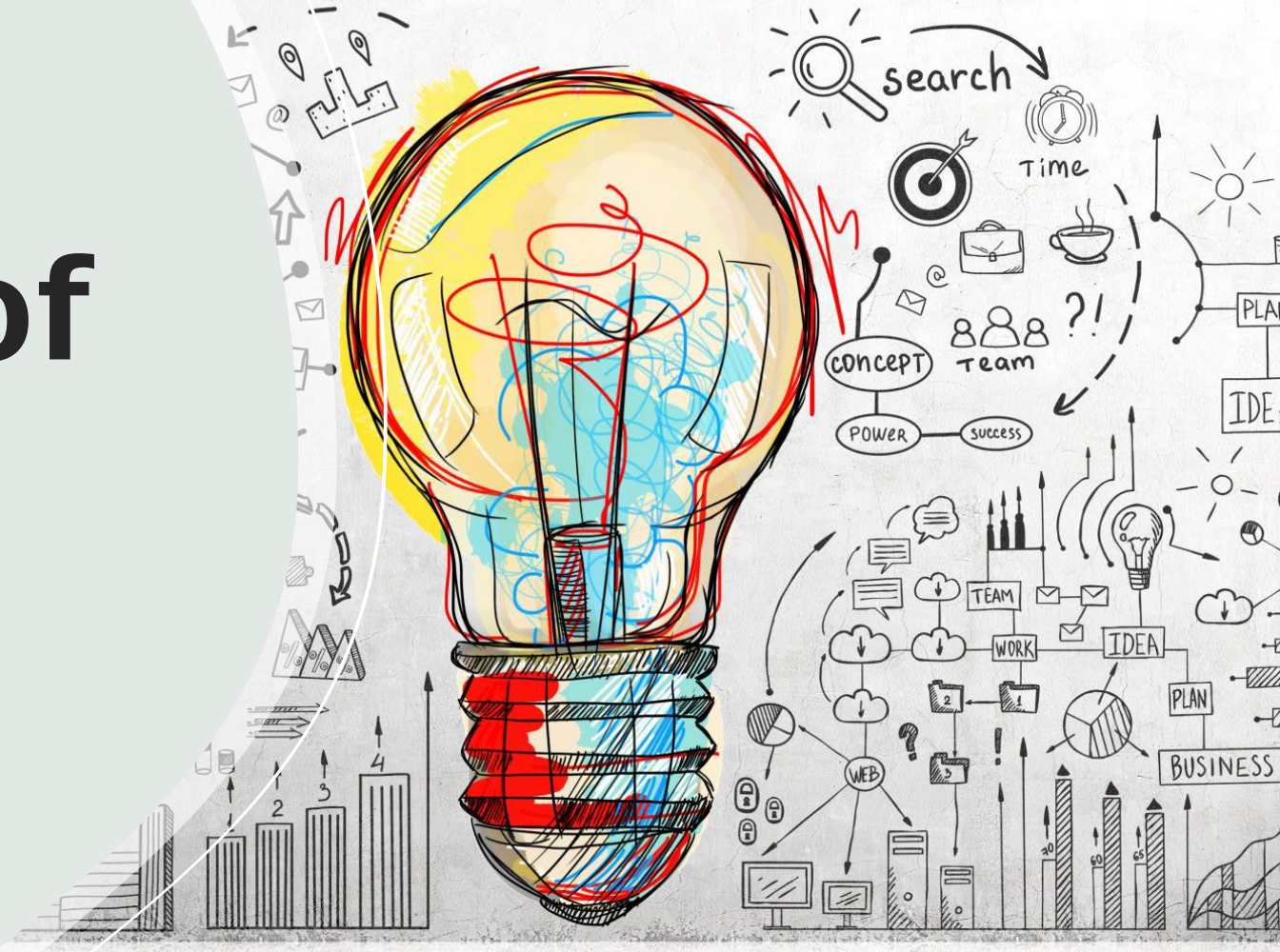
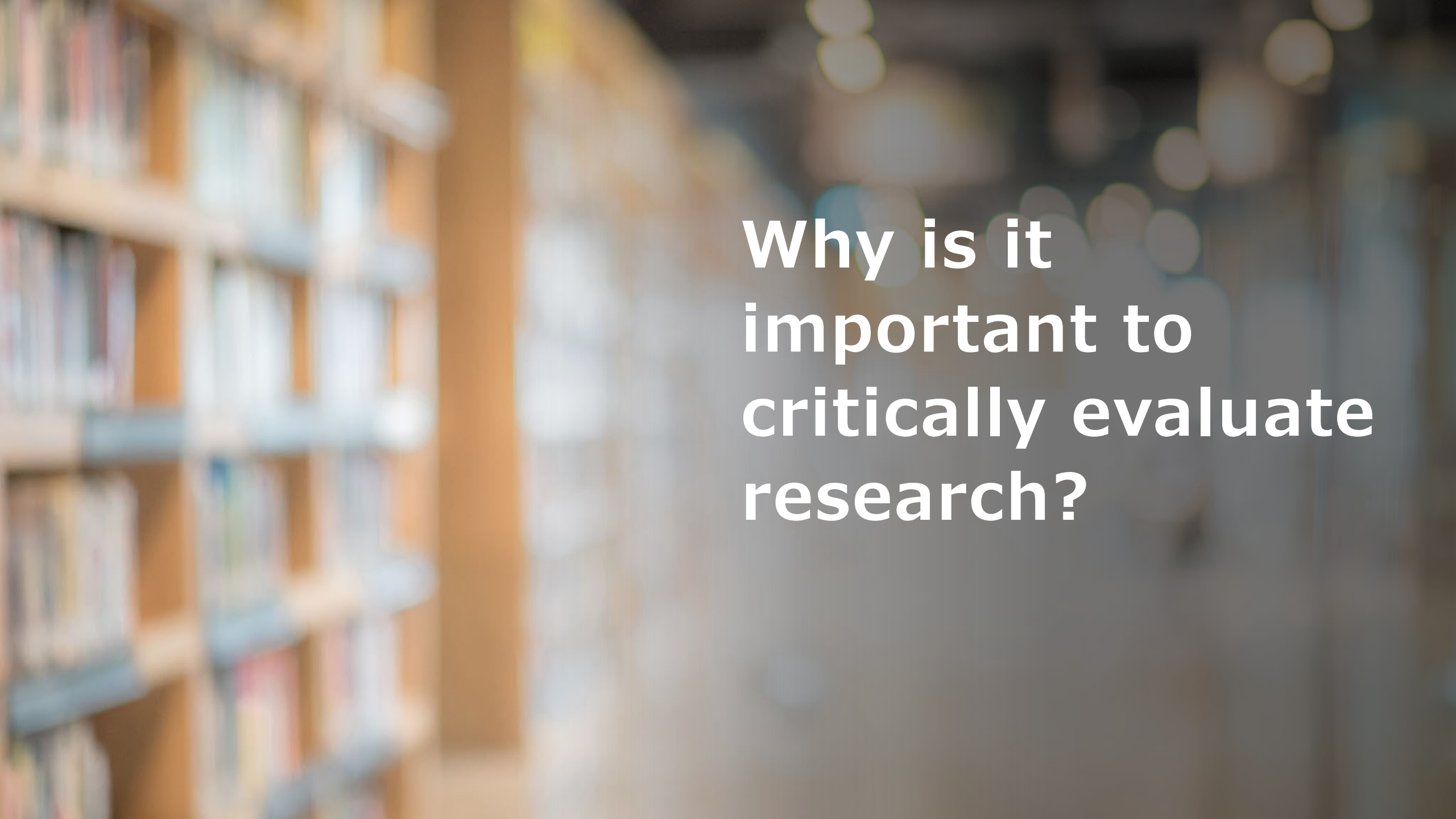
Critical evaluation of research

Chiropractic neurophysiology- CPA




Why is it important to critically evaluate research?

Not all research is created equally

It is necessary to do a quality assessment of research, not just take it for face value

It should not be about whether you like the research, or the researchers, or the results.

Different research designs require different ways of critically evaluating them

Important components of critical evaluation

1. Is the study design appropriate for the research question?
2. Key methodological features
    1. *Have they used the correct statistical analysis?*
    2. *Have they interpreted their results correctly?*
    3. *Have they declared conflicts of interest/bias?*
    4. *Have they covered all the key information in writing the study for publication? Ie could you replicate it?*
3. Sample size, drop out rates
4. Group differences at baseline

EQUATOR network

Enhancing the quality and transparency of health research

Checklists for critically evaluating various research designs

www.equator-network.org

Critical evaluation checklists

Study design	Checklist acronym	Checklist name
Randomized controlled trial (RCT)	CONSORT	Consolidated Standards for Reporting Trials
Systematic reviews and Meta-analyses of RCT's	PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analyses
Meta-analysis of observational studies	MOOSE	Meta-anylses of observational studies in epidemiology
Observational study	STROBE	Strengthening the reporting of Observational studies in Epidemiology
Qualitative research study	SPQR	Standards for reporting qualitative research
Case report	CARE	

CONSORT checklist

Title	#1a	Identification as a randomized trial in the title.
Abstract	#1b	Structured summary of trial design, methods, results, and conclusions
Introduction		
Background and objectives	#2a	Scientific background and explanation of rationale
Background and objectives	#2b	Specific objectives or hypothesis
Methods		
Trial design	#3a	Description of trial design (such as parallel, factorial) including allocation ratio.
Trial design	#3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons

CONSORT checklist

Participants	#4a	Eligibility criteria for participants
Participants	#4b	Settings and locations where the data were collected
Interventions	#5	The experimental and control interventions for each group with sufficient details to allow replication, including how and when they were actually administered
Outcomes	#6a	Completely defined prespecified primary and secondary outcome measures, including how and when they were assessed
Outcomes	#6b	Any changes to trial outcomes after the trial commenced, with reasons
Sample size	#7a	How sample size was determined.
Sample size	#7b	When applicable, explanation of any interim analyses and stopping guidelines
Randomization - Sequence generation	#8a	Method used to generate the random allocation sequence.
Randomization - Sequence generation	#8b	Type of randomization; details of any restriction (such as blocking and block size)

CONSORT

Randomization - Allocation concealment mechanism	#9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned
Randomization - Implementation	#10	Who generated the allocation sequence, who enrolled participants, and who assigned participants to interventions
Blinding	#11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how.
Blinding	#11b	If relevant, description of the similarity of interventions
Statistical methods	#12a	Statistical methods used to compare groups for primary and secondary outcomes

CONSORT

Statistical methods	#12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses
Results		
Participant flow diagram (strongly recommended)	#13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome
Participant flow	#13b	For each group, losses and exclusions after randomization, together with reason
Recruitment	#14a	Dates defining the periods of recruitment and follow-up
Recruitment	#14b	Why the trial ended or was stopped
Baseline data	#15	A table showing baseline demographic and clinical characteristics for each group
Numbers analysed	#16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups
Outcomes and estimation	#17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)
Outcomes and estimation	#17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended
Ancillary analyses	#18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory
Harms	#19	All important harms or unintended effects in each group (For specific guidance see CONSORT for harms)

CONSORT

Discussion		
Limitations	#20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses
Generalisability	#21	Generalisability (external validity, applicability) of the trial findings
Interpretation	#22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence
Registration	#23	Registration number and name of trial registry
Other information		
Interpretation	#22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence
Registration	#23	Registration number and name of trial registry
Protocol	#24	Where the full trial protocol can be accessed, if available
Funding	#25	Sources of funding and other support (such as supply of drugs), role of funders