### Purpose
- State the current knowledge about mediation analysis models.
- Identify psychosocial mediators in the most current research for peripheral musculoskeletal disorders.
- Clarify the clinical relevance mediation analysis.

### Background
- The root causes of the effects of healthcare interventions are best understood using mediation analysis.
- **Direct effect** quantify the effects of specific interventions on an outcome.
- **Indirect effects** are mechanisms that influence the effectiveness of the intervention on the outcome.
- Tells the "why" the change occurs not "if" change occurs.
- Clarify the roles of the mediating variables that lie between the causal pathway of exposure to outcome and quantifying the effects using regression coefficients.

![Diagram showing mediation model](image)

![Diagram showing search strategy](image)

**Figure 1.** The indirect effect of the mediator on the outcome.

**Figure 2.** The direct effect of the exposure on the outcome.

Total Effect (c) = Direct Effect (c') + Indirect Effect (ab).

### Methods
- Reviewed all manuscripts from PubMed, Embase, and PsycInfo.
- Two sets of reviewers screened titles and abstracts for 1936 studies.
- 13 full text studies were pulled and assessed by all four reviewers.
- Data was extracted from each study to determine study characteristics.
- Data was analyzed to determine strength and significance of the relationship between mediators.
- All four reviewers independently performed a quality assessment for risk of bias using Mansell's risk of bias tool.

### Results

<table>
<thead>
<tr>
<th>MSK Disorder</th>
<th>Exposure</th>
<th>Mediator</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee(^1)</td>
<td>Emergent Knee Pain Severity</td>
<td>Activity Modifying Behavior</td>
<td>Physical Function</td>
</tr>
<tr>
<td>Hand and Wrist(^4)</td>
<td>Pain Intensity</td>
<td>Depression(^*)</td>
<td>Disability</td>
</tr>
<tr>
<td>Upper Extremity(^5)</td>
<td>Pain Intensity</td>
<td>Pain Catastrophizing(^*)</td>
<td>Pain Interference</td>
</tr>
</tbody>
</table>

\(^*\) Indicates significant finding.

### Inclusion Criteria
- Cross-sectional or longitudinal mediation analysis
- Observational or experimental studies

### Exclusion Criteria
- Patients with spinal musculoskeletal disorders
- Osteoporosis

### Clinical Relevance
- Mediation analysis can be directly translated into clinical practice.
- Mediators that indirectly effect the path of exposure to outcome can be addressed in conjunction with the treatment to improve the total effect.

### Conclusions
- Psychological variables do mediate the selected exposures of pain and disability.
- The papers included in this systematic review have high risk of bias which mitigates the findings, however there is clinical significance in this topic which allows us to call for more research in this area.

### Acknowledgements / References
- We would like to thank Leila Ledbetter, MLIS, for assisting us with our literary search. Please see QR Code for digital handout and references.