitting time (OR = 0.80, 95% CI 0.21–2.99). The odds for NSP were increased for high work sitting vs. moderate work sitting (OR = 1.17, 95% CI 0.32–4.33) and the odds for NSP were the same low work sitting vs. moderate work sitting (OR = 1.01, 95% CI 0.28–3.59). The odds for NSP	New method for Objective Measurements of physical Activity in Daily living (NOMAD) Study	High-Income	(Hallman et al., 2015)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					for were the same high leisure sitting vs. moderate work sitting (OR = 1.02, 95% CI 0.28–3.74) and were decreased for NSP for low leisure sitting vs. moderate leisure sitting (OR = 0.86, 95% CI 0.25–3.02).			
Other	Cross-Sectional	Age, current smoker, moderate/heavy alcohol, sever obesity, chronic disease, clean room, current chemical exposure	Memory loss, headaches, head exploding light-headed, room spinning, tremor, coordination, numbness, cold hands/feet, appetite change, funny taste, swallowing, palpitations, weakness/fatigue, rashes, chronic cough, abdominal pain	Exposure-outcome among blue-collar women	Among blue-collar women with current chemical exposure, the odds were increased for memory loss (OR = 1.23, p > 0.05), headaches (OR = `.40, p > 0.05), light-headedness (OR = 1.12, p > 0.05), room spinning (OR = 1.14, p > 0.05), tremor (OR = 1.07, p > 0.05), coordination (OR = 1.43, p > 0.05), numbness (OR = 1.16, p > 0.05), and cold hands and feet (OR = 1.42, p > 0.05) as compared to blue-collar women without current chemical exposure. Odds of symptoms of "head exploding" were decreased among those with current chemical exposure (OR = 0.93, p > 0.05).	Workers at microelectronics plant represented by IBEW in Pennsylvania	High-Income	(Parkinson et al., 1990)
	Cross-Sectional	Age, education, marriage, income, smoking, obesity, major illness, life events, solvent exposure, job demands, job conflict, co-worker support, supervisor support, friend/relative support	Headache, lightheaded, vertigo, weakness, memory loss, abdominal pain, rash, multiple symptoms	Exposure-outcome among blue-collar women	Among blue-collar women with current solvent exposure, the odds were increased for depression (ß = 0.19, p < 0.05), lightheadedness (ß = 0.29, p < 0.01), vertigo (ß = 0.39, p < 0.01), weakness (ß = 0.33, p < 0.005), memory loss (ß = 0.33, p < 0.005), abdominal pain (ß = 0.54, p < 0.005), rash (ß = 0.20, p = 0.07), and multiple symptoms (ß = 0.23, p < 0.01).	Workers at semiconductor plant represented by IBEW in the mid-Eastern US	High-Income	(Bromet et al., 1992)
	Cross-Sectional	Occupation	Headaches that match cervical origin pain patterns	Blue-collar women vs. other women	As compared with blue-collar women, the odds of cervical origin headache were increased among female managers and professionals (OR = 2.94, 95% CI 1.3–6.6), and female clerical workers (OR = 1.37, 95% CI 0.6–3.2).	Residents of two adjoining Tasmanian municipalities randomly sampled from electoral rolls.	High-Income	(Grimmer, 1993)
	Cross-Sectional	Age, education, sex, alcohol, solvent exposure index	Continuous performance test; pattern comparison (latencies); pattern memory (latencies)	Male vs. female blue-collar workers[B]	Continuous performance test scores were decreased among blue-collar men as compared with blue-collar women (ß =–0.019, SE = 0.014), and pattern comparison (ß = 0.031, SE = 0.033) and pattern memory (ß = 0.020, SE = 0.029) were increased among blue-collar men as compared with blue-collar women.	Workers in six paint manufacturing plants in northern Taiwan	High-Income	(Tsai et al., 1997)
	Cross-Sectional	Overcompensating at work, job certainty, sexual harassment and discrimination	Insomnia, nausea, headaches	Exposure-outcome among blue-collar women	Among female construction workers, the odds of insomnia were increased among those who overcompensated at work (OR = 1.41, 95% CI 1.14–1.74) and decreased among those with job certainty (OR = 0.85, 95% CI 0.771–0.942). The odds of nausea were increased among those experiencing sexual harassment and discrimination (OR = 1.33, 95% CI 1.11–1.60). The odds of headache were increased among those experiencing sexual harassment and discrimination (OR = 1.21, 95% CI 1.02–1.43).	Female members of the Laborers' International Union of North America (LIUNA) in Seattle, Washington and Portland, Oregon.	High-Income	(Goldenhar et al., 1998)
	Cross-Sectional	Age, area of factory	Hearing impairment	Exposure-outcome among blue-collar women	Audiometric tests performed on 69 female workers from the weaving section revealed that workers with more than 10 years of noise exposure had the	Female workers from the weaving section of a textile	Lower-Middle-Income	(Nguyen et al., 1998)

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Table 2 (*continued*)

Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					worst hearing threshold levels at 1,000 and 4,000 Hz.	factory in Hanoi, Vietnam		
	Longitudinal	Gender, workload score	Fatigue spillover	Male vs. female blue-collar workers	Fatigue spillover was less frequent among female bus-drivers as compared with male bus drivers (ß = - 0.05, p > 0.05) and there was a negative interaction between gender and workload score (ß = - 0.24, p > 0.05).	Full-time, employed urban bus drivers working at the same terminal in central Stockholm, Sweden.	High-Income	(Rydstedt et al., 1998)
	Cross-Sectional	Magnetic field exposure, smoking, age, light at night, duration of sleep, depression, miscarriages	Nocturnal 6-hydroxymelatonin sulfate excretion	Blue-collar women vs. other women	Normalized 6-OHMS secretion was decreased among blue-collar women exposed to magnetic fields (ß = -4.06, SE = 1.51) as compared to office workers not exposed to magnetic fields.	Female workers from a garment factory in Kuopio, Finland and a reference group of employees of a governmental organization and university staff members.	High-Income	(Juutilainen et al., 2000)
	Cross-Sectional	Age, BMI, Illness, ergonomic stress level, environmental annoyance, perceived control	Serum Uric Acid	Exposure-outcome among blue-collar women	Among blue-collar women, serum urine acid levels were negatively associated with ergonomic stress levels (ß = -0.18, SE = 0.10), environmental annoyance (ß = - 0.05, SE = 0.03), and perceived control (ß = - 0.03, SE = 0.02).	Cardiovascular Occupational Risk Factors Determination in Israel Study (CORDIS)	High-Income	(Shirom et al., 2000)
	Cross-Sectional	Occupational class	Long-term condition, short-term condition	Blue-collar women vs. other women	As compared with professional women, the odds of long-term conditions were decreased among blue-collar women (OR = 0.80, 95% CI 0.62–1.04) and the odds of short-term conditions were decreased among blue-collar women (OR = 0.89, 95% CI 0.64–1.24).	Campbell National Health Monitor	High-Income	(Korda et al., 2002)
	Cross-Sectional	Noise level	Tooth abrasion	Exposure-outcome among blue-collar women	Among blue-collar women, the odds of tooth abrasion were increased among those exposed to intense noise as compared with those in the preparation department (OR = 3.74, 95% CI 1.42–7.85).	Workers at a large wool-producing company in Montenegro, Serbia.	Upper-Middle-Income	(Kovacevic and Belojevic, 2006)
	Longitudinal	Technical job, natural menopause, smoking > 10 cigarettes per day, technical and community education, education, 1-2 pregnancies, age category	Blood Lead Levels, Calcaneus Bone Lead Content	Blue-collar women vs. other women	Blood lead levels among women in technical jobs (for example, miners) were higher than blood lead levels among women in administrative support or sales (ß = 0.242, 95% CI = -0.115 - 0.599).	Bunker Hill Study	High-Income	(Potula and Kaye, 2006)
	Cross-Sectional	Age, gender, annual income level, marital status	Fibromyalgia	Male vs. female blue-collar workers[C]	The odds of fibromyalgia were increased among blue-collar women as compared with blue-collar men (OR = 15.01, 95% CI 1.90–118.50).	Female workers at four textile factories in Denizli, Turkey.	Upper-Middle-Income	(Cobankara et al., 2011)
	Cross-Sectional	Age, sex, race, marital status, education, pain, number of medical comorbidities, depressive symptoms, alcohol problems, smoking, physical activity obesity	Sleep Quality	Male vs. female blue-collar workers[C]	Sleep score quality was decreased among blue-collar women as compared with blue-collar men (ß = -0.100, p = 0.041).	A convenience sample of operating engineers coming to either an apprentice certification or Hazardous Materials (Hazmat) refresher course in Michigan.	High-Income	(Choi et al., 2013)
	Cross-Sectional	Former rotating shift work, recent rotating shift work, persistent rotating shift work; academic	High need for recovery after work		Among blue-collar women, work-related fatigue was decreased among those currently married or	Workers at a single semiconductor	High-Income	(Lin et al., 2015)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
		educational level; married/cohabitating, child-rearing responsibility; hepatitis B carrier, metabolic syndrome, anemia		Exposure-outcome among blue-collar women	cohabiting (OR = 0.5, 95% CI 0.2–0.9), and increased among those with child-rearing responsibilities (OR = 1.9, 95% CI 1.0–3.7).	manufacturing company receiving compulsory periodic health checkups.		
Reproductive & Sexual Health	Cross-Sectional	Occupation, age, smoking, parity, years of education	Birthweight of most recent birth	Blue-collar women vs. other women	As compared with women who were service workers during pregnancy, lower birth weight infants were born to women who were garment workers (ß = - 653, 95% CI - 1,041 to 265) or electronics workers (ß = - 337, 95% CI - 682 to 9).	Women in Tijuana working as electronic maquiladora workers; garment maquiladora workers; service workers; and those with no labor force history	Upper-Middle-Income	(Eskenazi et al., 1993)
	Cross-Sectional	Occupation, education, place of residence	Natural Menopause	Blue-collar women vs. other women	As compared with lower white-collar workers, the odds of natural menopause were increased among blue-collar factory workers (OR = 1.17, 95% CI 0.96–1.42).	Adult women randomly selected form the Finnish Population Register	High-Income	(Luoto et al., 1994)
	Cross-Sectional	Race, age, occupational class, smoking, contraception, coitarche, partners last year, total partners, anal intercourse, sexual intercourse with partner from abroad, no non-regular partners, diagnosis with other STI, past history of STI, high vaginal swab	HSV-2 Infection	Blue-collar women vs. other women	Odds of HSV-2 infection among blue-collar women were increased as compared with white-collar women (OR = 4.14, 95% CI 1.33–12.92).	Women newly attending a genitourinary clinic in London	High-Income	(Evans et al., 2003)
	Longitudinal	Occupational class	Prematurity, low birth weight, SGA, LGA, perinatal mortality, birth weight	Blue-collar women vs. other women	As compared with upper white-collar workers, the odds of prematurity were increased (OR = 1.14, 95% CI 1.07–1.22), the odds of low birth weight were increased (OR = 1.25, 95% CI 1.16–1.34), the odds of SGA were increased (OR = 1.44, 95% CI 1.31–1.58), the odds of LGA were increased (OR = 1.24, 95% CI 1.14–1.36), and the odds of perinatal mortality were increased (OR = 1.44, 95% CI 1.13–1.83) among blue-collar women between 2003 and 2006.	Finnish Medical Birth Register	High-Income	(Gissler et al., 2009)
	Longitudinal	Rubber cohort membership	Birth weight	Blue-collar women vs. other women	Among women who were rubber workers during pregnancy, the odds were increased for having a girl (OR = 1.15, 95% CI 1.02–1.13) and having a small-for-gestational age child (OR = 2.15, 95% CI 1.45–3.18) as compared with food workers.	Female workers at 12 Swedish rubber production facilities and female members of the Food Worker's Union.	High-Income	(Jakobsson and Mikoczy, 2009)
	Quasi-Experimental	Parental leave	Fertility	Exposure-outcome among blue-collar women	Among blue-collar women, the effect of the 1990 reform was an increase in the probability of having an additional birth in 0–36 months (ß = 0.048, SE = 0.016), in 0–120 months (ß = 0.036, SE = 0.016), and 17–28 months (ß = 0.078, SE = 0.013). The probability of having an additional birth was decreased in 0 - 16 months (ß = -0.031, SE = 0.009) and 29–120 months (ß = -0.008, SE = 0.016).	Women giving birth to their first child recorded in the Austrian Social Security Database.	High-Income	(Lalive and Zweimüller, 2009)
	Cross-Sectional	Age, education, year of conception, employment area, medical conditions during pregnancy, smoked during pregnancy, drank alcohol during pregnancy	Adverse Pregnancy Outcomes	Blue-collar women vs. other women	The odds of congenital anomalies among female laboratory workers in an aluminum smelter were increased during employment as compared with women who gave birth prior to employment (OR = 7.89, 95% CI 1.16–53.77).	The American Manufacturing Cohort Study (AMC)	High-Income	(Sakr et al., 2010)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
	Cross-Sectional	Age, marital status, education, age at first sexual exposure, sources of knowledge on HIV/AIDS	Use of condoms; sex with multiple partners; drug abuse	Exposure-outcome among blue-collar women	Among female garment workers, increased knowledge score was associated with increased odds of using a condom at last intercourse (OR = 1.482, p = 0.10), decreased odds of sex with multiple partners (OR = 0.832, p = 0.036), and decreased odds of drug abuse (OR = 0.766, p = 0.034).	Female workers randomly selected from five garment factories in Dhaka, Bangladesh	Lower-Middle-Income	(Sayem, 2010)
	Cross-Sectional	Age, education, monthly income, occupation, marital status, health status, sexual norms and other behaviors, rural residency, communist party membership	Lifetime multiple sexual partnerships	Blue-collar women vs. other women[C]	As compared with women in other occupations, the odds of having multiple sexual partners were increased among women in manual labor (OR = 3.347, 95% CI 1.069–10.476).	China Health and Family Life Survey (CHFLS) of 2000 and 2006 Survey of Chinese People's Sexuality	Upper-Middle-Income	(Yingying et al., 2011)
	Quasi-Experimental	Displacement and firm closure	Fertility	Exposure-outcome among blue-collar women	There were minimal effects of firm closure on fertility among blue-collar women for births in the three years following firm closure (ß = 0.002, SE = 0.016) and in the six years following firm closure (ß = - 0.013, SE = 0.023).	Women in Austria affected by a firm closure compared to a control group of nondisplaced women.	High-Income	(Del Bono et al., 2012)
	Cross-Sectional	Age, gender, nationality, marital status, level of education, level of knowledge, level of attitude	Use of condom in last sexual intercourse	Male vs. female blue-collar workers[C]	As compared with blue-collar men, the odds of using a condom during last sexual intercourse were increased among blue-collar women (OR = 8.790, 95% CI 2.009–38.467).	Workers at eight different construction Sites in the Kathmandu Valley of Nepal.	Low-Income	(Pant et al., 2013)
	Cross-Sectional	Maternal age, birth weight, male fetal sex, smoking status, occupational class, induction, preeclampsia, gestational diabetes, maternal diabetes mellitus, fear of childbirth, placental abruption, placenta previa, in vitro fertilization, prior terminations, prior miscarriages, prior caesarean section, time period	Planned Caesarian Section; Non-Planned Caesarian Section	Blue-collar women vs. other women	As compared to white-collar women, the odds of were increased for planned Caesarian section (OR = 1.11, 95% CI 1.03–1.19) and non-planned Caesarian section (OR = 1.19, 95% CI 1.13–1.25) among nulliparous blue-collar women. Among multiparous blue-collar women, the odds were also increased for planned C-section (OR = 1.14, 95% CI 1.08–1.22) and unplanned C-section (OR = 1.22, 95% CI 1.14–1.30).	Population of Finland	High-Income	(Räisänen et al., 2014)
	Case-Control	Occupation	Preterm birth	Blue-collar women vs. other women	As compared with women in office and administrative support occupations, the odds of preterm birth were increased among women in building and grounds cleaning (OR = 1.86, 95% CI 0.95–3.63) and among women in production occupations (OR = 1.43, 95% CI 0.83–2.45).	University of California, Los Angeles, Environment and Pregnancy Outcomes Study	High-Income	(von Ehrenstein et al., 2014)
	Cross-Sectional	Years Exposed to Sulfur Dioxide	Age at natural menopause; Early Menopause	Exposure-outcome among blue-collar women	Among blue-collar women, the rate of natural menopause was greatest among those with 21-25 years of sulfur dioxide exposure as compared to those with no sulfur dioxide exposure (HR = 1.290, 95% CI 1.035–1.608). The odds of early menopause were greatest among blue-collar women with 21–25 years of sulfur dioxide exposure as compared to those with no sulfur dioxide exposure (OR = 1.817, 95% CI 1.112–2.968).	Jinchuan Cohort	Upper-Middle-Income	(Wang et al., 2015)
Respiratory	Cross-Sectional	Sex, age, smoking habits, atopy, familial asthma, SFEV1, airway protection	Methacholine Responsiveness	Male vs. female blue-collar workers[C]	The odds of methacholine responsiveness among female potroom workers was increased as compared with male potroom workers (OR = 5.7, 95% CI 2.2–14.8).	Potroom Workers at Ardal aluminum plant in Western Norway	High-Income	(Kongerud and Soyseth, 1991)
	Cross-Sectional	Smoking, age, height, weight, mill number, dust concentration	Lung Function	Exposure-outcome among blue-collar women	Among European blue-collar women, increased dust concentration on the logarithmic scale was associated with decreased FEV1 (ß = -0.011, p >	Wool textile workers at five mills in West	High-Income	(Love et al., 1991)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					0.05), increased FVC (ß = 0.022, p > 0.05), and a decreased FEV1:FVC (ß = -0.785, p < 0.05).	Yorkshire, United Kingdom		
	Cross-Sectional	Cumulative smoking, Asian ethnicity, age, gender, not working in the weaving shed, total dust (pd1)	Lung function	Male vs. female blue-collar workers[C]	As compared with female blue-collar workers FEV1 was increased among male blue-collar workers (ß = 4.9, SE = 1.09) and FVC was increased among male blue-collar workers (ß = 5.96, SE = 1.05).	Workers at 16 mills in the Lancashire area of the United Kingdom.	High-Income	(Raza et al., 1999)
	Cross-Sectional	Sex, age, BMI, duration of employment, overall mean exposure to dust, current exposure to dust	Vital capacity, FEV1	Male vs. female blue-collar workers[C]	Among women, the observed mean vital capacity was 3.86 (SD 0.80) and among men the observed mean FEV1 was 3.20 (SE 0.76).	Workers at two dolomite mines with adherent production facilities located in the Bergslagen area of central Sweden.	High-Income	(Seldén et al., 2001)
	Case-Control	Age, smoking status, occupational class, prior lung disease	Adenocarcinoma of the lung; squamous cell and small cell carcinoma of the lung	Blue-collar women vs. other women[A]	As compared with white-collar women, the odds were increased among blue-collar women for adenocarcinoma of the lung (OR = 1.85, 95% CI 1.26–2.72) and for squamous and small cell carcinoma of the lung (OR = 1.67, 95% CI 0.79–3.52).	Hospital-Based Epidemiologic Research Program at Aichi Cancer Center (HERPACC)	High-Income	(Takezaki et al., 2001)
	Cross-Sectional	Gender	Acute airway response	Male vs. female blue-collar workers[B]	The rate of acute airway response was increased among blue-collar women as compared with blue-collar men (HR = 1.51, 95% CI 1.01–2.24).	Newly hired workers at one of three cotton mills close to Istanbul, Turkey.	Upper-Middle-Income	(Bakirci et al., 2007)
	Longitudinal	Occupational class	Asthma	Blue-collar women vs. other women	Compared with female administrators, managers, and clerical workers, the risk of asthma was increased among all blue-collar women (RR = 1.4, 95% CI 1.2–1.6), female woodworkers (RR = 1.5, 95% CI 1.2–1.7), and other blue-collar women (RR = 1.4, 95% CI 1.2–1.6).	All residents of Finland employed in wood-processing industries.	High-Income	(Heikkilä et al., 2008)
	Cross-Sectional	Occupational class; job exposure to gasses, fumes, dust or smoke; left or changed job because of respiratory symptoms	Chronic Rhinosinusitis	Blue-collar women vs. other women[C]	As compared with white-collar women, the odds of chronic rhinosinusitis were increased among blue-collar women (OR = 1.91. 95% CI 1.27–2.86).	Global Asthma and Allergy European Network Study (GA^2LEN)	High-Income	(Thilsing et al., 2012)
	Longitudinal	Welding	Rhinitis	Blue-collar women vs. other women	The rate of rhinitis among female ever-welders was increased as compared with female never-welders (HR = 1.9, 95% CI 1.4–2.6).	Respiratory Health in Northern Europe (RHINE) Study	High-Income	(Storaas et al., 2015)
	Cross-Sectional	Manganese Cumulative Exposure Index	Pulmonary Function	Exposure-outcome among blue-collar women	No significant effect of Mn dust exposure on the pulmonary function was found in the female workers (all p > 0.05).	Guangxi Manganese-Exposed Workers Healthy Cohort (GXMEWHC)	Upper-Middle-Income	(Wang et al., 2015)
Self-Rated Health	Cross-Sectional	Occupational class	Good health, poor health	Blue-collar women vs. other women[C]	As compared with professional women, the odds of self-reported good health were increased among blue-collar women (OR = 1.39, 95% CI 1.05–1.83). The odds of self-reported poor health were similar in blue-collar women and professional women (OR = 0.98, 95% CI 0.95–1.47).	Campbell National Health Monitor	High-Income	(Korda et al., 2002)
	Cross-Sectional	Occupational class	Poor Self-Reported Health	Blue-collar women vs. other women	As compared with female professionals and managers, the odds of poor self-rated health were increased among blue-collar women (OR = 2.02, 95% CI 1.57–2.61).	SUMER Study	High-Income	(Niedhammer et al., 2008)
	Cross-Sectional	Work hours per day, overtime, salary; exposure to chemicals and toxic vapors/substances, exposure to vibration and dangerous equipment, high temperatures, physical dangers/unhealthy	Health Status	Exposure-outcome among blue-collar women	As-compared with female professionals and managers, the odds of poor self-rated health were increased among blue-collar women (OR = 2.02, 95% CI 1.57–2.61).	Blue-collar workers from 12 manufacturing	Upper-Middle-Income	(Brunette et al., 2011)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
		conditions at work, poor air/ventilation, crowded workstations and uncomfortable working postures, having a safe work environment, adequate protective clothing and equipment, adequate work-related welfare facilities; psychological job demands/workload, work is interesting, company informs about its achievements, on-site training courses, resources/help and equipment availability, supervisor-related, discrimination - intimidation or threats; household income inadequacy, social and family working hours fit, adequate sanitary living conditions/potable water, children under 18.				companies in Lima, Perú.		
	Longitudinal	Working class parents, household appliances, and poor somatic health at age 16; time in paid work, poor cash margin, and having children at age 21; months unemployment, financial strain, physically heavy work, high demands, low control, violence, and daily smoking at day 30	Somatic health	Blue-collar women vs. other women	As compared with white-collar women with good somatic health at age 30, the odds were decreased for poor somatic health at age 16 (OR = 0.53, 95% CI 0.23–1.24) blue-collar women with poor somatic health at age 30. As compared with white-collar women with good somatic health at age 30, the odds of daily smoking (OR = 2.72, 95% CI 1.22–6.06) were increased in blue-collar women with poor somatic health at age 30.	Northern Swedish Cohort	High-Income	(Hammarström et al., 2011)
	Quasi-Experimental	Living wage	Global self-rated health; comparative self-rated health	Exposure-outcome among blue-collar women	Odds of "excellent" or "much better" *global* self-rated health were increased among women in the intervention factory as compared with women the control factory (OR = 1.4, 95% CI 0.61–3.0). Odds of "excellent" or "much better" *comparative* self-rated health were increased among women in the intervention factory as compared with women the control factory (OR = 1.4, 95% CI 1.4–6.7).	Workers at intervention and control factories in the Dominican Republic	Upper-Middle-Income	(Landefeld et al., 2014)
Smoking & Other Substance Use	Longitudinal	Gender, race, age, alcohol, burnout, job problems, unwind time, years driving	Smoking increase, initiation, and maintenance	Male vs. female blue-collar workers[B]	The odds of smoking were decreased among male bus drivers as compared with female bus drivers (OR = 0.60, 95% CI 0.33–1.09).	San Francisco MUNI Health and Safety Study	High-Income	(Cunradi et al., 2007)
	Cross-Sectional	Job demand and control; effort and reward; over commitment; physical demand; shift work; working hours; job pressure	Current Smoking; Former Smoking	Exposure-outcome among blue-collar women	Both job strain and passive jobs were associated with smoking among blue-collar women (OR = 2.6 and 3.7, respectively), and physical demand was associated with smoking among blue-collar women (OR = 16.8). No confidence intervals reported.	A random sample of White Pages listings in the sate of Victoria in Australia.	High-Income	(Radi et al., 2007)
	Longitudinal	Young adult socioeconomic position (education and occupational class); family socioeconomic position; family structure; family connectedness; smoker in home; easy access to cigarettes; high school; CES-D; number of friends who smoke; smoked during adolescence	Heavy and Light-to-Moderate Smoking	Blue-collar women vs. other women	As compared to women with further education, the odds were increased among blue-collar women for light-to-moderate smoking (OR = 1.88, 95% CI 1.28–2.78), heavy smoking (OR = 3.12, 95% CI 2.10–4.63). As compared to women with further education, there was no difference in odds of overweight among blue-collar women (OR = 1.04, 95% CI 0.49–2.21) and the odds of overweight were decreased (OR = 0.74, 95% CI 0.29–1.85).	National Longitudinal Study of Adolescent Health	High-Income	(Yang et al., 2008)
	Longitudinal	Partner cessation request, partner smoking, intervention group, age, gender, race/ethnicity, education, income, smoking quantity (per day)	Smoking Abstinence at 1- and 6-Months Post Intervention Follow-Up	Male vs. female blue-collar workers[B]	As compared with men, the odds of smoking at baseline among women were 0.36 times the odds of smoking at baseline among men (0.14, 0.91). The OR for smoking one-month post-intervention in women versus men was 0.71 (0.23–2.18) and the	The MassBUILT Study	High-Income	(Okechukwu et al., 2010)

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Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
					OR for prolonged cessation (six-months after baseline) in women vs. men was 1.19 (0.25, 5.80).			
	Cross-Sectional	Age, marital status, education, age at first sexual exposure, sources of knowledge on HIV/AIDS	Use of condoms; sex with multiple partners; drug abuse	Exposure-outcome among blue-collar women	Among female garment workers, increased knowledge score was associated with increased odds of using a condom at last intercourse (OR = 1.482, p = 0.10), decreased odds of sex with multiple partners (OR = 0.832, p = 0.036), and decreased odds of drug abuse (OR = 0.766, p = 0.034).	Female workers randomly selected from five garment factories in Dhaka, Bangladesh	High-Income	(Sayem, 2010)
	Cross-Sectional	Gender, age, education, ethnicity, negative affectivity, social desirability, drinking norms, policy enforcement, role overload, job insecurity, job hazards, decision involvement, self-estrangement, social interactions	Quantity of alcohol consumption; Frequency of alcohol consumption; Frequency of Drug Use	Male vs. female blue-collar workers[B]	As compared with blue-collar men, blue-collar women consumed greater quantities of alcohol (ß = 0.161, p > 0.05), consumed alcohol with greater frequency (ß = 0.260, p > 0.050), and used drugs less frequently (ß = -0.845, p < 0.01).	Random sample of workers from a single manufacturing firm in Israel employed at plants with 80 or more workers.	High-Income	(Biron et al., 2011)
	Longitudinal	Working class parents, household appliances, and poor somatic health at age 16; time in paid work, poor cash margin, and having children at age 21; months unemployment, financial strain, physically heavy work, high demands, low control, violence, and daily smoking at day 30	Somatic health	Blue-collar women vs. other women	As compared with white-collar women with good somatic health at age 30, the odds were decreased for poor somatic health at age 16 (OR = 0.53, 95% CI 0.23–1.24) blue-collar women with poor somatic health at age 30. As compared with white-collar women with good somatic health at age 30, the odds of daily smoking (OR = 2.72, 95% CI 1.22–6.06) were increased in blue-collar women with poor somatic health at age 30.	Northern Swedish Cohort	High-Income	(Hammarström et al., 2011)
	Cross-Sectional	Age, gender, race, income, education, self-rated health, occupational factors, union commitment, job satisfaction, exposure to occupational factors	Current smoking	Male vs. female blue-collar workers[B]	The odds of current smoking among blue-collar women were increased as compared with blue-collar men (OR = 1.37, 95% CI 0.87–2.17).	The MassBUILT Study	High-Income	(Chin et al., 2012)
	Longitudinal	Intervention status, age, gender, race, income, education, smoking intensity, union commitment, exposure to occupational hazards, concern about exposure to occupational hazards	Smoking Cessation at 1- and 6-months post-intervention monitoring	Male vs. female blue-collar workers[B]	Odds of smoking cessation one-month post-intervention were increased among blue-collar women as compared with blue-collar men (OR = 2.19, 95% CI 0.61–7.89). Odds of prolonged cessation six months post-intervention among blue-collar women were increased as compared with blue-collar men (OR = 1.20, 95% CI 0.24 – 6.06).	The MassBUILT Study	High-Income	(Chin et al., 2012)
	Cross-Sectional	Age, gender, race, income, education, time to first cigarette, age of smoking initiation, intention to quit at 30 days, self-efficacy for quitting 30 days, temptation to smoke, decisional balance, household smoking, dust exposure at work, chemical exposure at work, concern about exposure to occupational hazards	Heavy smoking	Male vs. female blue-collar workers[C]	The odds of heavy smoking among blue-collar men were increased as compared with blue-collar women (OR = 4.55, 95% CI 1.62–12.79).	The MassBUILT Study	High-Income	(Chin et al., 2013)
	Cross-Sectional	Occupational class, education, poverty-income ratio	Smoking	Blue-collar women vs. other women	The odds of smoking among blue-collar women were increased as compared with white-collar women (6.65, 95% CI 4.90–9.03).	Third Korean National health and Nutrition Examination (KNHANES III)	High-Income	(Cho and Lee, 2012)
	Cross-Sectional	Occupational class, exposure to workplace environmental tobacco smoke (ETS)	Never smoking; Exposure to workplace ETS; Smoking cessation; Smoking intensity	Blue-collar women vs. other women	The odds of being a never-smoking were similar among blue-collar women and female managers and professionals (OR = 1.08, 95% CI 0.75–1.55). The odds of workplace environmental tobacco smoker were increased among blue-collar women as compared with female managers and professionals (OR = 1.53, 95% CI 1.01–2.30).	Multi-Ethnic Study of Atherosclerosis (MESA)	High-Income	(Fujishiro et al., 2012)
	Cross-Sectional	Age, sex, past month cigarette use, AUDIT (alcohol problem), race, education	Smokeless Tobacco Use		The odds of smokeless tobacco use were increased among male operating engineers as compared with	Operating engineers coming	High-Income	(Noonan and Duffy, 2012)

(*continued on next page*)

Table 2 (*continued*)

Outcome Category	Study Design	Independent Variable(s)**	Specific Outcome	Referent Group	Summary of Study Findings	Brief Description of Study Population	Country Classification	Citation
				Male vs. female blue-collar workers[C]	female operating engineers (OR = 5.06, 95% CI 0.66–38.75).	to either an apprentice certification or Hazardous Materials (Hazmat) refresher course in Michigan.		
	Longitudinal	Labor market shock, cigarette prices, state anti-smoking sentiment, age, sex, education, race/ethnicity, employment status, family income, data collection year	Smoking status	Male vs. female blue-collar workers[B]	The odds of smoking among female construction workers were increased as compared with male construction workers (OR = 1.08, 95% CI 0.90 1.29).	Tobacco Use supplement to the Current Population Survey (TUS-CPS)	High-Income	(Okechukwu et al., 2012)
	Cross-Sectional	Occupational class, race/ethnicity, age, education, adverse childhood events	Monthly binge drinking, past-30 day smoking, past year marijuana use, polysubstance use (2+ more)	Blue-collar women vs. other women	As compared with women employed in non-physically demanding occupations, the odds were increased for binge drinking (OR = 4.01, 95% CI 1.68–9.49), past 30-day smoking (OR = 1.94, 95% CI 1.18–3.21), marijuana use (OR = 1.37, 95% CI 0.59–3.20), and polysubstance use (OR = 3.21, 95% CI 1.40–7.38) among blue-collar women.	A purposive sample of workers and their spouses or cohabitating partners sampled from a large union representing construction industry workers in Northern California.	High-Income	(Cunradi et al., 2014)
	Cross-Sectional	Occupational class; occupational status (high, upper, intermediate, simple, low); employment status	Cigarette smoking, heavy smoking; alcohol consumption, excessive heavy drinking; cannabis use; analgesic use; weekly analgesics use	Blue-collar women vs. other women	As compared with white-collar women, the 30-day prevalence of smoking (OR = 1.10, 95% CI = 0.88–1.38); the odds of smoking ≥ 20 cigarettes per day in the past 30 days (OR = 1.15, 95% CI 0.70–1.90); the 12-month prevalence of cannabis use (OR = 1.08, 95% CI 0.56–2.10); and the 30-day prevalence of analgesic use (OR = 1.23, 95% CI 0.93 - 1.63) were increased among blue-collar women. The 30-day prevalence of alcohol consumption (OR = 0.74, 95% CI 0.60 - 0.92); the 30-day prevalence of excessive heavy drinking (OR = 0.78, 95% CI 0.59 - 1.03), and the 30-day prevalence of analgesic use (OR = 0.88. 95% CI 0.73–1.07) were decreased among blue-collar women as compared with white-collar women.	German Epidemiological Survey of Substance Use	High-Income	(Maron et al., 2016)

* NR = Not Reported.

** We included only those independent variables for which authors reported results.

[A] Denotes studies in which occupational class was not the primary independent variable.

[B] Denotes studies in which sex/gender was not the primary independent variable.

[C] Denotes exploratory studies that considered multiple independent variables simultaneously.

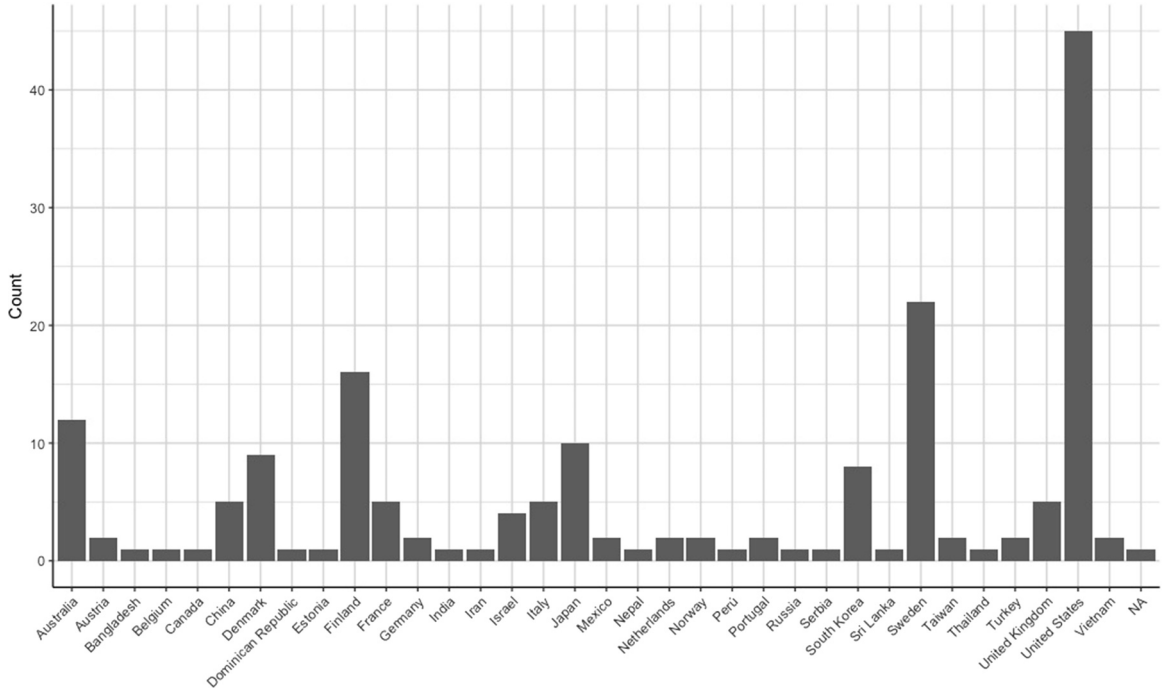
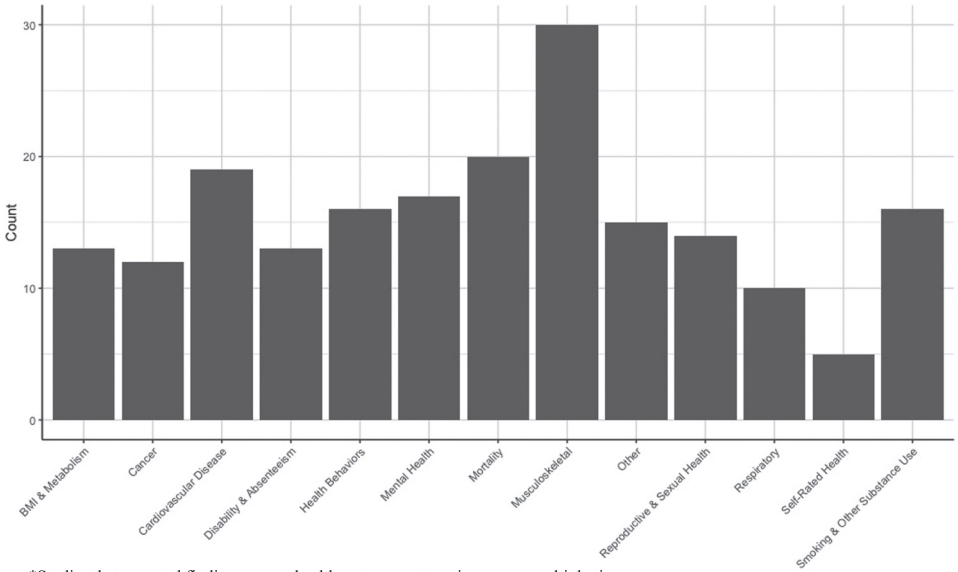


Fig. 3. Number of Studies Published by Country.

3.2. Health outcomes

We report characteristics for each study in Table 2 within each health outcome category. The two most commonly studied outcomes were musculoskeletal disorders (N = 30, 16.9%), followed by all-cause and cause-specific mortality (N = 20, 11.3%) and cardiovascular diseases (N = 19, 10.7%) (Fig. 3). Cross-sectional design predominated among studies of mental health outcomes, reproductive and sexual health, and smoking and other substance use. By contrast, the majority of mortality studies were longitudinal, and studies on cancer were either longitudinal or case-control design. (Fig. 4)

Overall, study findings across health outcome categories suggested inferior health among female blue-collar workers as compared with blue-collar men or women in other industries or job types. Of studies that compared the health of blue-collar men and women, the majority considered musculoskeletal, respiratory, or smoking-related outcomes. Studies on musculoskeletal disorders consistently showed increased risk for pain and work-related injuries in blue-collar women as compared with men (Cantley, Tessier-Sherman, Slade, Galusha, & Cullen, 2016; Iverson and Erwin, 1997; Kubo, Cullen, Desai, & Modrek, 2013; Lipscomb, Schoenfisch, & Cameron, 2013; Pollack et al., 2007; Taiwo et al., 2008; Tessier-Sherman et al., 2014; Wang, Rempel, Harrison, Chan, & Ritz, 2007). Similarly, blue-collar women exhibited inferior respiratory health compared with blue-collar men based on results from pulmonary function tests and airway responsiveness (Bakirci et al., 2007; Kongerud and Soyseth, 1991; Raza, Fletcher, Pickering, Niven, &



*Studies that reported findings across health outcome categories appear multiple times.

Fig. 4. Number of Studies by health outcome category*. *Studies that reported findings across health outcome categories appear multiple times.

Faragher, 1999; Seldén et al., 2001). Comparisons of smoking frequency in male and female blue-collar workers, however, yielded inconsistent findings (Chin, Hong, Gillen, Bates, & Okechukwu, 2012; Chin, Hong, Gillen, Bates, & Okechukwu, 2012; Chin, Hong, Gillen, Bates, & Okechukwu, 2013; Cunradi, Lipton, & Banerjee, 2007; Noonan and Duffy, 2012; Okechukwu, Bacic, Cheng, & Catalano, 2012; Okechukwu, Nguyen, & Hickman, 2010).

Inferior health was also observed among blue-collar women for a wide range of health outcomes as compared with women in other industries or job types. Increased risk for cardiovascular disease – including myocardial infarction, chest discomfort, coronary heart disease, hypertension, and stroke – was consistently observed in blue-collar women as compared with white-collar women (Baigi, Marklund, & Fridlund, 2001; Clougherty, Eisen, Slade, Kawachi, & Cullen, 2011; Cho and Lee, 2012; Honjo, Tsutsumi, Kayaba, & Group JMSCS, 2010; Ostlin, Alfredsson, Hammar, & Reuterwall, 1998; Stokholm, Bonde, Christensen, Hansen, & Kolstad, 2013; Wamala, Lynch, & Kaplan, 2001; Wamala, Wolk, Schenck-Gustafsson, & Orth-Gomér, 1997). The majority of studies on all-cause and cause-specific mortality found increased risk in blue-collar women as compared with other working women (Baigi, Fridlund, Marklund, & Oden, 2002; Bentley, Kavanagh, Subramanian, & Turrell, 2008; Bogren, 2014; von Bonsdorff et al., 2011; Brockmann, Müller, & Helmert, 2009; Chenet, Leon, McKee, & Vassin, 1998; Dasgupta, Baade, Aitken, & Turrell, 2012; Kåreholt, 2001; Mamo, Marinacci, Demaria, Mirabelli, & Costa, 2005; Mattisson, Horstmann, & Hein, Stayner, Lehman, & Dement, 2007; Pekkanen, Tuomilehto, Uutela, Vartiainen, & Nissinen, 1995; Prescott, Godtfredsen, Vestbo, & Osler, 2003). Two studies found decreased risk of all-cause and cause-specific mortality in blue-collar women as compared with women in the general population (Arena, Costantino, Sussman, & Redmond, 1999; Zhang et al., 2015), a finding which may reflect the fact that employed persons tend to be healthier on average as compared with members of the general population. Studies also find increased risk for various musculoskeletal disorders (Andersen, Thygesen, Davidsen, & Helweg-Larsen, 2012; Kaila-Kangas et al., 2006; Khatun, Ahlgren, & Hammarström, 2004; Lombardo, Vijitha de Silva, Lipscomb, & Østbye, 2012; Mattioli et al., 2009; Nakata et al., 2006; Niedhammer, Chastang, David, & Kelleher, 2008; Roquelaure et al., 2008; Roquelaure et al., 2009), adverse pregnancy-related outcomes (Eskenazi, Guendelman, & Elkin, 1993; von Ehrenstein, Wilhelm, Wang, & Ritz, 2014; Gissler et al., 2009; Jakobsson and Mikoczy, 2009; Räisänen, Gissler, Kramer, & Heinonen, 2014; Sakr et al., 2010), and smoking (Cho and Lee, 2012; Fujishiro, Stukovsky, Diez-Roux, Landsbergis, & Burchfiel, 2012; Hammarström, Stenlund, & Janlert, 2011; Maron, Kraus, Pogarell, Gomes de Matos, & Piontek, 2016; Yang, Lynch, Schulenberg, Roux, & Raghunathan, 2008) in blue-collar women as compared with women in other occupations and job types.

Of note, comparisons of risk of overweight and obesity in blue-collar women as compared with women in other industries or job types yielded mixed findings. Studies on health behaviors also did not consistently show whether levels of physical activity were increased or decreased in blue-collar women as compared with other women. This discrepancy persisted even in studies that only considered leisure time physical activity.

Studies that focused on identifying risk factors for morbidity and mortality among blue-collar women typically focused either on the physical risks associated with blue-collar, job demand, or organizational climate. Several studies identified chemical exposures a risk factor not only for cancers among blue-collar women (Betenia, Costello, & Eisen, 2012; Oddone et al., 2014; Richiardi et al., 2004; Thompson, Kriebel, Quinn, Wegman, & Eisen, 2005), but also for psychiatric distress and depression (Bromet, Dew, Parkinson, Cohen, & Schwartz, 1992; Parkinson et al., 1990). Increased job demand, job conflict, subjective monotony, skill underutilization and sexual harassment were all identified as risk factors for psychiatric distress (Goldenhar, Swanson, Hurrell, Ruder, & Deddens, 1998; Kivimäki et al., 2007; Melamed, Ben-Avi, Luz, & Green, 1995), although reduced psychological distress was observed among blue-collar women with adequate social support (Bromet et al., 1992; Brunette, Smith, & Punnett, 2011). Factors such as work control, job strain, and occupational stress do not appear to be associated with cardiovascular disease among blue-collar women (Hall, Johnson, & Tsou, 1993; Tsutsumi, Kayaba, & Ishikawa, 2011; Tsutsumi, Kayaba, Tsutsumi, & Igarashi, 2001). We include a complete discussion of study findings on the health of female blue-collar workers in Appendix B.

4. Discussion

The primary objectives of this systematic review were to catalogue the extent and strength of the existing empiric evidence on the health of blue-collar women; identify patterns in publication over time, across countries, and among various health outcomes; and to evaluate the degree to which study findings converge. We examined literature published between 1990 and 2015, a 25-year period selected to capture major trends in the global economy that may be salient to contemporary working women's health.

Our search identified 177 peer-reviewed studies published over the past 25 years across 40 different countries on a wide range of health outcomes. Findings from these studies suggests that blue-collar women experience worse health than either blue-collar men or other women. This finding emerged as a general pattern across a diverse array of studies with different target populations, designs, analyses, times, contexts, and referent groups. The following factors, however, may preclude direct comparison between many of the studies included in this review.

First, substantial heterogeneity across geographies implies heterogeneity in sociopolitical and cultural contexts, which in turn may influence labor regimes, gendered norms around labor force participation, and ultimately any findings on the association between gender, occupational class or the work environment, and health.

Second, while several studies reported findings on a specific exposure-outcome relationship among blue-collar women, the majority compared disease risk among blue-collar women to disease risk among another group of women (such as female white-collar workers). Fewer studies compared disease risk among blue-collar men and blue-collar women. These three different types of measures of association cannot be directly compared with one another. Interpretation of study findings that contrast risk of morbidity and mortality among blue-collar men and blue-collar women is further complicated by the fact that any differences may be attributable to differences in biological sex, socially-constructed gender, or some combination thereof. Interpretation of study findings that contrast the risk of morbidity and mortality among two groups of women distinguished by their occupational class is complicated by the fact that measures of associations likely reflect some combination of the effects of occupational class and indirect selection processes (i.e. selection of more or less educated women into a particular occupational class) (Klumb and Lampert, 2004).

Third, study findings were influenced by age- and cohort-effects that were not always addressed or adjusted for in analyses. Age effects result from the physiological state of aging and the social influences associated with a certain age, while cohort effects stem from influences associated with membership to a particular birth cohort (Carlsson and Karlsson, 1970). Although most studies controlled for age as a potential confounder, we note substantial heterogeneity in the age range to which the study population was restricted. Some studies, for example, limited participation to older adults (Wamala et al., 1997; Wu and Porell, 2000), while others included any adult over the age of 18 in their study samples (McCormack, Giles-Corti, & Milligan, 2006).

Because risk for nearly all diseases increases with age, studies that limited their samples to older adults are not comparable to those that included a broader range of ages. Cohort effects also hinder cross-study comparisons because different birth cohorts may have been exposed to

certain risk or protective factors that differentially influenced their likelihood of morbidity or mortality. Changes over time in societal norms or other social, political, and environmental factors related to gender and work potentially influenced patterns of health outcomes. As men and women's exposure to job-related chemicals and substances, ergonomic demands, and psychosocial stressors have varied over time, the statistical significance of study findings may depend on the specific birth cohorts included in the study population.

Fourth, because we did not limit our review to studies whose primary research question pertained to the causal effects of gender and occupational class on health, estimates for sex/gender or occupational class were often considered as secondary variables. Direct interpretation of the effect estimates for secondary risk factors, therefore, do not necessarily represent total effect estimates, and may be confounded even when the effect estimate for the main exposure is not (Westreich and Greenland, 2013). This phenomenon can occur when the set of variables used for adjustment are selected with the goal of isolating the causal effect of the main exposure, not the secondary variables. The appropriate set of control variables for a causal study of the effect of any of the secondary variables may be different, however, from the set presented in the current study. We therefore encourage readers to be cautious in drawing conclusions from studies that controlled for gender or occupational class but did not consider either as a main effect in their analysis. We indicate which studies did not consider gender or occupational class as a main effect with superscripts in the "reference group" column in Table 2.

Fifth, the generalizability of results in this review is limited by the over-representation of high-income nations. Although 40 different countries were represented in our synthesis, the majority were based on the experiences of women in industrialized, high-income countries – particularly the Scandinavian countries and the United States. The percentage of women employed in blue collar jobs in these countries has held steady over the past 30 years (Mammen and Paxson, 2000; O'Farrell, 1999), with growth of women in blue collar work occurring predominantly in middle and low-income countries (Centre for Social Development et al., 2018). A concerted effort to study the health of blue-collar women in lower and middle-income countries will be essential in order to gain a comprehensive understanding of how work influences women's health in varied geographic contexts amidst changing sociopolitical contexts, gender norms, and labor laws. Generalizability is further complicated by the fact that single study populations were represented multiple times among several of the papers, and by variability in the composition of blue-collar industries represented by the study population. While studies focused on workers from the same industry subsector (e.g. primary metals manufacturing, textile mills) may be more readily compared to one another, population-based studies where multiple blue-collar industries are represented have the potential to offer more general information about blue-collar workers' health.

Sixth, studies of working populations can yield biased findings due to the healthy hire and the healthy worker survivor effects. The healthy hire effect is the processes whereby healthier workers are more likely to seek and gain employment (Lea et al., 1999), a phenomenon that is particularly problematic for studies that directly compared blue-collar women with women in the general population or women outside of the workforce (Kåreholt, 2001; Soares, Grossi, & Sundin, 2007). A related point is that other dimensions of social class that precede employment status – namely educational attainment – may explain both entry into blue collar jobs and inferior health. Approximately half of studies included in this review (N = 89, 50.2%) did not adjust for educational attainment, which raises the possibility that differences in educational attainment offer a partial explanation for the observed inferior health of blue-collar women as compared with blue-collar men and women in other occupations or job types. Very few studies included in our review employed methods to address the potential for increased likelihood of null-biased results in longitudinal studies where a systematic attrition of unhealthy workers occurs over time (Betenia et al., 2012; Brown et al., 2017; Costello et al., 2016).

Finally, the majority of studies—and nearly all studies reporting on the health of blue-collar women in low- and middle-income countries—employed a cross-sectional design, which naturally raises questions regarding the temporal ordering of exposure and outcome. The notable exceptions were the quasi-experimental studies, one of which evaluated the effects of exogenous wage increases among factory workers in the Dominican Republic (Landefeld et al., 2014). The other two studies exploited changes in parental leave policies and firm closures in Austria (Del Bono, Weber, & Winter-Ebmer, 2012; Lalive and Zweimüller, 2009). We also note many studies that were limited by modest sample sizes, which decreases the power to detect real statistical associations, particularly among blue-collar women who often comprise a small minority of the study population. Threats to statistical power were particularly common among studies evaluating health outcomes with a low prevalence, such as cancer or cause-specific mortality.

5. Conclusion

In this "state-of-the-field" review, we find that research on the health of blue-collar women over the past quarter century generally suggests that blue-collar women experience worse health than blue-collar men or women in other occupational classes. Methodological limitations and notable heterogeneity across study populations, however, introduce uncertainty into the interpretation of such findings. These factors, alongside the rapidly changing nature of women in the workplace, motivate further study on the health of blue-collar women. Efforts to identify specific mechanisms by which blue-collar work may predispose women to adverse health may be particularly valuable in informing future workplace-based and policy-level interventions. For example, future reviews may focus on the synthesis of evidence on sex differences in response to physical hazards in the workplace so as to inform regulatory guidelines to improve occupational safety and health (Howard, Piacentino, MacMahon, & Schulte, 2017; Sheehan and Lam, 2015). Alternatively, future efforts may focus on synthesizing the evidence on the effects of various aspects of organizational climate on women's health and well-being in historically male-dominated industries and occupations.

Expanding research into other countries, particularly less developed nations, will be useful in order to gain understanding of how differences in labor laws, working conditions, workplace safety, and in cultural norms and attitudes toward women and work contribute to the health of blue collar women. With much blue-collar work in middle and low-income countries remaining in the informal sector, studies on the experiences of these "invisible women," at least from the economic sense, are needed.

Acknowledgements

The authors would like to thank Dr. Ellicott Matthay for her thoughtful comments on an earlier version of this manuscript. This research was supported by the National Institute of Health National Institute on Aging grant R01-AG026291; the National Institute on Occupational Health and Safety grant 5T42OH008429-13; and by the National Institute on Mental Health grant F31 MH 112246. The conclusions expressed are solely those of the authors.

Ethics approval

Ethics approval is not required for this paper, as this is a systematic review that does not directly involve data collected from human subjects.

Appendix A. List of search algorithms

Database	Search terms
Google Scholar	health, “blue collar women” health “female blue collar”
PubMed[A]	**Preliminary Search:** health, “blue collar women” health “female blue collar” **Updated Search:** ((((sex[tiab] OR female[tiab])) OR (("Sex Factors"[Mesh]) OR (("Women's Health"[Mesh]) OR "Women, Working"[Mesh])))) AND (((((((("Industrial Development"[Mesh:NoExp]) OR "Manufacturing Industry"[Mesh:NoExp]) OR "Construction Industry"[Mesh:NoExp]) OR "Extraction and Processing Industry"[Mesh]) OR "Textile Industry"[Mesh]) OR "Tobacco Industry"[Mesh])) OR ("blue collar"[tw] OR "blue-collar"[tw]))
Web of Science [A]	**Preliminary Search:** health, “blue collar women” health “female blue collar” **Updated Search:** (TS = (“blue collar”) OR TI = (“blue-collar”)) AND (TS = (women OR female OR “women work*”) OR TI = (Women OR female OR “women work*”))
SCOPUS	(TITLE-ABS-KEY ("blue collar" OR "blue-collar") AND TITLE-ABS KEY (women OR female) AND TITLE-ABS-KEY (industr* OR "women work*") AND TITLE-ABS-KEY (health))
Contemporary Women's Issues	**Words and phrases:** blue collar **Subject:** health general
Women's Studies Quarterly	blue collar AND health
Social Sciences Citation Index	TOPIC:(blue collar) OR TITLE: (blue collar) AND TOPIC:(women) OR TITLE:(women) AND TOPIC:(health) OR TITLE: (health)
LGBT Life with Full Text	Women AND Blue Collar
SafetyLit	Women AND Blue Collar
CINAHL	MH blue collar workers OR TI blue collar OR AB blue collar OR SU blue collar OR MH industry AND (MH "Women+") OR (MH "Women, Working+")
Gender Watch	((SU.EXACT("Gender") OR SU.EXACT("Women") OR SU.EXACT("Female employees") OR SU.EXACT("Gender differences")) OR all(women OR "women work*")) AND ((SU.EXACT("Manufacturing") OR SU.EXACT("Blue collar workers") OR SU.EXACT("Manual workers") OR SU.EXACT("Construction industry")) OR all("blue-collar" OR "blue collar"))
Cochrane	“Blue collar” AND women

[A]For Web of Science and PubMed we report our preliminary search strategy as well as the updated strategy developed by the medical librarian.

Appendix B. Description of findings by health outcome category

Studies that met the inclusion criteria for this systematic review were classified into one of 11 health outcome categories: BMI and metabolism; cancer; cardiovascular diseases; disability and absenteeism; mental health; all-cause and cause-specific mortality; musculoskeletal disorders; reproductive and sexual health; respiratory diseases; self-rated health; and smoking and other substance use. Disease endpoints that did not fit into one of these categories were classified as “other.” Below, we summarize study findings within each health outcome category. For each health outcome category, we first summarize results from studies that compared male and female blue-collar workers, we then summarize results from studies that compared blue-collar women to women in other industries or job types. Finally, we discuss specific risk factors for disease identified among blue-collar women. Where possible, we synthesize results and note consistency of findings.

BMI & metabolism (N = 13 Studies)

In one cross-sectional study of Michigan operating engineers, the odds of obesity were decreased in women versus men (Duffy, Cohen, Choi, McCullagh, & Noonan, 2012). Findings on risk of obesity or increased BMI in female blue-collar workers, however, yield mixed findings. While several studies note increased odds of obesity and increased BMI among blue-collar women as compared with either white-collar workers or professionals (Bennett, Wolin, & James, 2007; Cho and Lee, 2012; Miura and Turrell, 2014; Santos and Barros, 2003), others reported equivalent odds of overweight and obesity in blue-collar women and women with further education (Yang et al., 2008); lower waist circumference and waist-to-hip ratio in blue-collar women versus white-collar women (Nakamura, Nakamura, & Tanaka, 2000); and no increase in fat mass index (FMI) in blue-collar women versus those working in the transport and communications industry (Lewin et al., 2014). These discrepancies may reflect differences in the reference group selected by the investigators or differences in the specific outcomes considered. The one study that compared diabetes risk in blue- and white-collar women found increased risk for type 2 diabetes in blue-collar women (Maty, Everson-Rose, Haan, Raghunathan, & Kaplan, 2005).

Among blue-collar women, retirement was associated with weight gain; type 2 diabetes was associated with soda drinking; work-related factors such as low job stress, low social support, and repetitive work were associated with metabolic syndrome and elevated serum glucose levels (Eshak et al., 2013; Forman-Hoffman et al., 2008; Hwang and Lee, 2014; Melamed et al., 1995).

Cancer (N = 12 Studies)

No studies in this review compared cancer risk in blue-collar men and women. Women working in a wide-range of blue-collar industries - including textile mills, paper mills, printing and publishing industries, petroleum refining, and motor vehicles manufacturing – were at increased risk for cancers of the central nervous system (Cocco, Heineman, & Dosemeci, 1999). Comparisons of breast cancer risk in blue-collar women versus women in other industries and job types yielded mixed findings. While one study from the Netherlands found no difference in breast cancer risk in blue- and white-collar women, results from a Swedish case-control study suggest excess breast cancer risk among metal platers and coaters and results from a longitudinal U.S. study suggest increased breast cancer risk in female crafts/operatives as compared with housewives (Van Loon, Goldbohm, & Van Den Brandt, 1994; Pollán and Gustavsson, 1999; Pudrovska, Carr, McFarland, & Collins, 2013). However, studies suggest decreased risk for lung cancer and colon cancer in blue- versus white-collar women (Hrubá et al., 2009; Van Loon, Van den Brandt, & Golbohm, 1995).

Among blue-collar women, studies consistently identified increased risk for cancers of the lung, breast, and cervix associated with exposure to occupational hazards such as chlorinated organic solvents or metalworking fluids (Betenia et al., 2012; Oddone et al., 2014; Richiardi et al., 2004; Thompson et al., 2005). Greater duration of employment in blue-collar jobs was also associated with increased risk for cancers of the breast and bladder (Colt et al., 2011; Oddone et al., 2013).

Cardiovascular Diseases (N = 19 Studies)

One cross-sectional study from South Korea found that cardiovascular disease risk equivalent in blue-collar men and women (Won, Hong, & Hwang, 2013). However blue-collar women's cardiovascular health is consistently noted as inferior to women in other industries and job types. Studies find increased risk for a wide range of cardiovascular diseases including myocardial infarction, chest discomfort, coronary heart disease, hypertension, and stroke as well as elevated lipid levels in blue- versus white-collar women (Baigi et al., 2001; Cho and Lee, 2012; Clougherty et al., 2011; Honjo et al., 2010; Ostlin et al., 1998; Stokholm et al., 2013; Wamala et al., 1997; Wamala et al., 2001). However, two studies find reduced intima-media thickness in blue-collar women as compared with clerical workers and professional women, respectively (Gallo et al., 2003; Fujishiro et al., 2015).

Studies of risk factors for cardiovascular diseases among blue-collar women consider not only a wide range of risk factors, but also a wide range of specific disease endpoints, making it difficult to compare or synthesize study findings. Cross-sectional studies conducted in China and Israel identified sound pressure levels and short-cycle repetitive work, respectively, as risk factors for hypertension (Melamed et al., 1995; Zhao, Zhang, Selvin, & Spear, 1991). Scandinavian studies identified limited possibilities to learn new things, monotony, and noise (Hammar, Alfredsson, & Theorrell, 1994) as well as severity of symptoms with risk of first myocardial infarction (Jousilahti, Vartiainen, Tuomilehto, & Puska, 1996). Cardiovascular morbidities in general were more common in blue-collar women with low work social support and increased physical demand in one Swedish cohort (Hall et al., 1993), and noise exposure has also been linked with elevated serum cholesterol in Israeli blue-collar women (Melamed, Froom, Kristal-Boneh, Gofer, & Ribak, 1997). Risk for cardiovascular diseases were decreased among blue-collar women with increased psychological job demand, and no association was observed between work control and cardiovascular morbidity, job strain and hypertension, or occupational stress and stroke among blue-collar women (Hall et al., 1993; Tsutsumi et al., 2001; Tsutsumi et al., 2011).

Disability & Absenteeism (N = 13 Studies)

No studies included in this review compared risk of disability or absenteeism in male and female blue-collar workers. Studies did consistently find that blue-collar women were more likely to have a limiting, long-standing illness or disability (Arber, 1991; von Bonsdorff et al., 2011); report sickness absence (Christensen, Labriola, Lund, & Kivimäki, 2008; Niedhammer et al., 2008; Vahtera, Virtanen, Kivimäki, & Pentti, 1999); have lowered work ability (Aittomäki, Lahelma, & Roos, 2003); or report lost worktime injury or illness (Strong and Zimmerman, 2005) as compared to women in other industries or occupations. By contrast, two studies found decreased likelihood of functional impairment in Mexican blue-collar women (Guendelman and Silberg, 1993) and decreased odds of having a long-term condition, reduced activity days, or time off work among Australian blue-collar women (Korda, Strazdins, Broom, & Lim, 2002) as compared with their respective counterparts in white-collar jobs. Only three studies considered determinants of disability and absenteeism among blue-collar women, and identify risk factors ranging from organizational climate (Heo, Leem, Park, Jung, & Kim, 2015; Väänänen et al., 2004) and work-family conflict (Väänänen et al., 2008) to reduced heart rate reserve (Gupta et al., 2014).

Health behaviors (N = 16 Studies)

Both studies that compared health behaviors in blue-collar men and women found inferior health among blue-collar women as measured by levels of physical activity (Wu and Porell, 2000) and health risk scores (Hwang, Hong, & Rankin, 2015). The majority of studies that compared health behaviors in blue-collar women and women in other industries or job types found that blue-collar women were less likely to engage in physical activity and exhibited less healthy dietary patterns (Burton and Turrell, 2000; Ericson, Wirfält, Mattisson, Gullberg, & Skog, 2007; Gang et al., 2002; Mäkinen et al., 2010; McCormack et al., 2006; Miura and Turrell, 2014; Oliveira, Maia, & Lopes, 2014). However, several studies reported that blue-collar women were more physically active as compared with women in other industries and job types (Cho and Lee, 2012; Cleland, Schmidt, Salmon, Dwyer, & Venn, 2011; Kuiack, Irving, & Faulkner, 2007; Takao, Kawakami, & Ohtsu, 2003; Uijtdewilligen et al., 2014; Uijtdewilligen et al., 2015). Discrepant findings on physical activity in blue-collar women versus other women persist even among studies that only considered physical activity during leisure time. One study found that blue-collar women who participated in a cancer prevention intervention decreased their fruit and vegetable consumption over the course of follow-up (Harley et al., 2010).

Mental health (N = 17 Studies)

Overall, findings on the mental health of blue-collar women yielded mixed findings. Both studies that compared mental health outcomes in blue-collar men and women found that blue-collar women were more likely to be depressed (Minh, 2014) and to use stress-related drugs (Rydstedt, Johansson, & Evans, 1998). Findings from studies that compared the mental health of women in blue-collar jobs to women in other industries and job

types were mixed. Two studies from South Korea found increased risk of suicidal ideation among blue-collar women (Moon and Park, 2012; Yoon, Won, Lee, Jung, & Roh, 2014); increased odds of depression were noted in female garment workers as compared with service workers (Guendelman and Silberg, 1993); and female workers at the Toulouse AZF disaster were more likely to experience psychological distress (Cohidon et al., 2009). By contrast, three studies from Scandinavia find no evidence of a difference in burnout, suicide, or emotional exhaustion in blue-collar women as compared with women in other occupations (Ahlgren, Malmgren Olsson, & Brulin, 2012; Andrés, Collings, & Qin, 2010; Soares et al., 2007).

Among blue-collar women, studies linked psychological distress to work-related physical and psychological stressors including sexual harassment (Bromet et al., 1992; Brunette et al., 2011; Goldenhar et al., 1998; Loscocco and Spitze, 1990; Kivimäki and Kalimo, 1996; Melamed et al., 1995; Parkinson et al., 1990); domestic arrangements (Asztalos et al., 2009; Goldenhar et al., 1998; Loscocco and Spitze, 1990); and individual-level factors such as self-esteem, smoking, and BMI (Bromet et al., 1992; Kivimäki and Kalimo, 1996; Loscocco and Spitze, 1990). Reduced psychological distress was observed among blue-collar women with adequate social support (Bromet et al., 1992; Brunette et al., 2011).

Mortality (N = 20 Studies)

One study on smoking and all-cause mortality in urban transit operators reported increased risk for all-cause mortality in male drivers as compared with female drivers (Lipton, Cunradi, & Chen, 2008). Several studies reported comparisons blue-collar women versus women in other industries or job types, and the majority find increased risk for both all-cause and cause-specific mortality among blue-collar women (Baigi et al., 2002; Bentley et al., 2008; von Bonsdorff et al., 2011; Brockmann et al., 2009; Chenet et al., 1998; Dasgupta et al., 2012; Hein et al., 2007; Kåreholt, 2001; Mamo et al., 2005; Mattisson et al., 2014; Pekkanen et al., 1995; Prescott et al., 2003). Only one study found decreased mortality risk among blue-collar women as compared with white-collar women (Hirokawa, Tsutsumi, & Kayaba, 2013). Two studies found decreased risk of all-cause and cause-specific mortality in blue-collar women as compared with women in the general population (Arena et al., 1999; Zhang et al., 2015), a finding which may reflect the fact that working populations tend to be healthier on average as compared with members of the general population. Risk factors for mortality identified among blue-collar women included physical demand and exposure to metalworking fluid (Costello, Picciotto, Rehkopf, & Eisen, 2014; Hall et al., 1993), although shift work, active work, and increased psychological demand appeared protective against mortality (Åkerstedt, Kecklund, & Johansson, 2004; von Bonsdorff et al., 2012; Hall et al., 1993)

Musculoskeletal Disorders (N = 30 Studies)

Nearly all studies of musculoskeletal disorders find increased risk among blue-collar women as compared with blue-collar men or as compared with women in other industries or job types. Studies that compared blue-collar women and men find women at increased risk for pain in the neck, shoulder, and distal upper extremity (Wang et al., 2007). Women were also at increased risk for various work-related injuries (Cantley et al., 2016; Iverson and Erwin, 1997; Kubo et al., 2013; Lipscomb et al., 2013; Pollack et al., 2007; Taiwo et al., 2008; Tessier-Sherman et al., 2014), as compared with men, although five of these seven studies were based on the same study population of primary metal and fabricated metal product manufacturers in the US (Cantley et al., 2016; Kubo et al., 2013; Taiwo et al., 2008; Tessier-Sherman et al., 2014; Pollack et al., 2007). As compared with women in other industries or job types, blue-collar women were at increased risk for musculoskeletal disorders in general (Khatun et al., 2004); hospitalization for back disorders (Kaila-Kangas et al., 2006); injuries (Nakata et al., 2006; Niedhammer et al., 2008); carpal-tunnel syndrome (Mattioli et al., 2009; Roquelaure et al., 2009; Roquelaure et al., 2008); and disorders of the hip, back, and knee (Andersen et al., 2012; Lombardo et al., 2012). Higher risk for musculoskeletal disorders among blue-collar women are most likely attributable to the physical nature of jobs in blue-collar industries, and only one study found no evidence of a difference between blue and white-collar women's risk for neck and shoulder disorders (Ahlgren et al., 2012).

Several studies assessed risk factors for musculoskeletal disorders among blue-collar women. Specific risk factors identified included psychological or physical strain (Björkstén, Boquist, Talbäck, & Edling, 2001; Fredriksson et al., 1999; Hanklang, Kaewboonchoo, Silpasuwan, & Mungarndee, 2014; Kim, Park, Min, & Yoon, 2009; Nag, Vyas, & Nag, 2010; Vingård, Alfredsson, Goldie, & Hogstedt, 1991; Westgaard and Jansen, 1992) uncomfortable or inadequate work arrangements (Björkstén et al., 2001; Hanklang et al., 2014; Kaergaard and Andersen, 2000; Motamedzade and Moghimbeigi, 2012); age (Murata, Kawakami, & Amari, 2000; Nag et al., 2010; Vingård et al., 1991); tenure (Hanklang et al., 2014; Murata et al., 2000; Nag et al., 2010); household arrangement (Björkstén et al., 2001; Kaergaard and Andersen, 2000); and sitting time (Hallman, Gupta, Mathiassen, & Holtermann, 2015). The majority of these studies were conducted either in Scandinavian countries (e.g. Sweden, Norway, Denmark) or in low- and middle-income countries (e.g. India, Perú, Thailand, Iran). Although similar risk factors are noted across these various geographic contexts, most are based on very limited sample sizes.

Reproductive & sexual health (N = 14 Studies)

Only one study conducted in the Kathmandu Valley compared the sexual health of blue-collar men and women, and found substantially increased odds of condom use among female factory workers as compared with men (Pant, Kanato, Thapa, & Ratanasiri, 2013). The majority of studies compared blue-collar women to an all-female referent group and consistently noted increased risk for a wide range of adverse pregnancy-related outcomes – including low birth weight and small for gestational age (Eskenazi et al., 1993; Gissler et al., 2009; Jakobsson and Mikoczy, 2009), prematurity (Gissler et al., 2009; von Ehrenstein et al., 2014), perinatal mortality (Gissler et al., 2009), congenital anomalies (Sakr et al., 2010), and Caesarian section (Räisänen et al., 2014) – in blue-collar women as compared with women employed in other industries. Studies also found that blue-collar women were more likely to have multiple sexual partners, HSV-2 infection, and earlier natural menopause (Evans et al., 2003; Luoto, Kaprio, & Uutela, 1994; Yingying, Smith, & Suiming, 2011).

Two quasi-experimental studies evaluated the effects of parental leave policies and plant closures and fertility outcomes, respectively, among blue-collar women in Austria. These studies found that parental leave reform increased fertility but found minimal effects on fertility up to six years following plant closure (Del Bono et al., 2012; Lalive and Zweimüller, 2009). Increased knowledge on HIV/AIDS was associated with increased condom use and decreased odds of sex with multiple partners among garment workers in Bangladesh (Sayem, 2010), and sulfur dioxide was identified as an independent risk factor for early natural menopause among blue-collar women in China (Wang et al., 2015).

Respiratory diseases (N = 14 Studies)

Studies that compared the blue-collar women to that of blue-collar men or women in other industries consistently found inferior respiratory health among blue-collar women. As compared with blue-collar men, women were noted increased methacholine responsiveness; decreased FEV1 and FVC; and increased acute airway response (Bakirci et al., 2007; Kongerud and Soyseth, 1991; Raza et al., 1999; Seldén et al., 2001). Increased risk for asthma, chronic rhinosinusitis and lung cancers was observed blue-collar women as compared with women in other industries (Heikkilä, Martikainen, Kurppa, Husgafvel-Pursiainen, & Karjalainen, 2008; Takezaki et al., 2001; Thilsing et al., 2012; Storaas et al., 2015). Among European blue-collar women, increased dust concentration was associated with decreased lung capacity (as measured by FVC and FEV1) (Love, Muirhead, Collins, & Soutar, 1991), although no significant effects of manganese exposure on pulmonary function was observed among female metalworkers in China (Wang et al., 2015).

Self-Rated health (N = 5 Studies)

Studies on self-rated health that compared blue-collar women and white-collar women yielded inconsistent findings (Brunette et al., 2011; Hammarström et al., 2011; Korda et al., 2002; Niedhammer et al., 2008). In one quasi-experimental study of the effect of a living wage policy, affected factory workers “excellent” or “much better” global and comparative self-rated health as compared with workers in control factories (Landefeld et al., 2014).

Smoking & Other Substance Use (N = 16 Studies)

Comparisons of smoking frequency in male and female blue-collar workers yield inconsistent findings (Cunradi et al., 2007; Noonan and Duffy, 2012; Okechukwu et al., 2012). Notably, results from three studies that compared frequency of smoking in male and female construction workers are inconsistent even though based on the MassBUILT study population (Chin et al., 2012; Chin et al., 2012; Chin et al., 2013; Okechukwu et al., 2010). However, studies consistently find that blue-collar women smoked more frequently as compared with white-collar women, managers and professionals, and women with further education (Cho and Lee, 2012; Fujishiro et al., 2012; Hammarström et al., 2011; Maron et al., 2016; Yang et al., 2008), with job strain, passive work, and physical demand identified as risk factors for smoking in a cross-sectional study from Australia (Radi, Ostry, & LaMontagne, 2007). Findings on alcohol and other substance use are limited and inconsistent (Biron, Bamberger, & Noyman, 2011; Cunradi, Ames, & Xiao, 2014; Maron et al., 2016; Sayem, 2010).

Other health outcomes (N = 15 Studies)

Other health outcomes studied included work-related fatigue, insomnia, melatonin production, and sleep quality (Choi, Terrell, Pohl, Redman, & Duffy, 2013; Goldenhar et al., 1998; Juutilainen et al., 2000; Lin, Chen, Hsieh, & Chen, 2015; Rydstedt et al., 1998); fibromyalgia (Cobankara, Unal, Kaya, Bozkurt, & Ozturk, 2011); headache, cognition, and other neurobehavioral effects (Bromet et al., 1992; Goldenhar et al., 1998; Grimmer, 1993; Parkinson et al., 1990; Tsai, Chen, Chao, & Wang, 1997); serum uric acid production (Shirom, Melamed, & Nir-Dotan, 2000); blood and bone lead levels (Potula and Kaye, 2006); tooth abrasion (Kovacevic and Belojevic, 2006); hearing loss (Nguyen et al., 1998); and the prevalence long and short-term health conditions (Korda et al., 2002).

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