

Evidence-Based Practice

The Future of Learning and Work and Making Change to CSD Education

Mindy Bridges, PhD, CCC-SLP



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Abstract

In this presentation, I will review evidence-based practice (EBP) for speech-language pathologists. The presentation will include an overview of levels of evidence and how to write a clinical question using PICO. Additionally, I will discuss perceived barriers to implementing EBP. Finally, I will discuss my experiences incorporating EBP into existing courses as well as teaching a graduate-level EBP course.



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Mindy Bridges



Disclosures

Financial Disclosures

No financial disclosures noted.

Non-Financial Disclosures

I am an ASHA member and a certified speech-language pathologist.



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My background

- Certified SLP- was a practicing SLP for six + years
- Received my PhD from University of Kansas
Focus on reading and language development and disorders
- Have worked at KU (Research scientist) and KUMC (Assistant Professor) since graduation
- Currently PI or Co-I on NIH grants looking at reading comprehension in upper elementary and junior high
- Co-I on NIH grant looking at intervention for children at risk for reading comprehension difficulties
- Co-I on IES project looking at a dynamic assessment of early literacy skills for students with limited speech



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My experience related to EBP

Or, simply put- why am I here talking to you?

- I have years of clinical experience as an SLP.
- I teach a SLPD seminar on Evidence-Based Practice and also infuse this into my Reading Disorders course.
- Much of my research is community/school-based.
- I also teach and am very interested in Implementation Science, which is highly related to EBP.



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Take a minute to think about one question or knowledge goal you have related to this presentation/topic.

Write it down!



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Let's get started!



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My VERY informal research

I was interested in what students and clinicians know about EBP

- “A way to use research articles to make sure what you’re doing is right.” (MS student)
- “I use EBP practices to find evidence to support an intervention that I want to use.” (experienced clinician)
- “Using research and what you know to give the patients the best care.” (clinical supervisor)
- “I think we will learn about it in one of our clinical processes class times.” (MS student)



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Evidence based practice: what is it?

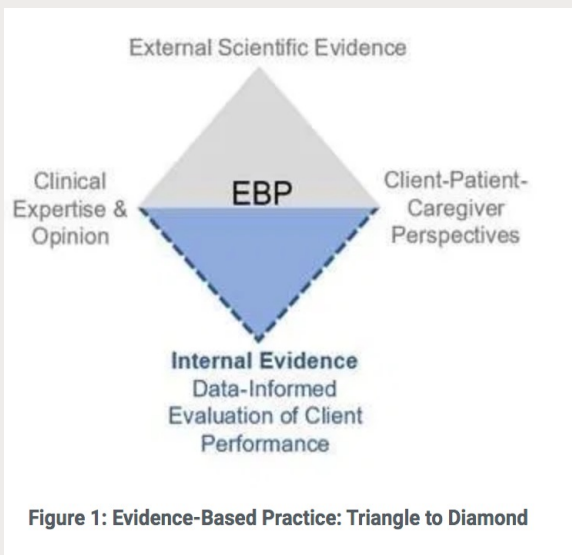
Evidence-based practice (EBP) is the integration of:

- External scientific evidence
- Clinical expertise/expert opinion
- Client/patient/caregiver perspectives

Taken from <https://www.asha.org/Research/EBP/>



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Higginbotham, J., & Satchidanand, A. (April 2019)
<https://academy.pubs.asha.org/2019/04/from-triangle-to-diamond-recognizing-and-using-data-to-inform-our-evidence-based-practice/>



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Importance of internal evidence (Higginbotham & Satchidanand, 2019)

- Discussed the importance of including internal evidence (practice-based evidence) as part of EBP, as discussed by Dollaghan (2007)
- Authors discuss the importance of graphing treatment data to help make informed decision on client care
 - "We argue that data visualization can serve as a catalyst for the systematic incorporation of internal evidence throughout the therapy process."
- Taken from <https://academy.pubs.asha.org/2019/04/from-triangle-to-diamond-recognizing-and-using-data-to-inform-our-evidence-based-practice/>



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Evidence-Based Practice (EBP)

Evidence-based practice (EBP) is the integration of

- **Clinical expertise/expert opinion**
 - The knowledge, judgment, and critical reasoning acquired through your training and professional experiences
- **Evidence (external and internal)**
 - The best available information gathered from the scientific literature (external evidence) and from data and observations collected on your individual client (internal evidence)
- **Client/patient/caregiver perspectives**
 - The unique set of personal and cultural circumstances, values, priorities, and expectations identified by your client and their caregivers



When all three components of EBP are considered together, clinicians can make informed, evidence-based decisions and provide high-quality services reflecting the interests, values, needs, and choices of individuals with communication disorders.



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ASHA: Committee on Clinical Research, Implementation Science, and Evidence-Based Practice (CRISP)

Monitor trends and issues regarding clinical practice research, implementation science, knowledge translation, and evidence-based practice in communication sciences and disorders (CSD); monitor the challenges and opportunities to enhance and expand clinical practice research, implementation science, knowledge translation, and evidence-based practice in CSD; generate reports to inform strategic planning efforts and otherwise advising the Association—including staff, members, committees, boards, and councils—regarding matters pertaining to clinical practice research, implementation science, knowledge translation, and evidence-based practice in CSD; and provide guidance about resources and programs that ASHA could develop or enhance to facilitate the advancement of clinical practice research, implementation science, knowledge translation, and evidence-based practice in CSD.

<https://www.asha.org/about/governance/committees/committees/committee-on-clinical-research-implementation-science-and-evidence-based-practice/>



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Creating and Documenting Clinical Impact

Committee on Clinical Research, Implementation Science, and Evidence-Based Practice (CRISP)

March, 2021

Table of Contents

- Introduction to Creating and Documenting Clinical Impact
- Creating Impact: Where Do We Start
- Clinical Impact for Beginners
- Knowledge Brokers
- Creating Impact Inside Academia and Outside Academia
- Panel Discussion
- Interview With Dr. Janessa Humbert and Dr. Meredith Harold



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EBP: A Reiterative process

Five step process (adopted from Sacket et al., 2000)

1. Ask the question (PICO)
2. Search for evidence
3. Evaluate evidence
4. Make the decision
5. Evaluate the outcomes after implementing the intervention/program

(Johnson, 2006)



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PICO question

Population: What are the characteristics and/or condition of the group? This may include specific diagnoses, ages, or severity levels (e.g., autism spectrum disorder, mild hearing loss).

Intervention: What is the screening, assessment, treatment, or service delivery model that you are considering (e.g., instrumental swallowing assessment, high-intensity treatment, hearing aids)?



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PICO question

Comparison: What is the main alternative to the intervention, assessment, or screening approach (e.g., placebo, different technique, different amount of treatment)? *Note: In some situations, you may not have a specific comparison in your PICO question.*

Outcome: What do you want to accomplish, measure, or improve (e.g., upgraded diet level, more intelligible speech, better hearing in background noise)?

<https://www.asha.org/research/ebp/frame-your-clinical-question/>



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CREATE A PICO QUESTION

Fill in each component to make your own PICO question.

P POPULATION	Example: adults with TBI
I INTERVENTION	Example: cognitive rehabilitation
C COMPARISON	Example: no treatment
O OUTCOME	Example: improved cognitive communication

EXAMPLE PICO QUESTION: Is cognitive rehabilitation an effective treatment for improving cognitive-communication in adults with TBI?




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EBP: A Reiterative process

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Evaluating external evidence

LEVEL	DESCRIPTION
1a	Well-designed systematic review or meta-analysis
1b	Well-designed randomized controlled trial
IIa	Well-designed controlled study without randomization
IIb	Well-designed quasi-experimental study
III	Well-designed non-experimental studies (i.e., correlational and case studies)
IV	Expert committee report, consensus conference, clinical experience of respected authorities

ASHA, n.d.



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CATE: Critical Appraisal of Treatment Evidence

Appraisal points

1. Was there a plausible rationale for the study?
2. Was the evidence from an experimental study?
3. Was there a control group or condition?
4. Was randomization used to create the contrasting conditions?
5. Were methods and participants specified prospectively?
6. Were patients representative and/or recognizable at beginning and end?
7. Was treatment described clearly and implemented as intended?
8. Was the measure valid and reliable, in principle and as employed?
9. Was the outcome (at a minimum) evaluated with blinding?
10. What nuisance variable(s) could have seriously distorted the findings?
11. Was the finding statistically significant?
12. If the finding was not statistically significant, was statistical power adequate?
13. Was the finding important (ES, social validity, maintenance)?
14. Was the finding precise?
15. Was there a substantial cost-benefit advantage?

Validity: Compelling____ Suggestive____ Equivocal____
 Importance: Compelling____ Suggestive____ Equivocal____
 Clinical bottom line:

Taken from: The Handbook for Evidence-Based Practice in Communication Disorders, by Christine A. Dollaghan, Ph.D., CCC-SLP. Copyright © 2007 Paul H. Brookes Publishing Co., Inc.



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Appraising synthesized research

- Assessing the Methodological Quality of Systematic Reviews (AMSTAR)
- Critical appraisal tools- Oxford Centre for Evidence-Based Medicine (CEBM)



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Appraising Guidelines

- Appraisal Guidelines for Research and Evaluation II- (AGREE: AGREE Next Steps Consortium, 2009; Updated 2013)
 - 23 criteria across domains that assess comprehensiveness and methodological rigor of the guideline

https://www.agreetrust.org/wp-content/uploads/2013/10/AGREE-II-Users-Manual-and-23-item-Instrument_2009_UPDATE_2013.pdf



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EBP: A Reiterative process

Five step process (adopted from Sackett et al., 2000)

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Identified barriers to EBP

In 2005, ASHA conducted a member survey of knowledge of EBP

What do you think were the often-mentioned barriers of EBP?



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Identified barriers of implementing EBP



TIME

Hoffman et al. (2013)- SLPs spent less than one hour per week dedicated to EBP practices

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Time

Brackenberry et al. (2008)- Writing and investigating/answering a clinical question takes 3-7 hours



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Time

“Most members could identify the definition of EBP. Most also thought that EBP was a good idea-**it’s just a shame we don’t have enough time to actually do it.**”



Challenges

With the importance of the role of CE comes some challenges. In fact, another question on the survey asked respondents to identify the most significant barriers to their ability to engage in EBP (see table below).

Barriers Cited by Clinicians as Somewhat or Greatly Limiting Their Ability to Engage in EBP	
Barrier	% of respondents
Insufficient time	79%
Cost of continuing education	59%
Lack of evidence	53%
Conflicting evidence	48%
Evidence irrelevant to clinical practice	48%
Lack of supervisory support	47%
Limited access to continuing education	43%
Difficulty interpreting scholarly literature	40%
Lack of access to scholarly literature	17%



Update on ASHA members and EBP

Evidence-based Practice: Where are we now? (Greewell & Walsh, 2021)



Table 4. Perceived barriers to EBP.

Perceived Barrier	Frequency	n	%	Mean Score	Std. Dev.
Allocated time	169	310	54.52	2.64	1.46
Caseload size	133	307	43.32	2.91	1.28
Access to journal articles at work	110	311	35.37	3.28	1.53
Comfort with statistical analyses	105	317	33.12	3.26	1.16
Access to resources (unspecified)	93	314	29.62	3.47	1.25
Access to journal articles at home	69	311	21.97	3.80	1.32
Ability to appraise research	66	314	21.02	3.79	1.25
Ability to perform literature search	59	314	18.79	3.91	1.16
Lack of training	49	315	15.56	3.90	1.10
Workplace culture	46	314	14.64	3.90	1.13

Note. Items indicating disagreement or strong disagreement (i.e., lower scores on the 5-point scale) were considered significant barriers. Scoring was reversed for negatively stated items (e.g., "I do not have allocated time at work to research/read about my clients"). ASHA = American Speech-Language-Hearing Association.

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Found that SLPs that reported less barriers reported an increased use of EBP!



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Reported frequency of use of different sources of EBP

Table 3. Evidence-based practice (EBP) sources—average scores are based on Likert-scale frequency responses: 0 = *never*, 1 = *yearly*, 2 = *monthly*, 3 = *weekly*, 4 = *daily*.

EBP source	<i>n</i>	Average score
Considering client preferences	315	4.43
Incorporate new research findings into practice	314	3.99
Relying on my own clinical expertise	301	3.87
Input from qualified colleagues	312	2.95
Journal articles	295	2.84
Sharing ideas with colleagues	310	2.81
Internet browsing	313	2.76
Professional blogs	298	2.74
Special interest group material	304	2.64
Professional websites	305	2.37
Input from experts in the field	311	2.10
Discipline-wide publications	310	1.98
Textbooks	313	1.97
Clinical practice guidelines	302	1.93
ASHA Maps website	312	1.78
Research databases	312	1.38
Seminars, conferences, or workshops	297	1.28
Posting questions on listservs or e-mail lists	308	1.0
Presenting findings at conferences/workshops	312	0.73
Online case studies	308	0.44

Note. ASHA = American Speech-Language-Hearing Association.



They also found that exposure and training to EBP principles and practice in graduate school significantly increased the likelihood that they were using EBP as clinicians!

- This was also found by Zipoli and Kennedy (2005)





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Challenges teaching EBP

Have talked about EBP and challenges with implementing it into clinical practice

What about teaching and integrating EBP into coursework?



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Evidence related to teaching EBP

- Two systematic reviews (Coomarasamy & Khan, 2003; Flores-Mateo & Argimon, 2007) showed that knowledge and skill was impacted by instruction related to EBP but not as much impact on attitudes and sustained behaviors of students
- “An allied health student could receive a comprehensive grounding in evidence based practice, but not be able to deploy their knowledge and skill post graduation due to workplace culture.” (p. 1042, Hitsche & Nicola-Richmond, 2017)
- Some evidence that older clinicians are “more resistive to evidence based practice” than younger colleagues (Asrons & Sawitzky, 2006; Hitch, 2015)
 - This contradicts some suggestions that new clinicians paired with an experienced clinician to learn more about EBP



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Wolter et al. (2011)

- Tutorial designed to provide guidance on infusing EBP into CSD programs
 - Undergraduate and graduate students
- Reference Analysis Worksheet- provides a framework to help students identify important research components
- Discusses importance of teaching EBP into both coursework and clinical practice at the graduate level



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CICSD

Teaching Information Literacy and Evidence-Based Practice in an Undergraduate Speech-Language Pathology Program: A Student Reflection

Cobus-Kou, L., & Waller, J. (2016). *Contemporary Issues in Communication Sciences and Disorders*, 43, 35-49.



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Has the coffee kicked in yet?



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My experience: Seminar in Evidence-based practice

SLPD seminar taught in the first semester of a student's SLPD program

Requirement of SLPD program at KU is to have at least **three** years of clinical practice

Range of students, from doctoral students who have had enough clinical practice to get their CCCs to SLPD students who have been working more than 15-20 years



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TED talk- Battling bad science (Ben Goldacre)

This is a really great TED talk to kick off a discussion of EBP or thinking about science

https://www.ted.com/talks/ben_goldacre_battling_bad_science?language=en



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Readings

Dollaghan (2007)- The Handbook for Evidence-Based Practice in Communication Disorders

Brown (2017)- The Evidence-Based Practitioner

Now use these as recommended texts but most assignments are a combination of journal articles, webinars, and websites

Emily Hanford's Hard Words podcast

Hidden Brain- Facts aren't Enough episode



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Types of assignments

Library search

- Watch videos related to completing literature searches
- Write PICO question
 - Search on TWO separate databases (examples: ERIC, Pubmed)
- Keep list of how many citations were found on each database
- Alter search terms at least two times and note differences



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Types of assignments

- Case study/scenario: discuss issues related to EBP and how they would go about gathering information in each area of EBP

Choose one of the provided case studies and write a brief (3-4 page) paper providing information about how you would move forward with assessment or treatment.

- Specify the types of evidence provided or that you could utilize
 - External, internal, client preference



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Type of assignments

- Final paper- The final graded requirement is a 10-15 page (or so) paper that represents
 - (a) development of an original PICO question concerning an intervention;
 - (b) details of an extensive search for evidence pursuant to the question;
 - (c) selection of 6 – 10 articles for evaluation of quality and level of evidence (have to include CATE or PEDro-P form for each)
 - (d) balancing of external and internal evidence
 - (e) the clinical conclusion.



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Top 3 Challenges I expected

- Limited knowledge on all components of EBP (continues to be focus on the external evidence, with some surprise on the inclusion/importance of clinical experience and of patient values)
- Limited knowledge of the resources available
- Limited expectations in workplace to utilize evidence-based practice in a systematic way (if at all)



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Limited knowledge components of EBP

We can do better here!

Not likely that you will have a EBP course in a master's level curriculum

However, EBP practices should be infused throughout the curriculum in all courses!

Reading disorders course: now start intervention section with some information related to EBP and infuse throughout



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Updating MA level course

- Will be adding an assignment where students have to identify three credible sources of information for a given topic
- In final project, students write assessment plan, treatment plan, and lesson plan for a case study
 - Will include specific criteria/points for how they will incorporate all levels of evidence from assessment to guide intervention plan
 - I have never been transparent that this was required OR designed points particularly for this



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Seems to be a student focus on the external evidence, with some surprise on the inclusion/importance of clinical experience and of patient values

The focus on needing a research-base for clinical practice is great

But might be neglecting the importance of clinical judgment/observations as well as client perspectives



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Examples: Resources for external evidence

ASHA Maps and Practice Portals

Journal articles

The Informed SLP

SpeechBite



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Resources related to perspectives

Can come directly from client

Can also be found in systematic reviews or studies

The ASHA logo is located in the bottom left corner of the slide. It consists of a circular icon with a stylized ear and sound waves, followed by the text 'ASHA American Speech-Language Hearing Association'.

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Resources for Clinical expertise/expert opinion

ASHA's Practice Portal

Each practice portal was developed and vetted by subject matter experts

ASHA's Evidence Maps

Searchable online tool

Only include systematic reviews, meta-analyses, and clinical practice guidelines

Provides quality readings



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Limited expectations of EBP in workplace

- If EBP is seen by students as just a way to complete an assignment, without examining the applied clinical issues, probably not likely to consistently engage in EBP in the workplace (Wolter et al., 2011).
- Many workplaces do not expect clinicians to show the use of evidence-based practice in any systematic way.
Example of school district in Seattle that requires EBP statements as a positive
- When workplaces do expect EBP, there is still limited support or guidance available.
Example of rehabilitation system that has a 50% EBP expert as a positive



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Shelley's experience

Dr. Shelley Blackwell, SLP.D, CCC-SLP
MTSS Support Specialist



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Challenges that surprised me

- Limited knowledge of how to successfully conduct a search
- Limited knowledge of research design/methodology/statistics
 - Encourage students to read articles but don't teach HOW to read articles
- Unaware of the lack of *readily-available* and/or *free* resources to gain evidence



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Information Literacy

Defined by American Library Association (1989)-
“...being able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.”

*American Library Association (1989). Presidential committee on informational literacy: Final Report. Chicago, IL: Author.



Information Literacy

Further defined by Association of College & Research Libraries (2015)-
"...the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning."

*Association of College & Research Libraries (2015). Framework for information literacy for higher education. Chicago, IL: Author. Retrieved from www.dla.org/acrl/standards/ilframework



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SO MUCH EVIDENCE

- Baker and McLeod (2011)
 - Pointed out that if “phonological intervention” was used as a search term in Google, likely be 217,000 hits to sort through
 - If use scholarly engine such as ERIC, still more than 400 hits
- Think about what students likely do when first trying to find evidence/information?



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Conducting a search

Search Strategies

<https://www.softchalkcloud.com/lesson/serve/w7acp8gr3VeX9Q/html>

PubMed MeSH

<https://www.youtube.com/watch?v=uyF8uQY9wys&feature=youtu.be>



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Invite a librarian from your university to speak to your class about how to do a literature search



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Lack of Research methodology/statistical knowledge

- Common for students and clinicians to report that they have difficulty reading research articles
 - "I read the introduction and the discussion and skip the rest."
- O'Connor & Pettigrew (2009)
 - 73% of less experience clinicians felt they were not able to read research and evaluate statistical findings
 - 43% of experienced clinicians felt the same way



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Lack of Research methodology/statistical knowledge

- Be prepared to go over concepts that you weren't prepared to review
 - We now require incoming SLPD students to take a intro to stats/methodology course prior to taking any other coursework
 - Course is for graduate students in the School of Health Professions
 - Focuses on conceptual knowledge, not conducting analyses



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Lack of Research methodology/statistical knowledge

- Make things applicable and accessible to students
 - Try to use examples that pertain to the clinical work of students in that particular cohort
 - The Brown text (The Evidence-Based Practitioner) has a lot of examples and homework assignments
- PEDRO-P training and group reviews of research articles
 - Plan to give extra credit to students in my reading disorders class who turn in a CATE form (Dollaghan) for research articles that are assigned in class



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KUMC journal club

Research presented at 2021 ASHA Teaching Symposium by Storkel and Berry

- Discussed the development and initial evidence related to the efficacy of a journal club related to reading research
- Dr. Berry led research for her SLPD Capstone project



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Research Reading Journal Club: Goals

Goals:

- Increase student knowledge of Evidence Based Practice principles (definition, use)
- Increase student critical appraisal skills
- Increase confidence reading research
- Increase departmental connections and community (COVID)



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Research Reading Journal Club

Content accessed via:

- Weekly emails
- Comprehensive journal club website

Open to:

- SPLH Undergraduate Juniors and Seniors
- Master's first and second year
- SLPD, PhD, AuD
- Off-site Clinical Supervisors, local professionals



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Research Reading Journal Club

Topics included:

- Overview of EBP
- Writing a clinical question
- Database search tutorial
- Journal article critiques and discussions
- Ethics and submitting to IRB



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Research Reading Journal Club

- Pre-post survey showed that students who participated in journal club
 - Increased confidence in their ability to complete skills such as write a PICO question, interpret statistical significance, interpret an effect size, and determine how clinically useful an article was following journal club



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Lack of Research methodology/statistical knowledge

Research methodology and statistical analyses are getting increasingly sophisticated

Give students working understanding of types of analyses

Also provide knowledge on good sources of research

Impact factors

Peer-reviewed versus not

Converging evidence versus single study



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Lack of knowledge of the limited free resources that might be available

- Undergraduate and master's level students do not seem to understand the difficulty in obtaining research when not in a university setting
 - Shock at my suggestion of emailing the author!
- Unaware of the limited amount of professional development that might be made available when employed



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Why isn't everyone using EBP?

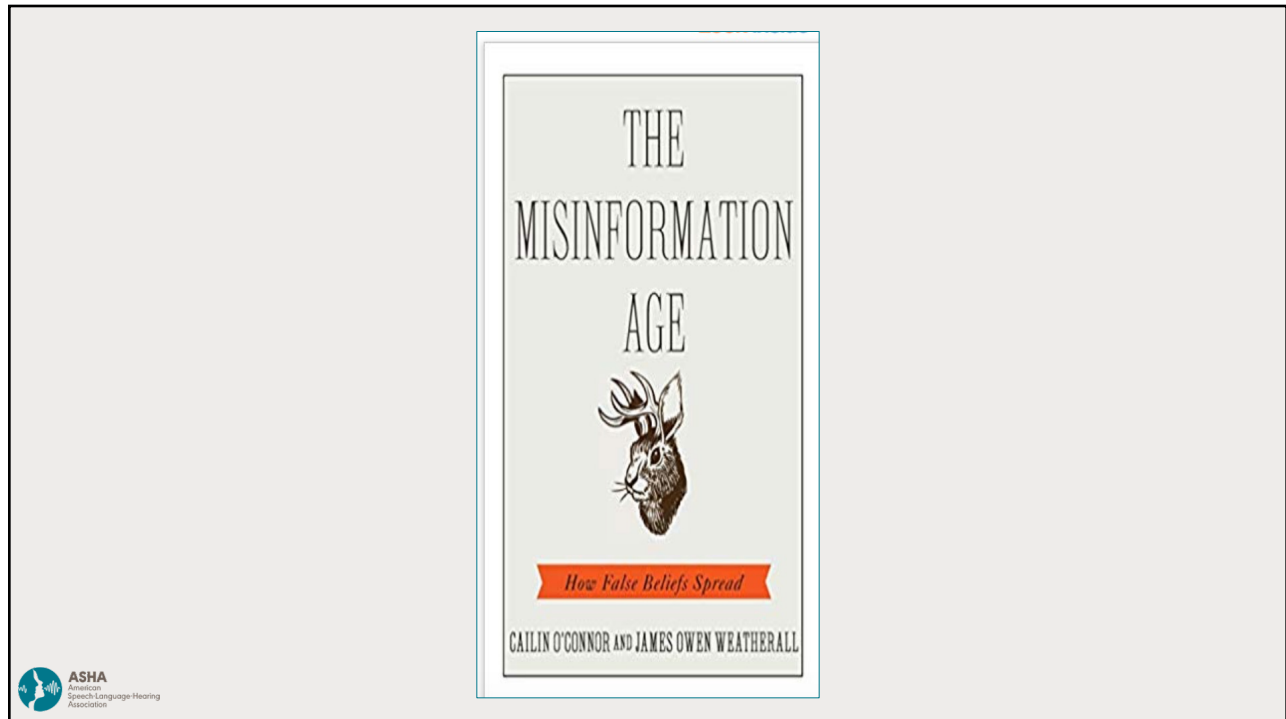
Simply providing information and/or training have been found to be ineffective in changing teacher practice (Fixsen et al., 2005).

“Our findings suggest that barriers to the use of research evidence are linked to an underlying belief that much research is not to be trusted or is, at least, severely limited in its potential applicability.”

Nelson, S. R., Leffler, J. C., & Hansen, B. A. (2009). Toward a research agenda for understanding and improving the use of research evidence. Northwest Regional Educational Laboratory.



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Testimony of others

- Dependence on the “testimony of others”- almost every single belief you have has come from another person
- “When you open the door for true beliefs to spread from person to person, you open the door for false beliefs from person to person,”

From The Misinformation Age



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Confirmation bias: Vaccination example from Hidden Brain podcast

- Individuals tend to search out or look for evidence that fits in with their own beliefs.
- Warning people or focusing on the negative does not seem to help change behaviors
 - Warning about the negatives will not influence anti-vaccination individuals to change their mind about their belief
- Focusing on the positive might influence behavior
 - When physicians provided with immediate positive information/reinforcement, hand washing before/after visits increased



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Final thoughts

Evidence-based practice is changing and evolving within our profession (and outside our profession)

It's our job to lay a foundation for our students

It's not enough to just say "Go Forth and Evidence-Base Practice!"



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*I was taught the way of
progress is neither swift nor
easy.*

Marie Curie

Questions? Comments?

mbridges2@kumc.edu

