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A Physical Fitness Perspective on Physical Education Lesson with Rampage Method Application

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Abstract: The purpose of this study is to investigate the effect of a program prepared in accordance with the Rampage method in physical education classes on the development of health-related physical fitness in children aged 9-12 (3rd-6th grade). Randomly selected control (n:30) and performance (n:34) groups were administered initial and final tests. SPSS 25.0 was used for statistical analysis. CG showed SLJ pre-test and post-test values of 106.33 ± 20.604 and 107.07 ± 18.94, respecti-vely, while PG exhibited pre-test and post-test values of 116.03 ± 19.983 and 123.71 ± 20.09 for SLJ. For the 20Meter run-ning test, CG had pre-test and post-test values of 15.23 ± 8.95 and 20.60 ± 9.06, whereas PG showed pre-test and post-test values of 18.59 ± 10.49 and 21.21 ± 10.10. Results of statistical analysis; A variable was found in the standing long jump measurements between the performance group(PG) and the control group(CG) ($p<0.05$). No significant difference was detected in the pre-test and post-test data for the other measured parameters. Based on these results, it is recommended to conduct comprehensive studies examining the effects of physical education classes prepared with the RAMPAGE method on children's physical fitness using different age groups or different physical fitness tests.

Keywords: Physical education, physical development, fitness

1. Introduction

Childhood and adolescence are significant contributors to the obesity epidemic due to sedentary behavior [1,2]. According to the World Health Organization [3], low levels of physical activity lead to health issues related to sedentary lifestyles. High levels of sedentary time, independent of the amount of physical activity, are associated with obesity and metabolic risks [4,5]. Studies indicate that obese children and adolescents are more likely to become obese adults and experience adverse health outcomes at an early age compared to their normal-weight peers [6,7,8,910]. However, the risk of developing costly and life-threatening chronic diseases associated with severe obesity in children or adolescents is reduced through regular physical activity [11,12]. Particularly, the middle school age is crucial as students' rates of physical development start to increase dramatically during those years. Simultaneously, students should overcome fundamental motor skills and develop their own hobbies and values [13]. Nevertheless, research has shown a decline in physical activity levels among students during middle school years [14]. Therefore, interventions targeting middle school children may be more effective than targeting adults.Schools are ideal environments to influence children's physical activities to meet these recommendations because they spend a significant portion of their time in schools compared to other settings outside their homes. Therefore, within schools, active school transportation [15,16], activity during recess [17,18] and physical education

classes become important [19]. Especially, physical education class has been identified as a key factor that can positively influence children's and adolescents' physical activity habits and promote lifelong activity behaviors [20]. The aim of this study is to shift the focus of the Turkish Middle School Physical Education Curriculum from being sports-oriented to health-related physical activity. Nearly 40% of the curriculum emphasizes health-related physical activity and physical fitness topics such as lifelong physical activity, sports, aerobic endurance, muscular endurance, flexibility, and weight management.Therefore, the aim of this study is to investigate the effect of a program prepared according to the Rampage method in physical education classes on the development of health-related physical fitness in children aged 9-12 (3rd-6th grades). Additionally, it aims to contribute to addressing the increasing health problems and sedentary behavior issues in children by structuring the scope and content of physical education classes with a structured program.

The significance of this study lies in elucidating how the research conducted will explain the variability in health-related physical fitness between existing physical education classes and classes prepared using the RAMPAGE method. It will also provide a new perspective for physical education program planning.

2. Materials and Methods

2.1. Participants

The participants for the study were selected through random sampling, with 34 students assigned to the intervention (performance) group and 30 students assigned to the control group. Due to the inability to implement different lesson plans within the same class, random selection was conducted across classes and sections. The participants consisted of students aged 9 to 12, ranging from the youngest 3rd grade to the oldest 6th grade.

Table 1. Descriptive Statistics of Participants

Variable	Group	n	Average	Average	U	p
Height (pre-test)	control	30	32,67	980,00	505,000	,094
	performance	34	32,35	1100,00		
	total	64				
Height (post-test)	control	30	33,17	995,00	490,000	,788
	performance	34	31,91	1085,00		
	total	64				
Weight (pre-test)	control	30	30,93	928,00	463,000	,527
	performance	34	33,88	1152,00		
	total	64				
Weight (post-test)	control	30	31,42	942,50	477,500	,661
	performance	34	33,46	1137,50		
	total	64				

2.2. Study Design

In the study, randomisation method was used to determine the participants. Participants consisted of 64 individuals in total as control group (n=30) and performance group (n=34). The participants were administered height, weight, WC, standing long jump, sit-up and mile run test as pre and post test. While the control group continued the normal physical activity programme, the performance group was applied a physical activity programme

prepared with the rampage method. The data obtained as a result of the physical activity programmes applied to the participants for 8 weeks were analysed.

2.3. Data Collection

Height Measurement

Subjects stand barefoot against the wall with their backs straight, using a Seca stadiometer for measurement. Their weight is evenly distributed on both feet, heels are in contact with the meter, and arms hang loosely at their sides. The scapula is identified as the most prominent part of the sacrum, positioned with the occipital region against the vertical scale. Subjects are instructed to take a deep breath and keep their heels straight while their hair is flattened for measurement, which is then recorded. Measurements, with a precision of 0.1 cm, are conducted according to the method described [24].

Weight Measurement

Students were measured barefoot and wearing appropriate clothing for physical education classes. Weight measurement was conducted using a precision digital scale by Seca. The student stands on the scale for weight measurement. For the second measurement, the student steps off the scale, and the scale is reset to zero. Then, the student steps back onto the scale for the measurement. This process is repeated twice to ensure the accuracy and repeatability of the weight measurements for the subjects. This method helps to increase accuracy and precision in weight measurement, as described by [24].

Body Mass Index

In the calculation of Body Mass Index (BMI), the student's height (in meters) and weight (in kilograms) are used. BMI is obtained by dividing weight in kilograms by the square of height in meters. BMI is considered an important parameter used to determine individuals' health status, as described [24].

Sit-Up Test

The sit-up test involves children lying on their backs with their knees bent at a 90-degree angle, hands behind their heads, and the soles of their feet flat on the ground. They then perform as many consecutive sit-ups as possible for one minute, with the number of repetitions recorded. During the test, if the feet lift off the ground twice, the last repetition is recorded. It is important for students to ensure that their shoulders touch the ground when lying down and that their elbows touch their knees when lifting their torso off the ground [25].

Standing Long Jump

The standing long jump test is conducted to measure lower extremity strength abilities. Students are responsible for jumping forward from a designated point while standing still. During the jumps, candidates must land on both feet, and the distance between the heel of the foot and the starting line is measured when the jump is completed. Students perform two jumps, and the better of the two distances is considered for evaluation. Candidates are not allowed to gain momentum by moving backward, and jumps are considered invalid in case of faulty landings. Therefore, it is important for candidates to land on both feet to ensure accurate measurement.

20 Meter Miller Run Test

The 20 meter miller run test is a test conducted by recording how many times a student runs the distance of 20 meters until they give up. Students begin with a signal given by a whistle and run from one end to the other, then return, continuing this cycle. This test is used to assess factors such as speed, agility, and anaerobic capacity [26].

2.3. Statistical Analysis

Basic central and dispersion parameters (Mean, SD, Mean Difference, CI difference 95%) were calculated for each variable. The Kolmogorov-Smirnov test was applied to confirm normality ($p>0.05$). The data were analyzed using an independent student's T- test and statistical significance was set at level $p<0.01$. SPSS 25 package programme (SPSS Inc., Chicago, IL, USA) was used for statistical analysis of the data.

3. Results

This study investigates the effects of two different physical education course contents (curriculum and Rampage method) on certain physical fitness parameters (anthropometric, cardiorespiratory, and musculoskeletal) of participating students (3rd-6th grades) over eight weeks covering two lessons per week. The aim was to compare developmental differences among the course contents. Significant differences were observed in height, weight, and cardiorespiratory, (20M miller run) measurements as a result of the curriculum-based lesson content ($p<0.05$), while no significant difference was observed in SLJ, sit-ups, and BMI. As for the outcomes of the lesson content prepared using the Rampage method, significant differences were observed in height, weight, and cardiorespiratory measurements(data), ($p<0.05$), while no significant difference was found in musculoskeletal and BMI data. Upon comparing the two lesson content programs, a significant difference was detected in the post-test data of the musculoskeletal parameter of standing long jump ($p<0.05$). No significant difference was found in the measured other parameters between pre-test and post-test data.

Mann Whitney U test results did not reveal any significant differences between the control (n=30) and performance (n=34) groups of 9-12-year-old students participating in the study concerning variables such as pre-test sit-ups, pre-test sit-ups, post-test sit-ups, pre-test 20M miler runnig, and post-test 20M miller runnig ($p>0.05$). However, a significant difference was observed in the post-test variable of sit-ups ($p<0.05$) conducted in the study.

Table 2. T-test Results for Control Group Scores

Control Group	X	ss	t	sd	p
Height (1) – Height (2)	-,036	,018	-10,770	29	,000
Weight (1) – Weight (2)	-2,500	1,757	-7,794	29	,000
BMI (1) - BMI (2)	-,217	,929	-1,279	29	,211
SLJ (1) – SLJ (2)	-,733	8,412	-,478	29	,637
Sit-up(1)-Sit-up(2)	-1,267	6,664	-1,041	29	,306
Miller Running (1)-miller running(2)	-5,367	3,178	-9,248	29	,000

* BMI: body mass ındex, SLJ: standing long jump

Table 3. T-test Results for Performance Group Scores

Performance Group	X	ss	t	sd	p
Height (1) – Height (2)	-,031	,025	-10,770	-7,449	0,001
Weight (1) – Weight (2)	-1,941	1,254	-7,794	-9,027	0,001
BMI (1) - BMI (2)	-,105	1,080	-1,279	-,565	0,211
SLJ (1) – SLJ (2)	-7,676	5,531	-,478	-8,093	0,637
Sit-up(1)-Sit-up(2)	-6,206	6,099	-1,041	-5,933	0,306
Miller Running (1)-miller running(2)	-2,618	2,686	-9,248	-5,683	0,001

* BMI: body mass ındex, SLJ: standing long jump

Table 4. Pre-post Test Results of The Participants

Variable	Group	n	Average	Average	U	p
SLJ (pre-test)	control	30	28,42	852,50	387,500	,099
	performance	34	36,10	1227,50		
	total	64				
SLJ (post-test)	control	30	25,25	757,50	292,500	,003
	performance	34	38,90	1322,50		
	total	64				
Sit-up (pre-test)	control	30	36,33	1090,00	395,000	,118
	performance	34	29,12	990,00		
	total	64				
Sit-up (post-test)	control	30	29,03	871,00	406,000	,159
	performance	34	35,56	1209,00		
	total	64				
Miller running (pre-test)	control	30	29,48	884,50	419,500	,222
	performance	34	35,16	1195,50		
	total	64				
Miller running (post-test)	control	30	32,22	966,50	501,500	,909
	performance	34	32,75	1113,50		
	total	64				

*SLJ: Standing long jump, U: Mann-Whitney U test

4. Discussion

The aim of the current research is to examine the effects of two different physical education curricula (curriculum and Rampage method) on specific physical fitness parameters (anthropometric, cardiorespiratory, and musculoskeletal) of students (3rd to 6th grades) participating in them over an eight-week period, with two lessons per week. The aim was to compare developmental differences among the course contents.

Through meticulous selection of activities utilized in every stage of the RAMP warm-up, taking into account both the long-term and short-term effects of these activities, enables the choice of exercises that not only enhance performance in the present session

but also play a crucial role in the holistic athletic progression of the athlete[21]. In the warm-up section of training, the use of the RAMP protocol is quite common among performance athletes [22]. However, the impact of the advantages of the RAMP protocol on the development of health-related physical fitness in children aged 9-12 (3rd-6th grade), especially during the transition to adolescence, has been a subject of curiosity in this study. In this study significant differences were observed in height, weight, and cardiorespiratory (20M miller run) measurements as a result of the curriculum-based lesson content ($p<0.05$), while no significant difference was observed in musculoskeletal (standing long jump, sit-ups) and BMI data.

As for the outcomes of the lesson content prepared using the Rampage method, significant differences were observed in height, weight, and cardiorespiratory measurements ($p<0.05$), while no significant difference was found in musculoskeletal and BMI data. Upon comparing the two lesson content programs, a significant difference was detected in the post-test data of the musculoskeletal parameter of standing long jump ($p<0.05$). No significant difference was found in the measured other parameters between pre-test and post-test data.

After conducting the first 15 minutes of integrated neuro-muscular training in physical education, researchers found no significant difference in sit-up and standing long jump test results among primary school students [23].

After an 8-week resistance training program, significant differences were found in the strength component among children averaging 9.7 years of age [24].

After strength training, there may be a significant improvement in spontaneous oxygen consumption, which explains the physical activity levels of students aged between 10-14 years [25, 27].

There is limited research specifically dedicated to examining the RAMPAGE protocol. However, similarities have been observed between certain aspects of this protocol and the internationally designed protocol utilized in the FIFA 11+ warm-up program, which aims to prevent injuries. It has been reported that the implementation of an adapted version of the RAMPAGE protocol during warm-up routines can reduce the risk of injuries in football players by up to 30%. From this inference, it can be concluded that the RAMPAGE protocol could contribute to injury prevention and support the development of physical health [28].

The limitations of this study may include: Gender differences were not considered in the study. Especially in pre-adolescent children, gender comparison can be made by applying the RAMP protocol. Additionally, the study could be expanded by addressing some potential differences. For example, factors such as physical activity levels and nutrition may also affect children's development. Since the comparison was made between the curriculum and RAMPAGE applied lessons, the weekly physical education class hours may be insufficient to observe development. The study was only conducted in a primary school physical education class and could be addressed with more participants in different locations.

5. Conclusions

The data for March 2022 and May 2022 is comprised of students from a private educational institution in Istanbul, aged between 9 and 12 years old (3rd and 6th grades), who participated in physical education classes. Based on the results, organizing physical education curriculum using the Rampage method did not contribute differently to some

physical fitness components compared to the curriculum-based physical education class. The current study is consistent with existing literature.

6. Patents

Author Contributions: The following statements should be used "Conceptualization, D.Z.C. and T.M.; methodology, T.M..; software, I.M.; validation, D.Z.C., I.M. and T.M.; formal analysis, T.M.; investigation, D.Z.C.; resources, D.Z.C.; data curation, I.M; writing—original draft preparation, T.M.; writing—review and editing, T.M. and I.M.; visualization, I.M.; supervision, T.M.; project administration, T.M.; funding acquisition, D.Z.C. All authors have read and agreed to the published version of the manuscript."**These authors contributed equally to this paper as senior authors.**

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Informed Consent Statement: All investigated students agreed to participate in the study

Data Availability Statement: "Not applicable"
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