



P-ISSN: 2394-1685  
E-ISSN: 2394-1693  
Impact Factor (RJIF): 5.38  
IJPESH 2023; 10(5): 06-11  
© 2023 IJPESH  
[www.kheljournal.com](http://www.kheljournal.com)  
Received: 05-07-2023  
Accepted: 11-08-2023

**Maxia B Fernandes**  
Physical Education Teacher,  
English Academic School,  
Kuwait

**V Basil Hans**  
M.D., Research Professor,  
Srinivas University, Mangalore,  
India

## The impact of a jump rope program on elementary students' jump rope knowledge

**Maxia B Fernandes and V Basil Hans**

### Abstract

Implementing a systematic jump rope program in elementary schools can give pupils a comprehensive grasp of the sport, from its health advantages to its cultural significance. Furthermore, such a program might serve as a basis for instilling a lifelong love of physical activity and fitness. This research investigates this exercise/training program in the context of primary school students in Goa. Based on the data that was evaluated and interpreted, it was discovered that there is a significant shift in the primary students' knowledge of jump rope. It was discovered that the students' jump rope performance improved along with their knowledge of the jump rope. They didn't know how to verify the height of the jump rope at first, but after the jump rope program, they were able to measure the correct height of the jump rope and were advising others in doing so as well.

**Keywords:** Dance, exercise, fitness arena, gravity, jump rope, training

### Introduction

Jump rope, often known as skip rope, is a popular, ageless, and rhythmic dancing physical activity in which a person jumps over a spinning rope. Jump rope isn't only for kids; it's a dynamic workout that crosses cultures and decades. It's a basic and adaptable exercise item that has made its way into fitness routines, playgrounds, and professional sports. People of all ages and fitness levels can enjoy jumping rope.

The jump rope has been used as an exercise and a source of entertainment since ancient culture. It has now blossomed into a full-fledged fitness sensation, embraced by athletes, fitness fanatics, and those looking for a fun way to work out. Jump rope is a portable and inexpensive piece of equipment that can be used to turn any open space into a personal training arena. The beauty of jump rope is in its simplicity. Jump rope adapts to all ability levels, whether performed by a beginner learning fundamental bounce or a seasoned expert perfecting complex skill. The jump rope has a wide range of variations, from the basic bounce to double unders and freestyle maneuvers. It's a blank canvas where exercise meets creativity, allowing you to customize your workout to your liking.

However, it is not only about rhythmic footwork and cardiovascular benefits. Jumping rope works a variety of muscles, improving coordination, agility, and balance. Its repetitive cadence not only raises the heart rate but also provides a meditative getaway, making each jump a conscious moment. The handles become extensions of your hands, coordinating the rope's revolutions. The tempo can change, from a steady and methodical rhythm to a rush of fast beats. Each revolution, the rope, a slender friend, whispers through the air, a lovely hum punctuating the workout. The jump rope is a dynamic maestro in the world of fitness, directing a workout that is both vigorous and playful- a dance with gravity that leaves you thrilled, invigorated, and most importantly connected to the rhythmic pulse of movement.

Knowledge is a familiarity, knowledge, or understanding of someone or something, such as facts, information, description, or abilities gained by experience or education through perceiving, discovering, or learning. A knowledge test is a test given to applicants or students that consists of questions on a specific game or sport, rules and regulations, specific areas of skill, or the entire. Researchers can create knowledge tests based on the demands of the study, or existing knowledge tests can be employed provided they meet the needs and objectives of the study.

**Corresponding Author:**  
**Maxia B Fernandes**  
Physical Education Teacher,  
English Academic School,  
Kuwait

True or false, multiple choice questions, matching, short answers, essay questions, and orals are all examples of knowledge tests. For the knowledge test in this study, the researchers employed multiple choice questions, true & false, and short answers. Due to the lack of a skipping test, the researchers created a teacher-made test with professional help and supervision.

Jump rope (American English) or skipping rope (British English) is the primary tool used in the game of skipping, which is played by children and many young adults in which one or more participants jump over a rope swung under their feet and over their heads. 2013 ([http://en.wikipedia.org/wiki/Skipping\\_rope](http://en.wikipedia.org/wiki/Skipping_rope)). Jump rope has numerous advantages. Here are a few benefits: improves coordination, reduces foot and ankle injuries, burns a lot of calories, is completely portable and enjoyable, improves cardiovascular health, bone density, makes you smarter, improves breathing efficiency, improves your ability to stay calm, and many more. Jump rope techniques include single bounces, criss cross, double unders, and so on.

## Literature review

### 1. The effect of Jump Rope training on the physical fitness of female pupils aged 9 to 10 years.

Jahromi, Gholami, M.S., and M.S. M. (2015) <sup>[8]</sup> investigated the influence of Jump Rope training on the physical fitness of female pupils aged 9 to 10. The students were divided into two groups for this purpose: the training group and the control group. The researchers gave the training group 15 weeks of Jump Rope instruction, including three sessions per week. One leg balance-balance, 9x4 Illinois test-agility, 50mts running test-speed, and Sargent jump test-power were employed to obtain data. Another study conducted by Nicholson in 2005 demonstrated that jump roping is not only enjoyable but also reduces the risk of obesity, diabetes, depression, and improves balance. Before the research was conducted the participants were introduced to jump rope and information about the method was given to them the statistical tools utilized were standard deviation for evaluating normal distribution. To utilize parametric or non-parametric test Smirnov-Kolmogorov has been applied for in group evaluation, dependent T-test was used at a significance level of 0.05 and paired T-test too. The characteristics investigated by the researchers were BMI, balance, agility, speed and power. According to the results, there was no significant variation in the pace of female students. This research illustrate that jump roping boosted the peak of power and height of jumping. The results have indicated improvement in balance, agility and power among female pupils as effect of jump rope training. Thus, the findings show that jump rope training increases the physical fitness of female students aged 9 to 10. Jump rope training improves various aspects of physical fitness in 9 to 10 female students, such as balance, agility, and strength, but not speed.

### 2. The detection of Jump Rope Training Courseware and its involvement in student psychomotor performance

Zeynalami, S.M. and Mousavi, F. (2015) <sup>[13]</sup> created courseware to improve students' jump rope abilities and psychomotor performance. The researchers focused on rope making courseware, teaching skills, how to design, how extensive should the training be, and whether learning of psychomotor performance is beneficial. The quasi experimental research design was adopted in this study. The study's population consisted of all fourth-grade pupils in

Kermanshah, with 70 male fourth-grade students serving as a sample. The pupils were randomly assigned to one of two groups after being sampled in a cluster. There were two groups: experimental and control. The data gathering tools were questionnaires created by the researchers and reviewed to assess the learner's performance. The questionnaire was validated by a supervisor and many jump rope professionals, and its validity was determined using Crombach's alpha. In addition, the researchers had created a lesson plan for the jump rope abilities that would be taught to the children. This study was intended to teach jump rope skills, a training program, and mental performance including movement, which included five components: imitation, independent performance, accuracy and speed, coordination skills, and functional skill normalization. Design, motor abilities, jump rope, and psychomotor skills were the variables. The results revealed a substantial difference in the performance of learners who received jump rope skill training courseware training. There was also a large common difference between the two groups. Students who used jump rope courseware performed better than those who followed the standard plan. It was concluded that the usage of jump rope courseware was beneficial in developing students' psychomotor skills.

### 3. Rope jump training for 7 weeks improved aerobic endurance, speed, and agility in middle school student boys

Sadi, P. (2013) <sup>[9]</sup> studied the effects of a seven-week rope jump training program on middle school male students' speed, endurance, and agility. It was a seven-week jump rope program in which 28 male middle school pupils were randomly assigned to the experiment and control groups. The youngsters ranged in age from 11 to 12 years old and were in sixth grade. The research was conducted between the 19th of January 2012 and the 14th of March 2013. The sessions were held three times a week, i.e. Sunday, Wednesday, and Monday are off days. It lasted between 15 and 50 minutes. Endurance, speed, and agility were the anthropometric factors evaluated. The above factors, as well as BMI, were tested before and after therapy for both groups. The agility-T-drill and cardiovascular endurance-540mts run tests were performed. Before and after the training sessions, dependent T-students and independent T-students were used to compare the difference between two groups and the difference among the groups. The significance difference was fixed at 0.05. The results revealed a considerable improvement in the experiment and control groups' cardiovascular endurance, agility, and speed. Thus, it is concluded that 7-week jump rope training is a practical and established training approach for enhancing cardiovascular endurance and agility in middle school boy's students, with a slight gain in speed.

### 4. The impact of peer-administered token reinforcement on elementary physical education students' jump rope activities

Alstot, A.E. (2012) <sup>[1]</sup> investigated the impact of peer-administered token reinforcement on elementary physical education students' jump rope habits. Physical education teachers chose participants at random, primarily those who possessed the traits of pre control, control, or utilization. The research had established treatment conditions, such as a baseline and a token. A document describing the Generic levels of Skill Proficiency was handed to the physical education teacher. The program lasted two months and consisted of 10 sessions per week. The 45-minute class was

held in the morning. The researcher was present throughout the session, however it was led and implemented by the school's physical education instructor. Two video cameras were employed to record the ten sessions as data gathering instruments. The equipment included a jump rope and a token. The researcher had educated the physical education teachers so that she could run the classes properly. The camera's recordings were taken into account for data analysis. Each session was observed in slow motion, and the number of successful and unsuccessful jump rope practice trials for each participant was recorded. The successful jump rope trial was coded by the researchers, as was the unsuccessful trial. Throughout the trial, data analysis was taking place. Data analysis also included interobserver agreement and treatment integrity. An alternate therapy designed was employed to evaluate the effect of the invention. Jump rope, token economy, behavior analysis, and interest were the variables for this study. In comparison to baseline sessions, 9 out of 10 individuals successfully raised the number of successful jump rope trials in token reinforcement. Based on the findings, it was determined that peer-administered token economies can be used as a tool for physical educators.

### 5. A comparison of two aerobics training methods (running vs. rope jumping) on health-related physical fitness in boys aged 10 to 12

Arazi, H, Fard, & Abdinejad, A.J. H. (2016)<sup>[2]</sup> examined two aerobic training regimens on health-related physical fitness in boys aged 10 to 12 years. Jump rope, running, and physical fitness were the variables. For this study, 32 male kids from pre-high school were randomly assigned to rope jump training with twelve students, jogging training with eleven students, and control group with 10 students. On boys aged 10 to 12, an eight-week program was implemented. Before the test, all health-related physical aspects were evaluated. Before and after the program, there was a pre-test and a post-test. CPT-sit and reach, endurance-sit ups, body fat was assessed using the prediction equation of slaughter *et al.*, and body mass-individual weight were all performed. Cardiovascular fitness was measured using a shuttle run of 20 meters. The program lasted eight weeks and lasted 15-60 minutes three days a week, with rope jump training and jogging groups. The Kolmogorov-Smirnov test was employed to ensure that the data was normal. Descriptive statistics were employed to report average and dispersion index values. To evaluate pre-test and post-test training within groups, paired T-tests were used, and ANOVA with Tukey post-hoc tests were used to compare three groups. SPSS was used to analyze the data, with a significance level of 0.05. The students were divided into three groups for evaluation. There was no significant difference in health-related physical fitness between the three groups at the start. In comparison to the control group, the rope jump eight-week exercise resulted in significant improvements in aerobic power and muscle endurance. When compared to the control group, there was an improvement in aerobic power and running training. According to the research, rope jump training appears to be a promising choice for limited space running training. With urbanization and a lack of room in houses, rope jumping might be a useful alternative for overcoming space constraints for health-related physical fitness activities, particularly for youngsters.

### 6. Jump Rope Training Improves Preadolescent Soccer Players' Balance and Motor Coordination

A. Trecroci, L. Cavagioni, R. Caccia, and G. Alberti. (2015)

<sup>[12]</sup> looked into the effects of a short-term training regimen that included jumping rope exercises on motor ability and body balance in young soccer players. The sample included twenty-four preadolescent soccer players who were recruited and divided into two groups. The children in the experimental group did jumping rope training at the start of the training session, whereas the children in the control group did soccer-specific skills at the start of the session. The Harre circuit test (HCT) and Lower Quarter Y balance test (YBT-LQ) were used to assess participants' motor ability (e.g., ability to perform a course with different physical tasks such as somersaults and passages above/below obstacles) and unilateral dynamic lower limb balance after eight weeks of training. To find any significant interaction, paired t-test and mixed analysis of variances scores were performed. The children who did jumping rope exercises had a substantial drop in Harre circuit test performance time, however there was no difference between the pre-test and post-test of the control group. The study's findings showed that jumping rope practice as part of regular soccer training improved general motor coordination and balance in preadolescent soccer players. As a result, it suggests that including jumping rope practice in regular soccer training sessions should be encouraged in order to develop children's motor skills.

### 7. The effect of a rope jump training program in Physical Education sessions on children's strength, speed, and VO2 max

Eler, N., and Acar, H. (2018)<sup>[14]</sup> investigated the effect of a rope-jump training program in physical education sessions on strength, speed, and VO2 max in boys aged 10 to 12. In this study, 240 male students participated in the experiment, including 120 students in the rope-jump group and 120 students in the control group. While the control group continued to receive physical education and sports lessons, the rope-jump group received regular physical education and sports classes as well as rope-jump training three days per week for 10 weeks. Body weight, body fat percentage, leg strength, 20-second speed test, and VO2 max test measurements were taken before and after the ten-week period in both groups. The data obtained was evaluated using the SPSS 16 program. The t-test was utilized in the statistical analysis in both the dependent and independent groups. As a result of the pre-test and post-test, a significant difference was discovered in all parameters except the speed of the control group. When pre-test and post-test measurements of differences between groups were analyzed, it was discovered that weight, body fat ratio, 20 m sprint, VO2 max, and leg strength measurements were considerably different in favor of the rope-jump group. On 10-12 year old boys, a rope jump training program had a positive effect on strength, VO2 max, and speed. As a result, it argues that including a rope-jump program in physical education and sports lesson curricula, as well as in sports branch training programs, may help youngsters develop motor skills and speed their growth.

### 8. Physical Activity Patterns in Indian Schoolchildren

A. Gulati, A. Hochdorn, H. Paramesh, E.C. Paramesh, D. Chiffi, M. Kumar, D. Gregori, and I. Baldi. (2014)<sup>[10]</sup> investigated the prevalence of physical activity and its relationship to socioeconomic characteristics and eating habits among school-aged children in India. The sample included 1680 school-aged children ranging in age from three to eleven years. The study relied on secondary analysis of anthropometric data and a questionnaire on the students'

lifestyle and food habits. The questionnaire asked about several aspects such as physical activity, educational background, lifestyle, and dietary habits of both parents and children. Questions were categorized according to distinct subjects, which may be educational topics, questions with picture choices, or questions with numerous answer choices. The findings revealed that the level of inactivity was 21%, with substantial differences between cities. Physical activity was also found to be highly related to socioeconomic position and consumption of fruits and vegetables. Thus, it was concluded that health promotion interventions aimed at enhancing the healthy lifestyle of Indian children should be initiated, with a focus on the demographic strata with low socioeconomic level.

### **9. Physical activity levels of school-aged children aged 10 to 13 years**

Ronghe, R., and Gotmare, N., as well as Kawishwar S. (2016)<sup>[15]</sup> tested the physical fitness of school-aged youngsters aged 10 to 13 years. The sample for this study consisted of 100 Nagpur city schoolchildren aged 10 to 13 years. The goal of this study was to assess and grade physical activity levels in children aged 10 to 13 years old using the Physical Activity Questionnaire for Children (PAQ-C), which is divided into four categories: Light Physical Activity, Moderate to Vigorous Physical Activity, and High Physical Activity. Permission was obtained from the school administration prior to the start of the study. The approach was explained to the school and children, and signed permission was obtained. It was an observational cross-sectional study with a questionnaire (PAQ-C) administered to students present on the day of the survey. The information was gathered and examined. The findings revealed that out of 100 children, 52% were engaged in moderate to vigorous level of physical activity (MVPA), 25% were engaged in moderate level of physical activity (MPA), 21% were engaged in vigorous level of physical activity (VPA), 1% were engaged in low physical activity level (LPA), and only 1% were engaged in high physical activity level (HPA). The survey found that youngsters who participated in various physical activities said that the most common physical activity they did in their leisure time was bicycle or walking 3-4 times per week. The researchers suggested that youngsters should engage in greater physical activity to assist them reduce their health risks.

### **10. In Delhi, India, an evaluation of outdoor school environments to promote physical exercise was conducted**

Tarun S., M. Arora, and T. Rawal. S. E. B. Neelon & Co. (2017)<sup>[11]</sup> described the qualities of the surrounding outdoor school surroundings in Delhi, India that may boost children's physical activity. The cross-sectional design was adopted for this investigation. The researchers conducted structured observations of outdoor school surroundings in a random sample of Delhi, India, schools. A list of 1297 schools in Delhi was gathered, from which the first fifty schools were chosen as a convenient sample. Due to the lack of outdoor school grounds, two schools were excluded. 16 school administrators volunteered to participate in the survey out of 48 schools. The audit tool Sport, Physical Activity, Eating Behavior, Environmental Determinants in Young People (SPEEDY) was employed. The SPEEDY school audit tool assesses six areas: i) access to the school, ii) the surrounding area, iii) the school grounds, iv) aesthetics, v) utilization, and vi) the overall environment. Six qualified data collectors

independently completed the audit throughout the summer of 2012, while schools were in session. According to the findings, one school had cycle lanes isolated from the road, while two others had cycle lanes on the road. There was pedestrian pavement on both sides of the road in two schools. One school had a designated pedestrian crossing. There were no warning signs, road safety signs, or route signs for cyclists to help calm car traffic. For outdoor physical activity, fifteen schools had playground equipment and nine had courts, an assault course (a sequence of equipment designed to be used together), and a quadrangle (an enclosed or semi-enclosed courtyard). The bulk of the schools (n=13) were well-kept and protected from the surrounding neighborhood by hedges, trees, or fences. Vandalism was discovered at one of the schools. There was graffiti in two schools, garbage in seven, and murals or artwork in fifteen. It was determined that the majority of the schools lacked physical activity infrastructure such as cycling lanes, marked pedestrian crossings, or traffic calming mechanisms such as school warning signs. The majority of the schools had playgrounds, courts, or outdoor play areas. Almost majority were free of graffiti and included murals or other forms of art. These findings established the foundation for future research into outdoor school environments, active transportation to school, and children's physical activity in India.

The study's goal was to determine the impact of a jump rope program on primary children' understanding of jump rope. The purpose of this study was to improve the students' knowledge of jump rope.

### **The following objectives were examined by the researchers for the research project**

#### **1. To assess fifth-grade students' understanding of jump rope gained through the jump rope program**

#### **2. Development of Skills**

Students should be taught fundamental jump rope methods, with advanced skills being introduced gradually as they improve.

Ascertain that each pupil is capable of performing fundamental motions such as basic jumps, alternating footsteps, and, eventually, talents such as double unders or cross overs.

#### **3. Physical fitness improvement**

Regular and regulated jump rope training will help pupils improve their cardiovascular endurance.

Improve coordination, agility, and balance while encouraging general physical growth.

#### **4. Knowledge expansion**

Teach pupils about the history and cultural relevance of jump rope in many countries.

Provide information about different types of jump ropes and their applications.

#### **5. Safety Concerns**

In still the importance of safety procedures in students, such as using the proper surface, providing ample space, and wearing appropriate footwear.

Educate them on the importance of warm-ups and cool-downs in order to avoid injuries.

#### **6. Teamwork and social skills development**

Incorporate group jump rope activities, such as relay jumps or

long rope games, to encourage student teamwork and collaboration.

Encourage pupils to help and encourage one another, so creating a good learning atmosphere.

### 7. Discipline and Persistence development

Encourage regular practice while emphasizing the need of perseverance in skill mastery.

Encourage people to develop personal objectives and work hard to achieve them.

### 8. Competitive jump roping experience

Introduce pupils to the world of competitive jump roping, highlighting it as a possible activity for them to pursue.

To promote healthy competition, organize intra-school jump rope events.

### 9. Encouragement of lifelong fitness habits

Highlight jump roping's health benefits, emphasizing its role in cardiovascular health, weight control, and overall fitness.

Motivate pupils to incorporate jump roping into their regular routines, even after school.

A jump rope program can promote holistic development for primary pupils by combining physical fitness, skill acquisition, historical knowledge, safety awareness, and personal growth through these aims.

The researchers utilized a single group pre-test-post-test design to investigate the effect of a jump rope program on elementary pupils' understanding of jump rope. The researchers used a single group pre-test-post-test design since the study contains a single group of 37 kids, both boys and girls, who would be examined before and after the jump rope intervention. As a result, the researchers chose a single group design.

The school was chosen using a non-probable procedure, and the samples were chosen using a convenient manner. The researchers created a knowledge exam to assess the students' understanding of Jump Rope. The researchers devised a series of questions. The expert double-checked these items (questions) and suggested any necessary changes. The knowledge test was modified in response to the suggestions. The researchers asked 10 kids who were not a part of the Jump Rope program to answer the test for item analysis. The difficult (questions that pupils were unable to answer) and very easy questions were removed from the knowledge test. The pupils were given the knowledge test only after the Jump Rope curriculum was completed.

The data was collected, and descriptive tools were utilized to determine the program's effectiveness. The statistical tools utilized in the study were simple descriptive tools such as mean, median, mode, and standard deviation to describe the type of performance. The frequency of each score was then calculated.

**Table 1:** Descriptive Statistics of scores of Knowledge test

Statistics	Points
Mean	11.05
Standard Error	0.21
Median	11
Mode	12
Standard Deviation	1.29
Minimum	6
Maximum	12

There are 12 questions, each worth one mark. There were 12 questions on the knowledge test. The exam was taken by 37 pupils

who were examined on their knowledge of jump rope.

**Table 2:** Statistics of Frequency of scores of Knowledge test

Score	Score wise Frequency
1 to 3	0
4 to 6	1
7 to 9	3
10	5
11	10
12	18
Total	37

Out of the 37 participants in the study, 18 students correctly answered all of the questions. For the knowledge test, 10 students received 11 points. For the knowledge test, 5 students received 10 points. 3 students received 7 to 9 points, while 1 student received 4 to 6 points.

### Discussions

The goal of the study was to determine the effect of a jump rope program on elementary kids' understanding of jump rope. Based on the data that was evaluated and interpreted, it was discovered that there is a significant shift in the primary students' knowledge of jump rope. It was discovered that the students' jump rope performance improved along with their knowledge of the jump rope. They didn't know how to verify the height of the jump rope at first, but after the jump rope program, they were able to measure the correct height of the jump rope and were advising others in doing so as well. The students were able to identify and exhibit the abilities that had been taught to them.

### Recommendations

A similar study might be conducted to investigate the influence of long-term jump rope activity on several fitness metrics.

A similar study might be conducted to investigate the effect of jump rope activity combined with music and knowledge on fitness.

It is possible to do research on the time required to learn how to jump rope and its usefulness.

A similar study might be conducted to determine how jump rope benefits athletes and ordinary individuals of various ages and genders.

### Conclusion

It is concluded that the jump rope program increased the pupils' understanding, with several of them receiving full scores on the knowledge test.

Implementing a jump rope program in primary schools not only improves kids' physical abilities and coordination, but it also broadens their awareness and appreciation of jump roping as an exercise and a sport. They learn about the intricacies of technique, equipment selection, history, and safety considerations in addition to jumping over a rope. Educators may provide pupils with a full learning experience that extends beyond the playground and into the worlds of history, culture, and health education by including such a curriculum. Finally, a well-rounded jump rope program can serve as a catalyst for encouraging lifelong exercise habits, instilling discipline, and cultivating a sense of accomplishment in elementary pupils.

### References

1. Alstot EA. The Effects of Peer-Administered Token

- Reinforcement on Elementary Physical Education Students' Jump Rope Behavior. *Journal of Physical Education Teaching*. 2012;31(3):261-278.
2. Arazi H, Fard AJ, Abdinejad H. A study examining the effects of two aerobic training modalities (running vs. rope jumping) on health-related physical fitness in boys aged 10 to 12. 9-17, *Physical Activity Review*; c2016.
  3. As Well JW, Kahn JV. New Delhi, 10<sup>th</sup> edition, *Research in Education*. Dorling Kinderstey India Pvt. Ltd. Ltd.; c2008.
  4. Lin Chen, Chun CCY. The Effects of a Jumping Rope Intervention on Health-Related Physical Fitness in Students with Intellectual Impairment. *Human Resource and Adult Learning Journal*. 2012;8(1):56-62.
  5. <http://en.wikipedia.org/wiki/Knowledge>, 2018
  6. 2013 ([http://en.wikipedia.org/wiki/Skipping\\_rope](http://en.wikipedia.org/wiki/Skipping_rope))
  7. Hogan MK, *et al.* (n.d.). <http://www.lifehack.org/articles/lifestyle/benefits-jumping-rope-you-probably-dont-know.html>.
  8. Jahromi MS, Gholami M. The effect of jump rope training on the physical fitness of female students aged 9 to 10 years. 135-140 in *Advances in Applied Science Research*; c2015.
  9. Partavi S. The effects of a 7-week rope-jump training program on cardiovascular endurance, speed, and agility in middle school student boys. *Sport Science*, 2013;6:40-43.
  10. Gulati Hochdorn A, Paramesh H, Paramesh EC, Chiffi D, Kumar M, Baldi I. Physical activity patterns among Indian schoolchildren. 47-54 in the *Indian Journal of Pediatrics*; c2014.
  11. Tarun S, Arora M, Rawal T, Neelon SB. In Delhi, India, an evaluation of outdoor school environments to promote physical exercise was conducted. 11th *BMC Public Health*; c2017.
  12. Trecroci Cavaggioni L, Caccia R, Alberti G. Jump Rope Training Improves Balance and Motor Coordination in Young Soccer Players. 792-798 in *Journal of Sports Science and Medicine*; c2015.
  13. Zeynalani SM, Mousavi F. The Sensing of Jump Rope Training Courseware and its Role in Learners' Psychomotor Performance. *Journal of Applied Environmental and Biological Sciences*; c2015. p. 237-245.
  14. Eler AH N. The impact of the Rope-Jump Training program in Physical Education sessions on children's strength, speed, and VO<sub>2</sub> max. 340-345 in *Universal Journal of Educational Research*, 2018, 6(2).
  15. Ronghe GN R. Physical activity level of school-aged youngsters aged 10 to 13. *International Biomedical and Advanced Research Journal*; c2016.