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Improving School-based Physical Fitness Testing Real World Evidence Through Domain Analysis Modeling

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plates were used to collect marker coordinate and GRF data, respectively. Peak knee flexion angle (KFA) and knee extension moment (KEM) were calculated. Musculoskeletal modeling was used to estimate muscle activation patterns and PFJRF during all box land-and-cut trials. Pre- and post-fatigue lower extremity mechanics were compared using paired samples t-tests. Significance for all tests were *a priori* set at $p < 0.05$.

RESULTS: Peak PFJRF was lowered after the fatigue protocol (6.6 ± 1.3 BW) compared to the pre-fatigue condition (8.8 ± 1.8 BW; $p = 0.038$). Post-fatigue peak KFA (-41.2 ± 8.0 deg) and peak KEM (2.2 ± 0.4 Nm/kg) were also reduced compared to pre-fatigue states (KFA: -50.7 ± 6.2 deg, $p = 0.020$; KEM: 2.8 ± 0.6 Nm/kg, $p = 0.012$).

CONCLUSION: Whole-body muscular fatigue decreased KFA and KEM, which led to reductions in PFJRF. Patellofemoral joint articular cartilage is highly sensitive to abnormal loading patterns (i.e., under-/overloading), which can lead degradation in overall cartilage composition. As such, chronic reductions in PFJRF may have implications in increasing future lower extremity injury risk.

D-25 Rapid Fire Platform – Effective Policies and Programs

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Chair: Christina D. Economos, *Tufts University, Boston, MA.*
(No relevant relationships reported)

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Development Of A Skills-based Curriculum To Promote Health Behaviors Through Physical Activity

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(No relevant relationships reported)

PURPOSE: The COVID-19 pandemic revealed a gap in parent resources to support child physical activity (PA) in the home environment. The purpose of this project was to develop a skills-based curriculum that empowers families to practice multiple effective health behaviors, through the common thread of PA.

METHODS: A 12-step curriculum integration process (Malik & Malik, 2011) was followed. The steps included: 1) assembling a curriculum development team; 2) determining the scope of the project; 3) considering the level of PA integration into the curriculum to create a common thread; 4) considering vertical and horizontal integration of PA into the curriculum; 5) creating module-specific working groups; 6) creating learning outcomes; 7) documenting content: topics covered, skills learned, attitudes developed; 8) determining themes; 9) determining sequencing; 10) selecting assessment tools; 11) communicating with partners on content and implementation; 12) re-evaluating and revising the curriculum based on partner feedback.

RESULTS: A multidisciplinary team was formed (1) and decided to create a 12-module family-based curriculum. PA was integrated (2) at the level of nesting (i.e., integration of PA into another health topic discussion) (3). Horizontal and vertical integration were achieved by including PA across topics and modules (4). Module-specific working groups were created based on individuals' expertise (5), with each responsible for developing learning outcomes (6). Content focused on improving family knowledge, skills, and attitudes of health topics (e.g., sleep, nutrition) (7) through the theme of families "moving together, being together, and thinking together" (8). Modules followed a 12-month sequence aligned with Maslow's hierarchy of needs (9) and self-assessment methods included completion of 20-day family activity challenges (10). The final curriculum was presented to key partners for review (11) with a commitment to continued revision (12).

CONCLUSIONS: A systematic process was used to develop a 12-module skills-based curriculum that integrated PA into each module to provide a common mechanism to support family engagement in health behaviors. Our next steps include assessing the effectiveness of the curriculum to enhance families' health knowledge, attitudes, and behaviors.

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Improving School-based Physical Fitness Testing Real World Evidence Through Domain Analysis Modeling

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The transformation of real-world data (RWD) to real-world evidence (RWE) in exercise and physical activity (PA) research and clinical practice, often obtained under field conditions, is challenging. Key roadblocks include disharmony in terminology, in the recording and curation of PA data, and in communication with relevant stakeholders. Our approach is to create a Domain Analysis Model (DAM) focused on school based physical fitness testing (SB-PFT) with the standards development organization Health Level Seven (HL7). Using the DAM to accelerate the evolution of RWE from RWD, we hope to standardize terminology, improve the quality of SB-PFT data, and streamline data collection and exchange between schools, clinical settings, state and local programs, and parents and children.

PURPOSE: To provide a harmonized heuristic of terminology and data flow associated with SB-PFT, which is mandated in public schools in the 5th, 7th, and 9th grades in 16 states, by employing an academic health center-community collaboration to facilitate interoperability across a wide range of conditions; enhance communication of data; and identify and address health disparities.

METHODS: The DAM approach, previously used for CPET DAM, requires substantial commitment and resources. We have convened bi-monthly with key stakeholders and content experts consisting of standards developers, school personnel, health department officials, exercise scientists, and clinicians to systematically address definitions; field protocols; data formats; communication with students, parents, school personnel; and incorporation of PFT data to address the crisis of poor PA in children.

RESULTS: Although more work is required, we have achieved consensus on the data elements in Table 1.

CONCLUSION: This promising work of standardization will enable quality reporting of information, facilitate sharing, provide opportunities to address health disparities, and enhance analytics quality for RWE.

Data elements	Number of terminologies considered	Total discussion time (hrs)	
		Leadership meetings	Collaborative team
Physical fitness	3	0.5	1.5
Aerobic capacity	4	1	1.5
Body composition	4	1	2
Muscle power	3	0.25	0.25
Muscle strength	5	0.25	0.25
Muscle endurance	5	0.25	0.25
Muscle flexibility	4	0.25	0.25
Health-related fitness	6	0.25	0.5
Skill-related fitness	3	0.25	0.5

Table 1. The total number of terminologies considered for each data element and the estimated time needed of intense and comprehensive discussion required within the separate monthly small leadership and large group meetings to achieve consensus on the associated data elements, in addition to the >30 hours of preparation that included an environmental scan of existing definitions and SB-PFT forms, reports, and approaches.

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Examining Physical Education And Physical Activity Policies Across Western New York School Districts

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School district wellness policies regarding physical education and physical activity (PEPA) are important for ensuring students are offered many opportunities to be physically active during the school day. The strength (i.e., weak language: recommends action; versus strong language: requires action) and comprehensiveness (i.e., inclusion of all policy components as required by federal law and evidence-based practice) of school district PEPA policies may vary by school district demographics.

PURPOSE: This study examines the strength and comprehensiveness of district PEPA policies by district socioeconomic status (SES), geographic locale (i.e., rural, suburban, urban), and district size (i.e., student enrollment).

METHOD: 80 school district wellness policies across 5 Western New York counties were collected via school district websites. Demographic data (including district SES, locale, and size) were collected from the National Center for Education Statistics website and district websites. PEPA policies (16 items) were located in each district policy document and scored on their strength and comprehensiveness using the WellSAT WSCC (a validated school wellness policy evaluation tool). Means and standard deviations were calculated for continuous variables. One-way ANOVAs with post-hoc tests compared PEPA scores by district SES, locale, and size.

RESULT: Districts ($n=80$) were primarily low SES (50%), located in rural areas (63%), and had large student populations (44%). Strength ($p<0.001$) and comprehensiveness ($p=.008$) significantly differed by locale. Rural districts had higher strength ($M=32.72$) and comprehensiveness ($M=59.34$) compared to urban ($M_{strength}=17.23$, $M_{comp}=31.36$), while suburban districts ($M_{strength}=30.73$, $M_{comp}=57.73$) had higher scores compared to urban. Strength ($p>.001$) and comprehensiveness ($p>.001$) significantly differed by SES. High SES districts had higher strength ($M=32.70$) and comprehensiveness ($M=62.60$) compared to low SES districts ($M_{strength}=12.10$, $M_{comp}=26.90$). No significant differences were found for district size.

CONCLUSION: School district PEPA policies vary by district locale and SES. Urban and low SES school districts should improve the language of their wellness policies to increase physical activity opportunities for students.

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Better Than Average: Physical Education Requirements In North And South Carolina's Tertiary Institutions

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Physical education requirements (PERs) in college help students learn and practice healthy lifestyle habits. During the 1920s/30s, 97% of colleges/universities required their students to take some form of physical activity/education course. Since then, a downward trend has been observed, with the most recent national data showing that only ~32% of U.S. colleges/universities mandate fully PERs today.

PURPOSE: The purpose of the study was to examine and compare the status of PERs in North and South Carolina's 4-year higher education institutions.

METHODS: Institution's academic catalogs were obtained via their respective websites and searched for PER information. Institutional Review Board (IRB) review was not necessary, as the information gathered was publicly available and human contact was not required. Data were summarized using descriptive statistics.

RESULTS: Findings of this study revealed that ~41% of South Carolina's institutions (i.e., 13 of 32) required PERs, and ~9% partially required PERs (i.e., 3 of 32), meaning that not all degrees mandated a PER or that it was an option among other choices. In North Carolina, ~60% of institutions mandated a PER (i.e., 32 of 53), while ~19% of institutions had a partial requirement (i.e., 10 of 53).

CONCLUSIONS: Both North and South Carolina are well above the national and state-level average regarding PERs. This is not an entirely unpredictable outcome,