Finding and using Evidence-Based health literature

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Liaison Librarian

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This talk will cover...

- Understanding evidence-based practice & literature
- Levels and types of evidence (e.g. Joanna Briggs criteria)
- Formulating a research question using PICO (and PICo)
- Using PICO to formulate search strategy
- Choice of databases
- Searching strategies
- Evaluating results
- This presentation can be found on the Home tab of this guide

http://libguides.usc.edu.au/nursing
Where do I find...?

Books, videos – use the library catalogue via DISCOVER on the Library Homepage

Journal Articles – use databases (via Libguides)

(Why? The journals we have are listed in the catalogue, but not the articles in them—use the databases to find articles in the journals)

USC Library’s DISCOVER tool will find many articles, but you need to learn to use the source databases behind it. These nursing and health databases make it easier to search for the articles you need.
Finding articles: Some key databases

- CINAHL (via EBSCO) [some full-text, links to others]
- PubMed (=Medline) [links to full-text]
- Emcare (via Ovid)
- JBI EBP Database
- Cochrane Library
- ...and more here:
  https://libguides.usc.edu.au/healthdatabases

these databases find articles from our full-text suppliers
One type of Hierarchy of Evidence (there are several)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Methodology</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Systematic review, meta-analysis</td>
<td>Systematic review: review of a body of data that uses explicit methods to locate primary studies, and explicit criteria to assess their quality. Meta-analysis: systematic review that uses statistical methods to combine data, and analyse and summarise the results of the studies included.</td>
<td>Cochrane Collaboration</td>
</tr>
<tr>
<td>2</td>
<td>Randomised controlled trials (RCT)</td>
<td>Experiment in which individuals are randomly allocated to either a control group or a group that receives a specific intervention. Randomisation reduces the likelihood of bias. The strength of evidence is considerably boosted by the presence of at least one properly designed RCT of appropriate size.</td>
<td>Articles published in peer-reviewed research journals</td>
</tr>
<tr>
<td>3</td>
<td>Cohort study</td>
<td>Evidence from well-designed trials without randomisation. Cohort study: observational study in which a defined group of people (the cohort) is followed over time. The people are selected on the basis of their exposure to a particular agent and followed up later for specific outcomes.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Case–control studies</td>
<td>Evidence from well designed trials without randomisation. Case–control study: study that compares people in two groups with and without a specific condition or disease, all taken from the same population. Usually analysed retrospectively.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cross-sectional survey</td>
<td>Survey or interview of a sample of the population to measure the distribution of interest at a particular point in time</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Case-report</td>
<td>A report based on a single patient or subject</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Expert opinion</td>
<td>Consensus of experience and opinions from respected authorities, based on clinical evidence, descriptive studies or reports from committees.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Anecdotal</td>
<td>Informal account of evidence in the form of an anecdote or hearsay, e.g., “My granny says the best treatment is to rub it with onions”. The term “anecdotal evidence” is often used in contrast to “scientific evidence”. Anecdotal evidence focuses on experience rather than more formal scientific evidence.</td>
<td>Source of informal verbal communication</td>
</tr>
</tbody>
</table>

An Evidence Pyramid- to visualize the hierarchy

The above image is based on the EBM Page Generator (2006) from Dartmouth College and Yale University and the Coursera MOOC "Understanding Clinical Research: Behind the Statistics" (2016).
The following eight slides show one example from each of the 8 levels noted on the last slide...from highest level to lowest, and a note on where they were found. Note especially: all examples from 1-7 are from peer-reviewed journals, but the *quality of evidence* declines as the evidence level number rises!
Exercise for osteoarthritis of the knee

Malene Freisen¹, Sara McConnell²

¹Faculty of Health Sciences, University of Sydney, Sydney, Australia. ²Department of Medicine, St Joseph’s Health Care Centre, Toronto, Canada

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Cochrane Database of Systematic Reviews, Issue 3, 2009. [Status in this issue: Edited]
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DOI: 10.1002/14651858.CD004376.pub2


Abstract

Background
Biomechanical factors, such as reduced muscle strength and joint malalignment, have an important role in the initiation and progression of knee osteoarthritis (OA). Currently, there is no known cure for OA; however, disease-related factors, such as impaired muscle function and reduced fitness, are potentially amenable to therapeutic exercise.

Objectives
To determine whether land-based therapeutic exercise is beneficial for people with knee OA in terms of reduced joint pain or improved physical function.

Search strategy

Next:
Systematic review – review of a body of data that uses stated methods to locate primary studies and stated criteria to assess their quality

Meta-analysis – systematic review that uses statistical methods to combine data and analyse and summarise the results
RCT- Randomized controlled trial

ORIGINAL RESEARCH: CLINICAL TRIAL

Is it possible to strengthen psychiatric nursing staff's clinical supervision? RCT of a meta-supervision intervention

Henrik Gongs & Niels Buus

Accepted for publication 19 September 2014

Correspondence to H. Gongs: e-mail: henrik@gongs.dk

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Niels Buus MScN PhD RN Associate Professor Health, Man and Society Institute of Public Health, University of Southern Denmark, Odense, Denmark


Abstract

Aim. To test the effects of a meta-supervision intervention in terms of participation, effectiveness and benefits of clinical supervision of psychiatric nursing staff.

Background. Clinical supervision is regarded as a central component in developing mental health nursing practices, but the evidence supporting positive outcomes of clinical supervision in psychiatric nursing is not convincing.

Design. The study was designed as a randomized controlled trial. All permanently employed nursing staff members at three general psychiatric wards at a Danish university hospital (n = 83) were allocated to either an intervention
**RCT**: Individuals are randomly allocated either to a control group, or a group that receives a specific intervention.

- Randomisation reduces the likelihood of bias.
- These are regarded as the “gold standard” in research evidence, but are difficult or impossible to conduct in many practical clinical settings; technically and ethically.
- **We will often have to accept “lower” grades of evidence in real life when there are no RCTs available to assist with a clinical decision**.
- *This is a crucial factor in assessing much nursing evidence*
Mortality after surgery in Europe: a 7 day cohort study

Rupert M Pearse, Rui P Moreno, Peter Bauer, Paolo Pelosi, Philipp Metnitz, Claudia Spies, Benoit Vallet, Jean-Louis Vincent, Andreas Hoeft, Andrew Rhodes, for the European Surgical Outcomes Study (EuSOS) group for the Trials groups of the European Society of Intensive Care Medicine and the European Society of Anaesthesiology

Summary
Background Clinical outcomes after major surgery are poorly described at the national level. Evidence of heterogeneity between hospitals and health-care systems suggests potential to improve care for patients but this potential remains unconfirmed. The European Surgical Outcomes Study was an international study designed to assess outcomes after non-cardiac surgery in Europe.

Methods We did this 7 day cohort study between April 4 and April 11, 2011. We collected data describing consecutive patients aged 16 years and older undergoing inpatient non-cardiac surgery in 498 hospitals across 28 European nations. Patients were followed up for a maximum of 60 days. The primary endpoint was in-hospital mortality. Secondary outcome measures were duration of hospital stay and admission to critical care. We used χ² and Fisher’s exact tests to compare categorical variables and the t test or the Mann-Whitney U test to compare continuous variables. Significance was set at p<0·05. We constructed multilevel logistic regression models to adjust for the differences in mortality rates between countries.
Cohort study – observational study where a group of people is followed over time. Selected for their exposure then followed up later for specific outcomes.
Effect of *T’ai Chi Chuan* Training on Cardiovascular Risk Factors in Dyslipidemic Patients

Ching Lan, M.D.,¹ Ta-Chen Su, M.D., Ph.D.,² Ssu-Yuan Chen, M.D., Ph.D.,¹ and Jin-Shin Lai, M.D.¹

Abstract

**Objective:** *T’ai chi chuan* (TCC) is a traditional Chinese exercise and is beneficial for health. Nevertheless, its effect on cardiovascular risk factors in dyslipidemic patients is not clear. The aim of this study was to evaluate the effect of TCC training on coronary heart disease (CHD) risk factors in patients with dyslipidemia.

**Design:** This was designed as a case-controlled study.

**Setting:** The study was conducted in a community setting.

**Subjects:** Fifty-three (53) patients (males: 24; females: 29) with dyslipidemia completed this study.

**Interventions:** The TCC group included 28 patients who participated in a 12-month *yang* TCC training program. The usual-care group included 25 patients who maintained a sedentary lifestyle during this study.

**Outcome measures:** Exercise testing was conducted at baseline and after 1 year of training. Body composition, lipid profile, fasting glucose and insulin levels, and inflammatory markers were also measured before and after training.

**Results:** After training, the TCC group showed an increase in VO₂ from 25.2 ± 12 to 27.4 ± 11.
Case-control study – evidence from well designed trials without randomisation

Compares 2 groups with and without a particular condition, from the same population. Usually analysed retrospectively.
What factors are associated with physical activity in older people, assessed objectively by accelerometry?

T J Harris,¹ ² C G Owen,¹ C R Victor,³ R Adams,² D G Cook¹

ABSTRACT

Objectives: To assess physical activity (PA) levels measured objectively using accelerometers in community-dwelling older people and to examine the associations with health, disability, anthropometric measures and psychosocial factors.

Design: Cross-sectional survey.

Setting: Single general practice (primary care centre), United Kingdom.

Participants: Random selection of 560 community-dwelling older people at least 65 years old, registered with the practice. 43% (236/560) participated.

Assessment of risk factors: Participants completed a questionnaire assessing health, disability, psychosocial factors and PA levels; underwent anthropometric assessment; and wore an accelerometer (Actigraph) for 7 days.

Main outcome measures: Average daily accelerometer

if strolling, 2 mph, moderate-intensity if faster) remains important for maintaining activities.¹ Factors associated with decreased PA levels in older people include: increasing age; female gender; obesity; medical problems; disability; pain; depression; smoking; reduced education; social isolation; low exercise self-efficacy; attitudinal barriers; bad weather; and unsafe neighbourhoods.⁵-⁷ These findings are from self-reported activity; however, the predominant activity, walking, is unreliably recalled.⁸ Questionnaires also suffer from recall bias and floor effects, with the baseline too high for most respondents.⁹ Motion sensors (pedometers and accelerometers) are sensitive to walking, objectively quantify PA as a continuous variable and are unrestricted by floor values.⁸ ⁹ Pedometers are cheap and easy to wear; they measure step-count but not intensity and therefore...
Cross sectional survey – measures the distribution across a population sample of a phenomenon at a particular point in time
Pulmonary haemorrhage associated with negative-pressure pulmonary oedema: a case report

Clinical record
A 53-year-old man underwent general anaesthesia for left total knee replacement. He had a history of depression and psoriasis, and was taking low-dose methotrexate long term. Preoperative physical examination and laboratory investigations gave normal results.

After induction of anaesthesia with propofol, rocuronium was administered for muscle relaxation; tracheal intubation was uneventful. The patient remained haemodynamically stable during surgery, and was moved to the recovery area and extubated. Within a few minutes of extubation, he developed a vigorous cough, followed by laryngospasm, hypoxia and hypertension. A laryngeal mask airway was inserted, aided by propofol (20 mg) administered intravenously. However, despite a patent airway, hypoxia persisted.

ABSTRACT
Negative-pressure pulmonary oedema caused by upper airway obstruction after tracheal extubation is well recognised, but extensive pulmonary haemorrhage is rare. We report a case of post-extubation, laryngospasm-induced pulmonary oedema with associated pulmonary haemorrhage. The patient required mechanical ventilation with high positive end-expiratory pressure.

Crit Care Resusc 2006; 8: 115-116

450 mL, positive end-expiratory pressure of 15 cmH₂O, respi-
Case Report - Report based on one single subject/client
Air travel and venous thromboembolism
Shanthi Mendis, Derek Yach, & Ala Alwan

Abstract There has recently been increased publicity on the risk of venous thrombosis after long-haul flights. This paper reviews the evidence base related to the association between air travel and venous thromboembolism. The evidence consists only of case reports, clinical case-control studies and observational studies involving the use of intermediate end-points, or expert opinion. Some studies have suggested that there is no clear association, whereas others have indicated a strong relationship. On the whole it appears that there is probably a link between air travel and venous thrombosis. However, the link is likely to be weak, mainly affecting passengers with additional risk factors for venous thromboembolism. The available evidence is not adequate to allow quantification of the risk. There are insufficient scientific data on which to base specific recommendations for prevention, other than that leg exercise should be taken during travel. Further studies are urgently needed in order to identify prospectively the incidence of the condition and those at risk.

Keywords Aircraft; Travel; Venous thrombosis/etiology; Thromboembolism/etiology; Causality; Risk factors; Epidemiologic studies (source: MeSH, NLM).

Mots clés Navigation aérienne; Voyage; Thrombose veineuse/étiologie; Thrombo-embolie/étiologie; Causalité; Facteur risque; Etude analytique (Épidémiologie) (source: MeSH, INSERM).

Palabras clave Aeronaves; Viaje; Trombosis venosa/etología; Tromboembolismo/etiología; Causalidad; Factores de riesgo; Estudios epidemiológicos (fuente: DeCS, BIREME).

Expert Opinion - Consensus of experience and opinions based on clinical evidence, reports etc.
Anecdotal evidence

Note: Info at this Level is not ‘wrong’ necessarily, but does not fulfill the Criteria on which to base serious decisions on patient or client welfare! Further evidence needed to back up the claims here.
Anecdotal evidence – opinion based on experience than formal science.

Note: Many Evidence Hierarchy schemes place laboratory and animal model experiments at this level!

e.g. It is not valid to infer that a drug’s effect on cells in a test tube (in vitro) will have the same effect in a living human (in vivo). [A common mistake in newspaper reports of medical “breakthroughs”]
Higher level decision support systems

- eTG
- UpToDate
- Cochrane, JBI
- CINAHL, Pubmed etc

Source: http://guides.library.upenn.edu/content.php?pid=192036&sid=1610308
Grades of Recommendation

<table>
<thead>
<tr>
<th>JBI Grades of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade A</strong></td>
</tr>
<tr>
<td>A ‘strong’ recommendation for a certain health management strategy where (1) it is clear that desirable effects outweigh undesirable effects of the strategy; (2) where there is evidence of adequate quality supporting its use; (3) there is a benefit or no impact on resource use, and (4) values, preferences and the patient experience have been taken into account.</td>
</tr>
</tbody>
</table>

| **Grade B**                 |
| A ‘weak’ recommendation for a certain health management strategy where (1) desirable effects appear to outweigh undesirable effects of the strategy, although this is not as clear; (2) where there is evidence supporting its use, although this may not be of high quality; (3) there is a benefit, no impact or minimal impact on resource use, and (4) values, preferences and the patient experience may or may not have been taken into account. |

Note: this is used in conjunction with FAME(Feasibility, Appropriateness, Meaningfulness and Effectiveness) which may inform the wording and strength of a recommendation. See full JBI document below for more...
Cochrane Library only contains high level EB resources—Systematic reviews and meta-analyses

• Cochrane entries are also found via PubMed, CINAHL and other databases

• JBI (Joanna Briggs database)—also a great source of systematic reviews & other evidence based summaries such as guidelines and more
The CINAHL database has a handy ‘Evidence Based’ button or tab to limit to these articles. It also allows selection of some study types (e.g. “RCTs”)

In other databases you can often add the search term “evidence based” or “RCT” etc to apply a rough filter to your results. Many EB articles include these words in the title or indexing
Health professionals should base their decisions on best available evidence (as well as clinical expertise and individual circumstances, such as patient preference). Systematic reviews (e.g. Cochrane), meta-analyses and RCT’s (randomized controlled trials) are usually regarded as the best forms of evidence. Remember that CINAHL (and PubMed) has Limits that allow you to narrow your search to different types of evidence-based studies.
Always remember: Dealing with real people, proper EBP always takes into account this “triad”.

Source: Greenhalgh et al., 2017
The health research process

PICO fits this process very well for most practical research questions in a healthcare setting

P = Patient/population
I = Intervention
C = Comparison
O = Outcome

Source: (Greenhalgh et al, 2017)
**Topic analysis: What is the PICO method?**

PICO is a method of putting together a search strategy that allows you to take a more evidence based approach to your literature searching when you are searching databases like CINAHL and PubMed.

PICO stands for:

- **Patient/Population** - Who or what population?
- **Intervention** - What are we doing to them?
- **Comparison** - What is the alternative? (If any)
- **Outcome** - What is your desired outcome?
Clinical scenario: A pregnant woman with type 2 diabetes is concerned about the effect her current treatment may have on her pregnancy and unborn child. The GP has heard that insulin pump therapy may be a more successful treatment than conventional insulin therapy. However, the GP wants to get his facts right, so searches the literature. The question he wants to answer is:

*Are insulin pumps more effective than conventional therapies in managing type 2 diabetes in pregnant women?*

A PICO analysis of this would be:

- **Patient/Population**: Pregnant women with type 2 diabetes (and unborn child)
- **Intervention**: Insulin pump therapy
- **Comparison**: Conventional insulin therapy
- **Outcome**: Improved management of glucose levels

Note: you may have two aspects to your patient / population concept
However, you may also want to broaden your search by thinking about synonyms and other keywords or word ending that you could use to make sure that you do not miss any important research. An extended PICO search strategy might look like this:

<table>
<thead>
<tr>
<th>Population</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main keyword</strong></td>
<td>Pregnant women and type 2 diabetes</td>
<td>Insulin pump therapy</td>
<td>Conventional insulin therapy</td>
</tr>
<tr>
<td><strong>Synonym</strong></td>
<td>Pregnancy and diabetes</td>
<td>Insulin infusion systems</td>
<td>Insulin injections</td>
</tr>
<tr>
<td><strong>Synonym</strong></td>
<td></td>
<td>Implantable infusion pumps</td>
<td>Successful pregnancy</td>
</tr>
</tbody>
</table>

When implementing the search, enter the search terms in the PICO order. It is likely that you will not need to enter all of the PICO strategy. You may find that you only need to search for the patient and the intervention.

http://www2.warwick.ac.uk/
Qualitative Questions - PICo

Qualitative and textual reviews: use PICo instead

P= Population - Who?
I= Phenomenon of interest - What?
Co= Context - Where?

- Re-focus to phenomenon of Interest, not intervention,
- and Context not comparator

The phenomena of Interest relates to a defined event, activity, experience or process

Context is the setting
What are caregivers' experiences of providing home-based care to persons with HIV/AIDS in Africa?

Source: Aromataris 2012
During the process...

- Choose appropriate databases (you may need more than one!)
- Use Advanced Search options
- Keep a Search History (databases will keep a history for each session)
- Critically evaluate your results!
What’s my topic?

- Understand your topic before you start! (Read about it in books etc. if necessary)
- Use your PICO or PICo analysis to generate search terms (keywords/phrases)
- Think of possible alternative words/phrases for the same concepts
All databases use the same syntax to combine terms...

**AND** Combine different concepts  
e.g. Hand AND injury

**OR** Add similar concepts  
e.g. cat OR feline

**NOT** Exclude concepts  
e.g. bones NOT ulna
Searching: CINAHL with Full Text

Caregiver* AND HIV OR AIDS patient* AND africa

Refine Search

105 Results for...

Boolean/Phrase: caregiver* AND ( HIV OR AIDS patient* ) AND africa

Limiters

Peer Reviewed

Refine your results

- Full Text
- References Available
- Abstract Available

Page: 1 2 3 4 5 Next »

1. Food meanings in HIV and AIDS caregiving trajectories: Rites of passage. (includes abstract) Makoae, Mokhantso G.; Psychology, Health & Medicine, 2021
The article describes the caregiving responsibility to provide food for chronically ill patients.
Subjects: Food Supply; HIV Infections; Caregiver Burden; Family; Stress, Psychology, Health & Medicine Database: CINAHL with Full Text

2. Experiences of HIV/AIDS home-based caregivers in Vhembe district. (includes abstract) Mashau NS; Davhana-Maselesele M; Curationis, 2009 Dec
The purpose of this study was to explore and describe the experiences of HIV caregivers.
Subjects: Caregivers; HIV Infections; Home Nursing; Volunteer Workers Database: CINAHL with Full Text
Truncation (*) and Wildcard (?)
Useful for word variant searching
(Symbols may vary between resources)
E.g. wom?n; fluid* (for fluid, fluids, fluidics..)
(For Google, use ~ e.g. ~fluid)
(check out the help / search tips on the database you are using)
SYNONYMS:
Different ways of expressing the same *general* idea...

*Examples:*

- Teenagers, teens, adolescents, adolescent, adolescence, youth, young adults
- Rural, regional, remote, country, outback
- Laughter, humour, humor, comedy, comic
- “Community care”, “out-of-hospital”, outpatient
• Thesaurus — directs you to correct subject terms (like PubMed’s MeSH system or CINAHL Subject Headings). Usually more accurate than keyword searching
  
  (Not available in every database)
• Use database features like “Limits” to refine your search
• Specialized medical databases (PubMed, CINAHL and Emcare) have special tools for nursing/health searching
Evaluation

Always evaluate every article you want to use- is it really reliable?

- Who wrote it? (authoritative authors?)
- Date (not outdated?)
- Subject coverage (relevant?)
- Bias (impartial?)
- Format (academic layout, clear methods etc.)
- Valid conclusions/claims
- Referenced (sources documented?)
- Peer-reviewed (academically evaluated?)
- Appropriate study design (fits inclusion criteria?)
• Many databases have a “Peer reviewed” or “Academic” limit (CINAHL (EBSCO) and Proquest databases)

• *Scopus* and *Web of Science* only includes PR titles

• *Cochrane* and *JBI* reviews are all PR

• [Ulrichsweb database](#) — gives PR information for each title
Some books and ebooks available at USC library on evidence-based healthcare


There are lots more...
Getting Help

Ask a Librarian:
In Person at the Information Desk By Telephone 5430 2803
Email InfoDesk@usc.edu.au Or ‘Ask A Librarian’ online
Drop-in: Held weekly (or more often) at most campuses

Libguides: http://libguides.usc.edu.au/