Novak, I., & Honan, I. (2019). Effectiveness of paediatric occupational therapy for children with disabilities: A systematic review. *Australian occupational therapy journal*.

PURPOSE

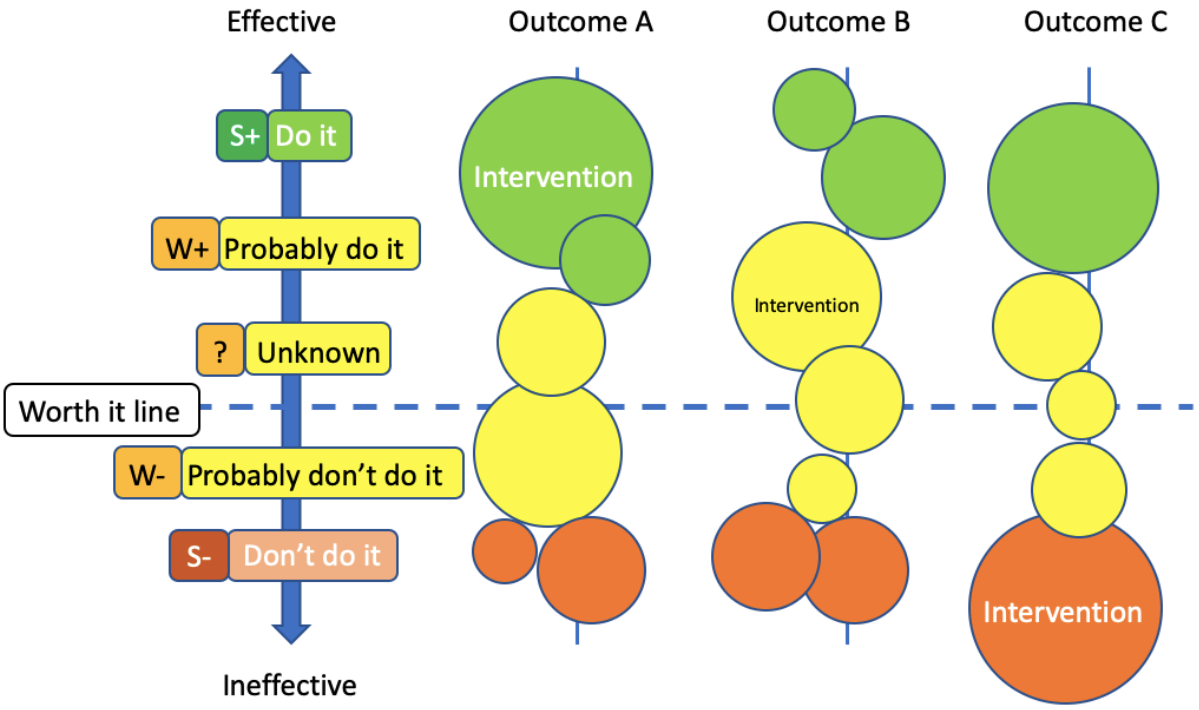
- "To systematically summarise the current intervention options available to paediatric occupational therapists across different childhood disability populations."
  - Basically, what WORKS in pediatric OT?

METHODOLOGY & FORMAT

- A systematic review summarizes the results of available carefully designed healthcare studies (controlled trials) and provides a high level of evidence on the effectiveness of healthcare interventions.
- Each component was completed by 2 independent reviewers and required unanimous agreement to determine inclusion and grading
- Searching – Cochrane Methodology
  - Comprehensive search to identify all papers addressing pediatric occupational therapy intervention
  - Only included papers that used rigorous research methods
    - Systematic reviews (SR)
    - Randomized controlled trials (RCT)

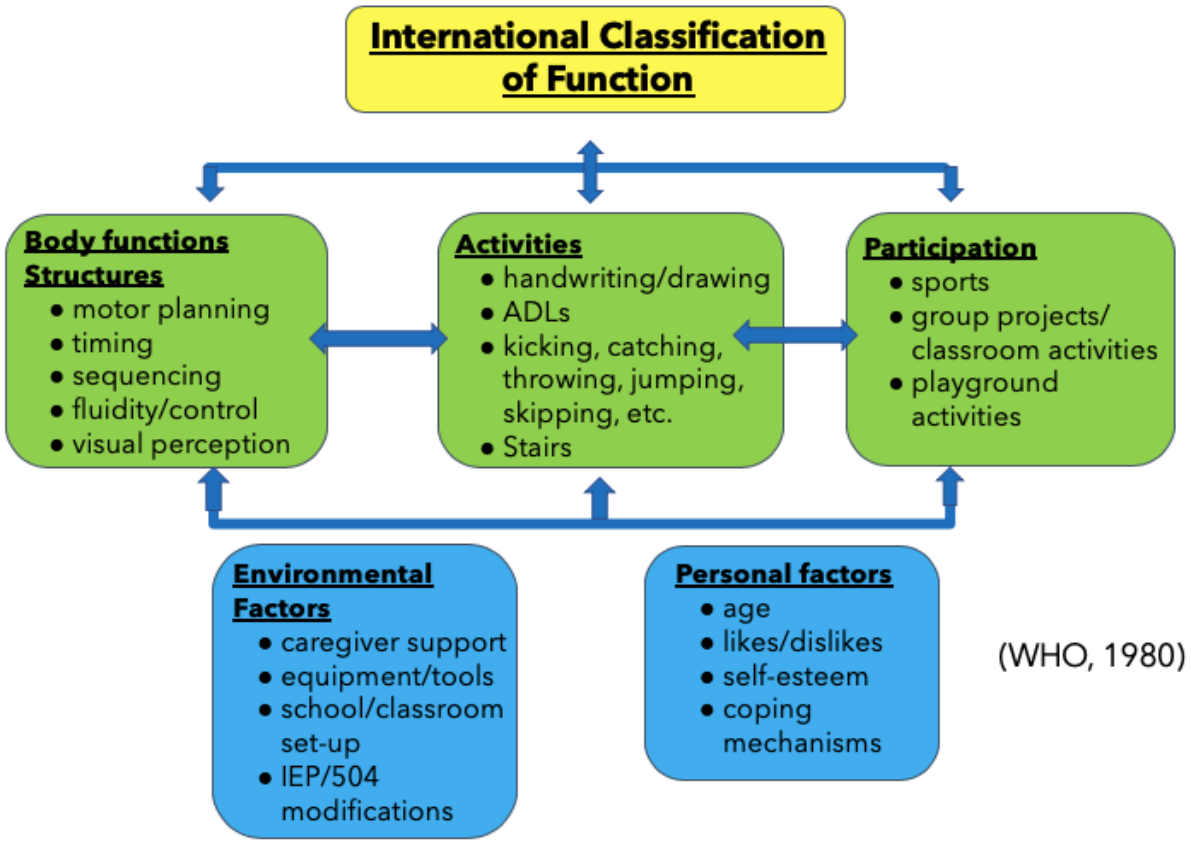
- Reporting – PRISMA statement
  - **P**referred **R**eporting **I**tems for **S**ystematic **R**eviews and **M**eta-**A**nalyses
  - This is shown in a flowchart in most systematic review papers, showing (in this case) how they started with 3,138 citations and ended up with 129 rigorous papers addressing pediatric OT intervention
- Determining efficacy of interventions – GRADE format (Guyatt, 2008)
  - **G**rading of **R**ecommendations **A**ssessment, **D**evelopment and **E**valuation that includes a transparent system for grading the quality (or certainty) of evidence and the strength of recommendations that flow from the evidence; GRADE is WHO-endorsed
  - Each paper is systematically rated to determine the strength of the conclusions and assigned a score or grade
  - High score = methodology is strong, "further evidence is unlikely to change our confidence in the estimate of the effect"
  - Low score = flawed, weak methodology, "further evidence is likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate"
  - Effect size refers to the magnitude of the intervention effect; a way of quantifying the size of the difference between two groups; valuable for quantifying the effectiveness of a particular intervention, relative to some comparison.
  - It allows us to move beyond the simplistic, 'Does it work or not?' to the far more sophisticated, 'How well does it work in a range of contexts?'
- PICO Questions – clarifies what question is specifically being asked
  - **P**opulation, **I**ntervention, **C**omparison, **O**utcome
  - Can frame questions, for this population, does this intervention in comparison to control, result in a better outcome?
  - Each must be clearly defined
- Knowledge translation – Evidence alert traffic light system (Novak, 2012)
  - Starts with papers, scores them using the GRADE system, and emphasizes the effect size –
    - Green – strong positive intervention, the intervention works well compared to control; "Go" interventions: those with strong evidence
    - Red – strong negative intervention, the intervention does not work better than comparison or can cause harm; "Stop" interventions: those with poor strength of evidence or evidence that suggests the intervention may be harmful

- Yellow – "Measure" interventions: those with mixed or moderate strength evidence
    - Weak positive, the intervention works a little better than comparison or nothing
    - Weak negative, the intervention weakly suggests there is no difference between comparison or nothing
    - Unknown, no research exists
- Each paper is given an appropriately colored bubble graphic, size based on effect size and forms clinical recommendations



METHODS

- 129 studies (75 SR, 54 RCT)
- Population/Diagnoses
  - 22 diagnostic groups
  - Fairly consistent with childhood disability incidence, but authors had to work with what evidence has been published
  - Autism Spectrum Disorder (ASD) = 24%
  - Attention Deficit Hyperactivity Disorder (ADHD) = 6%
  - Cerebral Palsy (CP) = 28%
  - Developmental Coordination Disorder (DCD) = 7%
  - Other = 35%
- Interventions
  - Separated into 52 groups
  - Marked as either bottom-up or top-down
- Comparisons
  - Rarely "no intervention" due to ethical concerns about denying treatment to children
  - Usually comparison was "usual care" or comparison to those awaiting treatment (on a wait list)
- Outcomes
  - Identified 135 intervention outcomes
  - Each outcome was assigned an International Classification of Function (ICF) category
    - Body structures & function
    - Activities
    - Participation
    - Environment
    - Personal factors



- 135 outcomes were broken down into 12 categories
  - Motor outcomes
  - Behavioral outcomes
  - Pain
  - Function
  - Self-Management
  - Feeding
  - Cognitive outcomes
  - Sensory outcomes
  - Sleep
  - Parent outcomes
  - Social
  - Mental health
- Details of EVERY SINGLE STUDY used in this systematic review can be seen in Table 1 of the Novak paper (attached)

RESULTS

- Overall Results
  - Green light = 30%, led to 40 positive recommendations
  - Yellow light positive = 56%
  - Yellow light negative = 10%
  - Red light = 4%
- Results by ICF Outcome
  - Green light
    - Evidence supporting interventions directed at body structures & function, activities, and environment
    - Activity level interventions contain the most green lights, outnumbering yellow and red in this area
    - Interventions directed at the activities and participations levels are considered top-down, directed at and working on the skills needed for and participation in the activities that are important to the child client
  - Yellow light
    - For interventions directed at body structures & functions and environment, most common rating was yellow light
  - Red light
    - All the red light interventions identified in the study were aimed at the body structures & functions level
  - Limited evidence addressing participation and personal factors levels
- Results by Comparison
  - As stated before, authors rarely "no intervention" due to ethical concerns about denying treatment to children, usually comparison was "usual care" or comparison to those awaiting treatment (on a wait list), but a few did describe comparison groups
  - Constraint Induced Movement Therapy (CIMT) for children with CP
    - No difference between CIMT vs Bimanual Training
      - CIMT = contstraint of unaffected limb with splint or cast to "force" use of the affected limb
      - Bimanual Training = task-oriented training for skills requiring use of both hands

        - No difference between Bimanual Training alone vs combined with Botox injection
        - Better outcomes related to more practice!
    - Top-down vs Bottom-up interventions for children with DCD
        - Top-down interventions were far more effective at achieving motor outcomes in children with DCD than bottom-up
        - Effect size for top-down was 0.89, which can be interpreted as out of 100 children with DCD, 89 responded positively to top-down interventions
        - This can be compared with the effect size for bottom-up of 0.12, meaning only 12 out of 100 children responded positively to bottom-up interventions
- Detailed Results
    - Depicted in Novak & Honan, 2019, Figure 3 – Bubble Chart
    - Patti's Novak Spreadsheet

CONCLUSIONS

- Author Conclusions – "This review provides a high-level summary of effective paediatric occupational therapy interventions. Thirty-nine effective intervention indications exist, offering both families and clinicians many choices to match their preferences and expertise. The paediatric occupational therapy evidence base suggests a growing trend towards activities-level, 'top-down' approaches and parent education, over and above 'bottom-up' approaches. There are important ethical implications of translating these effective evidence-based occupational therapy intervention options into clinical practice to give children the best chance at achieving their goals."

- BIG Take-aways:
    - **There are 40 pediatric OT interventions that have strong positive evidence for use! Use them!**
    - **Parent partnership is key**
    - **Top-down interventions aimed at improving function at an "activities" level provide bigger gains overall**
        - These interventions have the following in common:
            - Begin with the child's goal
            - Practice real-life activities in natural environments
            - Use intense practice and repetitions in therapy and at home
            - Used a "just-right" challenge to enable success under **self-generated** problem solving strategies
        - Some of OT's most classic and firmly rooted interventions do NOT fall in this category and were found to be red light
            - NDT & SI - originated in an era of medicine when intervention aimed to remediate the child's body structural deficits, thinking function would emerge
            - If you feel strongly about using these techniques, clarify what you are doing – don't use umbrella terminology, don't try to find where we all agree; SPLIT the terms to define exactly what you do to gather true evidence
            - Also, be aware of all the lovely well-supported top-down options and consider using them as alternatives

Is there anything you want to discuss or tease out on a future podcast?

Email us!

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