CAT Portfolio

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| Literature Review Matrix | | | | | | | | |
| Authors (Date) | Purpose | Study Design/  Level of Evidence | # subjects (or articles for SR) | Independent Variable(s)  (intervention) | Dependent Variable(s)\*  (outcome measured) | Results | Implications for Practice | Indicate “Shows effectiveness” or “indirect support for \_\_\_\_\_\_\_ theme” \*\* |
| Bartholomew et al (2018) | Time on task following brief moderate to vigorous physical activity within academic lessons | Level I, Cluster randomized control trial | 2716 students | Moderate to vigorous physical activity within the classroom  ICAN! Program | Time on task | Statistical differences with time on task between intervention groups and control groups. | Use of moderate to vigorous physical activity shows improvement in ToT, students with the lowest step count had lowest time on task scores | Shows effectiveness for physical activity intervention, indirect support for outcome measure |
| Crescentini et al. (2016). | Mindfulness-meditation training on primary school aged children | Level II, blinded pre-test, post-test design | 31 students | Mindfulness-oriented meditation within the classroom  Mindfulness-Oriented Meditation Program | Attention, behaviors and mental well-being | The intervention group had a reduction in CRTS-R subtests: cognitive problems/inattention, ADHD index, DSM-IV: inattention, CGI: restless-impulsive | Use of mindfulness-oriented meditation shows improvement in attention, behavior in the classroom | Shows effectiveness for mindfulness intervention, indirect support for outcome measures |
| Daly-Smith et al (2018) | Impact of acute classroom movement breaks and physically active learning on cognition, academic performance and classroom behavior | Level I, Systematic review | 17 studies | Movement breaks or physically active lessons within the classroom | Academic performance, classroom behaviors, cognition, physical activity | Low-medium outcomes, classroom movement break and physically active learning resulting in improvements to time on task | Use of physical activity within the classroom will improve with poor classroom behaviors | Shows effectiveness for brief physical active intervention, shows support for intervention dose/duration theme |
| Dinkel et al (2016) | Assess teacher’s knowledge and capacity for implementing classroom physical activity breaks | Level IV, descriptive | 346 teachers | Teachers’ knowledge | Reasons for physical activity within the classroom | Teachers felt physical activity was important for all student but ⅓ found barriers with implementing classroom physical activity into their classroom | Additional support to teacher could help with consistent and meaningful physical activity implementation | Shows indirect support for teachers’ perspective theme |
| Flook et al (2010) | Mindful awareness practices during seated activities and the impact on executive function process | Level I, block randomized control trial with stratification | 64 students | Mindful awareness practices within the classroom  InnerKids Program | Executive function, behavior | Students with poorer initial executive function and received mindful awareness practices, showed improved executive function post-intervention compared to controls based on both parent and teacher report | Use of mindful awareness practices shows improvement in executive function in the classroom and at home | Shows effectiveness for mindfulness intervention |
| Foran et al (2017) | Perceptions of elementary teachers who routinely prioritize physical activity in their classroom | Qualitative, ground theory | 7 teachers | Physical activity within the classroom | Teachers’ perceptions | Teachers who use physical activity within their classrooms have personal attributes, previous experience or teaching approach that prioritize physical activity | Teachers with these views are more likely to carryout physical activity within their classrooms | Shows indirect support for teachers’ perspective |
| Greico et al (2016) | Time on task with a traditional sedentary lesson or 3 competitive physical activity intensities | Level I, mixed methods design with randomization | 320 students | Academic-based physical activity within the classroom  Spelling Relay | Time on task | Statistical difference increase with time on task after light-moderate physical activity,  Statistical difference decreased with time on task after a sedentary  activity, time on did not statistically change for sedentary but competitive activity | Use of light-moderate physical activity and moderate-vigorous physical activity shows improvement in time on task compared to traditional lessons | Shows effectiveness for physical activity intervention, shows indirect support for outcome measure |
| Howie et al (2014) | Acute effects of 5, 10, and 20 min of classroom exercise breaks on on-task behavior | Level I, randomized control trial within subjects | 96 students | Varying intensities of  Brain BITES physical activity within the classroom | Time on task | Time on task was significantly higher in students after 10 min of classroom exercise breaks compared to a sedentary attention control | Use of 10-minute physical activity breaks in the classroom result in improvement in time on task | Shows effectiveness for physical activity intervention, indirect support for outcome measure |
| Ma et al (2014) | Brief high-intensity interval exercise on selective attention and to determine whether classroom off-task behavior predicts changes in attention following physical activity | Level III single group, repeated cross-over design | 44 students | FUNtervals physical activity within the classroom | Time on task, classroom behaviors | Time on task was significantly higher following 4-minute high-intensity physical activity, students with lower initial time on task had the greatest improvement with time on task | Use of 4-minute high-intensity physical activity results in improved classroom behavior | Shows effectiveness for physical activity intervention, shows indirect support for outcome measure |
| Ma et al (2015) | Off-task behavior predicts changes in attention after exercise and the acute effects of physical activity on attention | Level III, single group, repeated cross-over design | 88 students | FUNtervals physical activity within the classroom | Time on task, classroom behaviors, selective attention | Four minutes of high interval physical activity results in improved selective attention | Short bouts of physical activity is beneficial prior to initiating an important task requiring selective attention | Shows effectiveness physical activity intervention, indirect support for dose/duration theme and support of outcome measures |
| McMullen et al (2014) | classroom teachers’ perceptions of incorporating physical activity breaks into their classrooms and to determine preferred activity break features | Qualitative, phenmonology | 12 teachers | Physical activity within the classroom | Teachers’ perspective | Provides information on the perceived barriers that teachers face when implementing physical activity interventions | Treats to classroom control, connection to academic content and ease and enjoyment are the themes identified | Show indirect support for teachers’ perspective theme |
| Napoli et al (2005) | Mindfulness training with students increase focus and attention | Level I, randomized control trial | 254 students | Mindfulness training through Attention Academy within the classroom | Focus and attention | Statistically significant improvements in attention and decrease in anxiety | Use of mindfulness activities paired with sensorimotor tasks improves attention | Shows effectiveness for mindfulness intervention |
| Thomas et al (2016) | Impact of a six-hour mindfulness program in reducing and sustaining attention with primary school age students | Level II, randomized control trial with Level III quasi-experimental cross-lag | 30 students | Paws b. mindfulness program within the classroom | Attention | Overall positive impact on attention after use of the program | Mindfulness-based activities are effective in improving attention function within the classroom | Shows effectiveness for mindfulness intervention |
| Watson et al (2017) | Impact of classroom-based physical activity interventions on academic outcomes and to evaluate the impact of varying physical activity duration on academic outcomes | Level II, systematic review | 39 studies | Physical activity within the classroom | Academic and physical activity | Meta-analysis indicates positive effect of physical activity on improving on-task behaviors and reducing off-task behaviors | Physical activity is an immediate way to improve classroom behavior and attention | Shows effectiveness for physical activity,  shows supports for outcome measures |
| Wilson et al (2010) | Attention skills following a mindfulness- based intervention with students within the classroom setting | Level III, ABA withdrawal design | 12 students | Mindfulness based intervention within the classroom | Time on task | Increased attention during the mindfulness intervention  but return to the baseline attention when intervention was no longer presented | Improvement in attention during mindfulness exercises | Shows effectiveness for mindfulness intervention,  shows support for outcome measures and dose/duration theme |
| Zoogman et al (2015) | Analyses focusing on youth and looking at mindfulness interventions | Level I, systematic review and meta- analysis | 17 studies | Mindfulness based interventions within the classroom | Attention | Statistically significant results with mindfulness intervention and improvement in attention | Use of mindfulness intervention can improve classroom attention | Shows effectiveness for mindfulness intervention |

**CRITICALLY APPRAISED PAPER # 1**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Bartholomew, J. B., Golaszewski, N. M., Jowers, E., Korinek, E., Roberts, G., Fall, A., & Vaughn, S. (2018). Active learning improves on-task behaviors in 4th grade children. *Preventative Medicine, 111*, 49-54. <http://doi.org/10.1016/j.ypmed.2018.02.023>

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| **Purpose of the Study** | To examine student time on task following brief physical activity (PA) within an academic lesson and differences between demographic characteristics and its effect on time on task |
| **Setting** | * Elementary schools * Central Texas, USA |
| **Subjects/Sample** | * 2716 students from 28 elementary school in fourth grade   + 46% males, 54% females   + intervention n=99 classrooms, control n=50 control * Economically disadvantaged: 34.31% |
| **Study Design/**  **Methodology** | * Cluster randomized control trial with 2 intervention groups and 1 control   + three groups and school level were statistically similar * Pre- and post-test design * ICAN! Program used for 2 intervention groups |
| **Level of Evidence** | Level I |
| **Data Collection Tools/Measures** | * Momentary time sampling (MTS)   + pre- and post- intervention observations using 5 seconds per student for 15 minutes prior to intervention and 15 minutes’ post intervention * Accelerometers   + assessed moderate to vigorous physical activity * Reliability was established for all collection measures |
| **Results/**  **Main Findings** | * Statistical differences with time on task (ToT) between intervention groups and control groups. * Statistically more steps taken with intervention groups compared to control * No statistical differences between intervention groups in reading and math * Clinical significance:   + even in control group lower step counts also had lower time on task behaviors   + improvement in ToT noted with moderate to   physical activity |
| **Limitations** | * Long-term benefits are unknown * Missing possible diagnosis * No blinding by researchers * Frequency, length and duration of intervention not given |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧ Provides background info  ⌧ Similar Population  ⌧ DIRECTLY supports the Proposed Intervention **(shows effectiveness of increased physical activity and time on task)**  ⌧ INDIRECTLY supports Intervention **(shows effectiveness of teacher-led theme and use of momentary time sampling)**  ⌧ Provides info on assessment  tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Teacher-led physical activity instruction is similar to the proposed project with positive outcomes * Provides information on MTS which is an observation tool that could be used for the proposed outcome measures * ToT improved in intervention groups * Classroom PA intervention with similar age and population is similar to proposed project |

**CRITICALLY APPRAISED PAPER # 2**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Crescentini, C., Capurso, V., Furlan, S., & Fabbro, F. (2016). Mindfulness-oriented meditation for primary school children: Effects on attention and well-being. *Frontier in Psychology, 7,* 1-11. <http://dx.doi.org/10.3389/fpsyg.2016.00805>

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| **Purpose of the Study** | To determine the effects of mindfulness training on attention and well-being in children |
| **Setting** | * Primary school * Northeastern Italy |
| **Subjects/Sample** | * 31 children from year 2   + intervention n=16, control n=15 * Age range: 7-8 * Mean age: 7.3 * 100% consent received from parents |
| **Study Design/**  **Methodology** | * Randomized assignment at the school level * Students blinded to assignment * Teacher blinded to study purpose * Intervention: Week 1 and 2   + 10 minute per session for 3 sessions per week-total of 30 minutes per week * Week 3 and 4   + total of 45-55 minutes per week and reached * By week 8   + total of 1 hour and 30 minutes * Focus on 3 areas;   + mindfulness of breathing   + mindfulness of body parts   + mindfulness of thoughts * Control: Reading and commenting on the chapters in the book, discuss emotions and feeling experienced in the different scenarios |
| **Level of Evidence** | Level II |
| **Data Collection Tools/Measures** | * Child Behavior Checklist- Teacher Report Form * Conners Teachers Rating Scales-Revised   + Both are established and demonstrated good validity and reliability   + Conducted at baseline and post intervention * Short Mood and Feelings Questionnaire, student self-survey on depression or mood   + Not piloted, researchers design- one question |
| **Results/**  **Main Findings** | * Statistical decreases on internalizing behaviors, total behavior problems, cognitive problems/inattention, ADHD index, and CGI restless/impulsive subtests when comparing the intervention to the control * No statistical differences on Student Mood and Feeling Questionnaire * Clinical Significance:   + mindfulness is an appropriate intervention to use when addressing off-task behaviors in the classroom |
| **Limitations** | * No long-term effect noted * Control received instruction related to emotions and feelings so results may be less favorable compared to no instruction at all |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧ Provides background info  ⌧ Study uses the same/similar Population to your proposed project  ⌧ DIRECTLY supports the Proposed Intervention **(shows effectiveness of the intervention for improved attention outcome)**  ⌧ INDIRECTLY supports Intervention **(shows effectiveness for behavior/attention checklist outcome measures)**  ⌧ Provides info on assessment measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Classroom-based mindfulness program with similar length as the proposed intervention with similarly aged students * Clinical and statistical significance noted in attention following mindfulness intervention * Information on the us of a classroom behavior checklist |

**CRITICALLY APPRAISED PAPER # 3**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Daly-Smith, A. J., Zwolinsky, S., McKenna, J., Tomporowski, P. D., Defeyter, M. A., & Manley, A. (2018). Systematic review of acute physically active learning and classroom movement breaks on children's physical activity, cognition, academic performance and classroom behaviour: Understanding critical design features. *British Medical Journal Open Sport and Exercise Medicine, 4,* 1-16. <http://dx.doi.org/10.1136/bmjsem-2018-000341>

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| **Purpose of the Study** | To examine the impact of acute classroom movement breaks and physically active learning on cognition, academic performance, and classroom behavior. |
| **Setting** | * All studies analyzed were investigating within classrooms within schools. * Studies were from USA (8), Germany (3), UK (2), Netherlands (2), Canada (2), and Switzerland (1). |
| **Subjects/Sample** | * Seventeen studies reviewed * 8 classroom movement breaks studies- controls used   + sample sizes: 36- 1224, mean= 230   + study quality: 41%- 67%, mean= 54%   + randomized studies: nine studies   + non-randomized study: 1   + blinded participants-1   + blinded evaluators by way of video tape- 1 * 9 physically active learning studies- controls used   + sample sizes: 20-320, mean= 84   + study quality: 30%- 63%, mean=47%   + randomized studies: three studies   + non-randomization studies: nine studies   + blinded participants- 1 |
| **Study Design/**  **Methodology** | * Inclusion criteria:   + ages 4-17   + conducted in school or classroom   + intervention: acute classroom movement breaks or physically active learning   + activity outcome measures: physical activity, moderate-vigorous physical activity or time spend sedentary   + outcome measures: cognition, executive function, academic performance, classroom behavior or time on task (ToT) * published in English |
| **Level of Evidence** | Level I |
| **Data Collection Tools/Measures** | * Systematic review * Study quality was assessed by Downs and Black methodological quality assessment and ranked by overall quality percentage Eight databases and reference lists were searched |
| **Results/**  **Main Findings** | * A low-medium outcome resulting in a systematic review rather than a meta-analysis * Study quality related to classroom movement breaks and physically active learning has increased in recent years * Classroom movement breaks and physically active learning interventions improve ToT demonstrated by higher interrater reliability but under-reported validity * Classroom movement breaks and physically active learning results in weak evidence regarding academic performance * Clinical significances:   + the most active PA was whole body activities   + attention was shown to increase at 5 minutes of moderate-vigorous PA but not longer bouts of 10-20 minutes of moderate-vigorous PA |
| **Limitations** | * Heterogeneity was not assessed between studies * Non-English exclusion |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧ Provides background info  ☐Study uses the same/similar Population to your proposed project  ⌧ DIRECTLY supports the Proposed Intervention **(shows effectiveness of brief physical active intervention for improved attention outcome)**  ⌧ INDIRECTLY supports Intervention **(shows support for intervention dose/duration theme)**  ☐Provides info on assessments |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Moderate-vigorous PA in increments of 5-15 showed consistency in ToT which will help establish protocol for the proposed project * Despite an increase in duration (5, 10 and 20 minutes) the same accumulation of moderate-vigorous PA was achieved resulting in evidence shorter durations are more effective at increasing attention than longer durations * Whole body activities result in high levels of moderate-vigorous PA |

**CRITICALLY APPRAISED PAPER # 4**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Dinkel, D. M., Lee, J. M., & Schaffer, C. (2016). Examining the knowledge and capacity of elementary teachers to implement classroom physical activity breaks. *International Electronic Journal of Elementary Education, 9*(1), 182-196. Retrieved from <https://eric.ed.gov/?id=EJ1126711>

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| **Purpose of the Study** | To assess teachers’ knowledge and capacity for implementing classroom physical activity (PA) breaks |
| **Setting** | * Five school districts, online survey * Midwest, USA |
| **Subjects/Sample** | * 346 metropolitan elementary school teachers   + 92.2% female, 7.8% males * Convenient sample recruited through the district research boards |
| **Study Design/**  **Methodology** | * Descriptive exploratory design * Researches recruited teachers in the spring and fall of 2014 |
| **Level of Evidence** | Level IV |
| **Data Collection Tools/Measures** | * An online survey was developed by the researchers   + questions were on teacher’s willingness to utilized PA   + followed a socio-ecological model * The survey was piloted prior to use |
| **Results/**  **Main Findings** | * All teachers felt PA was important for all students * An overwhelming majority:   + thought classroom PA breaks were important for all students   + were aware of and utilized PA in classrooms   + utilized PA for improvement in class behavior * One-third of teachers experienced barriers to implementation   + A majority of those stated lack of time was the top barrier * Clinical Significance:   + Additional support to teacher could help with consistent and meaningful PA implementation |
| **Limitations** | * Convenient sample * Lacked randomization, non-experimental * Survey respondent bias possible * Short survey length * Significant differences in district response rate |
| **How is this study useful for your EBP project?  Check all that apply.** | ☐ Provides background info  ☐ Study uses the same/similar Population to your proposed project  ☐ DIRECTLY supports the Proposed Intervention  ⌧ INDIRECTLY supports Intervention **(shows support for teachers’ perspective theme)**  ☐Provides info on assessments |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * This study gives teachers’ perspective on implementing PA in their classrooms. More than 99% of teachers indicate that PA is important for all students and 90.8% reported they were aware of and utilized classroom PA. As such a high number of teachers are aware of and utilizing PA in the classroom, teacher compliance would not be an issue. * The overwhelming majority of teachers believe PA would benefit their students related to classroom behavior and thus more apt to utilize it. * There are barriers, most notably, time to implement the PA. Discussion with teachers and administration on the importance of school wide times for PA implementation (which has been had with building principal) would help alleviate the “time” barrier. Building a culture of PA importance helps teachers’ feel empowered to use PA. |

**CRITICALLY APPRAISED PAPER # 5**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S. Locke, J., … Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology, 26*(1), 70-95. <http://dx.doi.org/10.1080/15377900903379125>

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| **Purpose of the Study** | To determine if the use of mindful awareness practices (MAPs) over an eight week period during seated activities would impact the executive function process in second and third-grade students |
| **Setting** | * On-campus university elementary school * Los Angelos, USA |
| **Subjects/Sample** | * 64 children from second and third grade   + 35 females, 29 males   + intervention n=32, control n=32 * Age range: 7-9 * Mean age: 8.23 * Convenient sample |
| **Study Design/**  **Methodology** | * Randomized control trial with block randomization with stratification * Pre and post-test design * 16 treatment sessions   + 2 times per week for 8 weeks * 30-minute sessions * Three sequence program   + 1- 3-minute meditation   + 2- Inner Kids program- games/activities based on weekly topic   + 3- 5-minute body scan or meditation * Control participated in silent reading |
| **Level of Evidence** | Level I |
| **Data Collection Tools/Measures** | * Behavior Rating Inventory of Executive Function (BRIEF) a reliable and valid EF measure   + Metacognition Index   + Behavioral Regulation Index   + Global Executive Function * High internal consistency and test-retest reliability for teachers and parent * Baseline at pre-intervention * One post-intervention assessment * Baseline indicated no differences between 2 groups |
| **Results/**  **Main Findings** | * Students with poorer initial EF and received MAPs, showed improved EF function post-intervention compared to controls based on both parent and teacher report * Statistical significance on teacher report:   + Shift, Initiate, Plan/Organize and Monitor scales. * Statistical significance of parent report:   + Shift, Emotional Control, Initiate, Working Memory and Monitor scales. * Clinical significance:   + changes in executive function generalized outside of the classroom and into home life as indicated by the parental report   + students with lower initial executive function exhibited average executive function skills after MAPs |
| **Limitations** | * Small sample size * Teachers were not blinded * Lack of follow up after intervention |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧ Background info  ⌧ Population  ⌧ DIRECTLY supports the Proposed Intervention **(shows the effectiveness of the intervention for mindfulness intervention in elementary aged children)**  ⛝ INDIRECTLY supports Proposed Intervention  ⛝ Provides info on assessment measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Classroom-based mindfulness intervention with elementary aged students shows support for 8-week mindfulness intervention * Use of the BREIF as a measurement tool for pre and post-test designs could be considered for the proposed project * Changes in executive function were exhibited in 8 weeks with 2-30 minute sessions for a total of 8 hours of intervention which is similar to the proposed project * The InnerKids Program prompts interaction between students and teachers which is similar to the proposed project which is will be led by teachers with therapist design, development and consultation |

**CRITICALLY APPRAISED PAPER # 6**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Foran, C. A., Mannion, C., & Rutherford, G. (2017). Focusing elementary students with active classrooms: Exploring teachers' perceptions of self-initiated practices. *Journal of Elementary Education, 10*(1), 61-69. <http://doi.org/10.26822/iejee.2017131887>

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| **Purpose of the Study** | To explore the perceptions of elementary teachers who routinely prioritize physical activity (PA) in their classroom |
| **Setting** | * Seven city schools * A western city in Canada |
| **Subjects/Sample** | * Seven teachers in grades 1-6 from seven different schools   + female- 6, male- 1   + 4-24 years of experience * Appropriate inclusion and exclusion criteria * Recruited teachers by email, professional development course, colleagues, and sent to principals and teachers with public addresses from school websites |
| **Study Design/**  **Methodology** | * Qualitative constructive approach and ground theory * One investigator interviewed all 7 teachers * Semi-structured interview with probing questions * Interviews were conducted until theoretical saturation occurred |
| **Level of Evidence** | Qualitative |
| **Data Collection Tools/Measures** | * Semi-structured interview with open-ended questions and probing   + Questions were reviewed by 2 experts and revisions made based on their feedback * Primary research transcribed the interview * Levels of analysis were completed by way of 3 steps: initial coding, focused coding, and constant comparison based on prior research * Each transcript was analyzed prior to the next interview to understand trends and emerging themes |
| **Results/**  **Main Findings** | * All interviewees place importance on PA in their own lives * Three main themes   + their perceptions of improvement in student behavior occur after PA   + personal attributes, previous experience, and teaching approach prioritizing PA   + perceived belonging to a school culture with movement within the classroom was important * Clinical Significance:   + teachers with these views are more likely to carryout PA within the classroom |
| **Limitations** | * Small sample * Teachers self-identified as promoting PA within their classrooms * Limited perspective of only teachers currently using PA in their classrooms * No randomization |
| **How is this study useful for your EBP project?  Check all that apply.** | ☐Provides background info  ☐Study uses the same/similar Population to your proposed project  ☐DIRECTLY supports the Proposed Intervention  ⌧INDIRECTLY supports Intervention (**shows support for the teachers’ perspective theme)**  ☐Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * This study provides better understanding of teacher perspective on reasons for using PA with the classroom * The culture of the school and support from administration plays a factor in the continuation of PA within the classroom. Therefore, it is essential for teachers to feel support in the implementation of PA within the classroom. |

**CRITICALLY APPRAISED PAPER # 7**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Greico, L. A., Jowers, E. M., Errisuriz, V. L., Bartholomew, J. B. (2016). Physically active vs sedentary academic lessons: A dose response study for elementary student time on task, *Preventive Medicine, 89,* 98-103. <http://doi.org/10.1016/j.ypmed.2016.05.021>

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| **Purpose of the Study** | To determine differences in time on task (ToT) with a traditional sedentary lesson or a competitive activity completed at sedentary (1), light (2) or vigorous (3) intensities. |
| **Setting** | * Third, fourth and fifth-grade classrooms * Central Texas, USA |
| **Subjects/Sample** | * 320 students   + 51.2% female, 48.8% male * Age: 7-12 years * Mean age: 9.5 * Students were from a large study of 660 students across experimental and control schools were recruited for this study |
| **Study Design/**  **Methodology** | * Randomized mixed methods study design within an experimental study   + Within-subject factor (pre-post lesson)   + Between-subject factor (activity intensity dose) * Classrooms were randomly assigned to 4 levels of PA   + Each lesson lasted 15 minutes   + level 1- Sedentary, non-competitive traditional lesson   + level 2- Sedentary, competitive game   + level 3- Low-moderate intensity physical activity, competitive game   + level 4- Moderate-vigorous physical activity, competitive game * Researcher observing ToT were blind to the condition * Students were blind to the condition |
| **Level of Evidence** | * Level I |
| **Data Collection Tools/Measures** | * Momentary time sampling (MTS)   + measurement of ToT at 5 seconds per student for 15 minutes   + eco-behavioral assessment   + interrater reliability exceeded 90% in pre and post- assessment * Accelerometer   + assessed PA   + established reliability with the age group * Situational interest measure   + 1 question 5-point Likert rating   + no rated validity |
| **Results/**  **Main Findings** | * Statistical difference increase with ToT for level 3 & 4 post-intervention   + Level 4 had a greater increase * Statistical difference decreased with ToT for level 1 post-intervention * ToT did not statistically change for level 2 post-intervention * Clinically significance   + ToT decreased with post-traditional lesson   + ToT increases following both light-moderate PA and moderate-vigorous PA |
| **Limitations** | * Lacked long-term follow-up   + No information on ToT after 15-minute observation * Researchers did not have access to possible diagnoses related to attention or behavior |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of PA on attention)**  ⌧INDIRECTLY supports Intervention (**shows support for the dose/duration theme)**  ☐Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Use of brief PA within the classroom similar to the proposed intervention project with statistically significant increases in ToT reported * Justifies measurement tools for attention and ToT with MTS similar to that of the proposed project * Positive outcomes with similar aged elementary school students * Demonstrates effectiveness with teacher-led physical activity instruction within the classroom |

**CRITICALLY APPRAISED PAPER # 8**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Howie, E. K., Beets, M. W., Pate, R. R. (2014). Acute classroom exercise breaks improve on-task behavior in 4th and 5th-grade students: A dose-response. *Mental Health and Physical Activity, 7,* 65-71. <https://doi.org/10.1080/02701367.2015.1039892>

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| **Purpose of the Study** | To directly compare the acute effects of 5, 10, and 20 min of classroom exercise breaks on on-task behavior |
| **Setting** | * One elementary school * South Carolina, USA |
| **Subjects/Sample** | * 96 fourth and fifth-grade students in 5 classrooms * Ages: 9-12 * Economically disadvantaged: 34% * Convenient sample |
| **Study Design/**  **Methodology** | * Randomized control trial within-subjects experimental design * Activities were led by research staff * Four conditions:   + 10 min of sedentary classroom activity   + 5 min of classroom physical activity (PA) break   + 10 min of classroom PA break   + 20 min of classroom PA break   + each classroom was introduced to each condition, each week   + on-task behavior was observed from videotapes before and after each condition * PA was offered twice per week for 4 weeks * Brain BITES was utilized as the PA program   + activities were the same across the 5, 10 and 20-minute duration   + PA instruction was led by researchers |
| **Level of Evidence** | Level I |
| **Data Collection Tools/Measures** | * Momentary time sampling (MTS) via video to obscure conditions   + 15-second observation for each student in 3 different video viewings to assess time on task (ToT) * System for Observing Fitness Instruction Time was modified to asses the PA intervention to determine the actual intervention condition * Three coders and all were blinded to the condition   + Interrater agreement 81% initial then 3rd review to determine agreement * Baseline measures:   + Body Mass Index- fair reliability established   + Kaufmann Brief Intelligence Test- reliability and validity established   + Conners’ Parent Rating Scales- reliability and validity established |
| **Results/**  **Main Findings** | * ToT was significantly higher in students after 10 min of classroom exercise breaks compared to a sedentary attention control * Clinically significance:   + 10 minutes is an acceptable amount of time to devote to physical activity and see improvements in attention |
| **Limitations** | * Research staff administered the PA intervention * Subjectivity with direct observation |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness improve attention with PA outcome)**  ⌧INDIRECTLY supports Intervention (**shows support for the dose/duration theme)**  ⌧Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Use of brief high-intensity PA within classrooms with similar population to that of the proposed project * Use of MTS similar to that of the proposed research project * Provide PA duration information to guide proposed project |

**CRITICALLY APPRAISED PAPER # 9**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Ma, J. K., Le Mare, L., & Gurd, B. J. (2014). Classroom-based high-intensity interval activity improves off-task behaviour in primary school students. *Applied Physiological Nutrition and Metabolism, 39*, 1332-1337. <http://doi.org/10.1139/apnm-2014-0125>

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| **Purpose of the Study** | To examine the effects of brief high-intensity interval exercise on selective attention and to determine whether classroom off-task behavior predicts changes in attention following physical activity |
| **Setting** | * Public school system * Ontario, Canada |
| **Subjects/Sample** | * 44 second and fourth-grade students   + grade 2: n=20   + 5 females, 15 males   + grade 4: n=24   + 14 females, 10 males * Classrooms were recruited through school management * Convenient sampling |
| **Study Design/**  **Methodology** | * A single group, repeated cross-over design * Three-week intervention   + alternating PA and no activity days   + data collection in the final two weeks   + the PA was 4 minutes in duration with 10 minutes allotted for set-up, PA and cleanup   + no activity days were allotted 10 minutes of lecture   + all interventions and no activity observations were conducted after at least 20 minutes of sedentary work   + Four researchers observed student behavior for 50 minutes’ post intervention/no activity time     - each student observed 10 times     - each researcher observed a different set of 5-6 students’ * FUNtervals PA program was utilized |
| **Level of Evidence** | Level III |
| **Data Collection Tools/Measures** | * Behavioral Observation of Students in Schools tool and Momentary time sampling (MTS)   + 30 seconds of observation   + 15-second break to record observations   + focus on passive, verbal and motor off-task behaviors * Behavioral Observation of Students in School has not been validated but has high levels of inter-rater reliability |
| **Results/**  **Main Findings** | * Off-tasks behaviors were significantly lower following the 4-minute high-intensity PA * The effects were greatest with students in the highest quarter of off-task behavior on no activity days * Clinical significance:   + brief high-intensity interval PA can be utilized within the classroom to improve classroom behaviors |
| **Limitations** | * Small sample size * Short intervention window * No control or randomization * No blinding |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of brief PA outcome)**  ⌧INDIRECTLY supports Intervention (**shows supports use of attention/behavior and MTS outcome measure)**  ⌧Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Provided information on a behavioral checklist with high inter-rater reliability to use along with MTS * Provided information on FUNtervals high-intensity PA exercises that can be used successfully within a classroom * Students of similar age to the proposed project * This study supports use of PA with statistical significance with the elementary age population similar to the proposed project |

**CRITICALLY APPRAISED PAPER # 10**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Ma, J. K., Le Mare, L., & Gurd, B. J. (2015). Four minutes of in-class high-intensity interval activity improves selective attention in 9- to 11- year olds. *Applied Physiology Nutrition and Metabolism, 40,* 238-244. <https://doi.org/10.1139/apnm-2014-0309>

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| **Purpose of the Study** | To determine if off-task behavior predicts changes in attention after exercise and the acute affects of physical activity on attention |
| **Setting** | * Grades 3-5 in 7 different classes in 5 different elementary school * Southeastern Ontario, Canada |
| **Subjects/Sample** | * 88 students in grades 3-5   + female= 44, male =44 * Convenient sampling * 99% consent received from parents |
| **Study Design/**  **Methodology** | * A single group, repeated cross-over design comparing students’ attention on no activity day to their attention on brief high interval physical activity (PA) * Three-week intervention   + Week 1: Off-task behaviors were assessed on 2 occasions for each student     - familiarized with d2 selective attention test and PA exercises   + Week 2 and week 3: d2 administered following either PA or no activity * FUNtervals was used as the brief 4-minute PA exercise program * Daily rotation of either PA or no activity |
| **Level of Evidence** | Level III |
| **Data Collection Tools/Measures** | * D2 Test of Attention   + Stable construct, criterion and predictive validity over 23-month period and high test-retest internal reliability established * Behavioral of Students in Schools tool and momentary time sampling (MTS)   + rotated observation schedule   + 5-minutes per students in 30-second increments throughout the day with 5 minutes of observations for each student   + focus on passive, verbal and motor off-task behaviors   + high reliability established |
| **Results/**  **Main Findings** | * Four-minute high-intensity interval exercise improved selective attention in 9-11 year olds * Verbal off-task classroom behavior weakly predicted the changes in selective attention following PA but the motor and passive off-task behaviors do not. * Clinical Significance:   + use of brief PA interventions can improve attention within the classroom |
| **Limitations** | * No randomization * No blinding * Convenient sample |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of brief PA intervention)**  ⌧INDIRECTLY supports Intervention (**show supports for dose/duration theme)**  ⌧Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Brief PA was demonstrated to improve attention within the classroom * Provides information on MTS which is an observation tool that could be used for the proposed outcome measure * Similar aged students to the proposed project with positive outcomes * This study utilized 4 minute high intensity PA within the classroom of student similar in age to that of the proposed project |

**CRITICALLY APPRAISED PAPER # 11**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

McMullen, J., Kulinna, P., & Cothran, D. (2014). Physical activity opportunities during the school day: Classroom teachers’ perceptions of using activity breaks in the classroom. *Journal of Teaching in Physical Education, 33,* 511-527. <http://doi.org/10.1123/jtpe.2014-0062>

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| **Purpose of the Study** | To explore classroom teachers’ perceptions of incorporating physical activity (PA) breaks into their classrooms and to determine preferred activity break features |
| **Setting** | * An Indigenous elementary and high school district * Southwestern USA |
| **Subjects/Sample** | * Four elementary and eight high school teachers |
| **Study Design/**  **Methodology** | * Phenomenology * Researchers analyzed reflection in the teachers’ journals * Journal prompts were given along with reflection on the physical activity breaks * 1-2 semi-interviews per teacher |
| **Level of Evidence** | Qualitative |
| **Data Collection Tools/Measures** | * Interviews were transcribed * Journals and interviews were analyzed to determine emergent themes * Individual comparisons and between-subject comparisons were completed |
| **Results/**  **Main Findings** | * Three themes were identified   + Threats to classroom control     - chaos     - space constraints     - getting back on task   + Connection to academic content   + Ease and enjoyment     - ease of implementation     - enjoyment * Clinical Significance:   + teachers will carry out the proposed intervention so their perspectives are important   + These three areas need to be considered when developing instructional plan. |
| **Limitations** | * Small sample size * No randomization |
| **How is this study useful for your EBP project?  Check all that apply.** | ☐Provides background info  ☐Study uses the same/similar Population to your proposed project  ☐DIRECTLY supports the Proposed Intervention  ⌧INDIRECTLY supports Intervention (**shows supports for the teachers’ perspective theme)**  ☐Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Evidence to support the importance of training for teachers. This will be implemented through initial training of mindfulness and PA exercises to be used in the classroom and continued support through consultation with the occupational therapist. * Provides information on the perceived barriers that teachers face when implementing physical activity interventions to prepare the occupational therapist to address before they become a barrier. |

**CRITICALLY APPRAISED PAPER # 12**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Napoli, M., Krech, P. R., Holley, L. C. (2005). Mindfulness training for elementary school students. *Journal of Applied School Psychology, 21*(1), 99-125. <https://doi.org/10.1300/J370v21n01_05>

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| **Purpose of the Study** | To determine if mindfulness training with students increase focus and attention |
| **Setting** | * Two elementary schools * A southwestern city in the USA |
| **Subjects/Sample** | * 254 first, second and third-grade students within their classroom   + female n=108, males n=120   + 34 were excluded   + experimental group n= 97, control group n=97 |
| **Study Design/**  **Methodology** | * Randomized control trial * 12 bi-weekly mindfulness training for a total of 24 sessions for one school year * experimental group: participated in the Attention Academy Program focusing on paying attention to breathing, and sensorimotor movement activity * control group: reading or quiet activity |
| **Level of Evidence** | Level I |
| **Data Collection Tools/Measures** | * Baseline and post-intervention   + ADD-H Comprehensive Teacher Rating Scale     - standardized with 4000 children   + Test of Everyday Attention for Children     - 5 subtests, reliability ranges from 64% to 90%   + Test Anxiety Scale     - 86% test-retest reliability   + All tests are established |
| **Results/**  **Main Findings** | * There were statistically significant changes in scores between groups indicated few problems noted by teachers on the ADD-H Comprehensive Teacher Rating Scale   + Decrease in anxiety   + Increase in selective attention * Clinically significance:   + use of mindfulness activities paired with sensorimotor tasks showed improvement in attention within the school-age population |
| **Limitations** | * Measurement tools did not specifically address attention |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of mindfulness intervention for improved attention)**  ⌧INDIRECTLY supports Intervention **(show support for program activities)**  ☐Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Mindfulness activity paired with sensorimotor activity was shown to increase attention with a population and setting similar to the proposed project * This study provides detail on specific mindfulness activities used with students of similar age and statistically significant results |

**CRITICALLY APPRAISED PAPER # 13**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Thomas. G. & Atkinson, C. (2016). Measuring the effectiveness of a mindfulness-based intervention for children's attentional functioning. *Educational and Child Psychology, 33*(1), 51-64. Retrieved from <https://www.researchgate.net/publication/293826420_Measuring_the_effectiveness_of_a_mindfulness-based_intervention_for_children%27s_attentional_functioning>

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| **Purpose of the Study** | To assess the impact of a six-hour mindfulness program in reducing and selective attention with primary school age students. |
| **Setting** | * Primary school setting * North-west England |
| **Subjects/Sample** | * Thirty year-4 students * Ages: 8-9 year old |
| **Study Design/**  **Methodology** | * Randomized control trial with quasi-experimental cross-lag * Four data collection time points six to eight weeks apart   + baseline, time 1, time 2, time 3   + class one received the intervention baseline and time 1   + class two received the intervention between time 1 and time 2   + class three was the control * Use of Paws b. mindfulness program   + 6-week program   + 8 week and 14 weeks follow up for class 1   + 8 week follow up for class 2 * Convenient sampling |
| **Level of Evidence** | Level II RCT with Level III quasi-experimental component |
| **Data Collection Tools/Measures** | * Attention Checklist- teacher report   + Reliability established * NEPSY-II Inhibition subtest- researcher-administered attention measure   + face validity established   + naming total errors   + inhibition errors * Attention Checklist completed for all students at all four checkpoints |
| **Results/**  **Main Findings** | * There was an overall positive impact with statistical significance with the Paws b. mindfulness program at improving attentional functioning. * Teacher report measures results indicate statistical significant versus experimental group and waitlist control * Clinical Significance:   + mindfulness-based activities are effective in improving attention function within the classroom |
| **Limitations** | * Small sample size * No blinding * No report on possible behavioral or attentional diagnoses |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of mindfulness based intervention for improved attention)**  ⌧INDIRECTLY supports Intervention **(show support for program activities)**  ☐Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Study results indicate improvement in student attention with population and setting * Large effect size at follow up indicates students are generalizing what they have been taught and applying it. * This study provides detail on specific mindfulness activities used with students of similar age and statistically significant results |

**CRITICALLY APPRAISED PAPER # 14**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Watson, A., Timperio, A., Brown, H., Best, K., & Hesketh, K, D. (2017). Effect of classroom-based physical activity interventions on academic and physical activity outcomes: A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity, 14*, 1-24. <http://dx.doi.org/10.1186/s12966-017-0569-9>

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| **Purpose of the Study** | To evaluate the impact of classroom-based physical activity (PA) interventions on academic outcomes and to evaluate the impact of varying PA duration on academic outcomes |
| **Setting** | * All studies analyzed were investigating within classrooms within schools * Studies from USA (18), Netherlands (7), Australia (4), Canada (3), Scotland (2), South Africa (1), UK (1), Greece (1), Denmark (1), Switzerland (1) |
| **Subjects/Sample** | * Meta-Analysis   + sixteen articles * Systematic Review   + thirty-nine articles   + sample size: 4-4500, most less than 300   + sample ages: 5-13 years   + Intervention Deliverer:     - research staff: seven studies     - teacher: 24 studies   + randomized control studies: 14   + non-randomized studies: 25 * Intervention periods: single lesson to 3 years with most lasting nine weeks or longer |
| **Study Design/**  **Methodology** | * Systematic review and meta-analysis * Forest plots were used to determine homogeneity |
| **Level of Evidence** | Level II |
| **Data Collection Tools/Measures** | * Article quality assessment   + Strong: 3 articles   + Moderate: 14 articles   + Weak: 22 articles * Researchers followed the protocol for Preferred Reporting Items for Systematic Reviews and Meta-Analysis |
| **Results/**  **Main Findings** | * Meta-analysis indicated physical activity (PA) had a positive effect on improving on-task behavior and reducing off-task behavior within the classroom * Meta-analysis indicates PA had no impact on cognitive function * Meta-analysis indicated PA had no impact on academic achievement based on standardized assessment * Clinical Significance:   + PA results in immediate improvement in classroom behavior and attention within the classroom |
| **Limitations** | * A high number of weak quality studies may have influenced the results |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ☐Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of PA intervention with improved attention)**  ⌧INDIRECTLY supports Intervention (**shows supports smaller aspects of the intervention—content, structure, measurement)**  ⌧Provides info on measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Definitive results that indicate brief classroom PA improves classroom behavior in students of similar age and placement of the proposed project * Twenty-three studies utilized teacher-led instruction of PA. * Fourteen studies used attention or off-task behaviors through direct observation (similar to the proposed project) as their outcome measures |

**CRITICALLY APPRAISED PAPER # 15**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Wilson, A. N., & Dixon, M. R. (2010). A mindfulness approach to improving classroom attention. *Journal of Behavioral Health and Medicine, 1*(2), 137-142. <http://dx.doi.org/10.1037/h0100547>

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| **Purpose of the Study** | To assess attention skills following a mindfulness-based intervention with students within the classroom setting |
| **Setting** | * Private elementary school * Southern Illinois, USA |
| **Subjects/Sample** | * Twelve students in second and third grade   + female=7, male=5   + mean age= 8 * Group was chosen by school principal based on teacher concern of group dynamics and classroom behavior * No diagnoses reported |
| **Study Design/**  **Methodology** | * ABA withdrawal design * Phase A: baselines determined   + five 30-minute observation over two weeks * Phase B: Introduction of intervention   + five 15-minute mindfulness exercises   + followed by 30 minutes of observation for each session * Return to Phase A: no intervention   + one observation of 30 minutes each week for 2 weeks |
| **Level of Evidence** | Level III |
| **Data Collection Tools/Measures** | * Momentary time sampling (MTS)   + 10 seconds per student for 30 minutes * Inter-rater reliability was 94% |
| **Results/**  **Main Findings** | * Statistical data was not presented in this article * Increased attention during the mindfulness intervention * There was a return to the baseline attention when intervention was no longer presented * Clinical significance:   + improvement in attention following mindfulness exercises |
| **Limitations** | * No statistical data was analyzed * Small and convenient sample * No randomization or control * Short intervention period |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ⌧Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of mindfulness intervention for improved attention)**  ⌧INDIRECTLY supports Intervention (**shows support for behavior/attention measurement theme)**  ⌧Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * This study gave good examples of mindfulness exercise to use with the population along with an easy to read chart of ABA phase data. * Reinforced use of MTS with attention observation * Showed positive results with short term mindfulness exercises with similar population and setting * Due to return to baselines after intervention ended, continued use of mindfulness should be implemented throughout the school year. |

**CRITICALLY APPRAISED PAPER # 16**

**PIO Question:**  Does the use of brief classroom breaks integrating physical activity and mindfulness (I) increase attention to classroom tasks (O) in elementary school children (P)?

Zoogman, S., Goldberg, S. B., Hoyt, W. T., & Miller, L. (2015). Mindfulness interventions with youth: A meta-analysis. *Mindfulness, 6*(2), 290-302. <https://doi.org/10.1007/s12671-013-0260-4>

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| **Purpose of the Study** | To explore analyses focusing on youth and looking at mindfulness interventions |
| **Setting** | * Sixteen studies were conducted in school-based settings * Four  studies were conducted in clinical settings |
| **Subjects/Sample** | * All were empirical studies   + Sample sizes: 4-246   + 17 randomized control trials   + Instructor experience:     - 8 trained     - 12 experienced   + Moderators were coded to determine differences between studies |
| **Study Design/**  **Methodology** | * Ten databases and reference lists were searched * Inclusion criteria:   + peer-reviewed   + published in English   + participants were under 18 years old at initial assessment * mindfulness as the main component * Systematic Review: Meta-Analysis |
| **Level of Evidence** | Level I |
| **Data Collection Tools/Measures** | * Study quality was assessed by 2 coders characterizing differences in study samples, delivery methods and for potential moderations including publication year, number of participants, age, outcome measures, control group type etc… to determine study outliers resulting in a reduction from 28 to 20 articles remained following this analysis * Becker’s *del* was used to determine effect size in aggregation and omnibus analysis |
| **Results/**  **Main Findings** | * An overall small effect size over a varying sample of outcomes related to mindfulness with youth * Studies utilizing attention and mindfulness measures were the only measurements with statistically significant results. Therefore improvement in academic performance is not a statically significant expected outcome. * Clinical Significance:   + Utilizing attention and mindfulness measurements are best to determine outcome measures of mindfulness interventions with children |
| **Limitations** | * Variation among interventions * Small sample size * Possible omissions years searched were 2004-2011 * Varying methodology in studies |
| **How is this study useful for your EBP project?  Check all that apply.** | ⌧Provides background info  ☐Study uses the same/similar Population to your proposed project  ⌧DIRECTLY supports the Proposed Intervention **(shows effectiveness of mindfulness intervention for improved attention)**  ☐INDIRECTLY supports Intervention  ⌧Provides info on assessment/evaluation or other measurement tools |
| **This study was identified as the ‘best’ evidence and can be applied to your proposed EBP project in these SPECIFIC ways:** | * Evidence shows promise of mindfulness intervention with children to improve attention * Measures focusing on attention and mindfulness will provide the best outcome |