

Searching for rigour in mixed methods health research: *A methodological review*

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Outline

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1. Research Problem & Questions
2. Mixed Methods Research
3. Methods
4. Results
5. Discussion
6. Directions for Future Research

Mixed Methods & Health Geography

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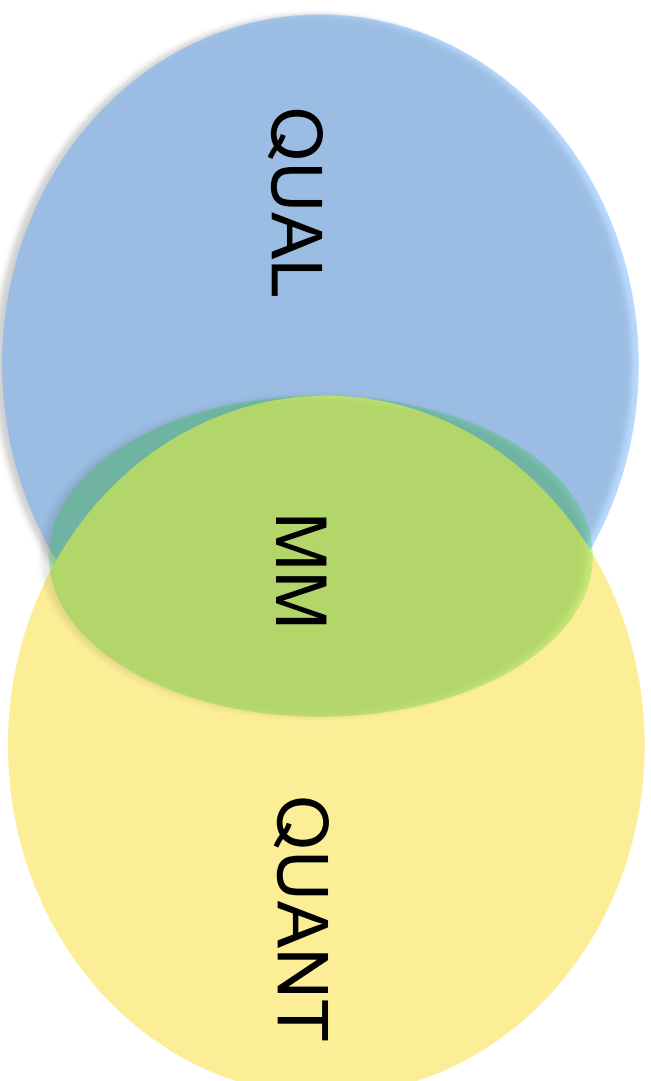
- Complex & diverse nature of health geography



Mixed Methods & Health Geography

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- Calls to “move beyond the methodological divide”¹

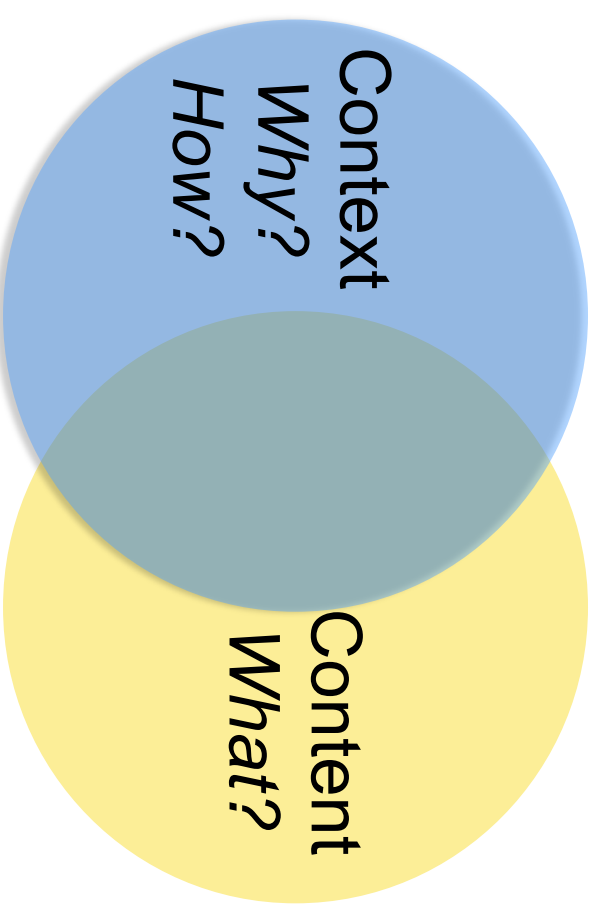


- Rigour?

¹Sui & Delyser (2012), p. 112

Empirical example: School-based obesity interventions

- Childhood obesity = global public health concern
- Schools ideal intervention setting
- BUT intervention environment shapes implementation and outcomes



Research Questions

1. How have mixed methods been **used** in research related to assessing the implementation and outcomes of school-based obesity interventions?
2. How have mixed methods been **reported** in these studies?
3. How has **rigour** been addressed in these studies?

Mixed Methods (MM) Research

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Creswell & Plano Clark (2011)

- Collect & analyze **both** quantitative & qualitative data
- **Integrate** quantitative & qualitative data
- Prioritize 1 data type or both have equal **priority**
- Framed in philosophical worldviews & theoretical lenses
- Specific (mixed methods) designs used

Johnson et al. (2007)

- **mixed methods study**: mixing within 1 study

Rigour in Mixed Methods

Quantitative

- Internal validity
- Generalizability
- Reliability
- Replicability

Qualitative

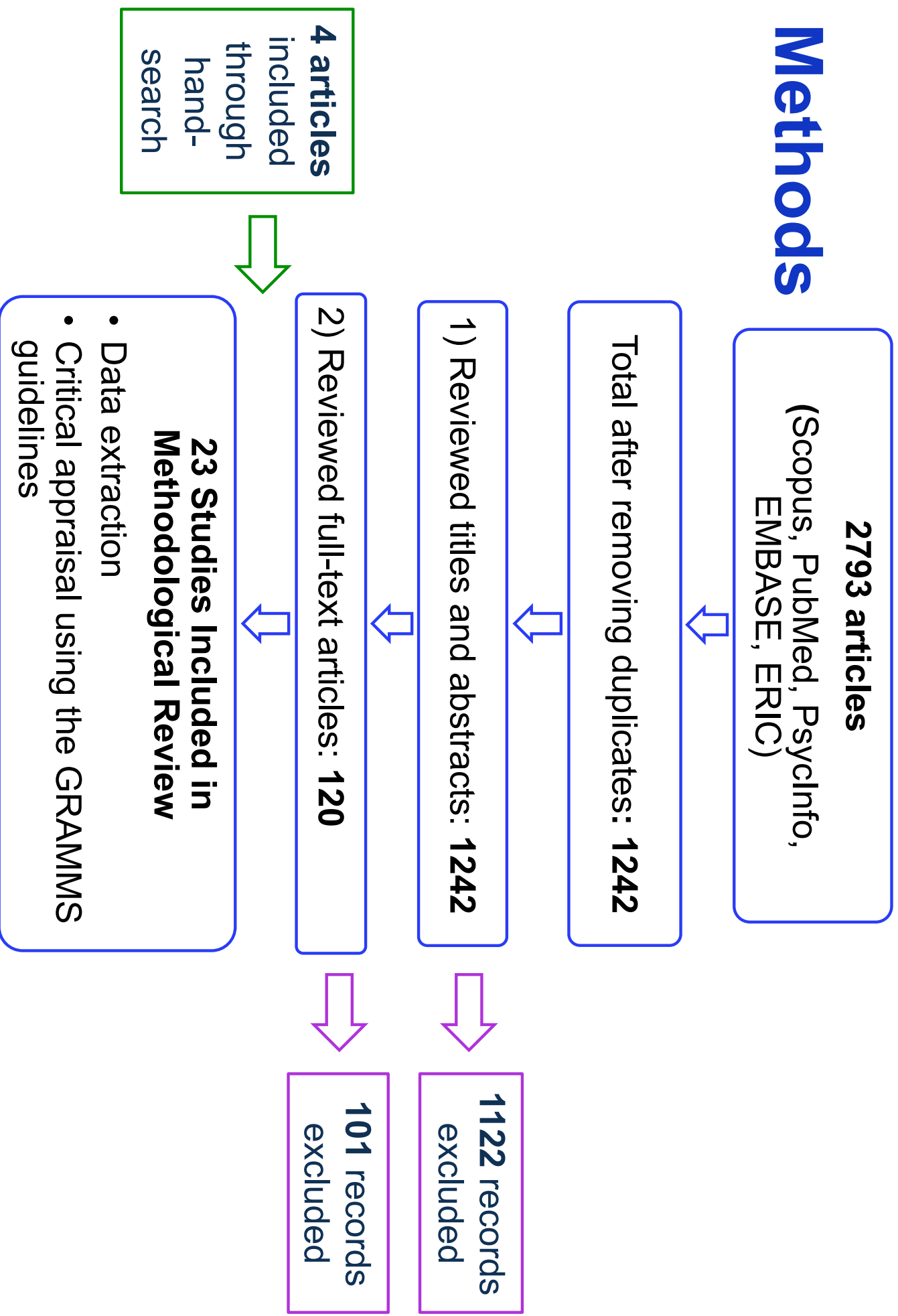
- Credibility
- Transferability
- Dependability
- Confirmability

- **Rigour in MM:** Complex, lack of consensus
- Additional criteria beyond monomethods required

GRAMMS Guidelines (O’Cathain et al. 2008)

- Justification for using MM approach
- Describe design (purpose, priority & sequence)
- Describe each method (sampling, data collection and analysis)
- Describe integration: where, how, and who
- Limitations of one method associated with the presence of another
- Any insights gained with mixing or integrating methods

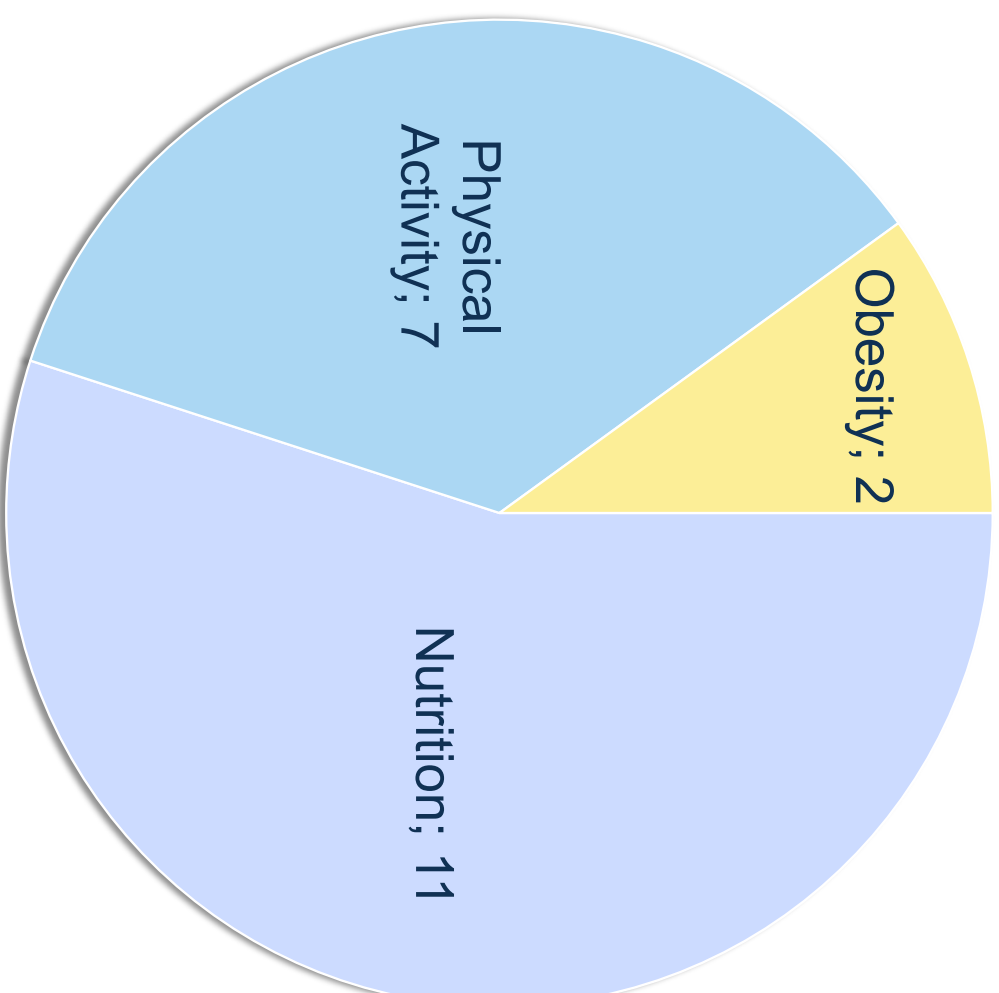
Methods



Results: Interventions

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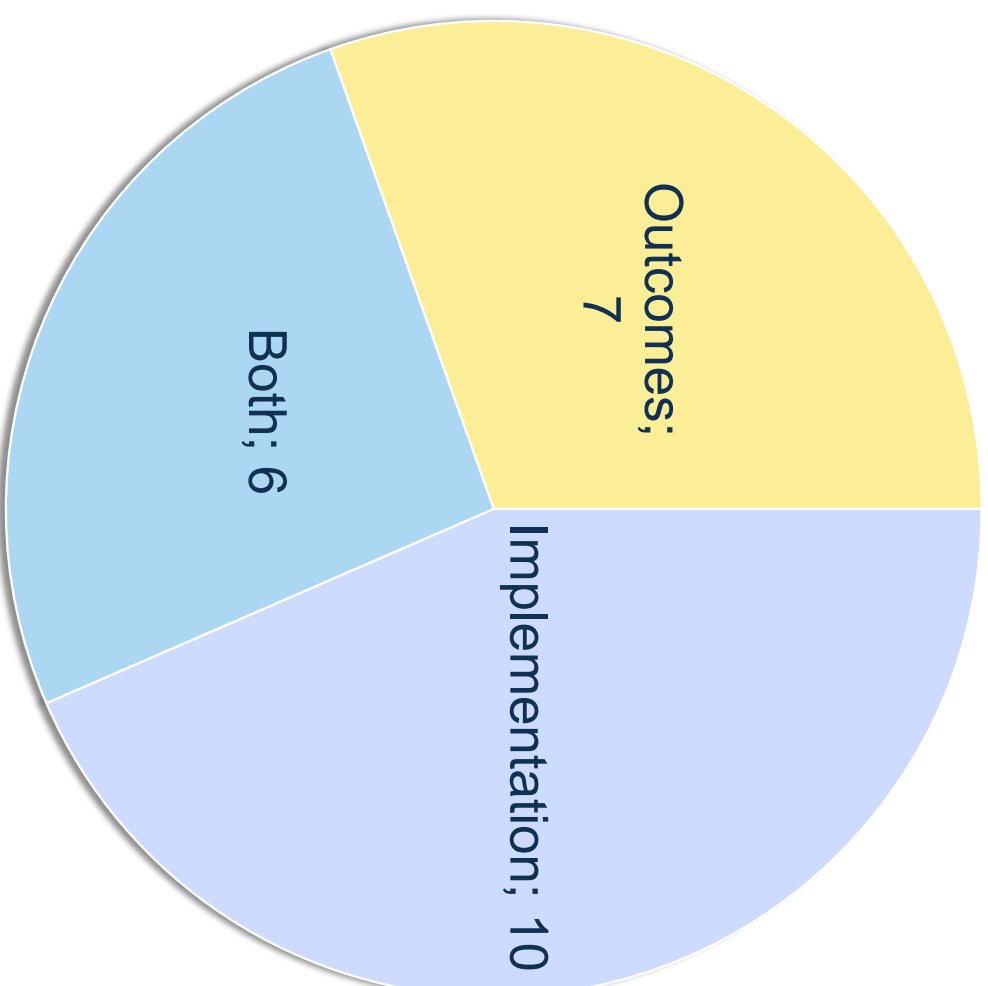
- 23 studies, 20 interventions



Results: Interventions

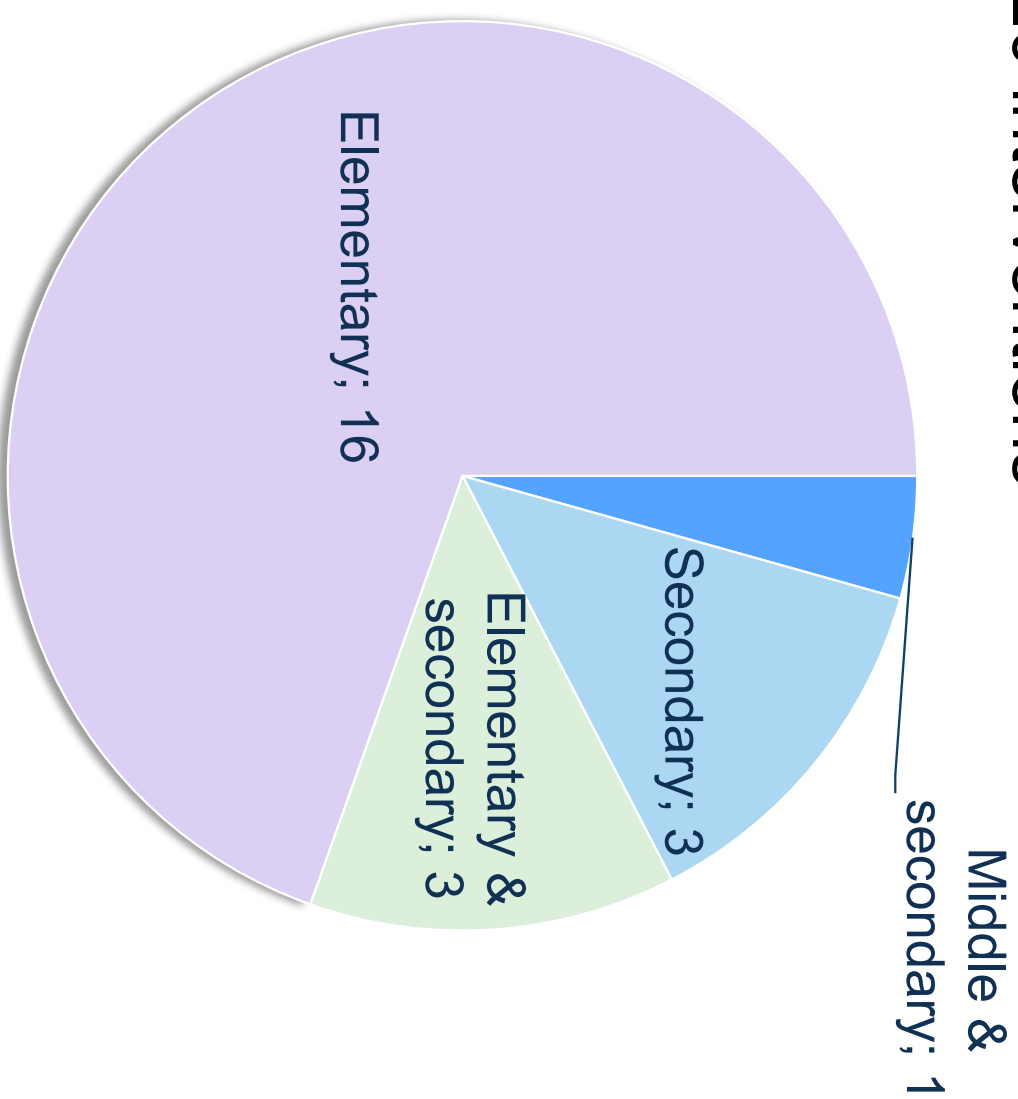
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- 23 studies, 20 interventions



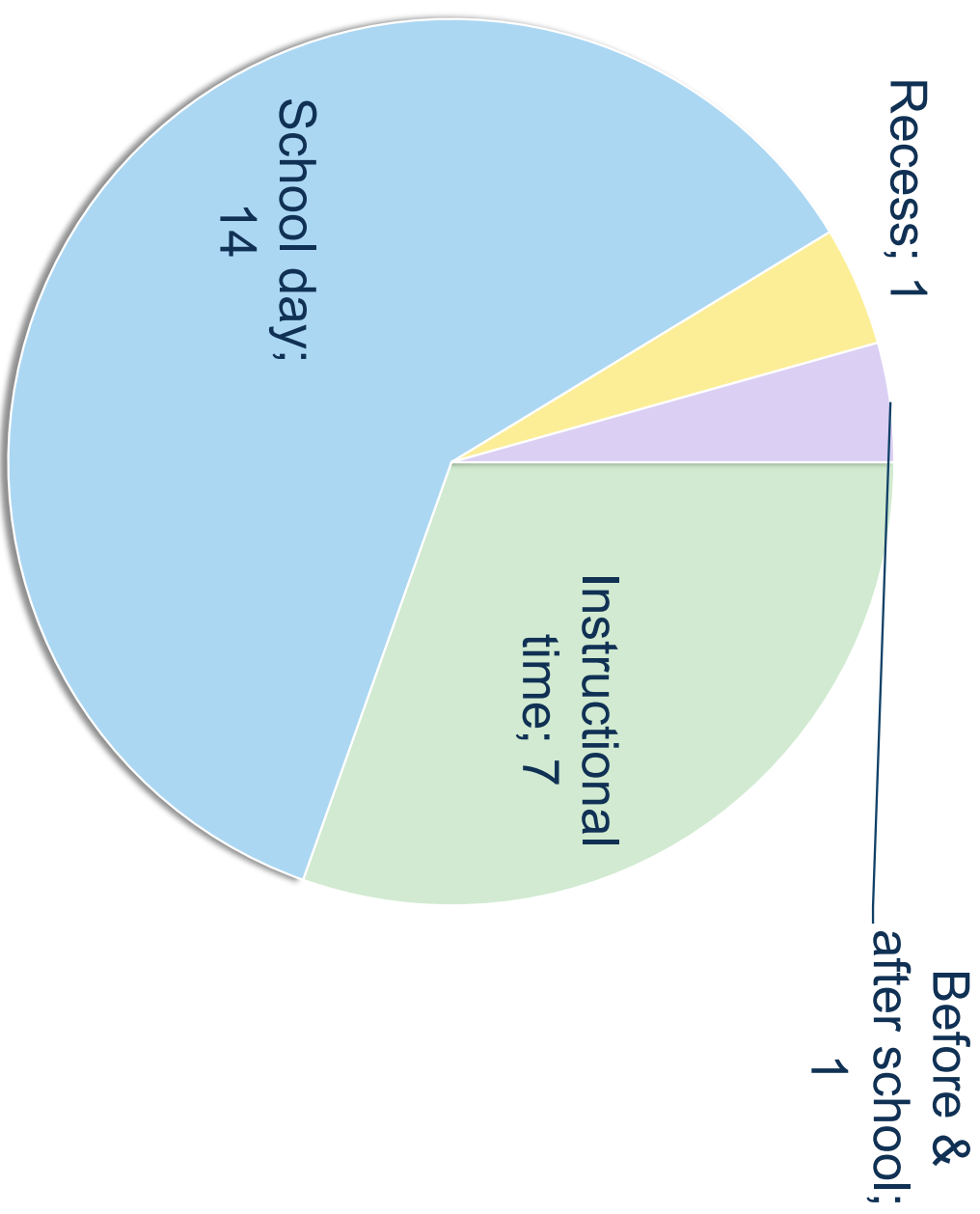
Results: Interventions

- 23 studies, 20 interventions



Results: Interventions

- 23 studies, 20 interventions



Results: GRAMMS Guidelines

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GRAMMS Guideline	Yes, but improvements are possible	No	Not enough information
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1) Describe the justification for using a MM approach to the research question

Is the use of MM research justified?	5	3	15	0
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2) Describe the design in terms of the purpose, priority, and sequence of methods

Is the design for mixing methods described?				
Priority of Methods	1	3	19	0
Purpose	3	7	13	0
Sequence	10	9	1	3
Stage of integration	1	7	15	0
Has rigour of the design been adhered to?	12	9	0	2

Results: GRAMMS Guidelines

GRAMMS Guideline	Yes	Yes, but improvements are possible	No	Not enough information
3) Describe each method in terms of sampling, data collection, and analysis				
Is the role of each QUANT method clear?	15	4	4	0
Is each QUANT method described in sufficient detail?	11	8	4	0
Is the QUANT analysis sufficiently sophisticated?	16	1	5	1
4) Describe each QUAL method				
Is the role of each QUAL method clear?	19	2	2	0
Is each QUAL method described in sufficient detail?	14	5	4	0
Is the QUAL analysis sufficiently sophisticated?	14	6	1	2

GRAMMS Guideline

	Yes	Yes, but improvements are possible	No	Not enough information
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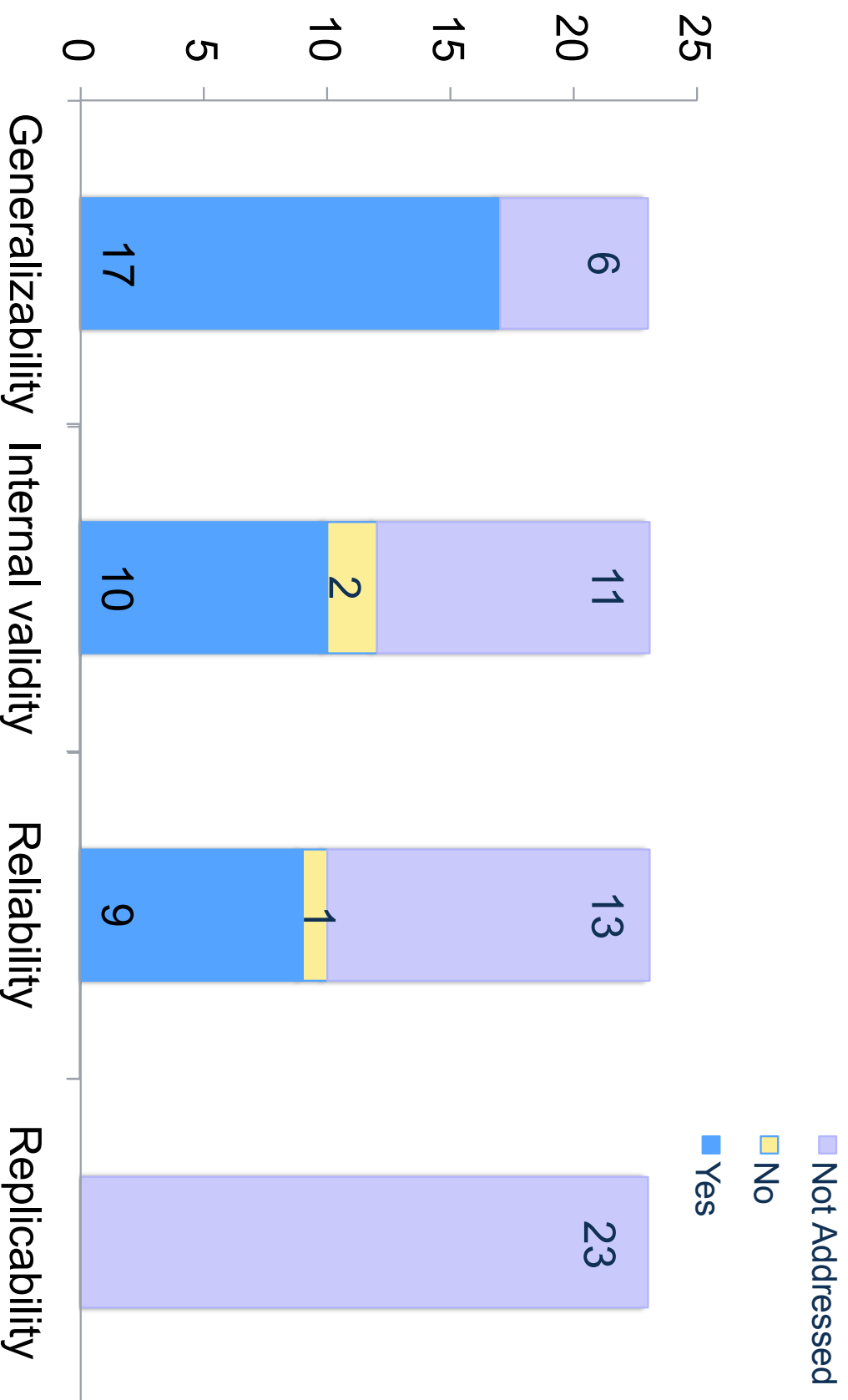
4) Describe where integration has occurred, how it has occurred, and who has participated in it

Is there evidence of integration?	6	17	0	0
Is the type of integration stated?	1	0	22	0
Is the type of integration appropriate to the design?	15	8	0	0
5) Describe any limitation of one method associated with the presence of the other method	0	1	15	6

6) Describe any insights gained from mixing or integrating methods

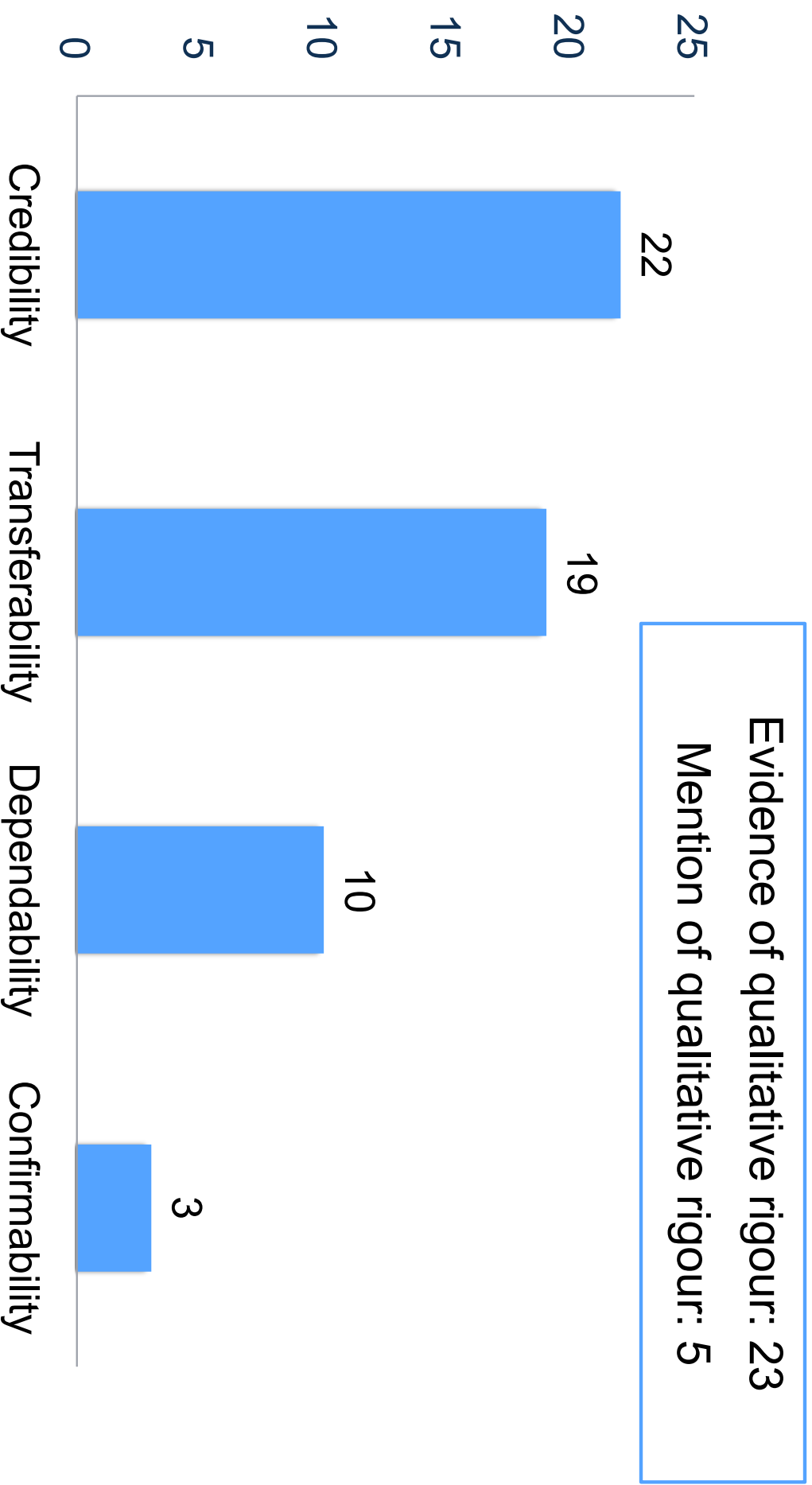
Is there clarity about which results have emerged from which methods?	20	2	1	0
Are inferences appropriate?	21	1	0	1
Are the results of all the methods considered sufficiently in the interpretation?	16	4	1	2
Has rigour been compromised by the process of integration?	2	0	16	5

Results: Quantitative Rigour



Results: Qualitative Rigour

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Discussion

- Poor reporting quality of MM studies
 - ▣ Labeling/justification of MM
 - ▣ Integration
 - ▣ Design
 - ▣ MM Limitations
 - ▣ GRAMMS guidelines
- Rigour
 - ▣ Quantitative & qualitative criteria
 - ▣ Need for practical techniques for MM rigour

Directions for Future Research

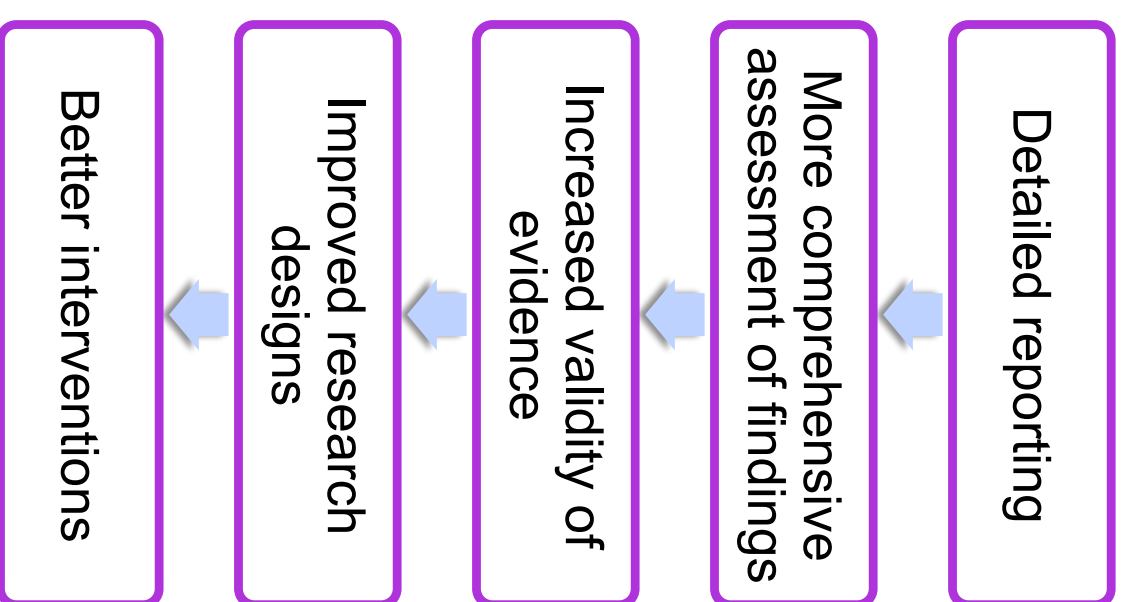
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- Review MM research where quantitative & qualitative components in separate articles
- Guide for publishing MM research in population health/health geography
- Further discussion regarding MM rigour and practical techniques

Conclusions

“mix[ed] methods combines the power of stories and the power of numbers. In public health, stories have the power to change policies, and statistics traditionally provide a strong rationale to make changes”

(Pluye & Hong, 2014, p. 30).



Acknowledgements

- Drs Susan J. Elliott, Scott Leatherdale, and Jennifer Robertson-Wilson
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Inclusion & exclusion criteria

Inclusion Criteria

- Empirical studies
 - School interventions for obesity, nutrition, and/or physical activity
 - Elementary and/or secondary school students (5-18)
 - Included at least 1 qual & 1 quant method in same article, analyses of both data types, and integration
 - English-language full-text peer-reviewed articles published (or in press) since 2000
- Review studies, studies without results
 - Interventions outside school settings
 - Clinical interventions
 - Interventions restricted to only overweight or obese participants
 - Survey consisted of closed- and open-ended questions (and no other qualitative methodology)
 - Did not integrate quantitative and qualitative methods
 - Missing information regarding data collection and/or analysis

Exclusion Criteria

Results: Rigour

QUANT rigour criteria	Yes	No	Not Addressed
Was there discussion of <i>generalizability</i> of the findings?	17	6	-
Were outcome measures and/or quantitative instruments <i>internally valid</i> ?	10	2	11
Were outcome measures and/or quantitative instruments <i>reliable</i> ?	9	1	13
Was there discussion of <i>replicability</i> of the findings?	0	23	-
QUAL rigour criteria	Yes	No	No
Was there any evidence of qualitative rigour?	23	0	0
Was there any <i>mention</i> of qualitative rigour or criteria?	5	18	18
Was there evidence of <i>credibility</i> ?	22	1	1
Was there evidence of <i>transferability</i> ?	19	4	4
Was there evidence of <i>dependability</i> ?	10	13	13
Was there evidence of <i>confirmability</i> ?	3	20	20

Mixed Methods Designs

<p>Convergent Parallel (n=14)</p>	<pre> graph TD A[Quant Collection & Analysis] --- C[Compare or relate] B[Qual Collection & Analysis] --- C C --- D[Interpretation] </pre>
<p>EXPLANATORY Sequential (n=5)</p>	<pre> graph LR A[QUANT collection & analysis] --- B[Follow up with] B --- C[QUAL collection & analysis] C --- D[Interpretation] </pre>
<p>EXPLORATORY Sequential (n=1)</p>	<pre> graph LR A[QUAL collection & analysis] --- B[Builds to] B --- C[QUANT collection & analysis] C --- D[Interpretation] </pre>
<p>Embedded (n=1)</p>	<pre> graph LR A["Quant (or Qual) Collection & Analysis Qual (or Quant) Collection & Analysis (before, during, or after)"] --> B[Interpretation] </pre>
<p>Multiphase* (n=2)</p>	<pre> graph LR A[Overall Program Objective] --- B[Study 1: QUAL] B --> C[Study 2: QUAL] C --> D[Study 3: MM] </pre>

Evidence of Qualitative Rigour

Criterion/Technique	Number of articles
Credibility	22
Triangulation (method, source, and/or investigator)	19
Use of participant quotes	16
Audio recording	18
Transcripts	17
Peer debriefing	3
Member checking	3
Negative case analysis	2
Transferability	19
Thick description	14
Purposeful sampling	10
Dependability	10
Computer-assisted analysis	9
Dependability audit	1
Confirmability	3
Researcher journal	3
Confirmability audit	1

Results: Quantitative Rigour

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