Evidence-based practice of practice-based evidence?

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Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

Gordon C S Smith, Jill P Pell

Abstract

Objectives To determine whether parachutes are effective in preventing major trauma related to gravitational challenge.
Design Systematic review of randomised controlled trials.
Data sources: Medline, Web of Science, Embase, and the Cochrane Library databases; appropriate internet sites and citation lists.
Study selection: Studies showing the effects of using a parachute during free fall.
Main outcome measure Death or major trauma, defined as an injury severity score > 15.
Results We were unable to identify any randomised controlled trials of parachute intervention.
Conclusions As with many interventions intended to prevent ill health, the effectiveness of parachutes has not been subjected to rigorous evaluation by using randomised controlled trials. Advocates of evidence based medicine have criticised the adoption of interventions evaluated by using only observational data. We think that everyone might benefit if the most radical protagonists of evidence based medicine organised and participated in a double blind, randomised, placebo controlled, crossover trial of the parachute.

Introduction

The parachute is used in recreational, voluntary sector, and military settings to reduce the risk of orthopaedic, head, and soft tissue injury after gravitational challenge, typically in the context of jumping from an aircraft. The perception that parachutes are a successful intervention is based largely on anecdotal evidence. Observational data have shown that their use is associated with morbidity and mortality, due to both failure of the intervention[1 2] and iatrogenic complications.[3] In addition, "natural history" studies of free fall indicate that failure to take or deploy a parachute does not inevitably result in an adverse outcome.[4] We therefore undertook a systematic review of randomised controlled trials of parachutes.

Methods

Literature search
We conducted the review in accordance with the QUOROM (quality of reporting of meta-analyses) guidelines.[5] We searched for randomised controlled trials of parachute use on Medline, Web of Science, Embase, the Cochrane Library, appropriate internet sites, and citation lists. Search words employed were "parachute" and "trial." We imposed no language restriction and included any studies that entailed jumping from a height greater than 100 metres. The accepted intervention was a fabric device, secured by strings to a harness worn by the participant and released (either automatically or manually) during free fall with the purpose of limiting the rate of descent. We excluded studies that had no control group.

Definition of outcomes
The major outcomes studied were death or major trauma, defined as an injury severity score greater than 15.[6]

Meta-analysis
Our statistical approach was to assess outcomes in parachute and control groups by odds ratios and quantified the precision of estimates by 95% confidence intervals. We chose the Mantel-Haenszel test to assess heterogeneity, and sensitivity and subgroup analyses and fixed effects weighted regression techniques to explore causes of heterogeneity. We selected a funnel plot to assess publication bias visually and Egger's and Begg's tests to test it quantitatively. Stata software, version 7.0, was the tool for all statistical analyses.

Results

Our search strategy did not find any randomised controlled trials of the parachute.

Discussion

Evidence based pride and observational prejudice
It is a truth universally acknowledged that a medical intervention justified by observational data must be in want of verification through a randomised controlled

Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials

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Vraagstelling

Zijn parachutes effectief in het voorkomen van zware lichamelijke aandoeningen, gerelateerd aan de strijd met de zwaartekracht?

Gordon C S Smith, Jill P Pell (2003) **Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials. BMJ,** 327:1459–61.

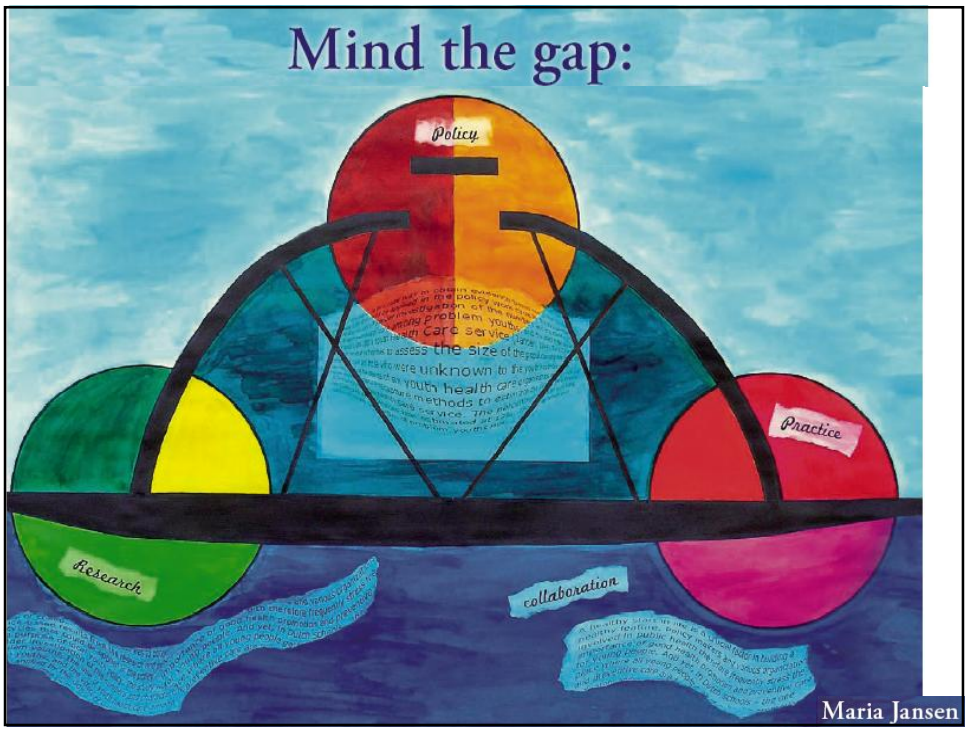
Methoden

- **Design** Systematische review van randomised controlled Trials (RCTs).
- **Databronnen:** Medline, Web of Science, Embase, Cochrane Library databases;
- **Studie selectie:** Studies die de effecten aantonen van het gebruik van een parachute gedurende een vrije val.
- **Uitkomstmaten:** Dood of ernstige verwondingen

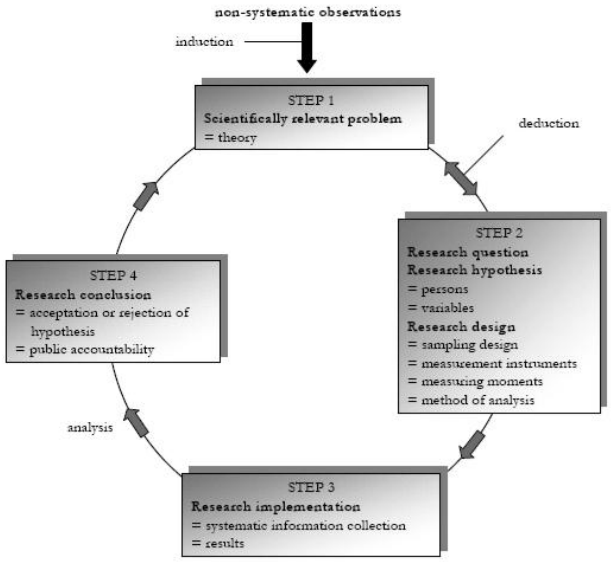
Resultaten en conclusie

- Er zijn geen gerandomiseerde gecontroleerde studies uitgevoerd naar de effectiviteit van deze interventie
- De basis voor het gebruik van parachutes in uitsluitend observationeel en de schijnbare effectiviteit van de interventie kan het gevolg zijn van een ‘healthy cohort’ effect
- Mensen die blijven hangen aan het idee dat alle interventies in de praktijk moeten zijn onderworpen aan de hoogste eisen van ‘evidence-based practice’ zullen dan ook niet twijfelen om zich aan te melden voor een dubbelblind gerandomiseerd vervolgexperiment.

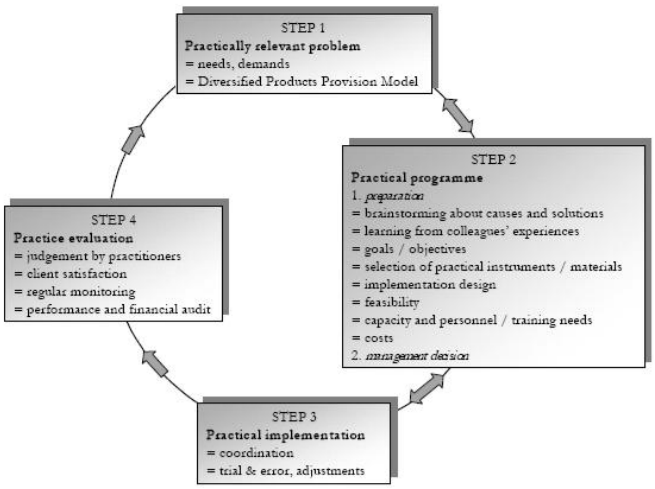
Smith & Pell, 2003. BMJ



Onderzoek



Praktijk



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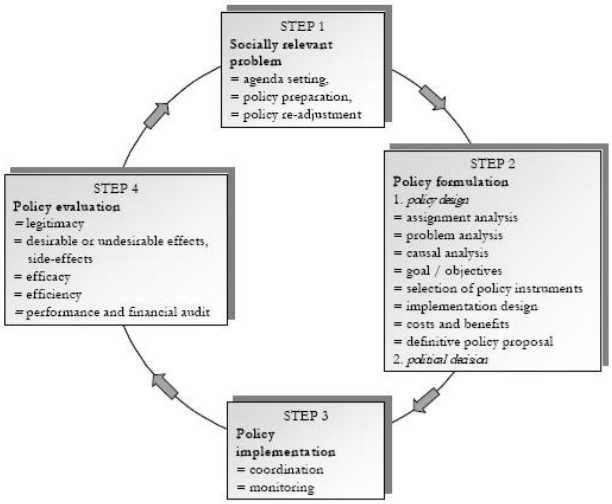

	POLICY	PRACTICE	RESEARCH
STEP 1 PROBLEM			
1. relevance	socially relevant problem, i.e., solving social problems	practically relevant problem, i.e. corresponding to the public's or client's requests or needs due to problems that are modifiable and tractable	scientifically relevant problem, i.e. explaining problems and adding to the body of knowledge
2. agenda setting	influence on agenda setting	limited influence on agenda setting	very limited influence on agenda setting
3. social status	bureaucratic status	intermediate social status	high social status
STEP 2 FORMULATION			
4. political influence	influence of political elite on policy formulation	sometimes indirect influence on policy formulation	usually no influence on policy formulation

	Policy	Practice	Research
STEP 2 Formulation			
5. interconnections and expectations	insufficient transparency of final goals and interconnections with research and practice cycles	insufficient transparency of final goals and interconnections with research and policy cycles	insufficient transparency of final goals and interconnections with policy and practice cycles
6. evidence	policy-based evidence: legitimacy, acceptability, visibility, immediacy, political salience	practice-based evidence: profitability, applicability, feasibility	evidence-based research: rationality, empirical validity, logical precision
7. legitimate actions	environmental approach, social, physical, economic	focus on individual behavioural approach	insufficient focus on environmental approach
8. value of theory and practice	theories are partly relevant; practical implementation is relevant	theories are irrelevant; practical implementation is relevant	theories are relevant; practical implementation is partly relevant
9. work attitude	work attitude of administrative control and opportunism; some creativity involved	firm, action-directed work attitude; 'quick and dirty'; creativity involved	cautious work attitude; detailed and time-consuming; creativity involved

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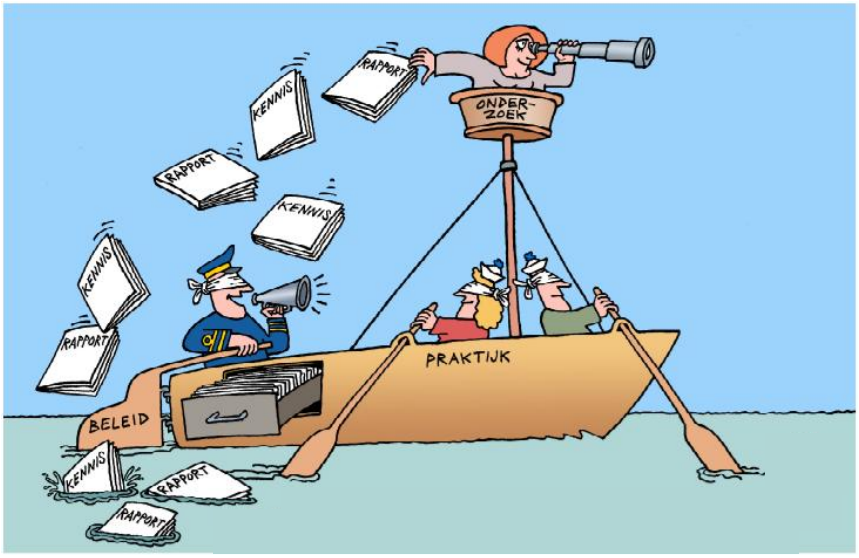

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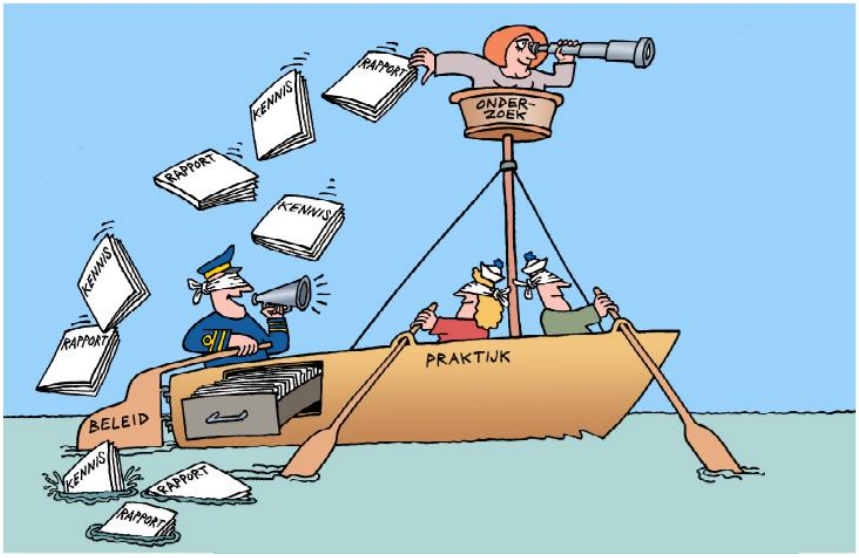
Evidence-based practice versus practice-based evidence

Vragen

- Zit er een spanning tussen evidence- en practice-based?
- Welk belang hecht het veld aan bewijskracht en hoe maak je evidence-based interventies zichtbaar?
- Welke uitdagingen liggen er in dit kader voor de wetenschap/ het veld/ NISB?

Forum

- Djoeke van Dalen (CGL)
- Marijn Aalders (Big!Move)
- Marian ter Haar (NISB)
- Lenneke Vaandrager (WUR)



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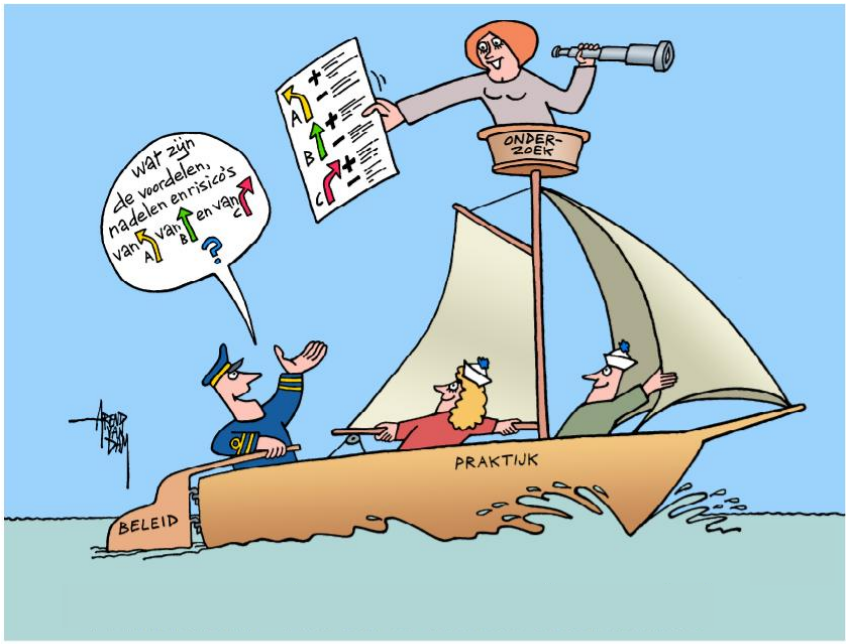

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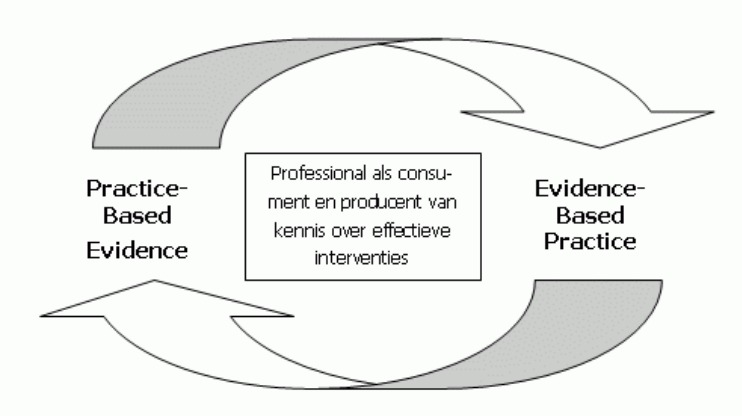

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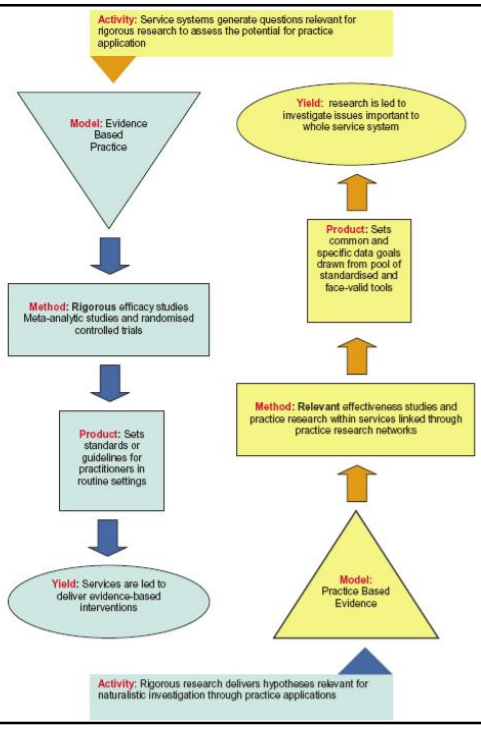

Barkham & Mellor-Clark (2003). Bridging evidence-based practice and practice-based evidence.