

ORIGINAL ARTICLE

The Using of an Elevation Training Mask: Does It Improve the Physiological Abilities of Futsal Players?

Asep Sumpena^{1,2}, Dikdik Zafar Sidik³, Angga M. Syahid³

¹ Department of Sport Education,, Faculty of Sport and Health Education, Universitas Pendidikan Indonesia, Bandung, West Java, Indonesia

² Universitas Pendidikan Indonesia Sekolah Pascasarjana, Sport Education Study Program, Bandung, West Java, Indonesia

³ Department of Coaching Education,, Faculty of Sport and Health Education, Universitas Pendidikan Indonesia, Bandung, West Java, Indonesia

ABSTRACT

Introduction: This examination expects to decide the impact of the High-Intensity Interval Training technique utilizing Elevation Training Mask dependent on oxygen-consuming limit on the physiological capacities of futsal players. **Methods:** This research is an experimental study with a 2x2 factorial design. The conditional assumption test, followed by the Two way ANOVA test to propose a hypothesis or formulation. The problem in this study was with the help of the computerized SPSS application version 25. Twenty male futsal players (age 21.70 ± 0.80 years, height 165.75 ± 8.29 cm, weight 64.29 ± 4.98 kg, $VO_2\max$ 45.3 ± 5.23 ml.kg⁻¹.min⁻¹). The period lasted six weeks, with each training group participating three days per week of equal volume and intensity. The post-test was conducted four days after the last training session. **Results:** No difference in the physiological abilities of futsal players based on the use of ETM and non-ETM. Male futsal players with high aerobic capacity using ETM and non-ETM are more effective than male futsal players using ETM and non-ETM. In addition, there is no interaction between groups. **Conclusion:** This study concluded that Futsal players with aerobic capacity were more effective than those with low aerobic capacity, both for aerobic capacity using ETM and without ETM compared to aerobic capacity using ETM and without ETM. However, the results may differ if there is an increase in the frequency of exercise using the ETM and an increase in the duration of the training period.

Keywords: High-Intensity interval training, Anaerobiosis, Exercise, Sports, exercise Tolerance

Corresponding Author:

Asep Sumpena, M.Pd.

Email: asepe_sumpena@upi.edu

Tel: +6222-2004750

INTRODUCTION

Several training methods that are often used to improve the physical condition of futsal players include resistance training (1), stability-oriented strength exercises on trunk stability (2), agility ladder training (3), and core strength training (4). no exercise simulates a person being in high altitude conditions, especially futsal players, by combining forms of resistance training by using a mask. A big aspect of exercise science for increasing the body's ability to utilize oxygen absorption is finding new training methods. High-altitude aerobic exercise has been shown to increase $VO_2\max$ and lead to a range of physiological markers, including ventilation

regulation, like increased forced vital capacity (FVC) and Forced Inspiratory Vital Capacity (FIVC) (5). Several new methods and modalities are used for advanced training, such as atmospheric oxygen reduction (oxygen reduction fraction) with nitrogen depletion, hypoxic sleep devices, Addition oxygen, and exposure to deficient conditions intermittent oxygen (6).

The altitude training method initially requires training at medium altitude (1,500-4000 m) to expand red platelet mass and at last increment peak sea level oxygen uptake ($VO_2\max$) and performance endurance (7). In addition, altitude training initiates physiological changes basically the same as those brought about by resistance training. Therefore (8), we applied this training method to improve aerobic performance.

As reported (9), Oxygen transport and absorption in the body are essential for endurance performance, so

advanced training is used as a popular preparation method. In addition, the worth of advanced training for tasks above sea level is by all accounts entirely embraced by sure researchers. Nonetheless, it may not be satisfactory to the individuals who don't know straightforwardly profit (10). VO_2 max was first depicted in 1923 as an oxygen supply during exercise. The total oxygen supply arrives at its most extreme without expanded practice to build it (11). High VO_2 max is often praised for the success of the aerobic exercise, and most people who choose to train in the highlands find exposure to this environment to be more beneficial in this environment.

In contrast, altitude lowers VO_2 max and reduces the amount of work done during training. At baseline hypoxic exposure, a lot bigger decrease in VO_2 max happened in people and was observed at altitudes of 580 m (12). At altitude, baseline exercise is performed at a slower speed and lower O_2 consumption than the ocean level, despite comparable pulse and higher lactate (11).

Recently, altitude training simulations have become increasingly popular due to their comfort in cold and rough and the low oxygen pressure regularly connected with high altitude training (13). Other devices, such as snorkels, are designed to simulate higher altitude conditions, but provide cheaper devices that are easy to wear during physical activity to create acclimatization conditions before entering altitude. It is recommended to do. Therefore, adaptation can be made even when the user is not in the actual environment (14).

Further developing fitness coordination with ergonomic guides is a mainstream procedure among competitors and wellness lovers. Recently, elevation training mask (ETM) masks have gotten progressively famous as instruments for working on athletic and actual fitness by reenacting conditions like elevation. In particular, the ETM is a gadget worn during exercise and is portrayed by the maker as a "flexible inward breath obstruction preparing gadget." The stream valve is intended to restrict the measure of air entering the veil, so it is intended to utilize oxygen cutoff points to recreate height preparing (approx. 914 to 5,486 m) (15).

From that point forward, numerous others have considered the impacts of tallness preparing on the performance of elite or trained athletes (6.16.21). Among consumers wearing "elevation training masks", ETM simulates altitude by creating an environment that actually lowers altitude (lowers oxygen partial pressure) when support data is limited. (17). Albeit moderate hypoxemia delivered by ETM during exercise has been illustrated (17), The utilization of ETM doesn't produce a hypoxic stimulus large enough to induce a physiological response of the body at actual altitude (17). Administration of ETM didn't deliver a hypoxic boost sufficiently able to get a physiological reaction

in the body at the genuine height (17). However, in one study, the control and mask groups significantly increased PPO and VO_2 max. In contrast, only the mask group had power output (PO) in VT, ventilation threshold (VT), respiratory compensation threshold (RCT), and it has been shown to increase PO significantly. RCT with ETM after six weeks of intensive cycling training. A relatively significant increase in VT PO, VT, RCT PO, and RCT when masked can have a significant impact on performance (17). These two studies made researchers confused and hesitated to be able to apply them.

To stay competitive, coaches and athletes are constantly looking for approaches to improve their performance. Different coaching methods were investigated to find the best way to improve athletes' performance in achievement sports. Altitude training using the HIIT method is thought to improve physiological abilities. In addition, When properly applied, respirators such as those listed above can increase the body's oxygen saturation. These two different studies can affect long-term endurance, post-practice recuperation rate, preparation, and ultimately VO_2 max. Therefore, more research is needed in the same year to resolve the questions regarding the use of this tool. Therefore, Thus, This examination plans to decide the impact of the High-Intensity Interval Training method utilizing Elevation Training Mask dependent on the oxygen-consuming limit on the physiological capacities of futsal players.

MATERIALS AND METHODS

This investigation was meant to decide the impact of differences in Elevation Training Mask (ETM) on physiological performance based on the capacity of male futsal players using High-Intensity Interval Training (HIIT). This examination is an exploratory investigation with a factorial design 2x2. The data obtained were analyzed by statistical computations. The analysis results are presented in the following section. Table I shows the descriptive results of statistical data analysis.

Table I: Subject characteristics

Variable	With ETM	Non ETM	Whole
Age, yr	21 ± 2	21 ± 1	21.70 ± 0.80
Height, cm	165 ± 2	167 ± 2	165.75 ± 8.29
Weight, kg	57 ± 2	68 ± 2	64.29 ± 4.98
VO_2 max, ml.kg ⁻¹ .min ⁻¹	46 ± 1	43 ± 1	45.3 ± 5.23

*ETM: Elevation Training Mask

This study involved 20 men futsal players as participants. Also, this study selected no women because the researchers wanted to see the impact on male players and avoid conflict but did support future research on women in this training. Before the study, the players signed a consent form expressing their consent to participate in voluntary research. To collect data, the players were tested first to find out the initial conditions.

Researchers set special requirements in this study, namely having participated in a pre-research training program carried out by researchers and had a minimum physical condition of 70%. The research samples taken from this population were male futsal members who had a VO_2 max according to the researcher's criteria, namely from 23 population who took the pre-study initial test, chose 20 samples that were consistent in following the research period, as well as elevation training masks available ten pcs. after that, players were divided into groups based on aerobic capacity (VO_2 max) into two groups, namely high aerobic capacity as much as 50% of the total number and low aerobic capacity as much as 50% of the total number. The high aerobic capacity players were divided into players with high aerobic capacity using ETM and Without ETM and those with aerobic capacity ability divided into players with low aerobic capacity using ETM and Without ETM because they were represented as a whole. Therefore, the data obtained is not only for samples with high or low aerobic capacity but both. Then all players were given treatment using the HIIT training method as many as 16 meetings with a predetermined training program with the same volume and intensity exercise, and then a final test was carried out. After the data was obtained, it was continued with analysis through computerized statistics with the help of SPSS software version 25.

The population sampled in this study were members of the UPI male Futsal Student Activity Unit, amounting to 20 people, the determination of the sample was used by purposive sampling technique because a study requires special criteria so that the sample taken later in accordance with the research objectives can solve the research problem and can provide a value. more representative so that there are 20 samples involved in this study. For future research it is recommended to use a larger sample of this study. However, this is the largest number of participants available.

This study used an existing physical component test instrument with construct validity and reliability, while the test instrument for aerobic physical components used a bleep test (18) and Anaerobic Capacity (AC) with Running-based Anaerobic Sprint Test (RAST) (19). For technical use, the initial test is carried out at the same time as a whole starting from the sequence Anaerobic Capacity (AC) with Running-based Anaerobic Sprint Test and Aerobic Capacity (bleep test), likewise when the final test is carried out at the same place and there is no difference in the test venue. The sample in this study was divided into 4 groups, 2 groups using ETM and 2 groups not using ETM through group division based on the aerobic capacity rating (VO_2 max) that was known during the initial test, the ETM used in this study was a Training Mask 3.0 in 1 ETM device with specifications 1 Overmolded Composite Rubber Mask contains 1 CryoActiv® Quad Layer Performance Sleeve and 1 Logo Shroud Plate.

There are 10 ETM devices used in this study, the ETM which is used uses the lowest setting, made that way because when using a medium or high setting the sample will not be able to complete the exercise program completely, this is related to the function of lung capacity which must researched further. The duration of time used in this study between work and rest is 1:1 or 30 seconds of work and 30 seconds of rest. But there are things that are modified, namely when the rest is not with a passive rest but is done with an active rest, namely by back-to-back running for 30 seconds. All samples performed with the same volume and intensity as the form of exercise using the principle of a training circuit using internal resistance consisting of 13 movements, namely air squats, triceps dips legs bent, 1/4 squat jumps, supermans, scissors kicks, mountain climbers, alternating lunges, plank tucks, leg lifts, left side lateral plank, right side lateral plank, burpees, and Russian twists. At week 1, meeting 1 with 8 shapes 4 sets, 2nd meeting with 9 shapes 4 sets, 3rd meeting with 8 shapes 5 sets, at week 2, 4th meeting with 9 shapes 4 sets, 5th meeting with 11 shapes in 3 sets, 6th meeting with 12 shapes in 3 sets, at week 3, 7th meeting with 13 shapes in 3 sets, 8th meeting with 8 shapes of 5 sets, 9th meeting with 12 shapes in 3 sets, at week 4, 10th meeting with 11 shapes of 3 sets, 11th meeting with 12 shapes of 3 sets, 12th meeting with 10 shapes of 4 sets, at week 5, 13th meeting with 12 shapes of 3 sets, 14th meeting with 10 shapes of 4 sets, the 15th meeting with 11 shapes of 3 sets, at week 6 at the 16th meeting and is the last meeting for treatment with 10 shapes of 4 sets. The highest exercise volume is 40 minutes while the lowest is 32 minutes.

Before doing the research, the players had to go through the anatomical adaptations first because the HIIT method is a training method that starts with an intensity of 85%-95% and is part of the interval training method, after going through pre-research, then the players are carried out the initial test. The initial data are used to compile an exercise program adjusted to the VO_2 max from the bleep test, then the data obtained through the final test are then made first a standard score using the z-score formula and then a t-score is made, by first doing a descriptive analysis used to interpret the data and information that has been obtained from the sample by collecting, arranging and classifying these data by looking for the mean and standard deviation.

Data were analyzed using Microsoft Excel software and SPSS version 25. After fulfilling the assumption test, namely the normality test (Sig. 0.891 > 0.05) and homogeneity test (Sig. 0.814 > 0.05). To compare the average difference between groups that have been divided on two independent variables using the Two Way Anova test.

Ethical Clearance

This Study was approved by Research Ethics Committee

for Research of Universitas Pendidikan Indonesia Number : B-0850/UN40.LP/PJ.00.00/2021

RESULTS

In the variable mask, the Sig value is obtained, amounting to sig. $0.229 > 0.05$, so it can be concluded that there is no difference in the physiological abilities of male futsal players based on the use of ETM or non-ETM, then on the aerobic capacity variable the Sig value is obtained. of $0.133 > 0.05$, so it can be concluded that there is no difference in the physiological abilities of male futsal players based on aerobic capacity, and the Sig. $0.370 > 0.05$, so it can be concluded that there is no interaction between with HIIT method with ETM or non-ETM with aerobic capacity between male futsal players and physiological abilities.

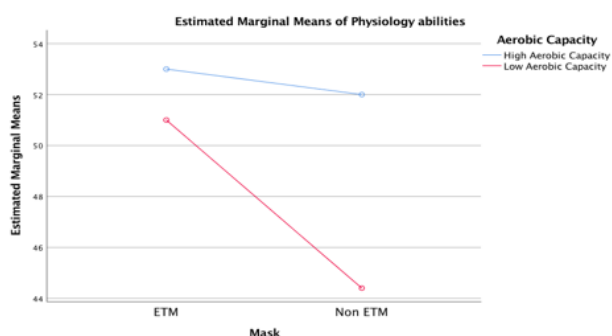


Figure 1: Estimated marginal means Mask with Physiology abilities

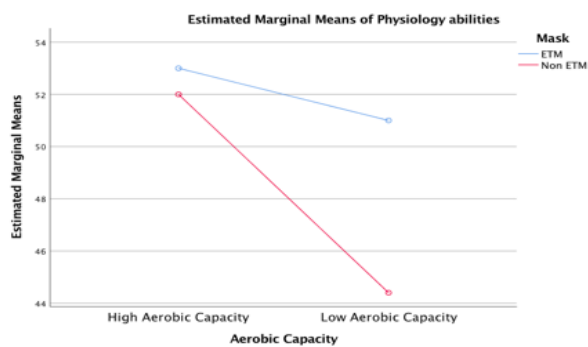


Figure 2: Estimated marginal means Aerobic capacity with Physiology abilities

Figure 1 shows that male futsal players with high aerobic capacity, either using ETM or not shown the blue line, are more effective than male futsal players with low aerobic capacity, whether or not using ETM, which are shown in red. In addition, Figure 2 shows that there is no interaction between groups. This is indicated by the two parallel visible lines and no visible cut line shown in Figure 2, namely a group of male futsal players with variable aerobic capacity both with high aerobic capacity and low aerobic capacity and a group of male futsal players with ETM variables both with ETM or Non ETM, the second variable does not influence each other.

Because it is not significant, we do not proceed to the multiple comparisons or post hoc section. Summary of results can be seen in Table II and Table III.

Table II: Summary of pre and posttest VO₂max, along with absolute change of VO₂max for all participants involved in the 5 week training.

Players	HIIT method With ETM		HIIT Method Non ETM		
	VO ₂ max pretest	VO ₂ max posttest	Play-ers	VO ₂ max pretest	VO ₂ max posttest
ID#	(mL.kg ⁻¹ .min ⁻¹)	(mL.kg ⁻¹ .min ⁻¹)	ID#	(mL.kg ⁻¹ .min ⁻¹)	(mL.kg ⁻¹ .min ⁻¹)
1	50.8	53.7	6	41.8	49.9
2	47.7	47.7	7	41.5	49
3	44.2	44.2	8	40.8	40.8
4	44.2	44.2	9	40.5	48
5	43.6	44.9	10	38.5	41.1
11	38.5	41.8	16	35	45.2
12	37.5	46.8	17	34.3	45.2
13	36.8	53.4	18	33.9	40.2
14	36.8	41.8	19	33.2	40.2
15	36	46.2	20	25.2	42.6
	VO ₂ max pretest	VO ₂ max posttest	Absolute change in VO ₂ max		
	(mL.kg ⁻¹ .min ⁻¹)	(mL.kg ⁻¹ .min ⁻¹)	(mL.kg ⁻¹ .min ⁻¹)		
With ETM	41.61 ± 5.20	46.47 ± 4.19	4.86 ± 1.01		
Non ETM	36.47 ± 5.21	44.22 ± 3.77	7.75 ± 1.44		

*Values are reported as mean +SD

**HIIT method with ETM and Non ETM groups were both given treatment with the same volume and intensity

***HIIT method with ETM has a significant effect on increasing VO₂max male futsal players (Sig. 0.003<0.05)

DISCUSSION

New findings from this study show that the use of the Elevation Training Mask (ETM) does not have a significant effect on the activities of the High Intensity Interval Training (HIIT) training method for 16 intensive meetings which may be influenced by aerobic capacity in male futsal players (21). However, there has been an increase in the physiological abilities of all male futsal players, both aerobic and anaerobic abilities, as well as women futsal players (22).

Table III: Summary of pre and posttest Anaerobic Capacity (AC), along with absolute change of AC for all participants involved in the 5 week training.

HIIT method With ETM			HIIT Method Non ETM		
Play-ers	AC pretest	AC posttest	Play-ers	AC pre-test	AC posttest
ID#	(Watts)	(Watts)	ID#	(Watts)	(Watts)
1	2300.8	3292.6	6	3406.8	2901
2	1394.7	1394.7	7	1811.5	1907
3	1671.2	1671.2	8	3549.6	3549.6
4	2359.2	2359.2	9	2268.6	1981.5
5	1914.1	3070.6	10	2506.3	1772.2
11	1603.8	2602.1	16	2271.4	1694
12	1773.5	1796.01	17	1595.9	1595.9
13	2216.6	2962.7	18	2373.8	2017.2
14	1693.8	2748.7	19	1220.1	1220.1
15	2289.9	2289.9	20	2745.7	2942.4
	AC pretest	AC posttest	Absolute change in AC		
	(Watts)	(Watts)	(Watts)		
With ETM	1921.76 ± 345.31	2418.77 ± 636.16	497.01 ± 290.85		
Non ETM	2158.09 ± 728.59	2374.97 ± 736.31	216.88 ± 7.72		

*Values are reported as mean +SD

**ETM and Non ETM groups were both given treatment with the same volume and intensity

***HIIT method with ETM has a significant effect on increasing AC male futsal players (Sig. 0.016<0.05)

The initial requirements that players must have before implementing a training program using the HIIT method will have an impact on the readiness and implementation of the training process. The habit of using ETM tools in the training process will have an effect. Further research needs to be studying on oxygen levels in the blood before, during, and after training while using the Elevation Training Mask (16) so that the study will be more in-depth in its study. It is better to measure the erythrocyte level because this is a strenuous exercise (23), the haemoglobin level in the blood such as the haemoglobin concentration is not related to the live low-train high method (24) whereas this method is with high interval intensity and vital capacity, and lungs (25) during exhalation and exhalation when using an elevation training mask. In physiological training to develop knowledge about training that is more effective and efficient, this research can be developed through other training patterns, or application to sports that are specifically dominated by physical abilities, such as sports dominated by speed, strength, and endurance. Research on the impact of implementing the HIIT method using this tool during training appears to be limited to the company's website. The available research

on other altitude training methods has demonstrated positive physiological adaptations in those participating in hypobaric chamber training. However, it is essential to mention that most of the positive changes were not significantly different compared to the baseline test data. The most significant limitation during this study was the total amount of ETM exposure during the training period. The participants who wear masks only do it for two hours a day for three days a week. Even then, the channel or valve that can be adjusted in the front to limit the amount of oxygen that will be received is set to the level that breathes the most air, taking into account the high intensity of exercise allows players futsal is not too short of breath, maybe for future research the valve can be adjusted according to its needs. Wearing an ETM for six hours each week may be considered by most as probably insufficient due to the lack of exposure during the five-week training period. The exercise and duration using the HIIT method in this study may be less than the exercise volume. The small sample size may have affected the results. In addition, the subject's motivation level is considered another limitation if they do not perform to the best of their ability. It can be suspected but not proven that the issue remains highly motivated to achieve optimal performance. In addition, there may be a possibility of CO₂ re-breathing if all the air is not completely expelled from the mask with each breath. This CO₂ re-inhalation has the potential to limit workloads leading to performance degradation.

It is suggested that future research expanding the scope of current studies by studying individuals who have had greater exposure to ETM over a longer period of time. In addition, the resistance limit adjustments can be made in various ways, with the possibility of obtaining different results. In addition to the changes mentioned above, by analyzing the amount of oxygen in the blood during and at the end of the exercise, the researcher to observe the physiological changes taking place, if able to the cellular level. Doing so can produce different results and broaden the knowledge of the overall effectiveness of this training.

Based on the results and discussion of the study, it was concluded that there is no difference in the improvement of physiological performance of male futsal players by the use of ETM. The physiological abilities of male futsal players depend on their aerobic capacity. There was no interaction between the use of ETM and the aerobic capacity to improve the physiological performance of male futsal players

CONCLUSION

Based on the results and discussion of the study, it was concluded that there was no difference in the physiological performance increase in male futsal players with the use of ETM. A further conclusion

is that there is a difference in the physiological performance of male futsal players based on aerobic capacity. Additionally, there is no interaction between the use of ETM and aerobic capacity in improving the physiological performance of male futsal players, thus the use of ETM is only implemented in 16 exercises in 6 weeks of treatment. Maybe if the exercise is carried out for a longer period of time the results will be different and the sample used will be different.

ACKNOWLEDGMENTS

We would like to thank UPI Institute for Research and Community Service as a source of funding for our research. We would also like to express our deepest gratitude to all UPI male futsal players who have been involved in our study.

REFERENCES

1. Julio T, David R, Juan JG. Light-load maximal lifting velocity full squat training program improves important physical and skill characteristics in futsal players, *Journal of Sports Sciences* 2017;35:10, 967-975. doi: 10.1080/02640414.2016.1206663
2. Jebavy R, Balč J, Vomackova H, Szarzec J, Stastny P. The effect of traditional and stabilization-oriented exercises on deep stabilization system function in elite futsal players. *Sports* 2020;8:153. <https://doi.org/10.3390/sports8120153>
3. Hidayat A. Effect of agility ladder exercises on agility of participants extracurricular futsal at Bina Darma University. *Journal of Physics: Conference Series* 1402, 2019;055003 IOP Publishing doi:10.1088/1742-6596/1402/5/055003
4. Lago FC, Rey E, Padryn CA, Sal de Rellón GA, Fragueiro RA, Garcia NJ. Effects of core strength training using stable and unstable surfaces on physical fitness and functional performance in professional female futsal players. *Journal of human kinetics* 2018;65:213–224. <https://doi.org/10.2478/hukin-2018-0029>
5. Chapman RF. The individual response to training and competition at altitude. *British Journal of Sports Medicine*. 2013 Dec 1;47(Suppl 1):140-4.
6. Aritz U, Pedro GM, Maria PP, Alfredo M. Usefulness of combining intermittent hypoxia and physical exercise in the treatment of obesity. *Journal of Physiology and Biochemistry*. 2012;68:289–304.
7. Wilber, Randall L. Application of altitude/hypoxic training by elite athletes, Universidad de Alicante Alicante, Espaca. *Journal of Human Sport and Exercise*. 2011;6:271-286.
8. Hoffman J. Physiological aspects of sport training and performance-2nd edition. United states. Human Kinetic. Inc; 2014.
9. Brian GW, Frank JS, Randy AB. The effects of an elevation training mask on vo2max of male reserve officers training corps cadets. *International Journal of Exercise Science*. 2017;10(1): 37-43.
10. Martin JT, Ferran AR. Altitude and hypoxic training in swimming. *World Book of Swimming: From Science to Performance*, 2010; 393-408.
11. Nolan P, Beaven M, Dalleck L. Comparison of intensities and rest periods for VO2max verification testing procedures. *International Journal of Sports Medicine*. 2014;35(12):1024–1029. doi:10.1055/s-0034-1367065
12. Gareth T, Barry WF, Jamie SMP, Neil SM, Alan JR. Altitude training in endurance running: perceptions of elite athletes and support staff, *Journal of Sports Sciences*. 2019;37:2, 163-172, DOI: 10.1080/02640414.2018.1488383
13. Benardot D. *Advanced sports nutrition*. Human Kinetics Publishers; 2020 Jul 28.
14. Welnetz RJ. Altitude mask simulator. Retrieved from <https://patentimages.storage.googleapis.com/3d/bf/92/60fb247d2383a1/US5848589.pdf> (visited 25/03/2020).
15. <https://www.trainingmask.com> (visited 25/03/2020).
16. Buchheit M, Kuitunen S, Voss SC, Williams BK, Mendez VA, Bourdon PC. Physiological strain associated with high-intensity hypoxic intervals in highly trained young runners. *The Journal of Strength & Conditioning Research*. 2012 Jan 1;26(1):94-105.
17. Porcari JP, Probst L, Forrester K, Doberstein S, Foster C, Cress ML, Schmidt K. Effect of wearing the elevation training mask on aerobic capacity, lung function, and hematological variables. *Journal of sports science & medicine*. 2016 Jun;15(2):379.
18. American College of Sports Medicine. *ACSM's guidelines for exercise testing and prescription*. 10th ed. Baltimore (MA): Lippincott Williams & Wilkins; 2018.
19. Zagatto AM, Beck WR, Gobatto CA. Validity of the running anaerobic sprint test for assessing anaerobic power and predicting short-distance performances. *J Strength Cond Res*. 2009;23(6):1820-1827.
20. Queiroga MR, Cavazzotto TG, Katayama KY, Portela BS, Tartaruga MP, Ferreira SA. Validity of the RAST for evaluating anaerobic power performance as compared to Wingate test in cycling athletes. *Motriz: Revista de Educação Física*. 2013 Dec;19(4):696-702.