

Content Analysis of the Physical Education Curriculum in Primary Schools (Analysis of Health-Related Physical Fitness Components)

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Abstract

This study examined the representation and distribution of Health-Related Physical Fitness (HRF) components within the primary school physical education curriculum using quantitative descriptive content analysis. The analysis covered the cognitive and knowledge-related content across all five primary grades and employed a structured content analysis instrument to identify five HRF components: cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition. The word served as the unit of analysis. Content validity was assessed through expert review using Lawshe's Content Validity Ratio (CVR), while reliability was established through inter-rater agreement (Holsti's coefficient = 0.92) and test-retest reliability over a 30-day interval (98% agreement). A total of 66 HRF-related references were identified, comprising 48 explicit and 18 implicit references. Cardiorespiratory endurance was the most frequently represented component (28.8%, n = 19), followed by flexibility (24.2%, n = 16), muscular endurance (21.2%, n = 14), muscular strength (16.7%, n = 11), and body composition (9.1%, n = 6). Although all five HRF components were represented, their distribution was uneven, with greater explicit representation of cardiorespiratory endurance and flexibility than of muscular strength and body composition. These findings indicate that the curriculum provides a partial rather than fully balanced representation of health-related physical fitness. Future curriculum revisions should therefore strengthen the explicit representation of all HRF components, improve their developmental sequencing across the primary grades, and consider alignment with internationally recognized physical education frameworks.

Keywords: Physical Education - Primary School Curriculum - Content Analysis - Health-Related Physical Fitness Component.

1. Introduction:

Within contemporary educational and public health discourse, physical education (PE) is widely recognized as a foundational pillar for holistic learner development, extending its pedagogical mandate far beyond the mere acquisition of isolated motor skills to encompass systemic health promotion and the cultivation of active lifestyles. This dual role is explicitly operationalized by SHAPE America's National Physical Education Standards (2024), which frame high-quality physical education as a comprehensive instructional baseline designed to structurally support students' long-term physical, cognitive, and health behaviors. The primary education stage represents a critical developmental window, during which pupils establish foundational movement capacities and lifestyle habits that heavily persist into adolescence and adulthood. Consequently, the structural equilibrium of the curriculum delivered during these early years serves as a critical determinant of public health outcomes.

Central to the health-promoting mission of physical education is the systematic integration of Health-Related Physical Fitness (HRF), a multi-dimensional construct directly linked to physiological efficiency, somatic growth, and metabolic protection.

Empirical research consistently demonstrates that HRF components—traditionally categorized into cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition—are key institutional outcomes that physical education curricula are expected to foster. As highlighted by Chen et al. (2018), healthy levels across all core fitness domains serve as powerful enabling factors that directly dictate children's physical activity volumes both within the school boundaries (such as during PE classes and recess) and throughout external organized sports. This makes fitness education a public health imperative rather than a discretionary pedagogical option.

This alignment between educational practice and public health tracking is further reinforced by global guidelines. The World Health Organization, (2020) mandates that children and adolescents reduce sedentary behaviors and actively engage in evidence-based physical activity as a core preventive health strategy. Expanding on these specifications, the U.S. Physical Activity Guidelines explicitly recommend that school-aged youth accumulate a minimum of 60 minutes of daily moderate-to-vigorous physical activity (MVPA). Crucially, these frameworks stress that this daily volume must not be restricted to aerobic conditioning alone, but must systematically incorporate vigorous, muscle-strengthening, and bone-strengthening

activities across the week to ensure optimal skeletal and neuromuscular architecture.

Despite these clear international consensus models, contemporary literature highlights a persistent and problematic gap regarding how HRF components are translated, weighted, and explicitly mapped within everyday school curricula. Content analysis studies of physical education teacher preparation programs have revealed significant deficits in how future educators are trained to deliver comprehensive fitness concepts, which directly impairs their readiness to transfer balanced health-related frameworks to elementary students.

To mitigate these structural inconsistencies, national frameworks have been introduced to audit and standardize curricular alignment. For example, the Centers for Disease Control and Prevention developed the Physical Education Curriculum Analysis Tool [CDC] (2006) to evaluate whether school goals, daily learning activities, and student assessment criteria are rigorously aligned with national health standards. Furthermore, supportive initiatives like the Physical Best program have demonstrated the practical feasibility of embedding diversified HRF content directly into daily school routines, yielding measurable improvements in youth fitness awareness and somatic engagement.

The imperative to critically audit local curriculum structures is further underscored by international comparative data. Landmark epidemiological studies published in BMC Public Health have confirmed that while cardiorespiratory endurance remains a dominant correlate of youth physical activity, other localized factors heavily dictate fitness expressions. Cross-national research in Frontiers in Public Health across Mediterranean populations discovered significant geographical variances in children's baseline fitness profiles, explicitly arguing that physical education curricula must be adapted and Contextualized to specific regional health profiles rather than blindly adopting generic frameworks. In nearby regional contexts, including Egypt, short-term school-based intervention models have successfully demonstrated that well-structured, multi-dimensional fitness programming can be effectively engineered into standard elementary timetables, yielding sharp improvements in children's physiological markers. Successful operational models from district-level K–5 standards documents in the United States demonstrate that fitness-related objectives can be made explicit, measurable, and progressively scaffolded across the primary school lifespan.

Therefore, the critical research problem does not rest on whether health-related physical fitness is completely omitted from primary education, but on whether its internal distribution, structural equilibrium, and pedagogical framing are explicit enough to satisfy contemporary holistic public health mandates. Despite the established epidemiological links between multi-dimensional fitness and pediatric

health, there remains a persistent ambiguity regarding how these specific domains are weighted and progressively scaffolded within local primary school curricula. Leaving fitness components implicitly defined or disproportionately distributed introduces severe instructional fragmentation, effectively limiting primary educators' opportunities to execute intentional teaching, progressive tracking, and rigorous assessment. Consequently, this study addresses this critical gap by systematically analyzing the cognitive and knowledge resources embedded within the primary school physical education curriculum across all five instructional levels. Specifically, **the research problem lies in uncovering the precise relative frequency, explicit-to-implicit ratio, and structural imbalances among the five core HRF dimensions—cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition—within the intended curriculum, thereby establishing the empirical baseline required to drive systematic, health-enhancing curricular alignment**

2. Methodology

2.1 Study Methodology: The study employed an analytical method through content analysis, given its suitability to the nature of the research. This method was applied by relying on quantitative estimations to evaluate the elements under investigation.

2.2 Study Population :Defining the original population is one of the fundamental aspects that researchers must carefully consider, as without identifying the population and understanding its internal elements, it becomes difficult to control all the variables related to the study. In the present research, the population consisted of all knowledge resources included in the physical education curriculum for the primary education stage across its five levels.

2.3 Study Sample: The study sample, representing a subset of the research population, was selected to examine the characteristics of the original population. In this study, the sample consisted of all Cognitive resources included in the physical education curriculum for the primary education stage across its five levels.

2.4 Data Collection Tools:

- **Content Analysis Tool:** A form was developed to analyze the knowledge resources included in the physical education curriculum for the primary education stage. This analysis card consisted of the following components:

- a) **Categories of Analysis:** Categories of analysis refer to a set of words with similar meanings or shared connotations, and are defined as the primary or secondary elements into which the units are classified. In the present study, the main category was health-related physical fitness components. The secondary categories included: cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition.

Table 1. Content Analysis Card

Main Category	Sub-Categories	Content
Health-Related Physical Fitness	Cardiorespiratory Endurance	Running, Jogging, Swimming, Cycling, Walking, Aerobic games, Skipping rope, Continuous running, position switching, repeated movements.
	Muscular Strength	Push-ups, Pull-ups, Jumping, Resistance Training, Shooting, Physical contact, Tackling
	Muscular Endurance	Sit-ups, Plank, Squats, Rope Skipping, Performing the same movement multiple times (passing, dribbling, defending).
	Flexibility	Stretching, Yoga, Gymnastics, Static/Dynamic Stretching, Rapid changes of direction, sudden movements, stretching during play
	Body Composition	BMI, Body Fat %, Lean Mass, Measurements

Operationalization of Explicit and Implicit HRF Representation

In the present study, a distinction was made between the explicit presence of a curricular term and the explicitness of its relationship to a health-related physical fitness (HRF) component. A curricular activity or term was considered explicitly present when it appeared directly in the written curriculum, such as running, walking, stretching, push-ups, or sit-ups. However, the HRF component associated with such a term could be represented either explicitly or implicitly.

An implicit HRF representation was identified when a curricular activity was explicitly stated but its relationship to a specific HRF component was not directly named. For example, running or walking constitutes an explicit curricular term, but when the curriculum does not explicitly identify cardiorespiratory endurance or aerobic fitness as the intended fitness component, its relationship to cardiorespiratory endurance was coded as an implicit HRF representation.

Similarly, stretching may be explicitly included as an activity while its relationship to flexibility is implicitly represented.

An explicit HRF representation was identified when the curriculum directly referred to the relevant fitness component, its physiological concept, or an unambiguous fitness-related objective. Accordingly, the coding process distinguished between the lexical presence of a curricular activity and the degree of explicitness with which its HRF meaning was represented. This distinction was applied consistently throughout the coding process.

b) Units of Analysis: One of the classifications of units of analysis is their division into the context unit and the recording unit.

- **Context Unit:** Context units are larger linguistic entities (such as a sentence, paragraph, or topic) that provide the framework for interpreting recording units. For example, if the word is the recording unit, the sentence becomes the context unit. In this study, the context unit refers to all Cognitive resources within the primary school physical education curriculum.
- **Counting Unit:** The researcher adopted the word as the unit of counting, as it allows for precise control of terms and descriptive expressions. This choice reflects the nature of the Cognitive resources analyzed, which require high accuracy, while also making the coding process simple and practical.

.4 Validity of the Content Analysis Tool:

After constructing the analysis instrument, its validity was assessed. Validity refers to the extent to which the tool accurately measures what it is intended to measure, independent of incidental research conditions. To establish validity, the instrument was reviewed by a panel of seven experts, who evaluated the appropriateness of each item for its designated domain. Lawshe's method was applied to calculate the coefficient of agreement among the experts using the following formula:

$$\text{CVR} = (\text{ne} - N/2) / (N/2)$$

Where:

ne = the number of experts who rated the item as “essential”

N = total number of experts

Interpretation

The CVR ranges from **-1 to +1**.

A **positive value** means more than half the panel agree that the item is essential.

A **negative value** means fewer than half consider it essential.

A value of **0** means exactly half the panel consider the item essential.

3. Reliability of the Analysis Instrument

- a) **Inter-rater Reliability:** The reliability of the analytical instrument was established by comparing the researcher's analysis of the primary school physical education curriculum with independent analyses conducted by two specialists possessing

substantial expertise in content analysis. Each content item was subjected to three separate analyses, and the percentage of agreement among the three sets of results indicated a high level of consistency. To further verify the reliability, Holsti's coefficient of reliability was employed, confirming the stability and robustness of the analytical procedure.

$$CR = (2M) / (N1 + N2)$$

Where:

CR = Coefficient of Reliability.

M = Number of coding decisions on which both coders agree.

N1 = Total number of coding decisions made by the first coder.

N2 = Total number of coding decisions made by the second coder.

Table 03: Agreement between Coders

Coders Compared	Units of Agreement (M)	Total Units (N1 + N2)	Agreement %
Researcher & Coder 1	46	100	92%
Researcher & Coder 2	47	100	94%
Coder 1 & Coder 2	45	100	90%
Average Agreement	-	-	92%

- b) **Test-retest Reliability:** stability over time" refers to the degree of agreement between the results of repeated analyses conducted at different points in time. In this study, the researcher analyzed the physical education and sports curriculum at the primary education level, repeated the analysis after 30 days, and calculated the agreement percentage using Holsti's coefficient.

Table 04: Stability over Time

The Analysis Process	Units of Agreement (M)	Total Units (N1 + N2)	Agreement %
First & Second	49	100	98 %

4. Results:

Table 05: Frequency and Percentage of Health-Related Fitness Components (Primary Education)

Health-Related Fitness Components	Frequency		Total	Percentage (%)	Rank
	Explicit Meaning	Implicit Meaning			
Cardiorespiratory Endurance	14	05	19	28.8%	01
Muscular Strength	09	02	11	16.7%	04

Muscular Endurance	09	05	14	21.2%	03
Flexibility	11	05	16	24.2%	02
Body Composition	05	01	06	09.1%	05
Total	48	18	66	100%	

The results showed that the Physical Education curriculum in the primary stage focuses primarily on cardiorespiratory endurance, which represents (28.8%) of the total activities, followed by flexibility (24.2%) and muscular endurance (21.2%). Meanwhile, muscular strength ranked fourth (16.7%), and body composition came last (9.1%) since it is more related to health measurements and assessment. This distribution highlights that the curriculum aims to build a solid physical foundation for children, mainly through developing endurance, aerobic fitness, and flexibility as the basis for proper motor performance and injury prevention, while giving moderate weight to gradually developing strength and muscular endurance. Body composition components are used as complementary assessment tools within the learning process.

5. Discussion

The present content analysis indicates that health-related physical fitness (HRF) is represented within the primary school physical education curriculum, but not in a fully balanced manner. Of the 66 recorded HRF-related references, 48 were explicit and 18 were implicit. Cardiorespiratory endurance accounted for the largest share (28.8%), followed by flexibility (24.2%), muscular endurance (21.2%), muscular strength (16.7%), and body composition (9.1%). This distribution indicates that the curriculum does not omit HRF; rather, some components receive greater curricular representation than others. Therefore, the findings suggest a partial rather than fully balanced representation of HRF within the cognitive/knowledge-related content of the intended curriculum.

5-1 The Aerobic and Flexibility Dominance

Cardiorespiratory endurance was the most frequently represented HRF component (28.8%). This finding is consistent with the central role of aerobic physical activity in international recommendations for children and adolescents. The World Health Organization (2020) recommends that children and adolescents engage in an average of at least 60 minutes per day of moderate- to vigorous-intensity physical activity, with regular aerobic activity forming an important part of this recommendation. Cardiorespiratory fitness is also widely recognized as an important marker of health during childhood and adolescence, (Ortega, Ruiz, Castillo, & Sjöström, 2008).

The relatively high representation of cardiorespiratory endurance may be related to the frequent inclusion of activities such as running, continuous movement, and other locomotor activities that can be readily incorporated into primary physical

education lessons. However, the frequency of curricular references should not be interpreted as evidence that this component receives more instructional time, since the present study analyzed written curricular content rather than classroom implementation.

Flexibility ranked second (24.2%). Its relatively high representation may partly reflect the common inclusion of stretching, mobility, gymnastics, and movement-preparation activities within physical education content. Nevertheless, the health-related importance of flexibility as a distinct component of physical fitness remains a subject of academic discussion. Nuzzo (2020), for example, questioned its status as a major component of health-related fitness, whereas Bouguezzi et al. (2023) argued that flexibility training may provide important benefits, particularly when appropriately integrated into physical training. Accordingly, the present findings should not be interpreted as indicating that the relatively high representation of flexibility is inappropriate; rather, they highlight the need for curricular balance among the different HRF components.

5-2 The Marginalization of Muscular Fitness

Muscular endurance was represented in 21.2% of the identified references, whereas muscular strength accounted for 16.7%. Although both components were present, their representation was lower than that of cardiorespiratory endurance and flexibility. This finding is noteworthy because international physical activity guidelines emphasize that aerobic activity should be complemented by muscle- and bone-strengthening activities. The World Health Organization (2020) recommends muscle- and bone-strengthening activities for children and adolescents on at least three days per week.

The relatively lower representation of muscular strength may also be related to the distinction between explicit and implicit curricular terminology. Of the 11 muscular-strength references, 9 were explicit and 2 were implicit. Although the majority were explicit, some strength-related content may be expressed through movement or performance terminology rather than being identified directly as muscular strength. Greater conceptual clarity in this area could help teachers recognize muscular strength and muscular endurance as distinct components of health-related physical fitness and support their more systematic treatment within the curriculum.

The health relevance of muscular fitness during childhood is well established. Smith et al. (2014) reported associations between muscular fitness and several health outcomes, including bone health, adiposity, and cardiovascular and metabolic risk factors. Therefore, the findings do not suggest that muscular fitness is absent from the curriculum; rather, they indicate that its representation could be strengthened and made more conceptually explicit..

5-3 Body Composition

Body composition had the lowest representation among the five HRF components, accounting for 9.1% of the identified references, with five explicit and one implicit reference. This relatively low representation may partly be explained by the conceptual nature of body composition, which differs from performance-oriented components such as endurance and strength (Caspersen, Powell, & Christenson, 1985).

Nevertheless, its limited representation indicates that body composition occupies a relatively minor position within the explicit curricular discourse on HRF. This finding should not, however, be interpreted as a recommendation to increase weight- or adiposity-focused assessment among primary school pupils. Cale and Harris (2009) questioned the use of fitness testing in physical education as an approach to promoting healthy lifestyles and physical activity, highlighting concerns about the educational value and effectiveness of fitness testing when it becomes a primary focus. Furthermore, Cale and Harris (2013) examined the role of physical education in addressing childhood obesity and cautioned against approaches that place excessive emphasis on body weight and obesity.

Therefore, the limited representation of body composition should not necessarily be addressed by increasing weight-focused testing; rather, it may be better addressed through age-appropriate health education concerning physical activity, healthy growth, nutrition, and overall well-being. A more appropriate curricular approach would be to introduce body composition at an age-appropriate conceptual level through health education related to healthy growth, regular physical activity, nutrition, and overall well-being. Such an approach would recognize body composition as an HRF component while avoiding an excessive focus on body weight, body size, or numerical indicators.

Overall, the findings indicate that the main issue is not the absence of HRF components from the primary school physical education curriculum, but rather their unequal distribution and varying degree of explicit representation. Cardiorespiratory endurance and flexibility received comparatively greater representation, whereas muscular strength and body composition were less frequently represented. These findings support the need for greater conceptual clarity and a more balanced representation of HRF components in future curriculum development, while recognizing that the present study addresses written curricular content rather than actual teaching practices or students' physical fitness outcomes

6. Conclusion

This study provides empirical evidence that health-related physical fitness (HRF) is represented within the primary physical education curriculum, but its

representation is uneven across the five dimensions examined. The descriptive-analytical mapping reveals that, while the curriculum establishes a clear movement-oriented foundation, it gives greater explicit attention to cardiorespiratory endurance (28.8%) and flexibility (24.2%) than to muscular strength (16.7%), muscular endurance (21.2%), and body composition (9.1%).

The key conclusions drawn from this investigation are:

- **Uneven Curricular Representation:** The distribution of HRF-related terminology is not balanced across the five dimensions. Cardiorespiratory endurance and flexibility occupy a comparatively prominent position, whereas muscular strength, muscular endurance, and particularly body composition receive less explicit representation.
- **The Vulnerability of Implicit Framing:** Muscular strength is represented at 16.7%, with some references appearing indirectly through movement- and performance-related terminology rather than through explicit physiological terminology. This pattern may limit the extent to which muscular fitness is clearly identified as a distinct component of health-related physical fitness within the curriculum.
- **Limited Explicit Representation of Body Composition:** Body composition accounts for only 9.1% of the analyzed curricular content, with five explicit references. This relatively low representation suggests that body composition occupies a marginal position within the explicit curricular discourse on health-related physical fitness.
- **Implications for Curricular Coherence:** The findings indicate that the main issue is not the complete absence of HRF from the curriculum, but rather the unequal distribution and varying degree of explicitness with which its five dimensions are represented. From a curriculum-analysis perspective, this highlights the need for greater conceptual clarity and more balanced representation of health-related fitness components.

Overall, the findings suggest that the primary physical education curriculum provides a foundation for health-related physical fitness, but its treatment of HRF is not fully balanced across the five dimensions examined. Strengthening the explicit representation and conceptual clarity of the less frequently represented components could contribute to a more comprehensive curricular treatment of health-related physical fitness. This interpretation is consistent with curriculum frameworks such as the CDC's Physical Education Curriculum Analysis Tool (PECAT), which emphasizes the development of knowledge, skills, and behaviors related to physical activity and physical fitness, and with SHAPE America's National Physical Education Standards, which frame physical education around holistic student development and health-enhancing physical activity and fitness.

7. Practical Recommendations

Based on the findings of this study, several recommendations may help strengthen the representation and integration of Health-Related Fitness (HRF) within the primary physical education curriculum:

- Improve the balance of HRF components: Review the distribution of curricular content to ensure more balanced explicit representation of the five HRF components: cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition.
- Increase explicit curricular terminology: Strengthen the use of explicit and conceptually precise terminology related to HRF, particularly muscular strength, muscular endurance, and body composition, rather than relying predominantly on broad movement- or performance-oriented descriptions. This would enhance the conceptual clarity of HRF within the curriculum.
- Strengthen health literacy content: Incorporate age-appropriate concepts related to body composition, healthy growth, nutrition, physical activity, and health-related fitness within the curriculum. Such content should emphasize health and well-being rather than reducing body composition to body weight or numerical indicators.
- Align curriculum development with established frameworks: Consider internationally recognized curriculum-development and analysis frameworks, such as the CDC's Physical Education Curriculum Analysis Tool (PECAT) and SHAPE America's National Physical Education Standards, as reference points when reviewing curriculum objectives, content, learning outcomes, and assessment. The PECAT is specifically designed to support systematic analysis and improvement of written physical education curricula.
- Strengthen teacher guidance within the curriculum: Provide clearer curricular guidance concerning the terminology, learning outcomes, and progression associated with the less explicitly represented HRF components. Such guidance could help improve consistency between curricular objectives and the intended treatment of health-related fitness.
- Promote developmental progression: Develop a coherent scope and sequence in which the five HRF components are represented progressively across primary grade levels, ensuring continuity in the development of movement experiences, health-related knowledge, and understanding of physical fitness.
- Conduct further curriculum-based research: Future studies should examine how the HRF terminology identified in the curriculum is translated into teaching practices and learning experiences, as the present content analysis does not directly assess classroom implementation.

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