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Health System

Validation & Item Analysis of a MEDLINE Search strategy... An Assessment Instrument for Residents

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Why Assess Searching Skills?

- **The competent physician**
 - Effective searching makes for better patient care
- **ACGME competencies**
 - Focus on Problem-based Learning & Improvement
- **Lifelong learning**



Why LIBRARIAN experts?

- **Expert searchers**
 - Trained in biomedical literature searching
 - Thorough knowledge of database design and functionality
 - Can identify and assess searching skills



The History of Search Assessment Instrument

Real-time, evidence-based medicine instruction: DR Bradley. J Med Libr Assoc 90(2) April 2002

- In 2002, Glover/Nesbit instrument became available (based on a national survey of medical librarians)
- U-M librarians attended the workshop “Evaluating Student MEDLINE Searches” (given by Glover & Nesbit)
- Glover/Nesbit instrument was modified by U-M librarians into the current instrument
- Prior data shows that the intervention work to improve skills

Search Assessment Instrument: The Validation Study

- In 2001, 20 interns Peds & Med/Peds received an instruction session by a librarian on effective MEDLINE searching (Ovid)
- Residents' pre- and post-training search strategies were assessed by two librarians, for a specific clinical case
- In 2004, 15 of the same residents were assessed on the same case, and scored by the same librarians

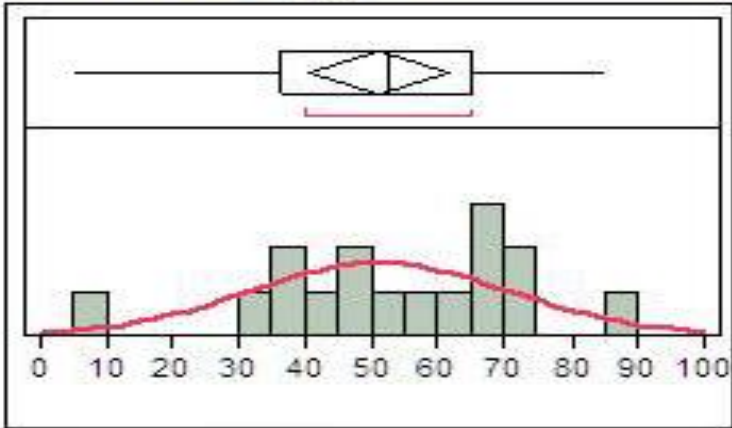
Search Assessment Instrument: Validation Study, cont'd

- For comparison, we evaluated a second cohort of graduating residents in 2002
- In 2008, 9 faculty with EBM expertise conducted the same search

Intervention Group Within-Subject Improvement

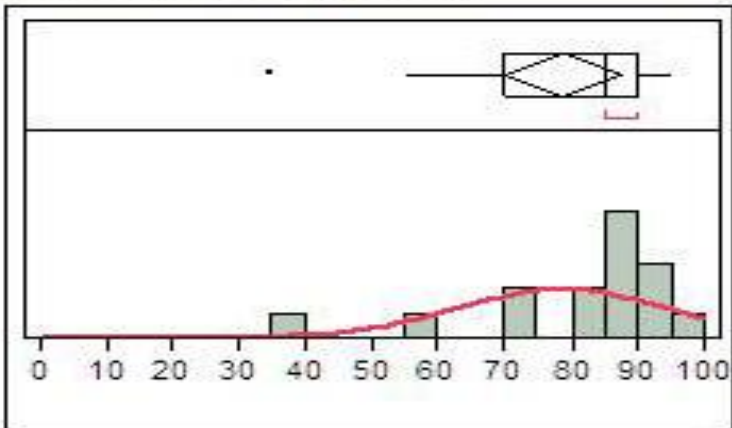
Distributions Time=Pre-Training (2001)

Search Strategy Score



Distributions Time=Post-Training (2004)

Search Strategy Score



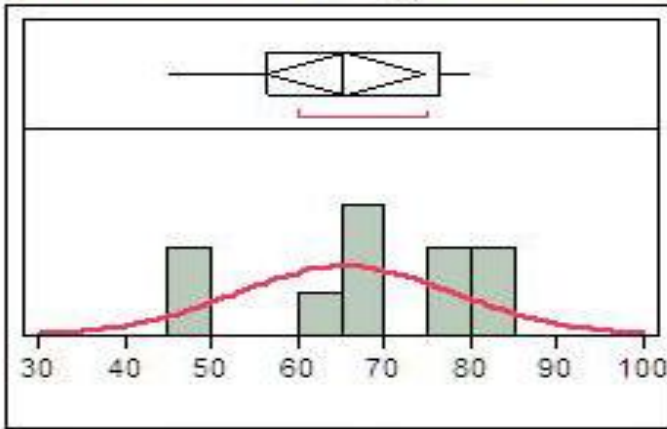
- Cohort 1 at Year 1 (interns) & then again at Year 3 (seniors)
- Significant Improvement in Search Strategy
- Matched Pairs t-test:
– $t(14)=5.43, p<0.0001$



Intervention Cohort vs. Usual Education

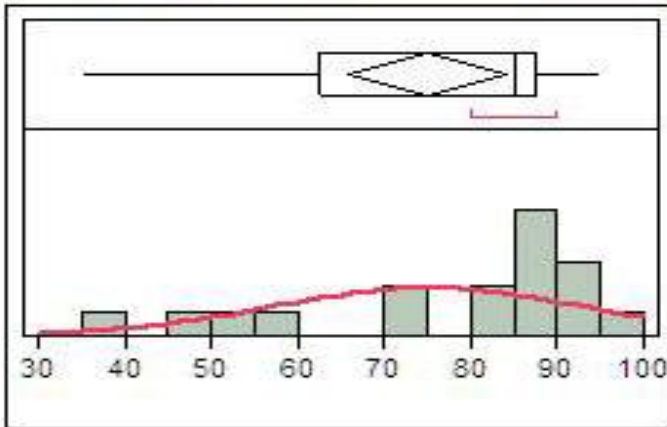
Distributions Group=Comparison (2002)

Final Search Strategy Score



Distributions Group=Post-Training (2004)

Final Search Strategy Score



- Cohort 1 (educated) vs. Cohort 2 (usual care)
- Intervention Group did Significantly better than comparison group (usual care)
- Wilcoxon Rank Test:
 - $\text{Chi-square}(1)=4.09, p=0.043$

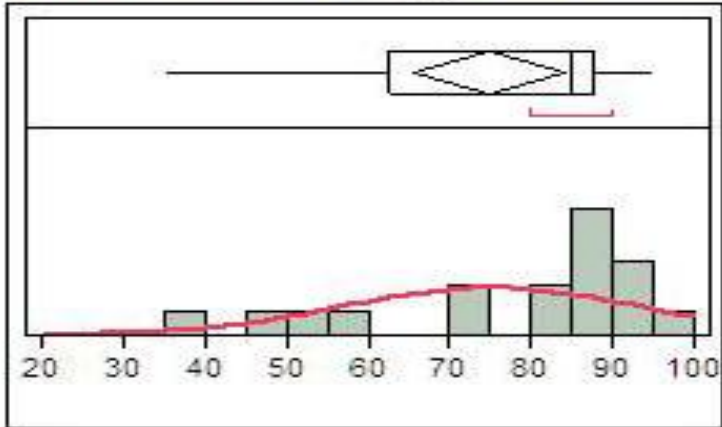


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Intervention Cohort vs. Faculty

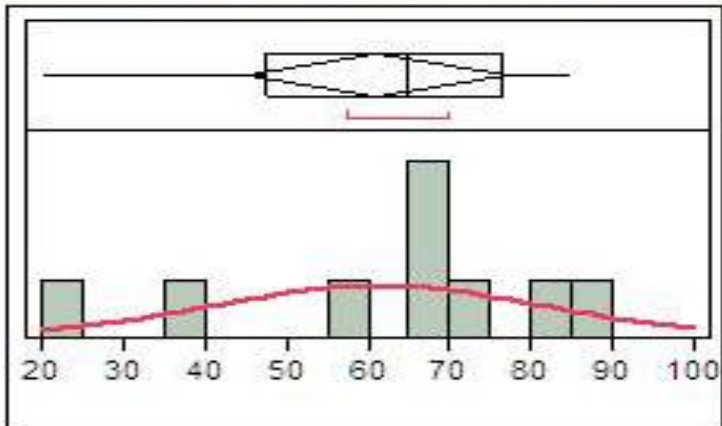
Distributions Group=Post-Training (2004)

Final Search Strategy Score



Distributions Group=Faculty

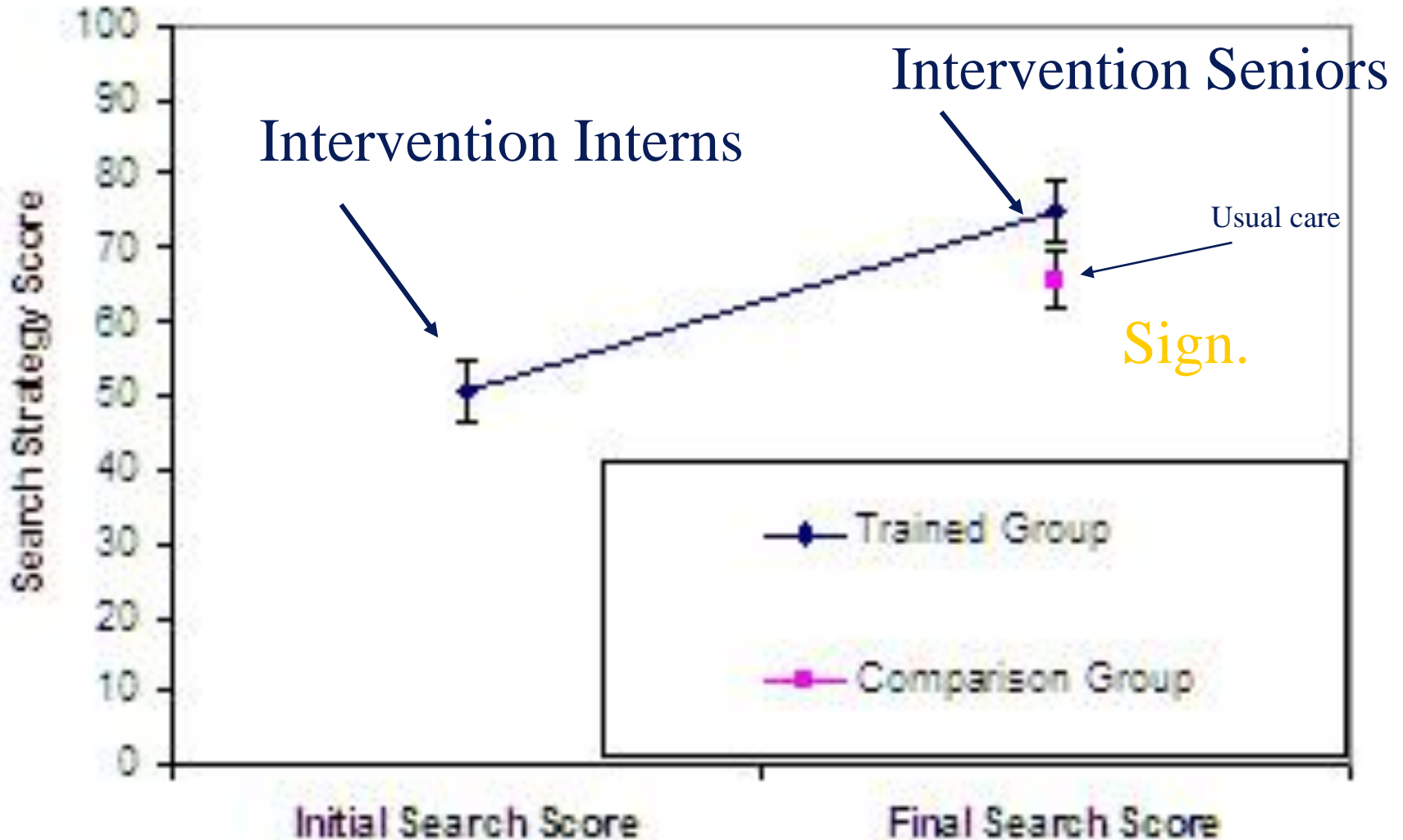
Final Search Strategy Score



- Cohort 1 (intervention) vs. EBM educators
- No significant difference
- Wilcoxon Rank Test:
 - Chi-square(1)=3.82, p=0.051

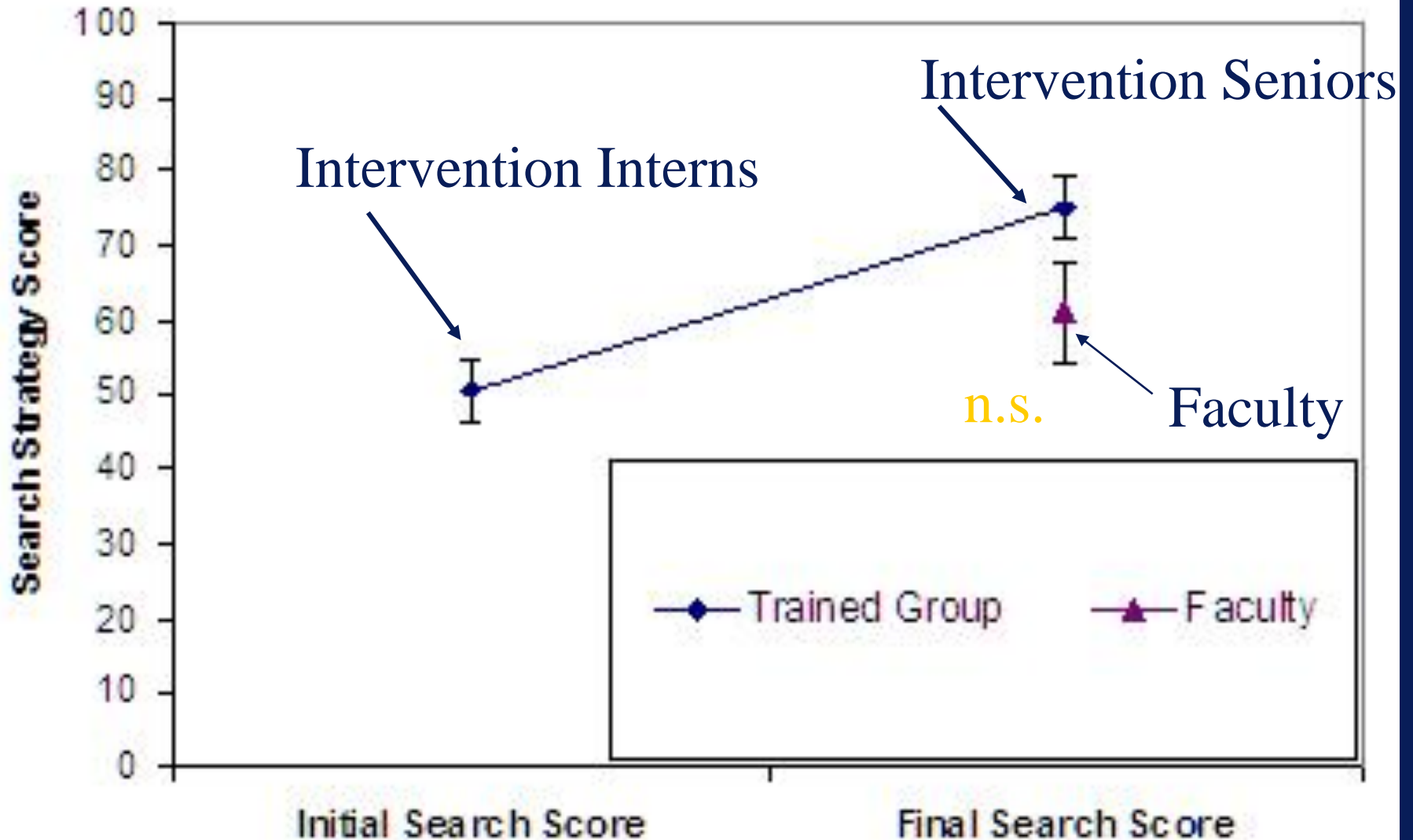


Summary



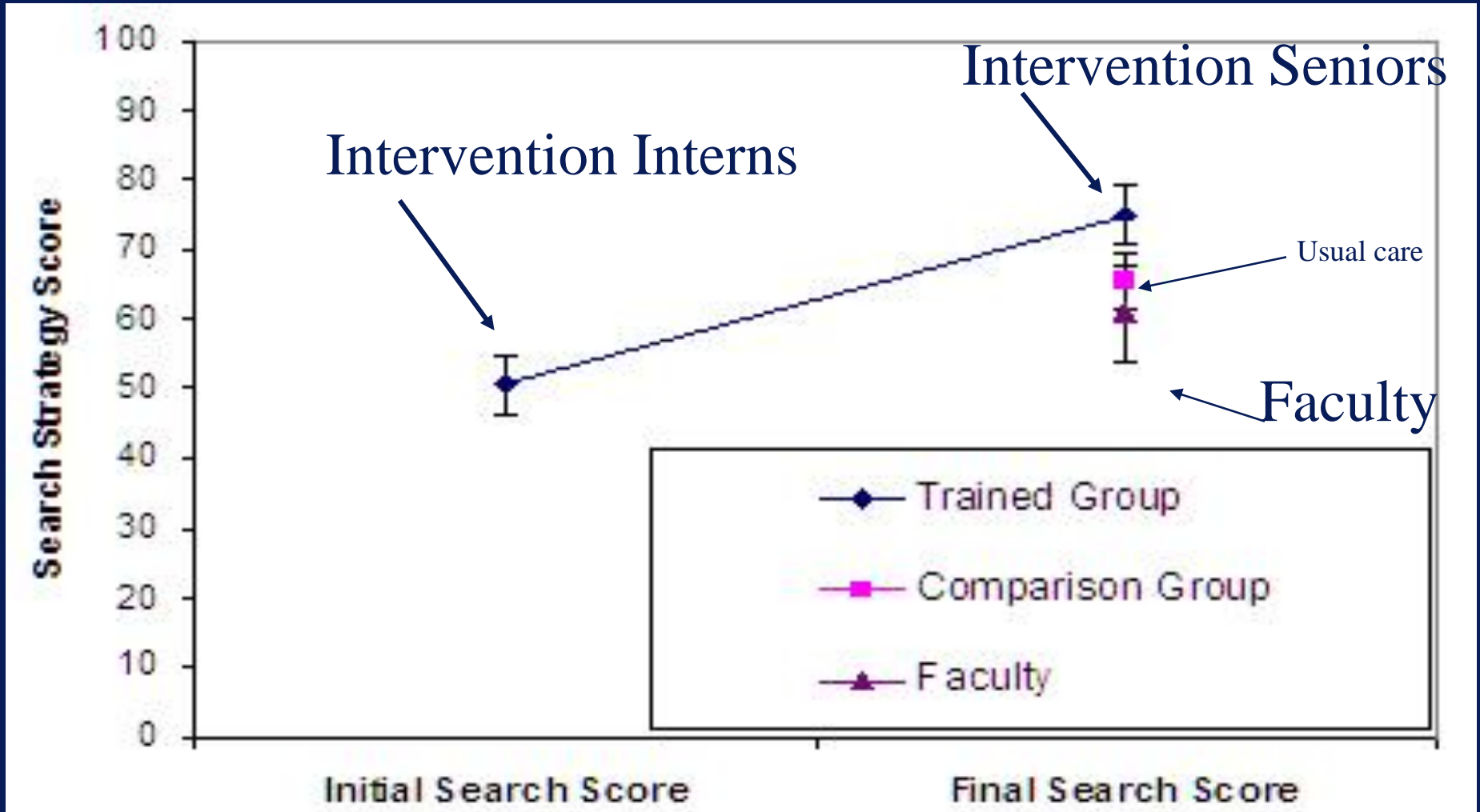


Summary





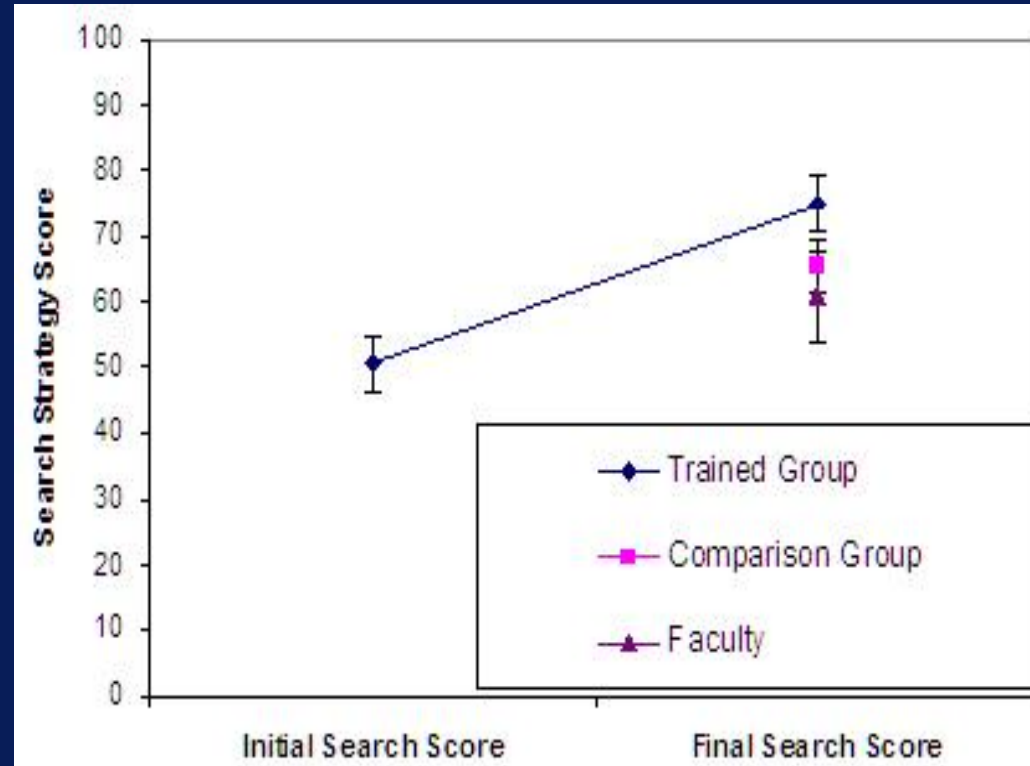
Summary





Summary

- Pre-Post improvement for Intervention Cohort
- Post-intervention better than Comparison Cohort 2
- Post-intervention no different from Faculty experts



Question: Are bronchodilator agents effective in treating bronchiolitis in infants?



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- 1 exp Bronchiolitis Obliterans/
or exp Bronchiolitis/ or exp
Bronchiolitis, Viral
- 2 exp Bronchodilator Agents/
3 exp Pediatrics/
4 1 and 3 and 2
- 5 exp Therapeutics/
6 1 and 3 and 5
- 7 6 and 2

Search Tactic	15 pts	10 pts	5 pts	No pts
1. Included all search concepts (+5/concept) <u>bronchiolitis</u> , bronchodilator agents, infant		X		
2. Use of MeSH (+5/concept) <u>bronchiolitis</u> , bronchodilator agents		X		
3. Exploded MeSH concepts (+5/concept)		X		
4. Used of proper subheading i.e. <u>tu</u> or <u>dt</u> (+5)				X
5. Use of all age limits i.e. infant & newborn (+5/concept)				X
6. Limit – human & English (+5/concept)				X
7. Focused – one or more concept (+5)				X
8. Used appropriate Boolean (+5)			X	
9. Combined all concepts (+10)		X		
10. Looked for evidence (+10) a) Limit by publication type (clinical trial, meta-analysis, practice guidelines, RCT, <u>multicenter study</u> .) b) Limit to EBM reviews c) Used MEDLINE EBM filter				X
11. Search efficiency i.e. did not limit every search statement, did not combine too many sets – minimum steps necessary (+10 pts)			X	
Subtotal (Positive Score 100 points possible)				

Search tactic	5	5	5	5	5	5	5
1. Inappropriate limits i.e. year (-5/limit)							
1. Incorrect term including subheading (-10/incorrect term or subheading) Pediatrics, Therapeutics	10	10	10	10	10	10	10
	X	X					
Subtotal (Negative Score)							



The Tool

- 1. Included all search concepts**
- 2. Use of MeSH**
3. Exploded MeSH
4. Use of proper subheadings
- 5. Limit – Human & English**
6. Focused one or more concept
7. Use of appropriate Boolean
8. *Combined all concepts*
9. Looked for evidence e.g. RCT
- 10. Search Efficiency**
11. Inappropriate Limits (negative)
12. Incorrect term in Subheading



Psychometrics/Item Analysis

Inter-rater reliability: 0.92

Alpha: 0.62

Item

Item-Total Correlation

1. Included all search concepts:	0.84
2. Use of MeSH	0.67
5. Use of all age limits	0.83
8. Used appropriate Boolean	N/A
10. Looked for evidence (limits, filters)	0.69



The Tool

-
- 1. Included all search concepts**
 - 2. Use of MeSH**
 3. Exploded MeSH
 4. Use of proper subheadings
 - 5. Limit – Human & English**
 6. Focused one or more concept
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 9. Looked for evidence e.g. RCT
 - 10. Search Efficiency**
 11. Inappropriate Limits (negative)
 12. Incorrect term in Subheading



Conclusions

- Next step: based on item analysis, revise the search instrument to focus on the items identified as critical elements

- Next step: creation of a PubMed search assessment instrument