

Web Appendix 1. Occupational health intervention studies published in the Italian language between 1990 and 2008. Classification according to the criteria proposed by the Cochrane Occupational Safety and Health Review Group (A codes and B codes) and brief description of the studies.

| Authors (journal, year) | Study design and setting (period) | Study population | Intervention | Main outcome measures | Main findings | Comments | OSHRG class (design, outcome) |
|--------------------------------|--|---|--|---|---|---|--------------------------------------|
| Arduini and Della Foglia [1] | Before-after study of leather, footwear and accessories sector (1986-1989) | n.a. | Administrational: workplace inspections (incompletely described) | Adherence of workstations to current legal and professional/technical standards | Apparent reduction of number of workstations not adhering to current legal and professional/technical standards (no statistical analysis) | - Exposure assessment methods not described or validated | A4 / B1 |
| Capodaglio et al [2] | Before-after study of biomechanical overload and low back pain in a large industrial wool processing factory (period?) | Unspecified number of workers (3 job tasks) | Ergonomic: platforms (detailed description) | Five exposure indices (OCRA, ESI, SI, TLV and ad hoc) before/after intervention | Unclear (no statistical analysis) | - Main study aim was risk evaluation | A4 / B1 |
| Carrer et al [3] | Before-after study of welders in a power station following raised urinary values for metals at biological monitoring (period?) | 7 welders (all men) | Educational [technological] (incompletely described) | Urinary Ni values before the intervention and at 12 and 18 months (defined) | >20-fold reduction in urinary Ni values at 18 months (no statistical analysis of main outcome) | - Study period and exact intervention unclear - Urinary values of Ni used as proxy for Pb and Al | A4 / B1 |
| Castagnoli | Before-after | n.a. | Technological: | Environmental | Noise levels appeared | - Numbers of | A4 / B1 |

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| and Attaccalite [4] | study of noise exposure in a gas cylinder branding department (period?) | | sound absorbing materials (detailed description) | noise exposure levels at two work stations, expressed as Leq Db(A) | to be reduced in both work stations (no statistical analysis) | noise exposure levels for each different operation not always specified | |
| Cella et al [5] | Quasi-experimental study of effectiveness of flu vaccination for workers in a large hospital (2002-2003) | 423 vaccinated workers and 423 controls matched by sex and working area | Health care: workers vaccinated in a voluntary vaccination campaign vs. sample of workers who did not respond to the appeal (vaccination described, campaign scantily described) | Numbers of influenza-like cases and numbers of working days lost; Cost benefit analysis | Significant reductions in cases and working days lost; Cost-benefit analysis, 4.5. (calculated according to Postma) | - Study design targeted effectiveness of the vaccine rather than the vaccination campaign, as claimed - Includes subanalysis stratified by age and job title | A2 / B3, B8 |
| Cornaggia et al [6] | Before–after study of noise in a “shaking out bay” in a metallurgic plant (no earlier than 1991) | n.a. | Technological: multiple changes to machine (detailed description) | Daily personal noise exposure level expressed as Lep,d Db(A) | “Exposure reduction from 102 to 86 Lep,d Db(A)” (no statistical analysis) | - Outcome measurements not clearly reported | A4 / B1 |
| Crippa et al [7] | Before–after study of latex allergy in a single large hospital (2001-2002) | All 20 subjects found to be allergic to latex in a population of 1962 workers exposed for | Secondary prevention: Alternative individual/ working group materials, or change of job task, as appropriate | Absence of symptoms at 12 months (defined) | Intervention effective for 11/14; 6 lost to follow-up (no statistical analysis) | - Study of prevalence which also reported a highly selective intervention | A4 / B2 |

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| | | ≥1 year | | | | | |
| Crippa et al [8] | Before–after study of trainees attending 3 different private/public hairdressing schools (2001-2004) | All 83 trainees [women, n=77] who completed the entire course; out of 154 who started | Educational: Two 3-hour sessions (not described) conducted during the 1 st and 3 rd years of a 3-year course | Self-reported: 1) use of protective strategies; 2) work-related diseases (choice of measures unclear explained) | Increased use of appropriate gloves; Reduced prevalence of dermatitis (accompanied by increased prevalence of back pain) | - Many aspects of study design/measures unclear - Main specified aim was to evaluate acquisition of “knowledge” of risk factors and preventive strategies | A4 / B2, B3 |
| Donghi et al [9] | Before–after study of noise exposure in a cement factory with noise levels above action level (1992-1993) | n.a. | Technological: Replacement/modification of machines and introduction of sound-absorbing materials (partially described) | Daily personal noise exposure levels in 5 different job tasks in 4 work stations; expressed as Lep,d Db(A) | Reductions of Lep,d in all 5 job tasks; 3 of 5 tasks below action level after intervention (no statistical analysis) | - Numbers of measurements and sampling times not specified | A4 / B1 |
| Duca et al [10] | Randomized controlled trial for prevention of dermatitis in 13 printing factories (1991-1993) | 868 [of 942] workers who satisfied eligibility criteria were randomized (individually matched by task, sex, age and | Educational: Individual advice to use freely available barrier cream at start of work and mid-shift vs. no advice (described) | Workers with dermatological symptoms at least one follow-up examination [at 4, 8 and 12 months] | 2% to 17% [95% confidence intervals] reduction in the proportion of symptomatic workers | - Workers with “severe” dermatological diseases were excluded - Creams chosen at company level and financed by researchers; unclear whether availability was boosted during | A1 / B3 |

| | | length of service) | | | | study - Contamination possible | |
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| Gasparri et al [11] | Before–after study of environmental tobacco smoke in public offices [n=10], “industrial buildings” [n=10], ‘pubs’ [n=7] and discos [n=4] (2004-2005) | n.a | Legislative: National law introduced in January 2005 prohibiting smoking in enclosed public spaces and workplaces | Breathing space concentrations vapor-phase nicotine [as marker of tobacco smoke] (defined) | Reductions in pubs and discos, ~95%; public offices, 77%; manufacturing companies, 43% | - “Industrial buildings” not described - Researchers conclude intervention was especially effective in places where concentration was initially high (pubs/discos) | A4 / B1 |
| Marchi et al [12] | Quasi-experimental study of smoking prevention among “trainees” attending official industrial hygiene course (1999-2001) | Intervention: 552 men, 531 women. Controls: 458 men; 312 women. | Educational: Personally consigned pamphlets plus individual access to informal counseling vs. no intervention (described) | At ~1 year, proportions of men/women smokers who ‘quit’; men/women non-smokers who ‘started’. Additionally, before-after analysis of intervention group with multiple outcome measures. (defined) | In treatment arm, RR (95% CI) of quitting: women, 2.7 (1.2-5.9); men 1.9 (1.0-3.6); of starting: women, 0.3 (0.2-0.7); men 0.4 (0.2-0.6) | - Controls were historical [follow-up closed in 1999] - Type of “trainees” not specified - Counselor’s profession unspecified - Quitting (and starting) smoking undefined | 1) A2/B7; 2) A4 / B7 |
| Marconi et al [13] | Quasi-experimental study of | n.a. | Technological: changes to composition and way | Environmental and personal monitoring of | Personal monitoring: 3-fold reduction during preparation of | - 12 environmental and 16 personal | A2 / B1 |

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| | exposure to ceramic fibres during turbine insulation work at a thermoelectric power plant (no later than 1997) | | materials are presented to workers responsible for fitting them vs. no change (described) | breathing space exposure to ceramic fibers during on site preparation of materials and during fitting (defined) | materials and 15-fold reduction during fitting Environmental monitoring: no reduction during preparation of materials but 10-fold reduction during fitting (no statistical analysis) | measurements | |
| Miscetti and Bodo [14] | Time series analysis of injuries in all building sites in the Assisi district from 1992 to 2006 | Dynamic | Intensification of routine 'OSHA inspections' (described) following a disastrous earthquake | Variations in annual injury incidence rates ('injuries' not defined) | Effectiveness claimed but without analysis of trend (no statistical analysis) | - Primarily a monitoring study (no clearly specified research question) | A3 / B5 |
| Nicoletti et al [15] | Attempted time-series analysis of upper limb musculoskeletal disorders in a large manufacturer of upholstered furniture, broadly classifiable as before-after study (2000-2005) | All manual workers (~3,500 at close of study) | Multicomponent. Educational [manual handling tutorials with cautionary tales from affected workers]; Organizational/Ergonomic/Technological [from 2002, some automation, task reorganization, improved equipment, including new mechanized equipment allowing | Incidence rates of work-related musculoskeletal disorders | Findings unclear; trends claimed for reductions in both work-related musculoskeletal disorders (graphical presentation without statistical analysis) | - Narrative article - Sketchy application of multiple analytical approaches - External comparison groups considered in results - Monetary estimate of benefits but not of costs - Timing of some | A4 / B3 |

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| | | | the most demanding tasks to be allocated to affected workers] (detailed but incomplete description) | | | components of the intervention unclear - Subsidiary aim: reduction of disabilities | |
| Pasquini et al [16] | Before-after study of exposure to NO ₂ and halogenated anesthetics in the surgery department of a large hospital (1984-1992) | n.a. | Technological [forced ventilation] (not described) | Environmental exposure levels, expressed in ppm and categorized (4 classes) | Apparent reduction of environmental exposure levels (no statistical analysis) | - Main study aim was risk evaluation | A4 / B1 |
| Paternoster et al [17] | Before-after study within departments of a single hospital (1996-1997) | Hospital auxiliary workers [n=201] (recruitment unclear) | Behavioral: Physiiatric education for patient lifting (described) | Four postural evaluations; score for overall lifting technique (described) evaluated on workers [n=40] on morning shifts at 6 months pre/post-intervention | No evidence of effectiveness | - Outcomes measured in different groups of individuals working on a particular shift | A4 / B2 |
| Perico and Pagni [18] | Before-after study of airborne pharmacological contamination in a ward for treatment of | n.a. [5 nurses] | Multicomponent. Organizational: Separate room or aerosol treatments. Technological: air exchange apparatus potentiated | Personal monitoring; environmental monitoring of pentamidine concentrations in treatment room | >6-fold reduction at personal monitoring; ~50% reduction at environmental monitoring of treatment room (no statistical analysis) | - Urinary pentamidine concentrations were below level of detection when measured at baseline | A4 / B1 |

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| | infectious diseases (period?) | | (described) | (described) | | | |
| Rivolta et al [19] | Before-after study of a health promotion program conducted in OH clinic/workplaces (2000-?) | About 800 smokers, of whom 472 agreed to participate | Multicomponent: Educational/Psychological and Pharmacological (nicotine substitute and antidepressants) (incompletely described) | Non-smokers (tested with cotinine) at 1 year | At 1 year 243/472 (51%) active participants had quit (no statistical analysis) | - No description of workers - On treatment analysis | A4 / B7 |
| Sebben et al [20] | Before-after study of noise exposure and hearing loss in the bottling department of a brewery (1980-1986) | 88 workers with pre/post audiometric test data | Technological: Soundproofing of machines (1983) (not described) | Environmental noise exposure levels (28 measures) expressed as Leq Db(A); Audiometric results | Claimed reduction of Leq Db; audiometric results unclear (no statistical analysis) | | A4 / B1, B3 |
| Scinardo et al [21] | Before-after study in a factory producing diamond grindstones with cobalt exposure concerns (period not specified) | Workers (number unspecified) in exposed sector of factory | Multicomponent. Technological: Increased efficiency of laboratory fume hoods extractor fans (described); Educational: optimize exposure-related behavior (incompletely described) | Personal and environmental monitoring of cobalt and total dust (techniques described but timing not specified) | Apparent reduction of personal/environmental cobalt concentrations only (no statistical analysis) | - Educational part of intervention describes desired behavior but not training methods/duration - No behavioral outcome measure | A4 / B1 |
| Terzi et al [22] | Before-after study of a wool mill insulated with asbestos | n.a. | Building reclamation: Removal of asbestos (described) | Environmental monitoring of breathing space: amosite | 11-20-fold reductions in amosite concentrations (no statistical analysis) | (Exact study period unclear) | A4 / B1 |

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| | (1990-1991?) | | | concentrations before/after intervention and at 5 months (defined) | | | |
| Tominz et al [23] | Before–after study of exposure to tobacco smoke in a Local Health Agency in Trieste: 1) workers (2004-2005); 2) internal environment (2004-2006) | 1) Before: 746 replies from all 1067 workers; After: 186 replies from a “sample” of 200 workers 2) n.a. | Legislative [National law introduced in January 2005 prohibiting smoking in enclosed public spaces and workplaces] | 1) Prevalence of: smokers; self-reported exposure to first/second-hand smoke (incompletely defined) 2) Breathing-space concentrations of PM _{2.5} and PM ₁₀ (described) | 1) Prevalence of smokers unchanged; reduced self-reported exposure to second-hand smoke [from 58% to 47%] 2) Apparent reduction of PM _{2.5} and PM ₁₀ environmental exposure | - Can be considered as two independent studies - Sampling procedure for follow-up interviews not stated | 1) A4 / B1, B7 2) A4 / B1 |
| Torri et al [24] | Before–after study of staff exposed to manual handling of patients in 2 hospitals (1995-1997) | Exposed workers [n=603; n=271] | Multicomponent: Technological [lifting appliances]; Ergonomic [new fittings]; Educational [OH physician course] | Before intervention and at 18 months: number/cost of working days lost due to low back pain in previous year | Reductions of both days lost [39%] and costs [39%] (no statistical analysis) | - Intervention costs not specified - Complex intervention only partially described | A4 / B4 |
| Zecchi [25] | Before-after study of biomechanical overload of the upper limbs in a Parmesan cheese production plant (2000-2005) | About 1000 workers | Multicomponent: Educational [via shop stewards], Organizational and Technological [mechanized lifting] | “Disabilities” (eg back injuries) related to biomechanical overload and numbers of working days lost | “Disabilities” and working days lost both reduced by ~40% (no statistical analysis) | - Initial report of an ongoing analysis of effectiveness - Outcome measure “disabilities” not defined | A4 / B3 |

Abbreviations:OSHRG, Occupational Safety and Health Review Group; n.a., not appropriate; OCRA, Occupational Repetitive Actions index; ESI, Ergonomic Stress Index; SI, Strain Index; TLV, Threshold Limit Values; Leq, Equivalent Continuous Sound Level; LEP,d, daily personal noise exposure; OSHA, occupational safety and health administration; PM₁₀, particulate matter of 10 micrometers or less; PM_{2.5}, particulate matter of 10 micrometers or less

Classification of study designs (A codes) [26]

A1 RCT or Cluster RCT

Criteria:

- Random assignment of the study participants to intervention(s).
- Randomisation procedure should be mentioned in the methods section.

A2 Controlled Before-After study or Prospective Cohort Study

Criteria:

- Intervention and control group outcomes measured both before and after the intervention
- No randomisation procedure but deliberate assignment of the intervention to one group

A3 Time-series

Criteria:

- Intervention group only
- Outcome measurements at least three times before and three times after the intervention

A4 Before After comparison without a concurrent control group, quality of care studies, comparison with arbitrary controls

Criteria:

- Outcome measurements before and after the intervention only
- For patients it can be an after measurement only

Classification of the occupational health outcomes (B codes) [26]

B1 Exposure Intervention to remove/eliminate exposure

Criteria:

- Exposure measured (e.g. on skin or inside a mask, metabolites from urine, etc.)
- Real life work situation involved

- Exposure due to holes in gloves in health care situations would mean real exposure to viruses and would be accepted

B2 Behaviour Intervention to influence working behaviour

Criteria:

- Behavioural features measured
- Not: measurement of knowledge, attitude, satisfaction, well-being, perception or compliance only (that might lead to a change in behaviour)

B3 Occupational disease Intervention to influence the course of occupational disease or work-related symptoms or signs

Criteria:

- Measurement of occupational disease symptoms or signs or measures of health (GHQ)
- Occupational as defined by the authors or otherwise clear from context

B4 Disability Intervention to: prevent the course of occupational disability, maintain working ability, reduce sickness absence or increase return to work

Criteria

- Measurement of time to return to work, time spent off work or being on sick leave, score on a work ability scale, rate of being disabled, number of compensation claims

B5 Injuries Intervention to reduce injuries and occupational accidents

Criteria:

- Measurement of the rate of accidents or injuries related to work

Not: back injuries (=occupational disease if stated by the authors) or intermediate outcomes that may eventually lead to less injuries like improved skills or awareness

B6 Quality of OHS Intervention to increase the quality of occupational health services or the qualifications of occupational health professionals

Criteria:

- Measurement of quality of care by means of observations
- Measurement of quality of occupational health professionals by means of tests

Not: measurement of the quality of instruments or health care workers' compliance to vaccination schemes etc.

B7 Health promotion program Intervention to change life style

Criteria:

- Studies have measured weight loss, physical exercise, use of stairs, food intake, smoking, alcohol or drugs intake or any other indicator of health improvement at the work place; OR

- Studies have measured the physiological change resulting from behaviour change: BMI, blood lipids, blood pressure, blood glucose or nicotine levels, etc.

- No occupational outcomes have to be measured, but the studies have to be performed in workers or at the workplace.

Not: satisfaction, knowledge or attitude towards lifestyle changes

B8 Cost effectiveness Intervention with an additional analysis of the costs

- Always together with other B-codes

- Measurement and analysis or even just the estimation of the costs, cost effectiveness, cost-benefit or cost-utility of intervention(s)

- Only for the added user-friendliness of the COHF databases

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