Search Skills of Health Librarians:
How do we measure up?

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Outline


Discussion
What do findings mean for health librarians?
Background (1)

- ‘Closing the Gap’
  - National strategic importance
  - Begs true identification of existing literature
- Diverse sources/resources
- MEDLINE – not sufficient, but necessary
- Searching difficulties
  - Specific: 1960s terminology (Kelly, 2008); Oceanic Ancestry Group (MeSH) neither intuitive nor specific
  - Generic: Imperfect indexing, different databases & interfaces, counterintuitive searching rules, individual skills, knowledge & expertise etc
Background (1)

• Effectiveness?
  1. End user education
  2. Search strategy performance

• End-user education?
  – SR of info training in health libraries (Brettle, 2007)
  – 17 desired outcomes in >50 studies
  – Database searching skills; Search behaviour/attitudes; search question development
  – Retrieved citations not assessed
Background (2)

• End-user education? (cont.)
  – SR of teaching EBP (Shaneyfelt et al, 2006)
  – 35/104 (33.7%) tools measured searching effectiveness
  – Expert teachers assessed effectiveness
  – Retrieved citations not assessed

  – 90% of searches contained errors
  – Experts - health librarians or content specialists
  – No validated method for peer review of searches
Background (3)

- Evaluation of Search Strategies?
  - Results evaluated against known set of relevant/irrelevant articles
  - Continuum?
    - ‘1 article on hand’
    - Existing subjective expert collections
    - Objectively derived ‘gold standards’ … search filters
  - Standard measures: sensitivity (recall), specificity, precision
  - Gold Standard used in filter development not assessment of individual’s searching effectiveness … our study
Objective/s

• **Quantify** experts’ literature searching effectiveness with respect to Aboriginal & Torres Strait Islander peoples

• **Compare** health librarians vs researchers

• **Examine** confidence and competence
Method (1)

- Ethics approval
- Sample size
  - 17 in each group
- Participants
  - OVID MEDLINE users
  - Random sample HLA members; Investigators on Indigenous NHMRC grants 2004-2010
  - Response rates
    - Librarians 31/165 (18.8%); researchers 15/199 (7.5%)
  - Consented participants who provided valid results
    - Librarians (28/31, 90.3%); researchers (3/15, 20.0%)
Method (2)

• Procedure
  – Task: “Search for references about Australian Indigenous health. Articles should relate to Indigenous peoples in Australia only. Try to find as many references as you can, while trying to exclude references about Indigenous people in other countries”
  – Strategy printed out and returned to researchers
  – De-identified
Method (3)

Measures

• **Gold Standard articles** (measure outcome)
  – 9 journals dual hand reviewed to produce gold standard set of 136/1469 (9.3%) relevant & 1333/1469 (91.7%) irrelevant articles

• **Evaluation checklist** (measure process)
  – Frequency analysis MESH & T/Words from 136 relevant gold standard articles to identify top 7 concepts:
    • 3 MeSH: Oceanic Ancestry Group; Health Services, Indigenous; Australia
    • 4 T'Word: Aboriginal; Australia, Torres Strait; Indigenous

• **Questionnaire**
  – Background + self-assessed confidence and competence using MEDLINE generally/this searching task, post-hoc sensitivity estimate and time spent on task
Method (4)

Analysis
• Entered on SPSS
  – Evaluation checklist for 7 relevant terms scored
• Search strategies saved on OVID MEDLINE
  – For each individual
  – For Gold Standard Set
  – Sets combined to provide
    • Sensitivity
    • Specificity
    • Precision
• No group comparisons possible with 3 researchers
Results (1)

• The Librarians
  – Years using MEDLINE (M = 11.12, SD = 5.23, range 1 to 20)
  – How competent? M = 4.01, SD = 0.69
  – How confident? M = 4.01, SD = 0.58
  – How often in 1 month?
    • 7 performed 4 or less
    • 6 performed 5 to 8
    • 3 performed 9 to 12
    • 12 performed 13 or more
Results (2)

• The Searches
  – 2 to 31 lines (M = 13.4, SD = 7.5)
  – Number of terms in any line 1-50 (M=5.7, SD=10.1)
  – Searching time M=19.2 mins (SD=7.8)
  – Relevant search terms M=4.2 (SD = 1.7)
  – Inconsistent use of EXPLODE
    • Redundant in Oceanic Ancestry Group (14/25, 56.0%)
    • Omitted for Australia (7/25, 28.0%)
Results (3)

• The Searches (cont.)
  – Truncation/Textwords
    • Indig*, Indigenous, Indigeno*
    • Aborigi*, aborigin*, aborigine, aboriginal, aboriginals
  – Range of terms for Indigenous
    • ATSI, Australoid, First People, Goori, Goorie, Islander, Koori Melanesia*, Murri, Native, Native People, Noongar, Original Inhabitants
  – 18/28 (64.0%) included health concept
One of the best...

AIH21 (Sensitivity = 81.6%, Specificity = 99.9%, Precision = 99.1%)

Set 1  Exp Oceanic Ancestry Group/
Set 2  Indig*.mp.
Set 3  Torres Strait islander*.mp.
Set 4  Aborig*.mp.
Set 5  Native*.mp.
Set 6  1 or 2 or 3 or 4 or 5
Set 7  Australia*.mp.
Set 8  Exp Australia/
Set 9  7 or 8
Set 10 6 and 9
Set 11 Limit 10 to yr="2006"
Scope for Improvement…

AIH25 (Sensitivity = 0.0%, Specificity = 100.0%, Precision = 100.0%)

Set 1    Australian indigenous health.mp.
Set 2    Health services, Indigenous/ or Australia/ or Culture/
Set 3    1 and 2
Set 4    Limit 3 to yr=”2006”
Results (4)

• Search Effectiveness
  – Correctly finding relevant articles (sensitivity)
    • M = 53.2%*, median 64.7%, range 0 – 93.4%
  – Correctly excluding irrelevant articles (specificity)
    • M = 97.4%, median 99.4%, range 52.6%-100%
  – Number of relevant/all retrieved (precision)
    • M = 83.3%, median 91%, range 16.7%-99.1%

*Correlated with number of relevant search terms, r = 0.56, p = 0.004)
Results (5)

• Confidence/Competence
  – Self assessed competency & specificity ($r = 0.41$, $p = 0.04$)
    • The more a person thought they were competent, the better they were at excluding irrelevant articles
  – Self assessed confidence related to post-hoc sensitivity estimate ($r = 0.64$, $p = 0.001$)
    • The more confident a person was the higher they rated their performance
Results (6)

• Confidence/Competence (cont.)
  – Post hoc sensitivity estimates were significantly higher (M = 78.8%) than observed (M = 53.2%)
  – Eta squared statistic = 0.49
    • People significantly overestimated their assessment of how well they searched
    • It was a large overestimation
Results Summary

• Wide variation & process errors
• On average, librarians only found 53.2% of the relevant literature
• Self-assessed confidence/competence not associated with actual performance except for limiting irrelevant articles
Discussion (1)

53.2% of what?

- Librarians
- Database
- Topic
- User's Needs/Purpose
- Error from ALL all sources

Librarian’s Competency 53.2% Sensitivity
Discussion (2)

Underscores questions about searching, incl for health librarians in relation to professional knowledge, skills and expertise in searching

–How well do I search?
–When does it matter?
–How do I know how well I search?
–How do I improve my searching?
–Who should assess my competency?
Discussion (3)

- Are process measures enough?
- Are we effectively teaching incoming professionals how to search?
- Once in the profession, how systematically are these skills developed?
- Development of expertise? (Lave & Wenger, 1991)
- If it’s hard for health librarians, how are end users faring?
- How can health librarians help end users assess their competencies
- Strategies for increasing ‘all cause’ sensitivity to near 100%?

Strengths

– Objective approaches to quantifying searching effectiveness (1) gold standard (2) frequency analysis
– Standardised searching task enabling comparisons
– Focus on area of strategic importance
Limitations

– Difficult to mirror real world in a 60 minutes search task
– Self selection bias limits generalisability
– Impact of ‘health’ in search task undetermined
– Where did they go? (The researchers…)
– Impact of using OVID MEDLINE
Research Conclusions

– ‘Closing the Gap’ should be married with explicit strategies to uncover existing research evidence, ie a search filter (Lowitja Filter launched – see website)
– Assessment of health librarians’ searching competencies warrants further professional debate and consideration (today!)
Looking Forward

• The future
  – Process AND outcome assessment
  – Self assessment AND peer assessment
  – Librarians AND end users
  – Doing AND teaching
  – All elements of searching

• An idea?
  – Target process (peer review) and outcome (gold standard)
  – Measure pre PD, and post PD
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