Evaluation designs for work disability prevention interventions

Kerstin Ekberg
Dept. of Medicine and Health
National Centre for Work and Rehabilitation
Linköping University

kerstin.ekberg@liu.se

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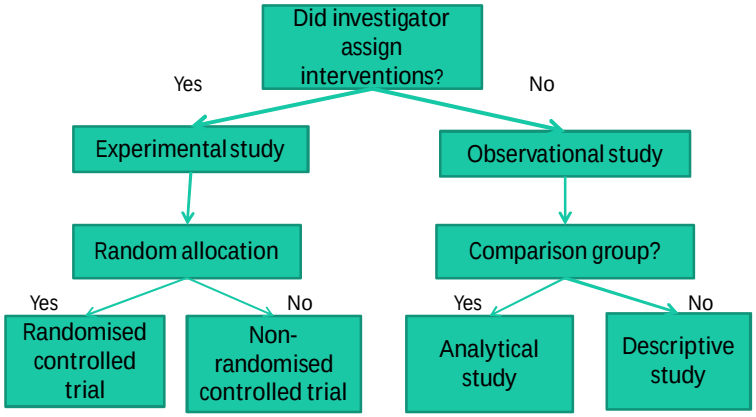
Learning objectives

- To understand advantages and drawbacks with different study designs in quantitative research

Classification of types of quantitative studies

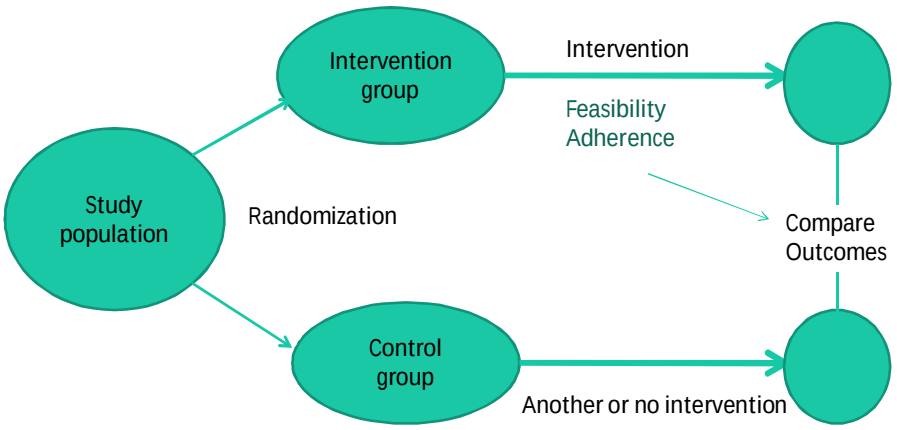


(Gerhardus, Schultz 2002)

Before doing the study

- Define the intervention before performing the study
  - What is the program expected to contribute compared to other programmes?
- Define primary and secondary outcomes or relevant outcome metrics before performing the study
  - What is a good measure of RTW?
- Identify possible confounders (factors associated with both intervention and outcome)
  - Individual, contextual
- Define eligibility criteria (criteria for inclusion & exclusion)
- Follow-up time

Randomized controlled trial



Etiology - Feasibility

- Etiology: Did the pill have the desired effect?
- Feasibility: Did the patient take the intended pill?

Feasibility - Adherence is seldom reported

the obedience of the subject to the advice

Pamphlet group	Information package group	CBT group
Advice about how to cope with back pain	Information packet once a week for 6 weeks, lifting advice, etc.	6-session structured program
Adherence:		
83% hade read the material Test indicated 36% had read it	72% had read the material Test indicated 36% had read it	13% one session 72% 4-6 sessions 53% 5-6 sessions

(Linton & Andersson, Spine 2000;25:2825-2831)

Randomized controlled studies

- Advantages
  - Internal validity high – you know the intervention characteristics
  - Precludes selection bias (intervention and control group are comparable)
  - Eliminates confounding bias if study groups are large enough (power calculation)
  - Useful for examination of small and moderate effects
- Drawbacks
  - External validity low – applicability to other patients low
  - Cannot always be used
  - May be expensive

Exampel: Coordinated and Tailored Work Rehabilitation: A Randomized Controlled Trial

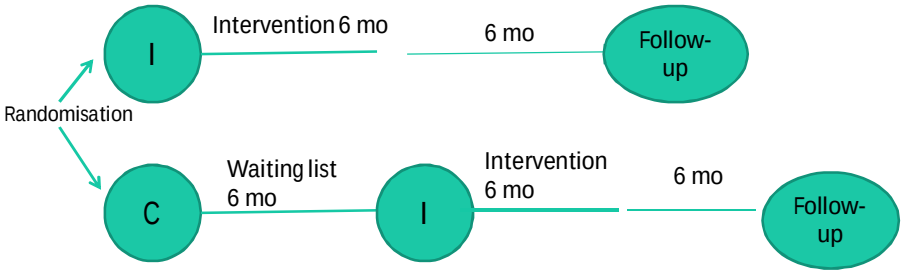
(Bültmann et al. 2009)

Workers on sick leave due to MSDs for 4-12 weeks

- Intervention: Multidisciplinary, coordinated and tailored intervention:
  - Screening by multidisciplinary team, identification of barriers for RTW
  - Collaborative development of rehabilitation plan, using feedback-guided approach
  - Periodically adjustment of intervention, feedback, flexibility
  - Intervention 3 months

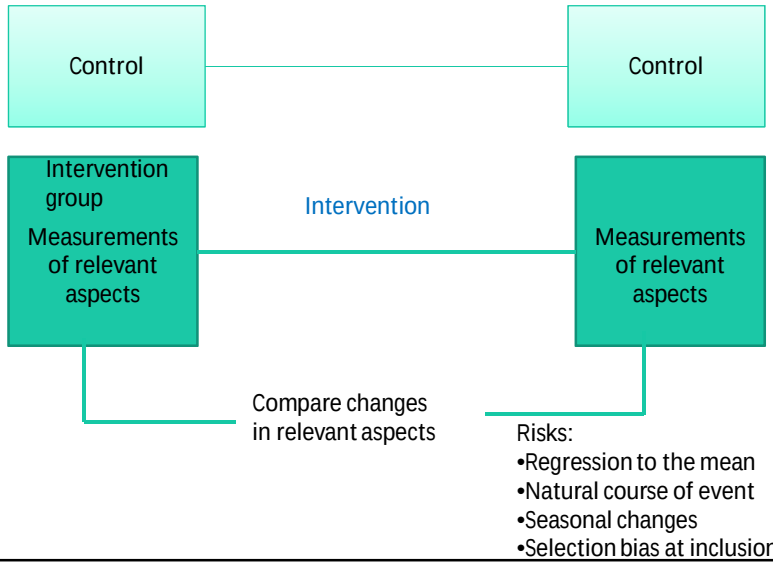
Example (Perski & Grossi 2004)

- 80 patients with diagnosed mental disorders
- Randomly assigned to treatment, 6 mo, and controls; waiting list – intervention
- Intervention according to a structured program
- Outcome: Time until RTW, self-rated health



Quasi-experimental studies

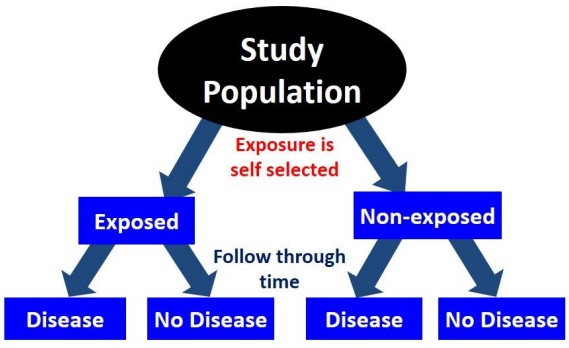
Before-after studies and studies with or without control group



Observational studies

Cohort studies
Case-control studies
Cross-sectional studies

Cohort Studies



The groups should be as equal as possible in relevant aspects, but one is not exposed for the intervention

Cohort studies

- Need a clear, unambiguous definition of the intervention (exposure)
  - sometimes by degree, resulting in more than one intervention group
- The comparison group should be similar to the intervention group in important respects – e,g, use propensity scores to identify matched subgroups
- Identification of outcome should be similar in the groups
- Minimize losses, or track them

Cohort studies -Track people forward in time from intervention, to outcome

- Advantages
  - Low risk for recall bias (prospective, follows the subjects)
  - Best way to ascertain the natural course of event
  - Possible to study multiple outcomes: predetermined primary and secondary outcomes
  - Enables calculation of incidence rates, relative risks, survival curves, hazard ratios.
- Drawbacks
  - Inefficient for rare events
  - May be expensive
  - Selection bias (groups not comparable)
  - Loss to follow-up – differential losses (bail-outs are not random events)

What to look for in observational studies

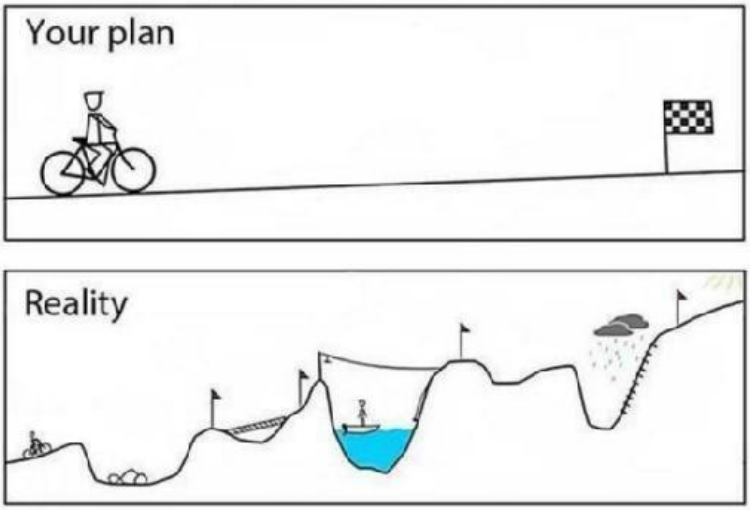
- Is selection bias present? (are groups comparable)
- Is information bias present? (incorrect determination of intervention, outcome, or both, is information gathered differently for different groups)
- Is confounding present? (are associations due to a third factor)
- If the results cannot be explained by these three biases, could they be the result of chance? (Criteria for causality, e.g. temporality, consistency, strenght of association, etc)
- If the result still cannot be explained away, then (and only then) might the findings be real and worthy of note.

Grimes & Schultz, Lancet 2002;359:248-52.

Efficay-Effectiveness-Efficiency

- Efficacy – Did the intervention work?
  - Based on RCT studies
  - Internal validity high
  - Good efficacy in a program may lead to that the program will be applied to people who were excluded in the RCT-study – i.e. effectiveness may be low
- Effectiveness – Did the intervention work in real life in non-ideal circumstances?
  - Based on observational studies, quantitative or qualitative, or real practice
  - External validity high
- Efficiency – Is the intervention worth its cost?
  - Cost-effectiveness, etc.
  - Basis for prioritizing in e.g. health care

Research



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