UNIVERSITEIT GENT

FACULTEIT GENEESKUNDE EN GEZONDHEIDSWETENSCHAPPEN

WHEN AND HOW TO ASSESS WORK ABILITY AND FOR WHAT PURPOSE?

Part 1 : Pre-employment examinations

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Work ability

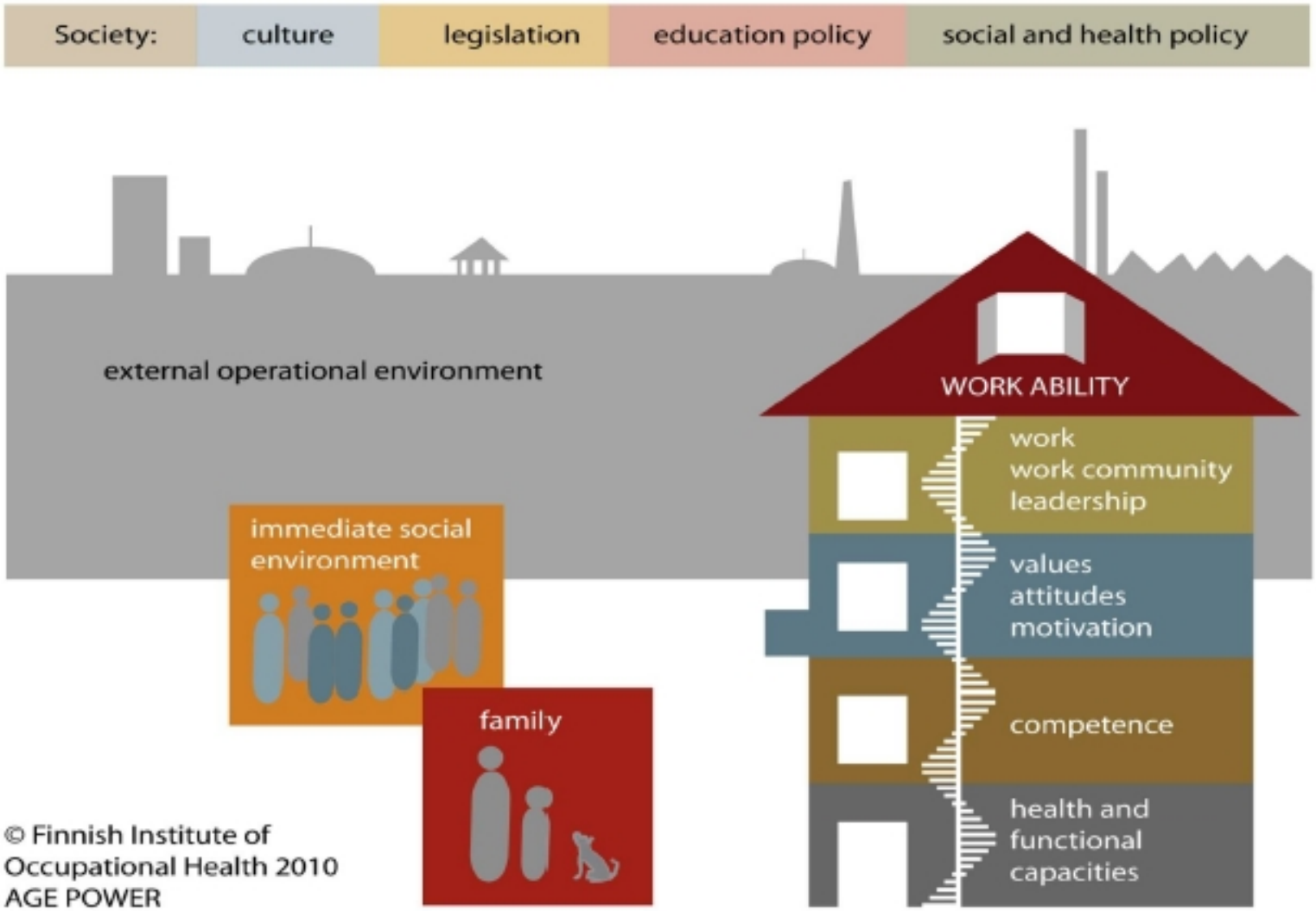
- Work ability was constructed and defined in 1981 in a follow-up study of aging Finnish employees

  "How good is the worker at present, in the near future, and how able is he or she to do his or her work with respect to the work demands, health and mental resources?"

  "Person's ability to cope in working life"

- Newer concept of work ability, emphasising that individual work ability is a process of human resources in relation to work (Ilmarinen, 2001)

Work ability house



Work ability

Human resources can be described by (1) health and functional capacities (physical, mental, social), (2) education and competence, (3) values and attitudes, and (4) motivation.

When this comprehensive set of individual factors is related to (5) work demands (physical, mental), (6) work community and management, and (7) work environment, the outcome can be called the individual work ability.

Work ability

- The work ability concept is a dynamic process that changes greatly for several reasons throughout an individual's work life.
  - One of the main factors inducing change is aging and its effects on human resources.
  - The other large source of change aging workers must face is the change in the nature of work.
- Measured by the work ability index (WAI)
  - A self-administered questionnaire, 7 items (total score between 7-49)
  - Developed by the Finnish Institute of Occupational Health

Fitness for work

- ***Definition***
  - The determination of whether the individual is fit to perform his or her tasks without risk to self or others (Cox 2000, Serra 2007)
  - Assessment of fitness for work is regulated by specific and general legislations in many countries

Fitness for work

- ***Several types***
  - At the beginning of the work relationship
  - After transfer of positions within employment
  - After the emergence of a health problem
  - At return to work after a period of sick leave
  - Periodically for hazardous, physically demanding or safety-sensitive jobs,…

Pre-employment examinations

- ***Background***
  - Many employers and other stakeholders believe that health examinations of applicants can prevent occupational diseases, injuries and sickness absence (Pachman 2009)

- ***Types***
  - Pre-employment (before the employment offer) vs pre-placement (after the employment offer)
  - General pre-employment examination vs a job-focused or task-specific examination

Pre-employment examinations

- ***Definition***
  - The assessment of a job applicant's capacity to work without risk to their own or others' health and safety (Cox 2000, Serra 2007)

Pre-employment examinations

- ***Different aims***
  - To protect workers in their employment from health and safety risks and prevent decline in health (impact of work on health)
  - To place workers in an occupational environment adapted to their physical, psychological and mental capacities (impact of health on work)
  - Health promotion : make workers aware of risks, their prevention, possible medical follow-up and improving their lifestyles
  - Economical considerations : to prevent an employer ‘s / social security’s potential financial losses (sickness absence, early retirement, permanent disability,…)

Pre-employment examinations

- ***Criteria***
  - Main factors that occupational physicians (OPs) take into account when assessing fitness for work (Serra 2007)
- ***5 Categories***
  - Health and safety risks
  - Determination of capacity
  - Ethical considerations
  - Legal requirements
  - Economical criteria

Pre-employment examinations

- ***Assessment tools***
  - Clinical interview
  - Occupational history taking
  - Physical examination
  - Health questionnaires and others such as the WAI
  - Diagnostic tests (chest X-ray, hematological tests,…)

Pre-employment examinations

- ***Health evaluation alone is not enough***
- ***The OP must have skills to identify the problem in its context correctly (Franco 2003)***
  - Therefore, OPs need detailed knowledge and clear information on work conditions and required health standards for the job
  - Medical findings obtained through standardized medical criteria and valid methodologies
  - Joint assessment of all factors to come to a decision - outcome

Pre-employment examinations

- ***Risk assessment and job analysis***
  - Risks of the job : exposures and accidents
    - chemical, physical, biological agents, ergonomic and psychosocial factors
    - own and others' safety
  - Functional job requirements and essential functions
    - physical eg to walk, climb, lift, reach, hear, see,…
    - mental eg read, calculate, work in team, take decisions, emotional demands,...

Pre-employment examinations

- ***Outcomes***
  - Fit – hire the applicant
  - Unfit – reject the applicant
  - Fit with conditions/restrictions, either temporary or permanent – hire and offer training and/or workplace adaptations

Pre-employment examinations

- ***No evidence base***
  - Few scientific evidence for effectiveness or efficiency but world wide application of such examinations (Serra 2007, Cochrane 2016)
  - They may be useful in specific job conditions with health risks (Hulshof 1999)
  - They should target specific occupational groups to increase their effectiveness (Braddick 1992, Whitaker and Aw 1995)

Cochrane Library

Cochrane Database of Systematic Reviews

Pre-employment examinations for preventing injury, disease and sick leave in workers (Review)

Schaafsma FG, Mahmud N, Reneman MF, Fassier JB, Jungbauer FHW

WILEY

Background

Many employers and other stakeholders believe that health examinations of job applicants prevent occupational diseases and sickness absence. This is an update of the original Cochrane review (Mahmud 2010).

Objectives

To evaluate the effectiveness of pre-employment examinations of job applicants in preventing occupational injury, disease and sick leave compared to no intervention or alternative interventions.

Search methods

We searched CENTRAL (the Cochrane Library), MEDLINE, EMBASE, CINAHL, PsycINFO and PEDro (up to 31 March 2015). We did not impose any restrictions on date, language or publication type.

Selection criteria

We included randomised controlled trials (RCTs), controlled before-after (CBA) studies, and interrupted time-series (ITS) studies of health examinations to prevent occupational diseases and injuries in job applicants in comparison to no intervention or alternative interventions.

Data collection and analysis

All five review authors independently selected studies from the updated search for inclusion. We retrieved two new studies with the updated search from 1 April 2008 to 31 March 2015, resulting in a total of eleven studies.

Authors' conclusions

There is very low quality evidence that a general examination for light duty work may not reduce the risk for sick leave, but may have a positive effect on fitness for duty for army recruits after 12 months follow-up.

There is inconsistent evidence of an effect of job-focused pre-employment examinations on the risk of musculoskeletal injuries in comparison with general or no pre-employment examination. There is very low quality evidence that incorporation of a bronchial challenge test may decrease occupational asthma compared to a general pre-employment examination with lung function tests. Pre-employment examinations may result in an increase of rejecting job applicants in six out of seven studies.

Risk mitigation based on the result of pre-employment examinations may be effective in reducing an increased risk for occupational injuries based on very low quality evidence. This evidence supports the current policy to restrict pre-employment examinations to only job-specific examinations. Better quality evaluation studies on pre-employment examinations are necessary, including the evaluation of the benefits of risk mitigation, given the effect on health and on the financial situation for those employees who do not pass the pre-employment examination.

Pre-employment examinations

- ***No evidence for a general pre-employment examination (Pachman 2009, Cochrane 2016)***
  - Non-hazardous jobs or jobs with low risk
  - Common mental and psychiatric disorders
  - Alcohol and drugs (ab)use

Pre-employment examinations

- ***Inconsistent or low evidence for a job-focused pre-employment examination (Cochrane 2016)***
  - 1) inconsistent evidence that focusing on the physical demands of particular work tasks lowers the risk of musculoskeletal injuries (compared to general or no pre-employment examination)
  - 2) low evidence that focusing on the risk of developing asthma lowers the risk

Pre-employment examinations

- ***Some evidence for specific risks and occupations***
  - Occupational asthma (Hulshof 1999, Wilken review 2012)
    - Pre-employment examinations identifies subjects who are at an increased risk for developing work-related allergic disease, but pre-employment screening is too low to be used as exclusion criterion
    - They provide an opportunity to inform workers about their increased risk and should encourage the uptake of preventive measures
    - Pre-employment results can be taken as baseline for targeted medical surveillance programmes

Pre-employment examinations

Wilken review 2012

TABLE 1 Recommendations

Recommendations	Strength of recommendation	Level of evidence
Questionnaire-based identification of all workers at risk of developing work-related asthma is recommended as basis for surveillance	Strong	High
Pre-placement screening for specific cross-reacting, work-associated sensitisation among potentially HMW allergen-exposed subjects is recommended in order to identify those at higher risk for work-related asthma	Strong	Moderate
Detection of sensitisation either by specific IgE or SPT should be included in surveillance (not only pre-placement) for identification of subjects at risk of work-related asthma with foreseeable regular exposure to HMW agents (such as laboratory animals, bakery dust, enzymes or latex)	Strong	Moderate
In atopics and subjects with pre-existing asthma or sensitisation, pre-employment investigation should be performed in order to inform them about their increased work-related asthma risk	Weak	Moderate
Because of the low PPV, exclusion of asymptomatic atopics or sensitised subjects from exposure to potential occupational allergens or irritant agents cannot be recommended		

Pre-employment examinations

- ***Some evidence for specific risks and occupations***
  - Pre-employment examination of low back pain risk in workers exposed to manual handling of loads: French guidelines (Petit 2016)
    - LBP is common, with a multifactorial origin, brief and recurrent episodes with spontaneously favourable outcome
    - Medical contraindications alone should not exclude employment on the basis of a previous history of “simple” nonspecific LBP
    - Evaluate a history of “severe” LBP (history, frequency, duration, treatment, consequences), comorbidities and job history
    - No value of investigation of asymptomatic spinal deformity (eg lordosis) and lack of predictive value of imaging on future LBP

Pre-employment examinations

- ***Some evidence for specific risks and occupations (Pachman 2009, Cochrane 2016)***
  - Firemen
  - Pilots
  - Professional drivers
  - Army

Pre-employment examinations

- ***Positive aspects***
  - Get to know the occupational physician and OH service - building trust
  - Collect “basal” data and values
  - Prevention of an occupational disease or injury and of further health deterioration

Pre-employment examinations

- ***Negative aspects***
  - Yielding of findings that are very common and not relevant
  - A major question is whether a medical examination can predict health risks and healthy functioning in the future
  - Diversion of resources from efforts that might be beneficial to health outcomes, as well as unnecessary expenses
  - Delay of or denial of employment with negative effect on health and financial situation of the candidate

Pre-employment examinations

- ***Ethical aspects***
  - Discrimination
    1) the disabled (legal definitions);
    2) the non-disabled candidates but with a chronic disease;
    3) racial discrimination

    Equity needs to be guaranteed by performing similar assessments on all candidates applying for the same job

  - Respect for individual worker confidentiality : no divulging of specific medical diagnosis by physicians to third parties

Pre-employment examinations

- ***Ethical aspects***
  - Workers have the right to be protected from unnecessary examination and testing
  - Right to appeal in case of disagreement (not possible in every country eg. Belgium)
  - The doctor's loyalty : always to the worker (patient) or also to the employer and State
  - Selection of workers based on "absence of illness" rather than "fitness for work" : economic consideration

Pre-employment examinations

- ***Future***
  - Need for more and better studies that evaluate the effectiveness and efficiency of pre-employment examinations
  - Development of some consensus regarding best practices and criteria eg Dutch guideline, 2005

Pre-employment examinations

- ***Dutch guideline , Ministry of Social Affairs and Employment (2005)***
  - STEP 1 : Give information to the employer about the purpose, criteria and procedure concerning the pre-employment examination
  - STEP 2: Inventory of specific job requirements • employer completes the form and returns it to the OH service
  - STEP 3: Establish specific job requirements • OH service assesses the form and • if there is no specific job requirements, no pre-employment examination • if there are indeed special job requirements > to step 4

Pre-employment examinations

- STEP 4 : Establishing content of pre-employment examination - OH service sets specific job load requirements and corresponding tests/examination methods
- STEP 5 : Implementing pre-employment examination • employer informs in advance the worker • OH service invites the worker • OP carries out pre-employment examination
- STEP 6: OP evaluates test/examination results and comes to a decision
- STEP 7: Information about test results • OH service informs examinee and after his consent the employer of the results • The test data are processed

Pre-employment examinations

- ***Dutch guideline , Ministry of Social Affairs and Employment (2005)***
  - Instruments : List of 19 specific job requirements :

    information sheets including criteria for specific job requirements, potential health and / or safety risks, potential measures for the reduction of health and / or security risks, special job load requirements, medical questions and examination methods.

Pre-employment examinations

1. LOPEN	
Criteria bijzondere functie-eis:	▶ in totaal gemiddeld meer dan 6 uur per dag lopen tijdens het werk of gemiddeld >1 uur per dag in totaal over zwaar terrein
Potentiële gezond-heidsrisico's:	▶ lage rugklachten, artrose knie, artrose heup, heupklachten: mate van bewijs onvoldoende
Potentiële maatregelen voor reductie van gezondheidsrisico van bijzondere functie-eis:	*Organisatie:* ▶ taakroulatie ter verkorting van de duur van het lopen ▶ organisatorische aanpassing van het arbeidsproces waardoor het lopen wordt voorkómen of de loopduur wordt verminderd *Techniek:* ▶ gebruik van horizontale transportmiddelen voor personen
Bijzondere belastbaarheidseisen	▶ geen klachten bij het lopen en geen ernstige functionele beperkingen van de onderste ledematen ▶ een normale cardiorespiratoire belastbaarheid ▶ geen ernstige cardiale beperkingen zoals: - decompensatio cordis vanaf NYHA-klasse 2 (= geen klachten in rust, maar normale fysieke activiteit resulteert in vermoeidheid, hartkloppingen, dyspnoe of angineuze pijn) - angina pectoris vanaf NYHA-klasse 3 (= klachten bij normale dagelijkse activiteiten) - ernstige ritmestoornissen ▶ geen perifeer arterieel vaatlijden (PAV, claudicatio intermittens) vanaf stadium II (= bij inspanning ontstaat ischemie van de benen)

Onderzoeksvragen	Heeft u in de afgelopen 12 maanden klachten gehad van: ▶ pijn of bewegingsbeperking van de onderste ledematen (heupen, bovenbenen, knieën, onderbenen, enkels, voeten)? *nee / ja* ▶ pijn bij het lopen? *nee / ja* ▶ kortademigheid bij inspanning? *nee / ja* ▶ pijn op de borst bij inspanning? *nee / ja* ▶ onregelmatige hartwerking? *nee / ja* Bent u in de afgelopen 5 jaar behandeld voor: ▶ klachten van de onderste ledematen? *nee / ja* ▶ ademhalingsproblemen? *nee / ja* ▶ hartklachten, ziekten van hart- en bloedvaten of hoge bloeddruk? *nee / ja* Rookt u? *nee / ja* Zo ja, hoeveel per dag? Doet u in uw vrije tijd aan sportbeoefening? *nee / ja*
Onderzoeksmethoden [12, 17, 18]	Lichamelijk en overig onderzoek: op indicatie, dit kan onder meer bestaan uit: ▶ inspectie van onderbenen, voet en tenen ▶ palpatie van arteriële pulsaties: a. femoralis, a. tibialis posterior en a. dorsalis pedis (vooral een niet-palpabele a. tibialis posterior duidt vaak op PAV (sensitiviteit 71%, specificiteit 91%, voorspellende waarde van positieve uitslag 49%, voorspellende waarde van negatieve uitslag 96%) ▶ beoordeling van de huidtemperatuur ▶ onderzoek van de gewrichtsfuncties van knie, enkel en voet

Case EMUTOM Pre-employment examination

- **DO YOU AGREE OR NOT?**
  - Vanessa Smith, 30 years, is applying for the position of firefighter.
    The procedure is going well. Finally, she has to go to the OP for a pre-employment medical examination.
  - She fills in some forms with questions about her medical history. She fills in that she suffers from asthma. Despite her asthma, she has participated in top -level regattas.
    Then a biometric examination is conducted by the medical assistant.
    Her physical condition is determined using a cycle ergometer.
  - The OP discusses the questionnaires and the results of the medical investigations with Vanessa. He explains to her that due to her asthma complaints, especially occurring in contact with irritants, she is not medically fit to take part in firefighting operations.
  - Together they reach the conclusion that the work in fire service is not suitable for Vanessa.

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Preventive medical examinations of workers

Kenniscentrum Medische Keuringen in Arbeid

Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde nvab

Leidraad

Preventief medisch onderzoek van werkenden

Juni 2013

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Preventive medical examinations of workers

- Dutch Guideline (first edition in 2005)
- Aim : assess medical fitness for the job, in the mindset of sustainable employability
- Differs from the legal mandatory health surveillance and general population screening, but it can be compared with a pre-employment examination
- The OP is the initiator and main performer in the PME process

Preventive medical examinations of workers

- Definition
  - A medical examination which is offered to a worker without a specific health complaint or an indication of a health risk or malfunction.
  - The PME 's goal is to recognize a risk or problem at an early stage, to prevent or to treat or to offer the worker another solution.
  - PME of workers comprises the voluntary medical examination of workers, the discussion with the employee of the results, and providing advice and carrying out or referral for intervention.
  - PMO can lead to a feedback at group level to the company.

Preventive medical examinations of workers

- Phase 1 Preparation
  - Step 1 take the initiative : PMO agenda setting in the company
  - Step 2 choose the goals and draw up plan
  - Step 3 establish budget and make decision
  - Step 4 drawing project
  - Step 5 information of the workers

Preventive medical examinations of workers

- Phase 2 Implementation
  - Step 6 invite employees
  - Step 7 carry out medical examination (questionnaire, screening, additional diagnostics)
  - Step 8 individual feedback and individual targeted interventions
  - Step 9 analysis at group level, group reporting and group interventions
- Phase 3 Evaluation and follow-up
  - Step 10 evaluation of process and follow-up plans

Main References

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