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

http://libguides.usc.edu.au/nursing
Where do I find...?
Books, DVDs – use the library catalogue
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)
- CINAHL (via EBSCO) [some full-text, links to others]
- PubMed (=Medline) [links to full-text]
- JBI Evidence Database
- Informit Health Collection (Australian) [some full-text, links to others]
- Google Scholar [links to full-text]
- Global Health [limited full-text, links to others]

also available...
- Health Source: Nursing/Academic (EBSCO) [some full-text, links to others]
- Nursing Journals (via Proquest) [some full-text, links to others]

*these databases find articles from our full-text suppliers*
Levels of Evidence: Grades of Recommendation

Effectiveness of a treatment or intervention is established to a degree that ...

- **Grade A**: ...merits application (Good evidence)
- **Grade B**: ...suggests application
- **Grade C**: ...warrants consideration of applying the findings
- **Grade D**: ...is limited
- **Grade E**: ... not established (Little or no evidence)
Another 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></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>Articles published in peer-reviewed research journals</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, eg. “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>

Adapted from: Greenhalgh (20), Sackett et al. (25), and Cochrane (30)

An Evidence Pyramid - to visualize the hierarchy

- Meta-Analyses
- Systematic Reviews
- Critically Appraised Literature
- Evidence-Based Practice Guidelines
- Randomized Controlled Trials
- Non-Randomized Controlled Trials
- Cohort Studies
- Case Series or Studies
- Individual Case Reports
- Background Information, Expert Opinion, Non-EBM Guidelines
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

Matlene Fransen1, Sara McConnell2

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Cochrane Database of Systematic Reviews, Issue 3, 2009. [Status: This issue: Edited]
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DOI: 10.1002/14651858.CD003476.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.
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
Is it possible to strengthen psychiatric nursing staff’s clinical supervision? RCT of a meta-supervision intervention

Henrik Gonge & Niels Buus

Accepted for publication 19 September 2014

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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
Cohort Study

Mortality after surgery in Europe: a 7 day cohort study

Rupert M Pears, Rui P Moreno, Peter Bauer, Paolo Pelosi, Philipp Metnitz, Claudia Spies, Benoît Vallet, Jean-Louis Vincent, Andreas Hoeft, Andrew Rhodes, for the European Surgical Outcomes Study (EUROS) 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 $\chi^2$ 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.

Lancet 2012; 380: 1059–65
See Comment page 1034
*Members listed in appendix
Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK (R M Pears MD); UCIN, Hospital de São José, Centro Hospitalar de Lisboa Central, EPE, Lisbon, Portugal (Prof R P Moreno PhD); Section of Medical Statistics (Prof P Bauer PhD), and Department of Anaesthesia and General Intensive Care
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 VO₂max from 25.3 ± 1.2 to 27.4 ± 1.1.
Case controlled 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% (238/560) 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. 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. These findings are from self-reported activity; however, the predominant activity, walking, is unreliably recalled. Questionnaires also suffer from recall bias and floor effects, with the baseline too high for most respondents. Motion sensors (pedometers and accelerometers) are sensitive to walking, objectively quantify PA as a continuous variable and are unrestricted by floor values. 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.

450 mL, positive end-expiratory pressure of 15 cmH₂O, respi-
Case Report - Report based on a particular subject/client
Rank 7- Expert opinion

Air travel and venous thromboembolism
Shanthi Mendis,¹ Derek Yach,² & Ala Alwan³

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/etología; Causalidad; Factores de riesgo; Estudios epidemiológicos (fuente: DeCS, BIREME).

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

CINAHL, Pubmed etc

Cochrane, JBI

eTPG etc

Source: http://guides.library.upenn.edu/content.php?pid=192036&sid=1610308
Cochrane Library only contains the high level

• EB resources – Systematic reviews and meta-analyses
• JBI (Joanna Briggs database) - also a great source of RCTs & evidence based summaries

Cochrane entries are also found via PubMed, CINAHL and other databases
handy ‘Evidence Based’ button or tab to limit to these articles. It also allows selection of some study types (e.g. “RCTs”)
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 good evidence.
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.
The nursing research process

this Joanna Briggs logo illustrates it well

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

P = Problem
I = Intervention
C = Comparison
O = Outcome

Source: Joanna Briggs Institute website
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.
Producing these search terms...

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>Main keyword</td>
<td>Insulin pump therapy</td>
<td>Conventional insulin therapy</td>
<td>Improved management of glucose levels</td>
</tr>
<tr>
<td>Synonym</td>
<td>Insulin infusion systems</td>
<td>Insulin injections</td>
<td>Successful pregnancy</td>
</tr>
<tr>
<td>Synonym</td>
<td>Implantable infusion pumps</td>
<td></td>
<td></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

I = Phenomenon of interest

Co = Context

- 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
Example

- 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)
• Think of possible alternative words/phrases for the same concepts
All databases use the same syntax...

**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  Choose Databases

Suggest Subject Terms

caregiver*  Select a Field (optional)

AND HIV OR AIDS patient*  Select a Field (optional)

AND africa  Select a Field (optional)

Add Row

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

1993 Publication Date  2013

Academic Journal

Food meanings in HIV and AIDS caregiving trajectories: Rethinking food security
(includes abstract) Makoae, Mokhantsoo G; Psychology, Health & Medicine, 2010
The article describes the caregiving responsibility to provide food for chronically
Subjects: Food Supply; HIV Infections; Caregiver Burden; Family; Stress, Psychology
Database: CINAHL with Full Text

Academic Journal

Experiences of HIV/AIDS home-based caregivers in Vhembe District, Limpopo:
(includes abstract) Mashau NS; Davhana-Maselele M; Curations, 2009 Dec;
The purpose of this study was to explore and describe the experiences of HIV
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)
Examples:
Teenagers, teens, adolescents, adolescent, adolescence, youth, young adults
Rural, regional, remote, country, outback
Laughter, humour, humor, comedy, comic
• Thesaurus -- directs you to correct subject terms (like PubMed’s MeSH system). Usually more accurate than keyword searching
• (Not available in every database)
• Use database features like “Limits” to target your search
• Specialized medical databases (PubMed, CINAHL) have special tools for nursing/health searching
Evaluation

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

- Who wrote it? (believable authors?)
- Date (not outdated?)
- Subject coverage (relevant?)
- Bias (impartial?)
- Format (academic layout, clear methods etc.)
- Referenced (sources documented?)
- Peer-reviewed (academically evaluated?)
- Appropriate study design (fits inclusion criteria?)
• Some databases have a “Peer reviewed” or “Academic” limit (EBSCO and Proquest databases)
• **Web of Science** only includes PR titles & most titles in Scopus are PR
• **Cochrane and JBI** reviews are all PR
• **Ulrichsweb database** — gives PR information for each title
Some books in the library on evidence-based nursing

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

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