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Methodological quality of meta-analyses and systematic reviews on the psychological interventions for breast cancer: An Umbrella Review of Their Effects on Anxiety, Depression, Distress, and Quality of Life

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Tagoro

cajasiete

Gobierno de Canarias
Consejería de Universidades, Ciencia e Innovación y Cultura
Agencia Canaria de Investigación, Innovación y Sociedad de la Información

ICI Instituto Canario de Igualdad

tea

hogrefe

International Agency for Research on Cancer

World Health Organization

GLOBAL CANCER OBSERVATORY

CANCER TODAY

GLOBOCAN 2022

EUROPE

Number of new cases	Number of deaths	Number of prevalent cases (5-year)
4 471 422	1 986 093	13 646 087

Statistics at a glance, 2022

Cancer causes persistent **physical, emotional, and social symptoms.**

- Fatigue, depression, anxiety, malnutrition often extend months/years post-treatment (Aizpurua-Pérez & Pérez-Tejada, 2020).
- These symptoms are linked to poor adherence and reduced treatment efficacy.

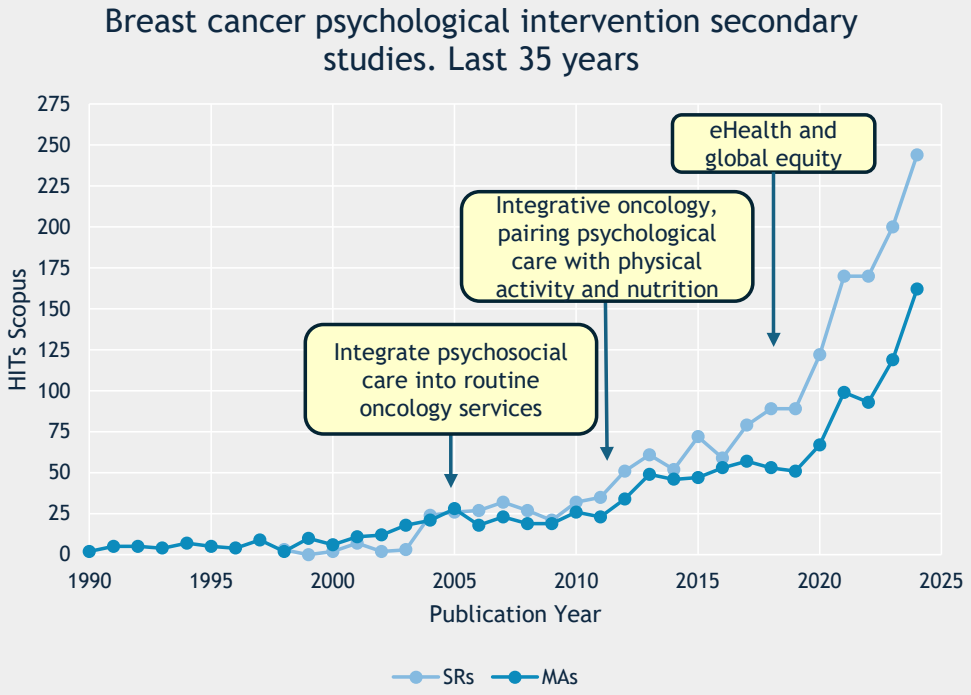
Rapid growth in systematic reviews and meta-analyses on psychological interventions.

- Interventions vary in type (CBT, mindfulness, etc.), population, outcomes.
- The field is rich, but fragmented and inconsistent.

Aizpurua-Pérez, I., & Pérez-Tejada, J. (2020). *Revista Española de Psicología de la Salud, 15*(1), 25-38

Quantity of evidence is high but what about its **quality**?

- Many reviews lack methodological rigor and fail to analyze moderators.
- Clinicians and decision-makers face uncertainty.
- We must identify what works, what doesn't, and what to optimize.



Objectives:

- To develop a **modified version of the AMSTAR2 tool**, specifically adapted to assess the methodological quality of systematic reviews and meta-analyses in the field of psychological interventions for cancer.

- To evaluate the methodological quality of **published systematic reviews and meta-analyses on psychological interventions for breast cancer**, using the Modified AMSTAR2 criteria specifically adapted to this field.

- To examine the **relationship between review quality and other key characteristics** of the meta-analyses, such as year of publication, type of intervention, and population studied.

Shea, B. J., Reeves, B. C., et al. (2017). AMSTAR 2: A critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ, 358*, j4008.

Search Strategy

Generalist sequence for Psychological Component			
Operator	***Topic Name***	***Search within***	***Sequence***
	Cancer	Abstract	"breast cancer" OR "breast carcinoma" OR "breast neoplasm*"
AND	SR/MA	Topic or equivalent "Title/Abstract/Keywords"	"systematic review*" OR "meta-analysis" OR "metaanalysis" OR "metanalysis" OR "meta-analyses" OR "metaanalyses" OR "metanalyses"
AND	Psych. Interv	Abstract	"psycho* intervention" OR "psycho* program*" OR "emotion* management" OR "emotion* regulation" OR mindfulness OR support OR meditation OR mind-body OR "cognitive change" OR "behav* change" OR "cognitive behav* therapy" OR "cognitive-behav* therapy" OR CBT OR relaxation OR "compassion-focused therapy" OR self-compassion OR "compassion training" OR "psycho-oncologic* intervention" OR "coping" OR "resilience" OR "psychotherap*"
AND	RCT/Intev	Title	"randomized control*" OR "intervention*" OR "program*"
NOT	Studies of no interest	Topic or equivalent "Title/Abstract/Keywords"	"case study" OR "case report" OR "survey study" OR "prediction*" OR "associat*" OR "correlation* study" OR "observation* study" OR editorial OR comment OR letter
NOT	Population of no interest	Topic or equivalent "Title/Abstract/Keywords"	athletes OR "college students" OR "teacher*" OR rat OR rats OR mice OR mouse OR dog OR dogs OR cats

Inclusion/exclusion criteria

P	• Adult (≥18 years)breast cancer patients at any stage and/or survivors
I	• Psychological component(s) based interventions
C	• No established limitation
O	• Anxiety, depression, distress, quality of life (QOL)
S	• At least including RCTs

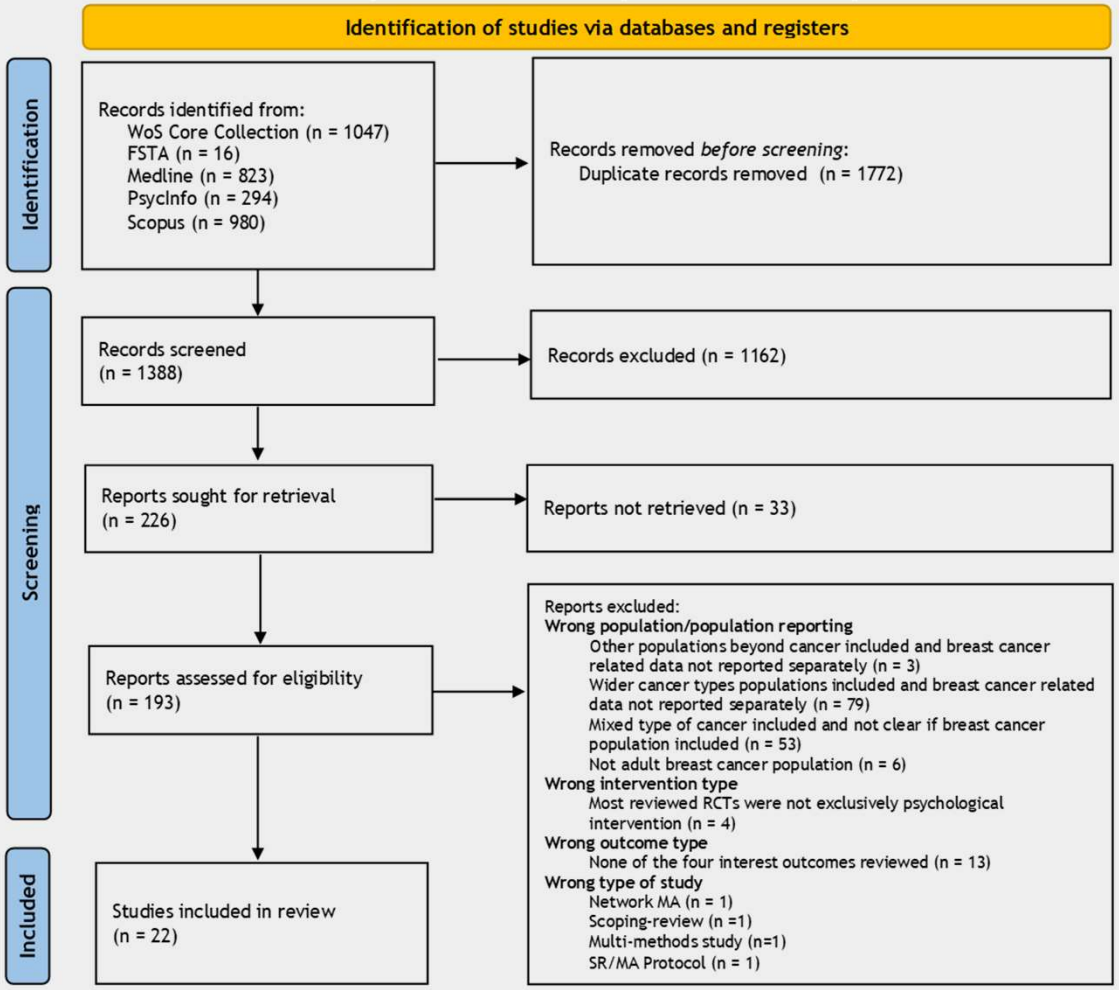
Data extraction

- A protocol was created and pilot tested with 44 variables divided in categories: General study characteristics, Sample and Intervention characteristics, detailed information about outcomes and moderators.

- $AMSTAR2_{Modified}$ was developed: Here main changes listed summarized

Type	*n*	*Items*	*Category*
Expanded	8	Q2	A. Design & Protocol
		Q4, Q6-Q9	B. Search & Duplication
		Q13-Q14	D. Analysis & Interpretation
Clarified	7	Q1, Q3	A. Design & Protocol
		Q5	B. Search & Duplication
		Q10-Q11	C. Bias & Quality Assessment
		Q12, Q15	D. Analysis & Interpretation

Huedo-Medina TB, Garcia M, Bihuniak JD, et al. Methodologic quality of meta-analyses and systematic reviews on the Mediterranean diet and cardiovascular disease outcomes: a review. Am J Clin Nutr 2016, 103: 841-850


Identification of studies via databases and registers
Identification
Records identified from:
WoS Core Collection (n = 1047)
FSTA (n = 16)
Medline (n = 823)
PsycInfo (n = 294)
Scopus (n = 980)
Records removed *before screening*:
Duplicate records removed (n = 1772)
Screening
Records screened
(n = 1388)
Records excluded (n = 1162)
Reports sought for retrieval
(n = 226)
Reports not retrieved (n = 33)
Reports assessed for eligibility
(n = 193)
Reports excluded:
Wrong population/population reporting
Other populations beyond cancer included and breast cancer related data not reported separately (n = 3)
Wider cancer types populations included and breast cancer related data not reported separately (n = 79)
Mixed type of cancer included and not clear if breast cancer population included (n = 53)
Not adult breast cancer population (n = 6)
Wrong intervention type
Most reviewed RCTs were not exclusively psychological intervention (n = 4)
Wrong outcome type
None of the four interest outcomes reviewed (n = 13)
Wrong type of study
Network MA (n = 1)
Scoping-review (n =1)
Multi-methods study (n=1)
SR/MA Protocol (n = 1)
Included
Studies included in review
(n = 22)

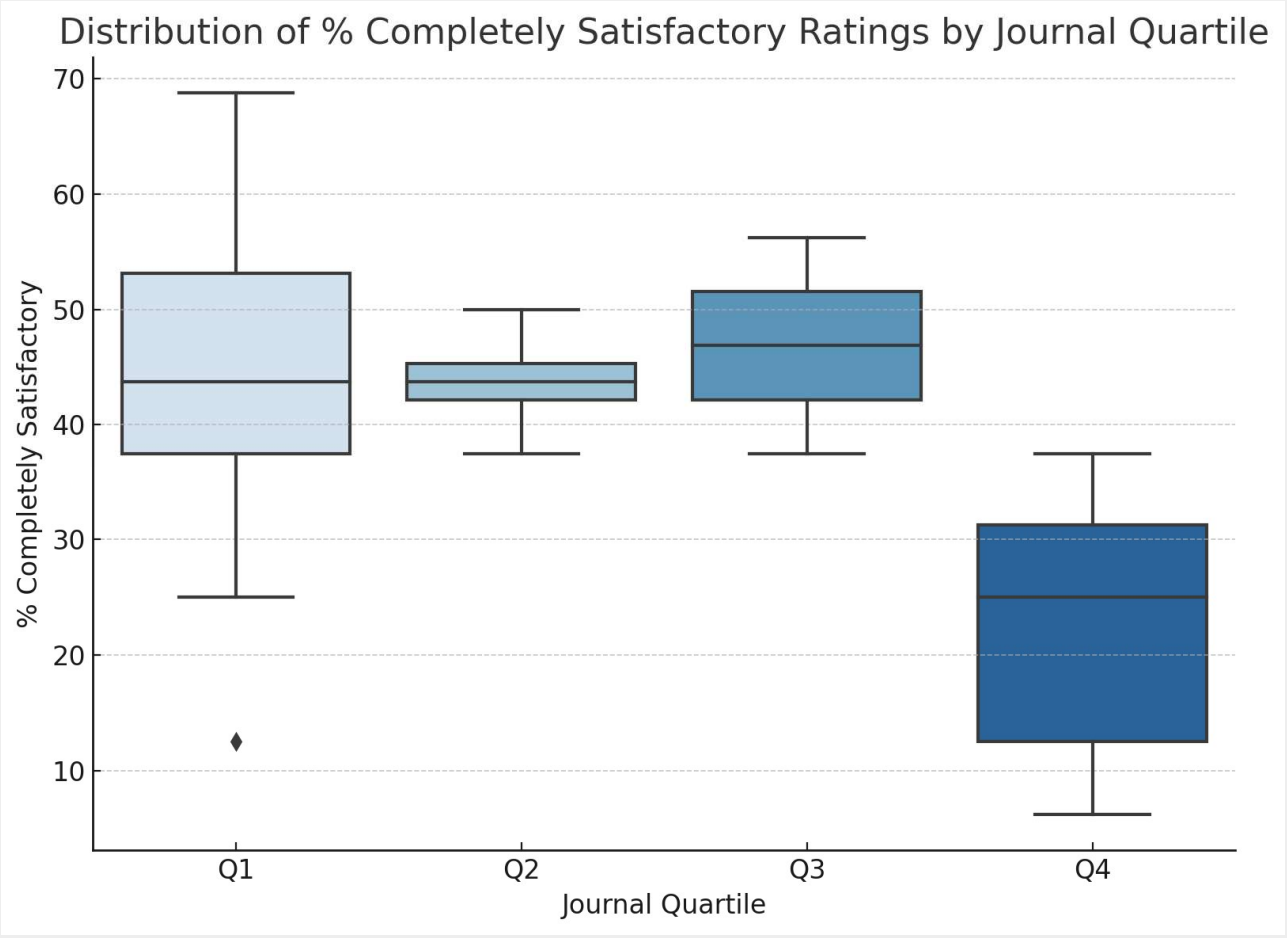
Inter-rater reliability was high, (κ between 0,88 and 1, *r* between 0,99 and 1)

Descriptive Variables	Min	Max	Mean	SD
Publication year	2010	2024	2020	3,49
Sample size	344	18570	3031,6	3857,1
AMSTAR2 Modified				
Completly satisfactory	8,33	68,7	40,2	14,1
Unsatisfactory	12,5	66,7	31,4	13,2

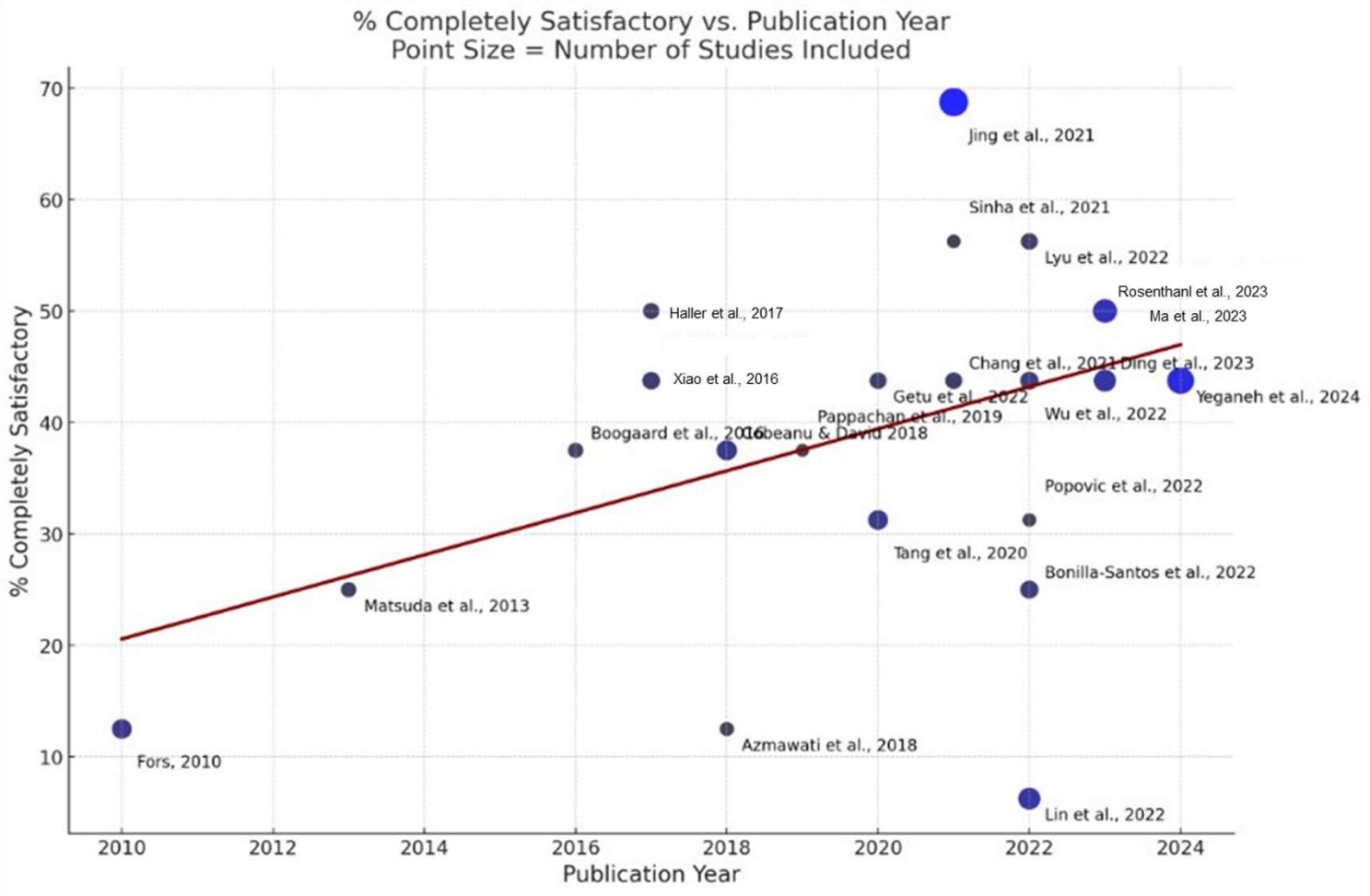
Question	Agreement (%)	Reliability (κ)	Unsatisfactory (%)	Not completely satisfactory (%)	Completely Satisfactory (%)
1. Did the research questions and inclusion criteria for the review include the components of PICO?	100	1			90,9
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	100	1	63,6	18,2	13,6
3. Did the review authors explain their selection of the study designs for inclusion in the review?	100	1	13,6	NA	86,4
4. Did the review authors use a comprehensive literature search strategy?	94.7	0.919	4,5	63,6	9,1
5. Did the inclusion criteria permit grey literature?	94.7	0.919	63,6	NA	36,4
6. Did the review authors perform study selection in duplicate?	94.7	0.919	54,5	36,4	9,1
7. Did the review authors perform data extraction in duplicate?	100	1.0	22,7	54,5	4,5
8. Did the review authors provide a list of excluded studies and justify the exclusions?	100	1.0	0	NA	100
9. Did the review authors describe the included studies in adequate detail?	94.7	0.919	4,5	4,5	90,9
10. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	100	1.0	13,6	36,4	50
11. Did the review authors report on the sources of funding for the studies included in the review?	100	1.0	90,9	NA	9,09
12. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?	90.7	0.888	0	11,8	88,2
13. If meta-analysis was performed, did the review authors assess the potential impact of Risk of Bias in individual studies on the results of the meta-analysis or other evidence synthesis?	94.7	0.919	41,2	11,8	41,2
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	100	1.0	5,9	NA	88,2
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	100	1.0	11,8	NA	64,7
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	100	1.0	13,6	NA	81,9

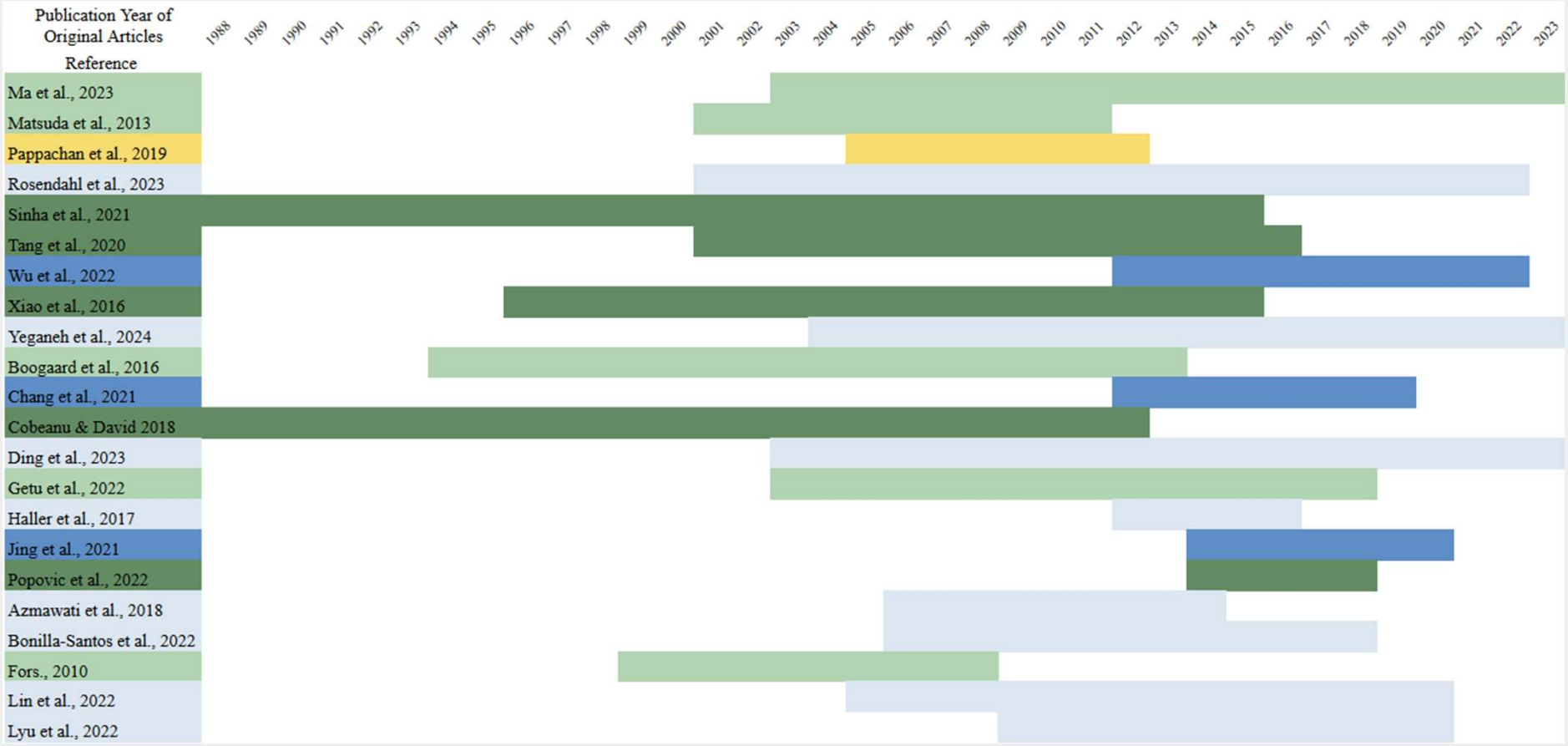
$AMSTAR2_{Modified}$ Scale Items Assessing Methodological Quality of the Meta-Analysis (I=22), Inter-Rater Agreement, and Reliability

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	Unsatisfactory %	Not completely satisfactory	Mostly satisfactory	Completely satisfactory
Azmawati et al., 2018	Y	0	0	MY	0	MY	NC	MY	Y	PY	0	NA	NA	NA	NA	0	31.25	6.25	18.75	12.5
Bonilla-Santos et al., 2022	Y	Y	0	MY	0	0	NC	MY	Y	MY	0	NA	NA	NA	NA	Y	25	0	18.75	25
Boogaard et al., 2016	Y	0	0	PY	0	MY	MY	MY	Y	Y	Y	Y	0	MY	NA	Y	25	6.25	25	37.5
Chang et al., 2021	Y	0	0	PY	0	0	0	MY	Y	Y	0	Y	0	Y	Y	Y	43.75	6.25	6.25	43.75
Cobeanu & David 2018	Y	0	0	PY	0	0	MY	MY	Y	0	0	Y	0	Y	Y	Y	43.75	6.25	12.5	37.5
Ding et al., 2023	Y	Y	0	NC	0	0	MY	MY	Y	Y	0	MY	0	Y	Y	Y	31.25	0	18.75	43.75
Fors., 2010	Y	0	0	NC	0	0	NC	MY	Y	MY	0	NA	NA	NA	NA	0	37.5	0	12.5	12.5
Getu et al., 2022	Y	0	0	NC	Y	MY	MY	MY	Y	MY	0	Y	Y	Y	0	Y	25	0	25	43.75
Haller et al., 2017	Y	NC	0	NC	Y	MY	MY	MY	Y	Y	0	Y	Y	Y	NA	Y	12.5	0	18.75	50
Jing et al., 2021	Y	0	0	PY	Y	Y	Y	MY	Y	Y	0	Y	Y	Y	Y	Y	18.75	6.25	6.25	68.75
Lin et al., 2022	NC	0	0	0	0	0	0	MY	MY	0	0	NA	NA	NA	NA	Y	50	0	12.5	6.25
Lyu et al., 2022	Y	MY	Y	MY	0	MY	0	MY	Y	Y	0	Y	Y	Y	Y	Y	18.75	0	18.75	56.25
Ma et al., 2023	Y	MY	0	MY	0	Y	MY	MY	Y	Y	0	Y	0	Y	Y	Y	25	0	18.75	50
Matsuda et al., 2013	Y	0	0	MY	Y	0	0	MY	Y	PY	0	Y	0	Y	NA	NC	37.5	6.25	6.25	25
Pappachan et al., 2019	Y	0	0	MY	Y	0	MY	MY	0	MY	Y	MY	MY	Y	Y	Y	25	0	37.5	37.5
Popovic et al., 2022	Y	0	Y	Y	0	0	0	MY	Y	0	0	NA	NA	NA	NA	Y	37.5	0	6.25	31.25
Rosendahl et al., 2023	Y	MY	0	MY	Y	MY	MY	MY	Y	Y	0	Y	Y	Y	Y	Y	12.5	0	31.25	56.25
Sinha et al., 2021	Y	Y	0	Y	Y	0	NC	MY	Y	Y	0	Y	0	Y	0	Y	31.25	0	6.25	56.25
Tang et al., 2020	NC	0	0	NC	Y	0	MY	MY	Y	Y	0	Y	NC	NA	NA	Y	25	0	12.5	31.25
Wu et al., 2022	Y	0	0	PY	0	MY	MY	MY	Y	Y	0	Y	MY	Y	Y	Y	25	6.25	25	43.75
Xiao et al., 2016	Y	0	Y	PY	0	0	MY	MY	Y	MY	0	Y	Y	Y	Y	0	31.25	6.25	18.75	43.75
Yeganeh et al., 2024	Y	MY	0	MY	0	MY	MY	MY	Y	MY	0	Y	Y	Y	Y	Y	18.75	0	37.5	43.75



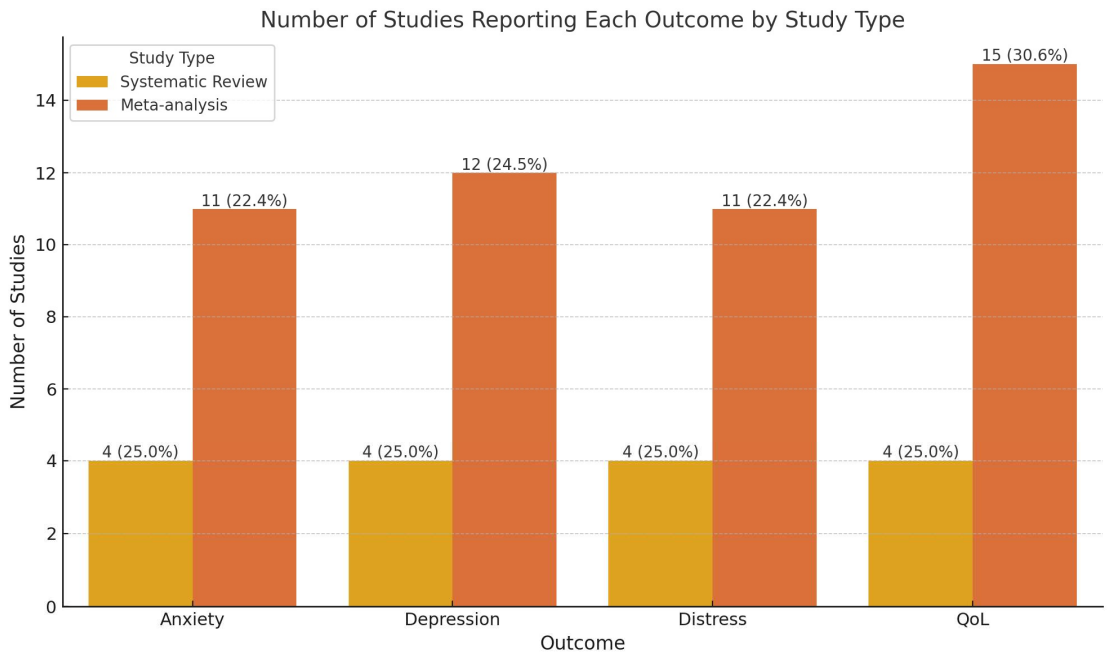
F (3, 18) = 3014, p = 0,05


% Completely Satisfactory vs. Publication Year
Point Size = Number of Studies Included
% Completely Satisfactory
Publication Year
70
60
50
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
2024
Jing et al., 2021
Sinha et al., 2021
Lyu et al., 2022
Rosenthanl et al., 2023
Ma et al., 2023
Haller et al., 2017
Xiao et al., 2016
Chang et al., 2021
Ding et al., 2023
Getu et al., 2022
Yeganeh et al., 2024
Wu et al., 2022
Pappachan et al., 2019
Boogaard et al., 2016
beanu & David 2018
Popovic et al., 2022
Tang et al., 2020
Bonilla-Santos et al., 2022
Matsuda et al., 2013
Azmawati et al., 2018
Fors, 2010
Lin et al., 2022

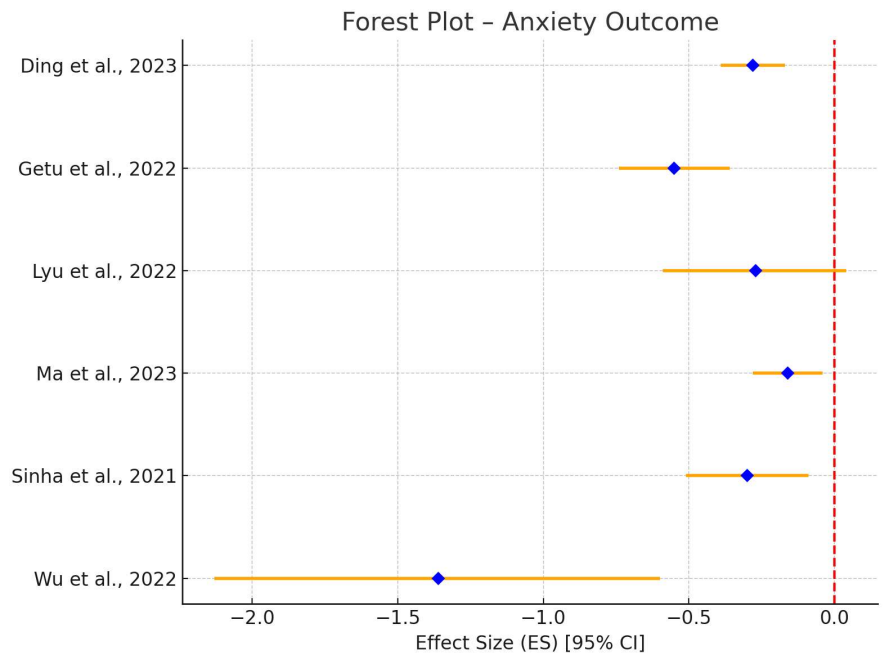


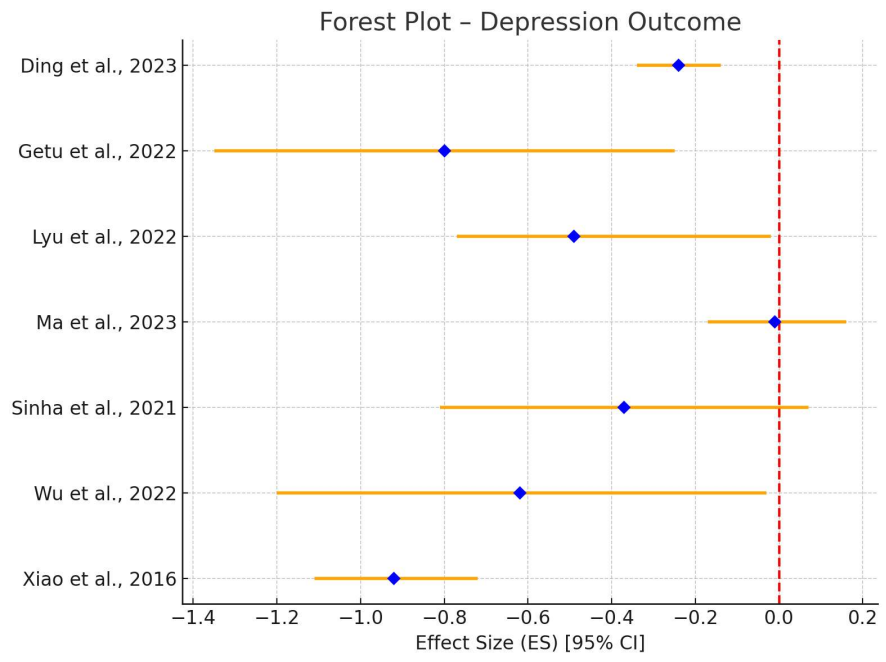
	%
Only MBI	13,6
At least MBI	36,4
CBT	22,7
At least CBT	22,7
Psychoed. Ssupport	4,5

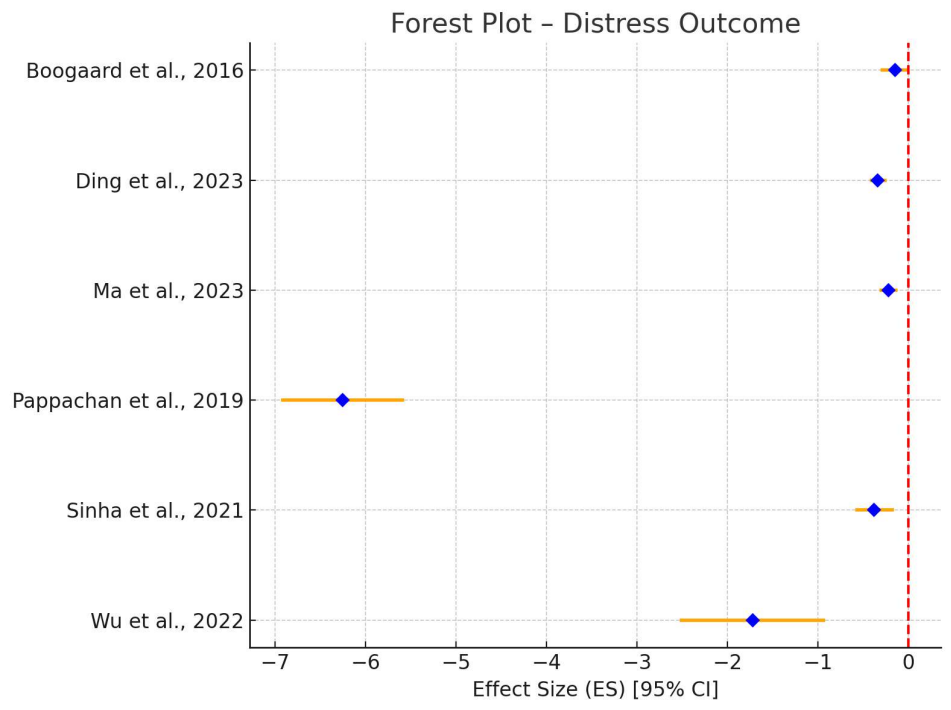
Descriptive Variables	Min	Max	Mean	SD
Publication year	2010	2024	2020	3,49
k included	4	45	15,9	10,9
Sample size	344	18570	3031,6	3857,1
# Outcomes	0	11	3,7	3,1
# Moderators	0	6	1,4	1,8

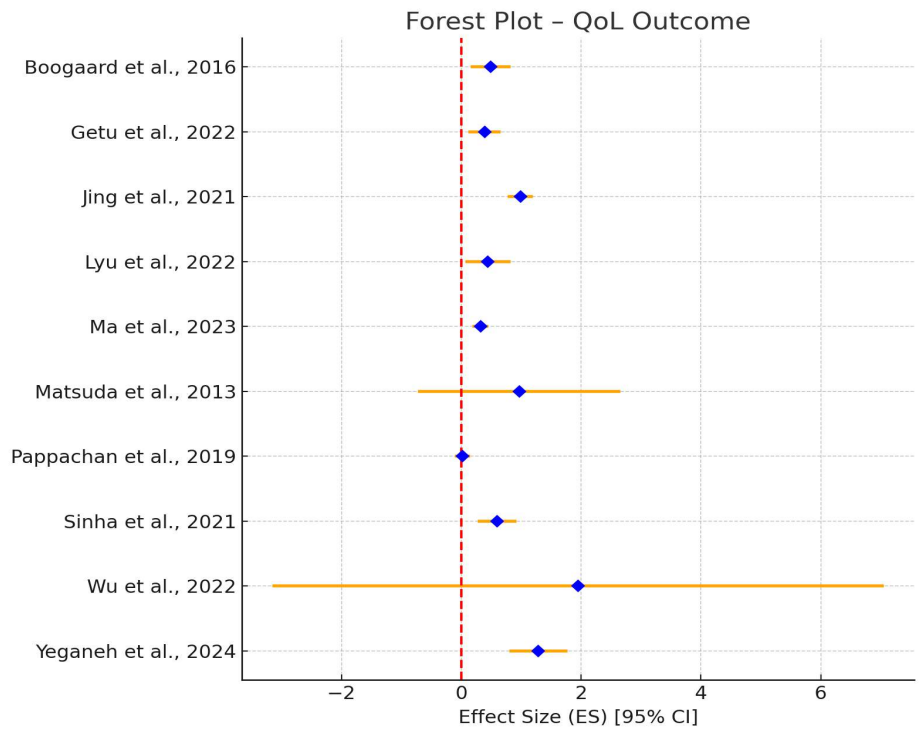


Outcome	MA studies Overall Efficacy	
	Improvement of the Experimental Group	*No Significant Effect*
Anxiety	5 de 6	1 de 6
Depression	5 de 7	2 de 7
Distress	5 de 6	1 de 6
QOL	7 de 10	3 de 10


Forest Plot – Anxiety Outcome
Ding et al., 2023
Getu et al., 2022
Lyu et al., 2022
Ma et al., 2023
Sinha et al., 2021
Wu et al., 2022
−2.0
−1.5
−1.0
−0.5
0.0
Effect Size (ES) [95% CI]


Forest Plot – Depression Outcome
Ding et al., 2023
Getu et al., 2022
Lyu et al., 2022
Ma et al., 2023
Sinha et al., 2021
Wu et al., 2022
Xiao et al., 2016
−1.4
−1.2
−1.0
−0.8
−0.6
−0.4
−0.2
0.0
0.2
Effect Size (ES) [95% CI]


Forest Plot – Distress Outcome
Boogaard et al., 2016
Ding et al., 2023
Ma et al., 2023
Pappachan et al., 2019
Sinha et al., 2021
Wu et al., 2022
−7
−6
−5
−4
−3
−2
−1
0
Effect Size (ES) [95% CI]


Forest Plot – QoL Outcome
Boogaard et al., 2016
Getu et al., 2022
Jing et al., 2021
Lyu et al., 2022
Ma et al., 2023
Matsuda et al., 2013
Pappachan et al., 2019
Sinha et al., 2021
Wu et al., 2022
Yeganeh et al., 2024
−2
0
2
4
6
Effect Size (ES) [95% CI]

MODERATOR VARIALBES		
AS	Assessment point	41,2%
TI	Type of intervention	41,2%
DT	Delivery type	17,6%
IM	Intervention modality	11,8%
TG	Type of control group	11,8%
TL	Therapy length	11,8%
TO	Assessment tool used	11,8%
CS	Cancer stage	5,9%
DS	Treatment dose	5,9%
N	Sample size	5,9%
TCT	Type of cancer treat ment	5,9%
TP	Type of professional	5,9%

Study	Outcome	Short-term	Long-term
Chang et al., 2021	Anxiety	-	NS
	QoL	+	+
Cobeanu & David 2018	Anxiety	+	NS
	Depression	NS	NS
	Distress	+	+
	QoL	+	NS
Getu et al., 2022	Anxiety	+	
	Depression		
	QoL	+	NS
Ma et al., 2023	Anxiety	-	NS
	QoL	+	+
Pappachan et al., 2019	Depression	NS	NS
	Distress	-	-

Only MBI	
At least MBI	
CBT	
At least CBT	
Psychoed. Ssupport	

METHODOLOGICAL QUALITY

- Inconsistent **methodological quality** in the high volume of reviews.
- The application of a **Modified AMSTAR2** tool revealed lacked:
  - Stronger results than in HIV, blood pressure, and exercise SRs
  - **High rigor observed in breast cancer psychological intervention review**
  - >70% "Completely Satisfactory" in key items:
    - PICO framing, Study description, Excluded studies with justification
    - Meta-analytic methods, Heterogeneity discussion
  - Low frequency of “Completely Unsatisfactory” across all items
  - AMSTAR2 Modified captures detailed quality differences and strengths

- **Higher methodological** quality was more frequently observed in **recent publications** and in those appearing in higher-quartile journals.
- **Meta-analyses tended to be of higher quality than systematic reviews** without quantitative synthesis.

OUTCOMES

- Psychological interventions showed the most consistent effectiveness in reducing anxiety and improving quality of life.
- Depression outcomes were moderately positive but less stable over time.
- Distress showed the most variability across studies and follow-up periods.

- Future work should focus on strengthening methodological standards, using living reviews, adopting integrative oncology approaches, and expanding the use of digital health tools to improve accessibility, long-term effects, and equity in psychosocial cancer care.

Thank you for your attention

I welcome your thoughts or questions

Pérez-Setién, E., Egana-Marcos, E., Gonzalez-Mojica, M. I., Alonso-Alberca, N., Balluerka, N., & Huedo-Medina, T. B., *Methodological quality of meta-analyses and systematic reviews on the psychological interventions for breast cancer: An Umbrella Review of Their Effects on Anxiety, Depression, Distress, and Quality of Life*. In prep 2025

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