



THE ECOSYSTEM  
OF EVIDENCE

Lessons learned in the pandemic  
era and future challenges

10<sup>th</sup> International Conference for EBHC Teachers and Developers  
10<sup>th</sup> Conference of the International Society for EBHC  
Taormina, 25<sup>th</sup> - 28<sup>th</sup> October 2023

#EBHC2023



# 21<sup>st</sup> Century Evidence-Based Medicine (EBM)

Teaching Evidence-Based Medicine to Medical Students using a  
Virtual Journal Club: A mixed method study

Collaborative with Dow International Medical College, Karachi,  
Pakistan (2022)

**Paulo B. Pinho, MD**  
Chief Medical Officer  
[www.Journalclub.net](http://www.Journalclub.net)

# Background — History of Journal Clubs



1800'S

1900'S

Sir James Paget



*“a kind of club . . . a small room over a baker’s shop near the Hospital-gate where we could sit and read the journals.”*

Esi, Martina. “Journal clubs.” *BMJ : British Medical Journal* 335 (2007): s138 - s139.

Sir William Osler



For *“the purchase and distribution of periodicals in which he could not afford to subscribe”*

McGlacken-Byrne SM, O’Rahelly M, Cantillon P, *et al*  
Journal club: old tricks and fresh approaches  
*Archives of Disease in Childhood - Education and Practice* 2020;**105**:236-241.

Dr. Tinsley Harrison



Bimonthly meeting where one member of the group would present a research paper and others would critique it

Topf J, Sparks M, Phelan, P, *et al*  
The Evolution of the Journal Club: From Osler to Twitter  
*American Journal of Kidney Diseases* 2017;**69**(6):827-836.



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# Background – On the Shoulders of Pioneers to Today's Education



1900'S

2018

- **Germany in the early 1900's**
  - Departments of Medicine and Medical Schools began to use them
  - Evolution for continuing medical education
- **Since 1980's**
  - Teach critical appraisal skills
  - Maintain current the growing body of medical knowledge



Linzer M. The journal club and medical education: over one hundred years of unrecorded history. *Postgrad Med J.* 1987 Jun;**63(740)**:475-8.



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# Background – The Perfect Storm of Information Overload



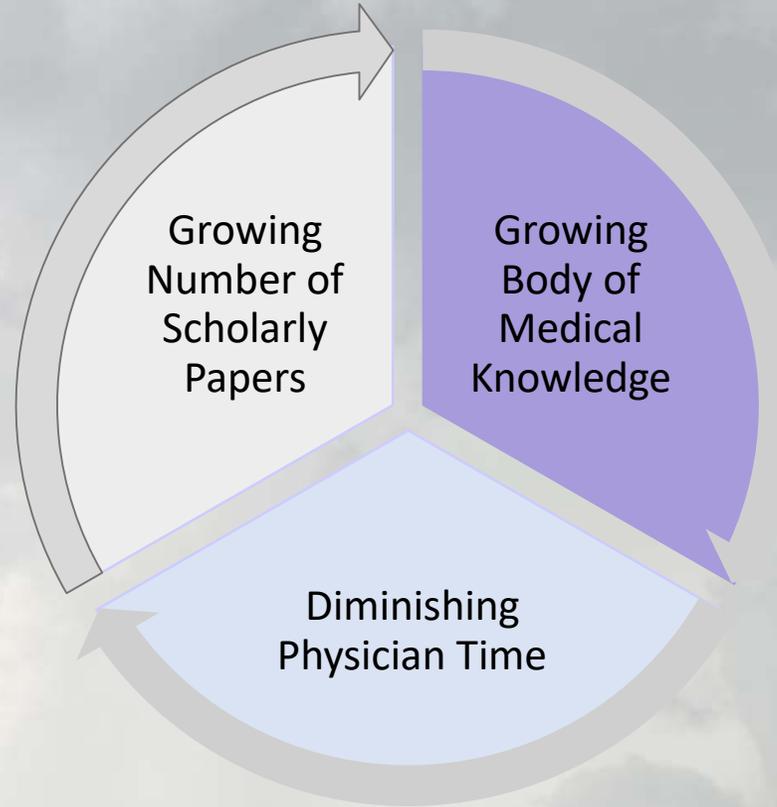
Number of Journals  
**30,000**



Annual Publications  
**2.5 M**



Total Publications to Date  
**50M - 2014**



- *“If physicians would read two articles per day out of the six million medical articles published annually, in one year, they would fall 82 centuries behind in their reading.”*
- *“What was learned in the first 3 years of medical school will be just 6% of what is known at the end of the decade from 2010 to 2020.” – Peter Densen*

*“One of the commonest complaints of practicing physicians is their difficulty in keeping up with medical literature.” – Nathan Flaxman, MD*

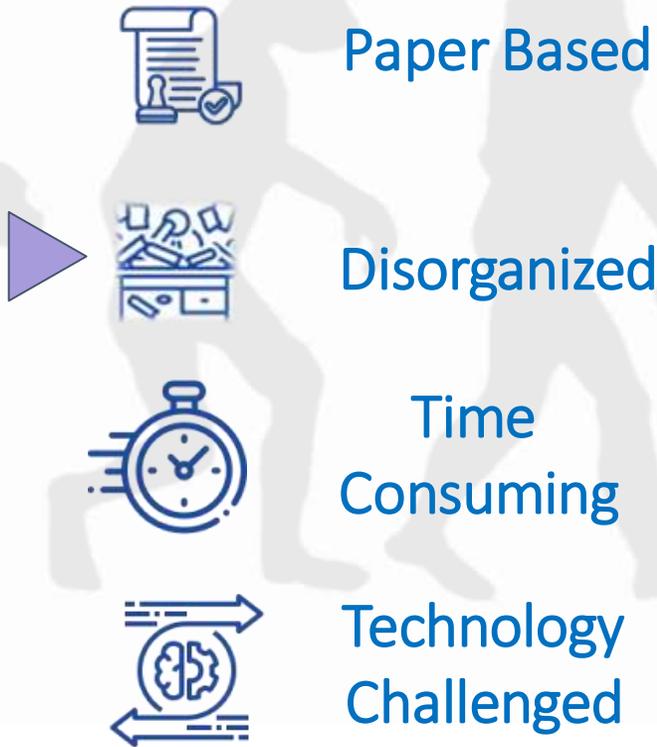
# Background — Evolving Journal Club to Keep Pace in the St



2018

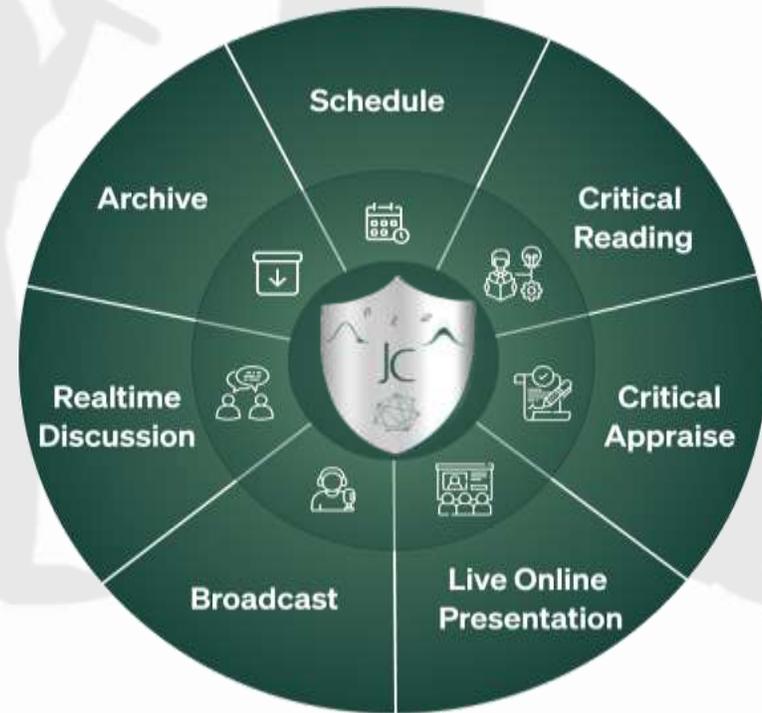
Tomorrow

Current Journal Club



There is no Virtual Journal Club

## Enter a Virtual Journal Club Platform!



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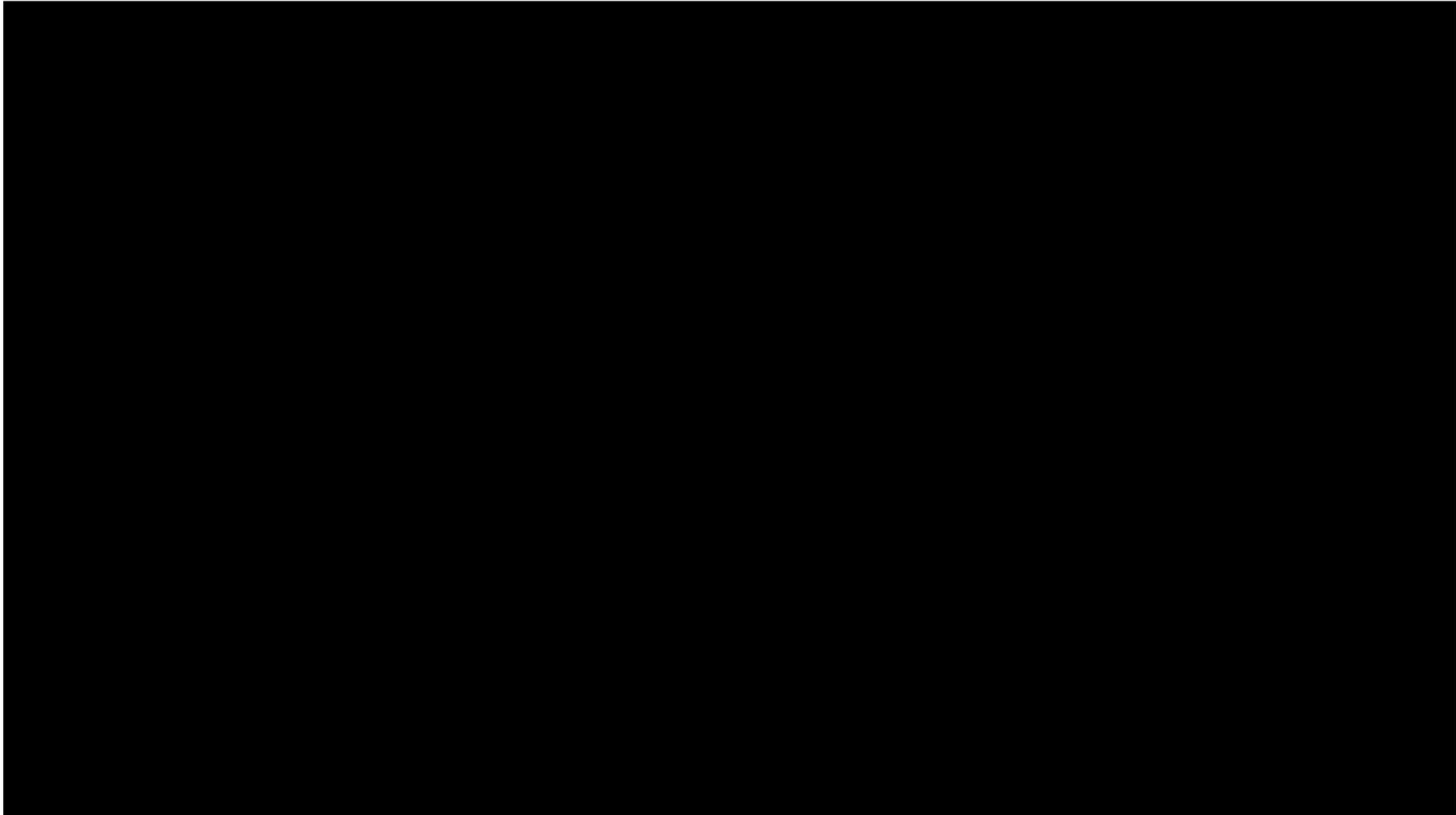
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# Tomorrow's EBM Experience Available Today



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# Aims



- Assess the **feasibility** of educating a diverse healthcare practitioner participant pool Evidence-Based Medicine (EBM) concepts in a two-day workshop
- Perform a **mixed methods study** to evaluate a novel Virtual Journal Club (VJC) tool – JournalClub.net
- **Measure ease, comprehensiveness and effectiveness** of EBM learning through Pre and Post survey analysis



# Methods



- **Ninety-nine (99) participants attended a 2-day EBM workshop**
  - Undergraduate medical, dental and pharmacy students
  - Postgraduate medical trainees
  - Practicing physicians
- **Structure of workshop**
  - **Day 1** - introduction to EBM and its principal concepts
  - **Day 2** - practical sessions and smaller group discussions using JournalClub.net
  - **Surveys** - A pre course self-assessment and practice survey and post course outcomes survey with Likert scale questions
  - **Quiz** – an EBM quiz was administered to participants

Workshop Survey Participant Info (n=99)		
<b>Gender</b>		
Female	75	76%
Male	24	24%
<b>Mean Age</b>	33	
<b>Qualification/Education</b>		
Medical Students	69	70%
1st year	4	
2nd year	6	
3rd year	29	
4th year	30	
Faculty, Doctors, Pharmacists, Nurses	22	22%



# Methods – Flow Charts



## Pre-Workshop



N=98  
Completed Pre-Workshop Survey

	Responses (n)
<b>Pre-Workshop EBM Attitudes and Beliefs</b>	
EBM is Crucial to Physician Practice	98 (99%)
EBM is Necessary for Optimal Treatment	98 (99%)
Incorporating Research into Care Provision is Important	98 (99%)
<b>Pre-Workshop EBM Skillset</b>	98 (99%)
Locating Professional Literature	98 (99%)
Searching Online Databases	98 (99%)
Critical Appraisal Skills	98 (99%)
Identifying Knowledge Gaps	98 (99%)
Critical Appraisal Appraisal of Scientific Literature	97 (98%)
Identifying Patient-Relevant Clinical Questions	98 (99%)

N=1 Did Not Complete Pre-Workshop Survey

## Workshop



N=99  
Completed EBM Workshop and VJC

## Post-Workshop



N=89  
Completed Post-Workshop Survey

N=10 Did Not Complete Post-Workshop Survey

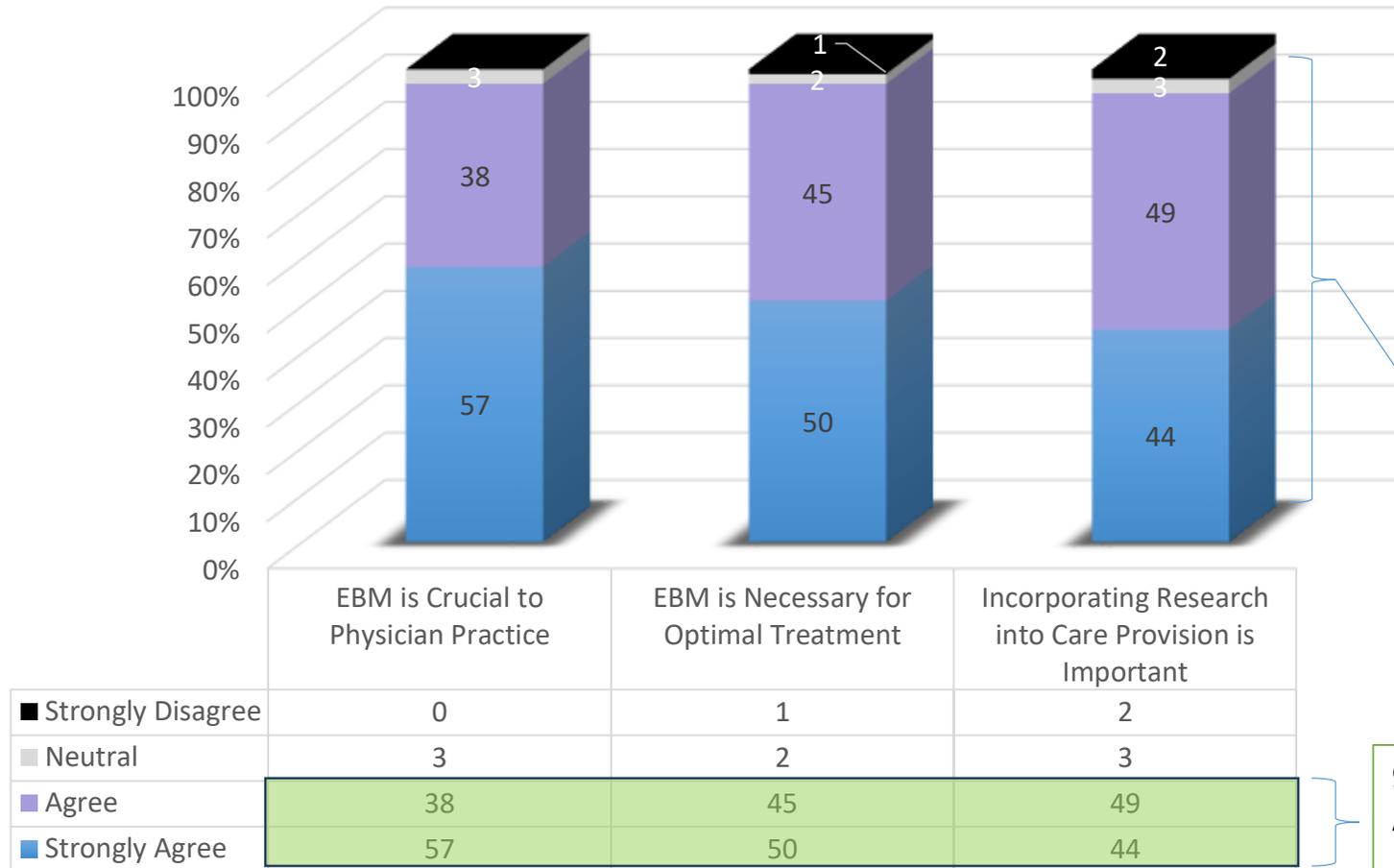
	Responses (n)
<b>Virtual Journal Club (VJC) Usability and Effectiveness</b>	
VJC is effective and efficient for EBM skills learning	89 (90%)
VJC makes EBM learning less intimidating	89 (90%)
VJC interface was easy and intuitive to use	89 (90%)
I would recommend VJC to others	89 (90%)
<b>Virtual Journal Club (VJC) &amp; Workshop Value to EBM and Critical Appraisal</b>	
VJC is more effective at EBM training than traditional methods	89 (90%)
Workshop led to confidence in critical appraisal	89 (90%)
Workshop led to improved EBM skills	89 (90%)
<b>EBM and Critical Appraisal Skills</b>	
Reading and Appraisal Tool Made Learning Easy	89 (90%)
VJC Facilitates Critical Appraisal of Scientific Papers	49 (49%)



# Results – Pre-Workshop



## Pre-Workshop EBM Attitudes and Beliefs (n=98)



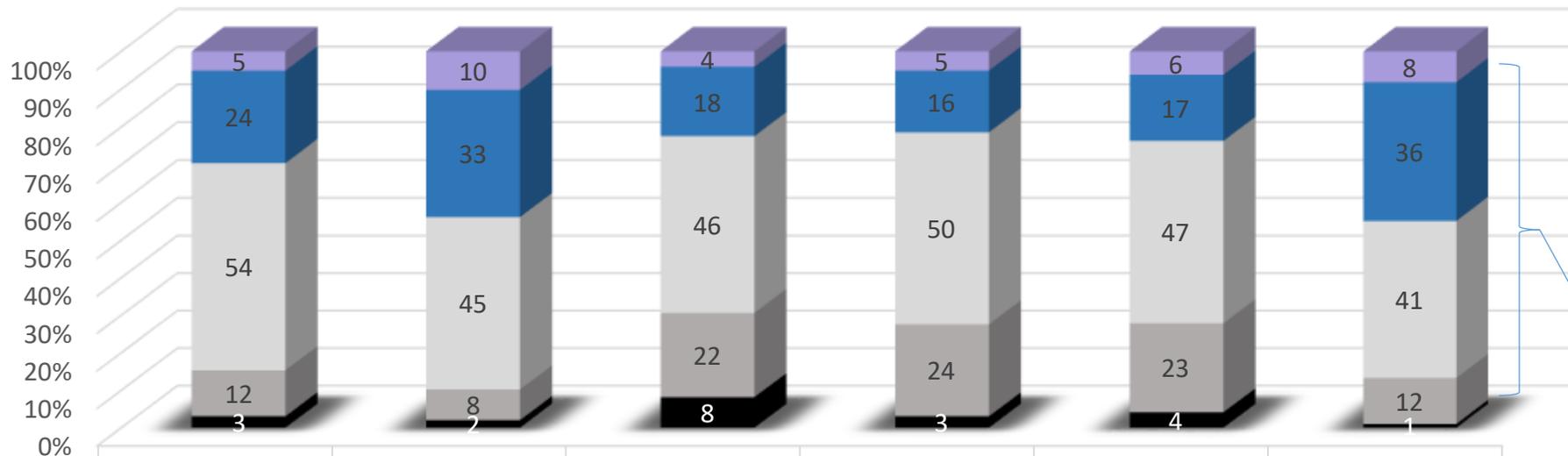
96% answered Agree or Strongly Agree to the Relevance of EBM and Research



# Results – Pre-Workshop



## Pre-Workshop EBM Skillset



	Locating Professional Literature (n=98)	Searching Online Databases (n=98)	Critical Appraisal Skills (n=98)	Identifying Knowledge Gaps (n=98)	Critical Appraisal of Scientific Literature (n=97)	Identifying Patient-Relevant Clinical Questions (n=98)
Advanced	5	10	4	5	6	8
Above Average	24	33	18	16	17	36
Average	54	45	46	50	47	41
Limited	12	8	22	24	23	12
Poor	3	2	8	3	4	1

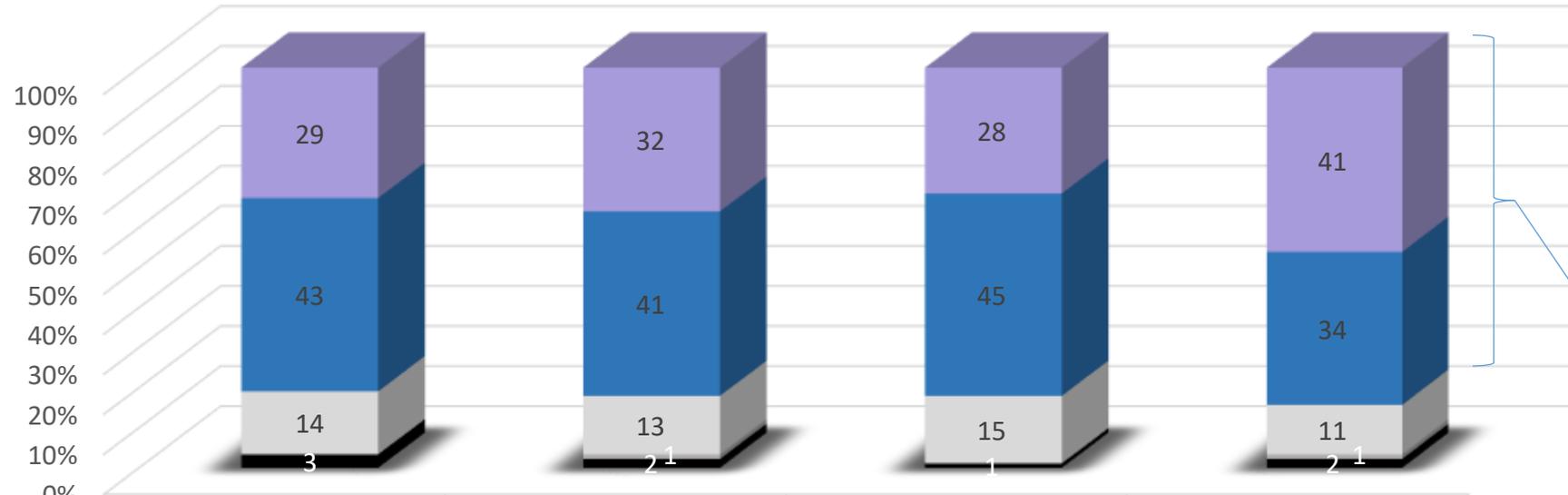
69% answered that their baseline EBM and Critical Analysis Skills were Average or Below



# Results – Post-Workshop



## Virtual Journal Club (VJC) Usability and Effectiveness



	VJC is effective and efficient for EMB skills learning (n=89)	VJC makes EBM learning less intimidating (n=89)	VJC interface was easy and intuitive to use (n=89)	I would recommend VJC to others (n=89)
Strongly Agree	29	32	28	41
Agree	43	41	45	34
Neutral	14	13	15	11
Disagree	0	1	0	1
Strongly Disagree	3	2	1	2

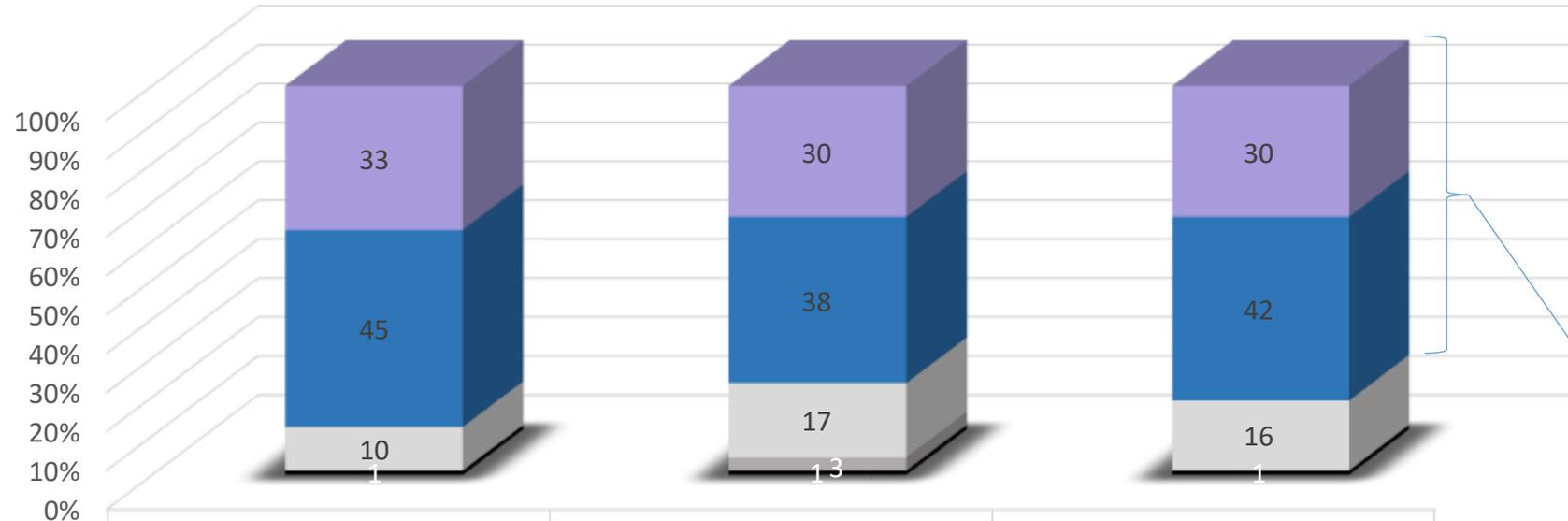
82% answered Agree or Strongly Agree to the Value and Effectiveness of VJC



# Results – Post-Workshop



## Virtual Journal Club (VJC) & Workshop Value to EBM and Critical Appraisal



	VJC is more effective at EBM training than traditional methods (n=89)	Workshop led to confidence in critical appraisal (n=89)	Workshop led to improved EBM skills (n=89)
Strongly Agree	33	30	30
Agree	45	38	42
Neutral	10	17	16
Disagree	0	3	0
Strongly Disagree	1	1	1

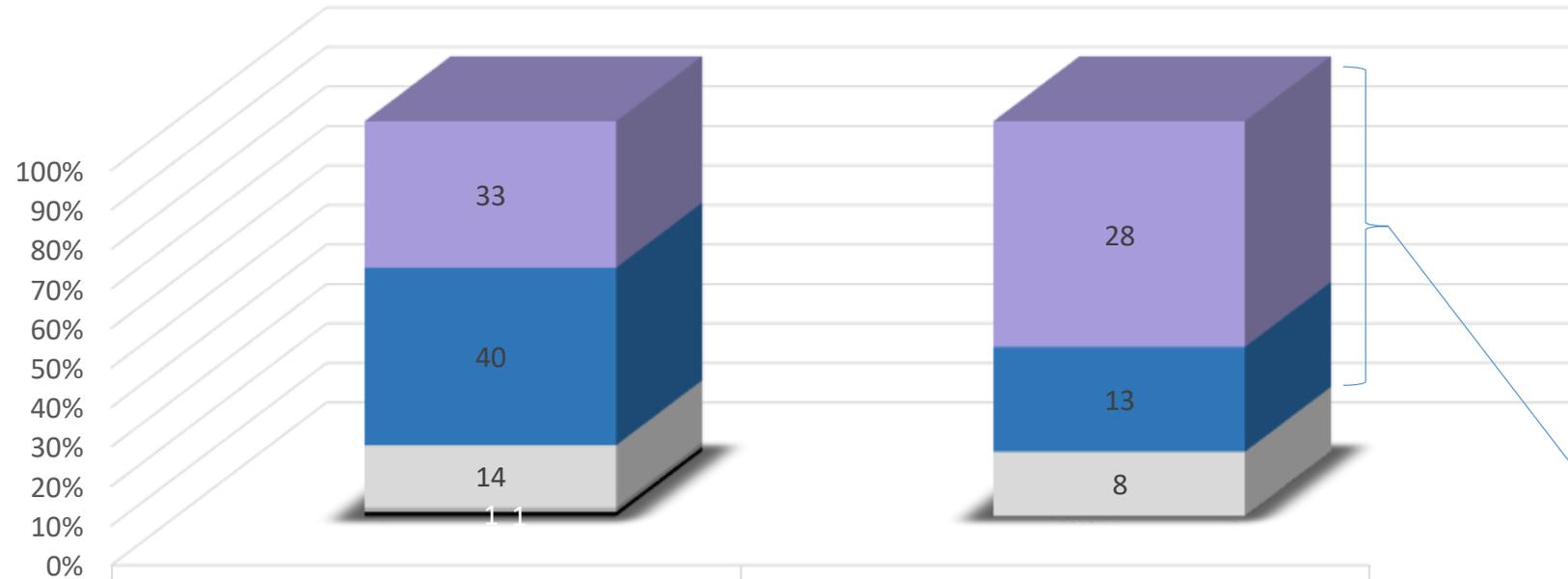
82% answered Agree or Strongly Agree to the Impact of VJC and Workshop to EBM and Critical Appraisal Skills



# Results – Post-Workshop



## EBM and Critical Appraisal Skills



	Reading and Appraisal Tool Made Learning Easy (n=89)	VJC Facilitates Critical Appraisal of Scientific Papers (n=49)
Strongly Agree	33	28
Agree	40	13
Neutral	14	8
Disagree	1	0
Strongly Disagree	1	0

82% answered Agree or Strongly Agree to the Acquisition of EBM and Critical Appraisal Skills



# Limitations



- **Incomplete participation** in the pre- and post-workshop surveys
- **Quiz results format not lent** to statistical analysis
  - Pre and post-test on EBM concepts is a better format
  - Peer-reviewed article critical read should be included in a more robust post-test
- **Short exposure** - longer formalized education would contribute to better ease of use and mastery
- **Biases** – recall, group think, authority bias, anchoring bias
- **Mixed methods study** – case-control format with traditional journal club in a more educationally matched cohort



# Conclusions



- **History** - Journal club has existed for nearly 2 centuries for socialization, knowledge sharing, continuing education and expanding knowledge, teaching critical appraisal
- **The Perfect Storm** - Growing medical knowledge, scholarly papers and physician time constraints
- **Legacy Constraints** - To date, formats are paper based, disorganized, time intensive and tech challenged
- VJC is a novel, tech forward, streamlined and efficient way to **teach critical knowledge analysis and EBM techniques**

