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EFFECTS OF TEACHING PROGRAM BASED ON PHYSICAL EDUCATION CLASSES FOR UNDERSTANDING MODEL ON VOLLEYBALL SKILLS AND ENJOYMENT IN SECONDARY SCHOOL STUDENTS

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ABSTRACT

This study investigated the effects of the Teaching program based on physical education classes for Understanding (TPPEC) model on volleyball skills and enjoyment in secondary school students. A total of 54 students (18 girls) from two classes participated in this study, of whom 28 (age = 15.5 ± 0.7 years) were randomized to a TPPEC model (EXP) group and 26 (age = 15.7 ± 0.6 years) to a control group (CON) that maintained their usual physical-education activities. Four tests for volleyball skills were conducted: service, overhead, and forearm passing and setting. Additionally, the sport enjoyment questionnaire was used the first and the last week of intervention. Results from repeated measures analysis of variance (ANOVA) showed a significant interaction for overhead passing ($F\ 1, 58 = 5.273$, $p = 0.025$, Partial $\eta\ 2 = 0.083$) and forearm passing ($F\ 1, 58 = 4.641$, $p = 0.035$, Partial $\eta\ 2 = 0.074$). When examining the impact of TPPEC program on service accuracy, there was a significant main effect for time ($p < 0.01$) with both groups improving their result after the sixweeks intervention (EXP-ES = 0.32, % change = 9.1% vs. CON-ES = 0.57, % change = 14.4%). There was no significant time or group time effects for setting ($p > 0.05$). The EXP group showed significantly better results for enjoyment compared to the CON group ($p \leq 0.05$). The findings show the effectiveness of the TGfU model of short duration (12 lessons) in an educational context to improve volleyball skills. We also highlight the importance of enjoyment during these classes compared to traditional physical education classes.

KEYWORDS: Teaching Program; Technique; School.

INTRODUCTION

Throughout history, teaching approaches in physical education (PE) were evolving and transforming. New teaching approaches focus on using modified games, technical– tactical learning in similar sports, cognitive training, learning progression, teaching tactics before teaching technique, and problem-solving. The PE curriculum. Furthermore, it was observed that the use of isolated techniques conquered teaching as a part of structured lessons. With this approach, we isolate skills teaching and learning and later transfer them into the actual game. Students reported bad experiences with PE teaching and learning processes and identified them as a barrier to participating in sports and other physical activities in their childhood and adolescence. Furthermore, the teaching strategies have been recognized as the main limitation in supporting suitable development in the cognitive, psychomotor, and affective learning domains during PE lessons. In the traditional teaching model, the game play is only presented at the end of the lessons, and consequently, the isolated skill-drill students often perceive it as meaningless and boring. In this regard, game-based pedagogy approaches have been promoted to improve physical fitness, skill execution, and decision-making in PE and sports teaching/coaching. The Teaching Games for Understanding (TPPEC) approach was presented as an alternative to the traditional content-orientated mode, which includes skill and tactics learning throughout actual game play. TPPEC generates an immense game understanding and increases motivation, physical activity levels, enjoyment, and engagement in PE lessons. This model includes modified games to encourage decision-making in an active learning setting with strategic and tactical problems.

MATERIALS AND METHODS

PARTICIPANTS

This was a cluster-randomized, interventional trial comparing TPPEC school-based program with traditional physical education classes in adolescent students. Fifty-four adolescent students (18 girls) from two different classes in school from coimbatore district, of whom 28 (age = 15.5 ± 0.7 years) were randomized to a TPPEC school-based program (EXP) group and 26 (age = 15.7 ± 0.6 years) to a control group (CON) that maintained their usual physical education activities. To be included in the study, participants had to be between 14 and 16 years old, be free of any medications that could affect the results, not have medical problems, and not have participated in any systematic volleyball training either at the time of the study or in the past

(besides apart from regular physical education classes at school, which lasted up to 90 min/week). Body height, weight, and body mass index of the participants are presented in Table 1.

TABLE 1
GENERAL CHARACTERISTICS OF THE PARTICIPANTS

Variables	EXP GROUP		CON GROUP	
	Pre Test	Post Test	Pre Test	Post Test
BH (cm)	175.2 ±5.3	175.3 ± 4.8	174.0 ± 3.9	174.4 ± 4.1
BW (kg)	64.3 ±5.5	64.5 ± 5.2	63.2 ± 5.9	63.7 ± 5.7
BMI (kg/m^2)	20.3 ±3.7	20.1 ± 2.8	20. 5 ± 3.2	20.8 ± 3.8

Values are defined as mean ± SD. Abbreviations: BH, body height; BW, body weight; BMI, Body mass index; EXP, experimental; CON, control.

Procedures Volleyball skills measurements of the subjects in the experimental and control groups were conducted in the school gym. For all subjects, the testing was performed simultaneously in the period from 10 a.m. to 1 p.m. in both the initial and final measurements. All measurements were performed with the same measuring instruments in the initial and final measurements. During the initial and final measurements, the same assistants were also included. Reliability for the assessment of volleyball skills tests showed to be good, with ICCs from 0.85 to 0.94.

SERVICE

The aim of the test is to hit the target on the volleyball court. The player performs ten consecutive serves, trying to direct the ball towards the zone of higher values. Points are awarded according to the specific target areas hit; zero is obtained if the ball hits off the court; also, a higher value is obtained if the ball hits between two zones. The final score is the sum of all ten attempts. Players can choose their desired position behind the service line. The test is a modified version of the test, so the test's reliability was performed for this research.

OVERHAND AND FOREARM PASS

The aim of the test is to hit the target with your overhand and forearm pass from zone VI to position III while the coach is throwing balls from zone VI from the other side of the court. The target is positioned on the net, 3 m from the right sideline. The dimensions of the target are 1.5 m in length and 2 m in width. Players who successfully pass the ball to the target area receive 2 points. The second target area is for balls that did not reach the main target area but would probably reach players in the match situation. The second target area is extended from the right lateral line and is 3 m long and 4 m wide. Players who successfully pass the ball to the second target area get 1 point. Finally, a pass that does not reach the target areas will receive 0 points. The final score is the sum of 6 attempts.

PASSING

The aim is to hit a horizontal target with your fingers in front of your head. The player must hit a horizontal target in position IV from zone III, with the addition of balls from zone VI, on the same side of the court. The target is placed next to the net at a height of 2.7 m and 5.5 m from the player's position when performing the passing. This target was chosen because it is close to the attacker's position when preparing to spike the ball during the match. The coach is positioned 5 m from the player performing the pass, throwing the ball over his head and passing to the middle player. It is necessary to play the ball with your fingers to a hoop that is 80 cm in diameter. Players who successfully play the ball through the hoop get 3 points. Balls that hit the outside of the hoop and do not pass through the goal are valued 2 points. Players who play the ball 2.3 m from the net (and thus 1.5 m from the goal) get 1 point. Balls that are not in any of the target zones receive 0 points. The final score is the total number of points from 6 attempts.

ENJOYMENT STUDENTS'

Enjoyment levels in PE were measured using the Sports Enjoyment Scale which is a part of a larger scale, the "Sports Commitment Scale". We have used only the Sport Enjoyment Scale due to highest reliability and applicability in school settings. The scale included four items and was used to assess the aspects of enjoyment, pleasure, fun, and happiness rated on a 5-point Likert scale that ranged from 1: strongly disagree to 5: strongly agree. The items were modified to represent students' enjoyment in the Volleyball units. The sample items were: (a) "I like volleyball lessons," (b) "I have fun in volleyball lessons," (c) "volleyball lessons make me happy," and (d) "I enjoy volleyball lessons." Scores for the four items were averaged and then used as students' enjoyment scores. The scale has been found to have satisfactory internal consistency in school settings

STATISTICAL ANALYSIS

Statistical analysis was performed with the SPSS statistical program version 22 (SPSS Inc., Chicago, IL, USA). The results are presented as mean values ± standard deviation (SD). A was used to demonstrate that the data had a normal distribution ($p > 0.05$). Furthermore, Levene's tests were determined for all test variables. A two-way analysis of variance (ANOVA) was used to test the main effect of the group (EXP vs. CON) and the main effect of time (pre-test vs. post-test), and the interaction of group × time for volleyball skills test

results. The magnitude of the Cohen's d effect (ES) for changes within the group was classified as follows: »trivial« 2.0, and »extremely large« >4.0. A partial eta squared (η 2) was computed to check the differences between groups, where 0.01 was determined as a small effect, 0.06 as a medium effect, and 0.14 as a large effect. Statistical significance was set at $p \leq 0.05$ level of significance.

RESULTS

TABLE II
EFFECT OF TEACHING GAMES FOR UNDERSTANDING (TGFU) ON VOLLEYBALL SKILLS PARAMETERS

Variables	Group	Pre -Test	Post - Test	p- Value η 2p
Over-head pass (score)	EXP GROUP	5.1 ± 1.37	6.37± 1.67	Group: p=0.633, η 2 p: 0.004 Time :p < 0.001, η 2 p: 0.193 Interaction: p = 0.025, η 2 p: 0.083
	CON GROUP	5.77± 1.85	6.07± 1.82	
Forearm pass (score)	EXP GROUP	4.33± 1.69	5.77± 2.27	Group: p=0.077, η 2 p: 0.053 Time :p < 0.012, η 2 p: 0.104 Interaction: p = 0.035, η 2 p: 0.074
	CON GROUP	4.2 ± 2.31	4.33± 1.86	
Pass (score)	EXP GROUP	8.77 ± 2.91	9.4 3 ±1.28	Group: p=0.143, η 2 p: 0.037 Time :p < 0.403, η 2 p: 0.012 Interaction: p = 0.498, η 2 p: 0.008
	CON GROUP	10.03± 3.33	10.1± 2.75	
Service (score)	EXP GROUP	25.7 ± 7.96	28.03± 6.77	Group: p=0.769, η 2 p: 0.002 Time :p < 0.005, η 2 p: 0.012 Interaction: p = 0.517, η 2 p: 0.007
	CON GROUP	25.47 ±6.59	29.13±6.25	
Sports Enjoyment	EXP GROUP	38.03± 7.77	40.03± 7.89	Group: p=0.789, η 2 p: 0.005 Time :p < 0.005, η 2 p: 0.020 Interaction: p = 0.617, η 2 p: 0.028
	CON GROUP	39.13±7.25	40.13±7.90	

Abbreviations: TGFU, teaching games for understanding; EXP, experimental group; CON, control group; ES, Cohen d effect size

Results from repeated measures ANOVA showed a significant group (EXP vs. CON) × time (Pre to Post) interaction for overhead passing ($F\ 1, 58 = 5.273$, $p = 0.025$, Partial $\eta\ 2 = 0.083$) and forearm passing ($F\ 1, 58 = 4.641$, $p = 0.035$, Partial $\eta\ 2 = 0.074$, See Table 2). When examining the impact of program on service accuracy, there was a significant main effect for time ($p < 0.01$) with both groups improving their result after the six-weeks intervention (EXP-ES = 0.32, % change = 9.1% vs. CON-ES = 0.57, % change = 14.4%). There was no significant time or group × time effects for passing ($p > 0.05$).

DISCUSSION

The present study aimed to implement the TPPEC model into the PE program and examine its impact on volleyball skills and enjoyment. The study's main findings were examining its impact on volleyball skills and enjoyment. The study's main findings were that the six-week PE intervention significantly improved volleyball overhead and forearm passing compared to the CON group. Additionally, the EXP group showed better results for enjoyment compared to the CON group. TGFU is a game-based pedagogical model that generates a greater understanding of the game and increases the engagement, level of PA, motivation, and enjoyment in physical education classes. Studies have mainly used instructional training and a traditional model in order to improve skills in the sport. Moreover, a similar model is used in PE settings in order to teach students the skills of a particular sport. Technical skills like serving, setting, and passing accuracy seem to play a critical role in volleyball performance. Two studies showed similar improvements for small sided volleyball group and instructional training group in volleyball accuracy. Gortsila et al. on a sample of young volleyball players after ten weeks of volleyball instruction

However, one main limitation is that we have used volleyball accuracy tests. Therefore, in future studies, we should use tests with criteria used by volleyball coaches to assess the quality of students' technique and not just outcomes. Moreover, we did not measure the students again to see if retention in learning has occurred. Nevertheless, this is the first study that showed that the TGFU model could improve volleyball skills besides tactical knowledge. Moreover, enjoyment during these classes will motivate students and help them acquire good exercise habits.

CONCLUSIONS

The results show that both teaching models have been effective in improving volleyball skills in closed situations, given that students from both groups reached a similar level of volleyball accuracy. However, given the greater enjoyment Favoured by the TPPEC model, we think it would be preferable to use this model in the PE settings, as a greater level of enjoyment and intrinsic motivation are reached, and these are key factors in the desire to participate in PE and learn skills. Therefore, physical education teachers should consider implementing the mini-volleyball and the TPPEC model as an alternative for teaching volleyball in schools.

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