ANALYSIS OF HOME GYMNASTICS DURING COVID-19

ANÁLISE DA GINÁSTICA DOMÉSTICA DURANTE A COVID-19

ANÁLISIS DE LA GIMNASIA DOMÉSTICA DURANTE EL COVID-19

ORIGINAL ARTICLE
ARTIGO ORIGINAL
ARTÍCULO ORIGINAL

Shuang Guo[1]
(Physical Education Professional)
Li Lin[2]
(Physical Education Professional)

1. Chongqing Metropolitan College of Science and Technology, Chongqing, Yongchuan, China.
2. Chengdu College of Arts and Sciences Chengdu, SiChuan, China.

Correspondence:
Li Lin
Chengdu, SiChuan, China. 610400.
cdcaslinli@126.com

ABSTRACT

Introduction: Gymnastics has become a viral sport thanks to home isolation and low requirements for sports venues and equipment. However, evidence is still lacking that home gymnastics can maintain physical and psychological function stability, even if performed correctly. Objective: Analyze the effects of home gymnastics during covid-19 restrictions. Methods: This experiment adopts the intragroup control method, five times a week for four weeks. Before and after the experiment, relevant data such as baseline physical quality, body shape, body composition, and exercise indexes are collected. The data are compared and analyzed statistically. Results: Home gymnastics can effectively improve the body composition of its practitioners, improve basal metabolism, improve their body shape, improve cardiopulmonary function, and make athletes maintain good exercise ability, good lifestyle habits, and a healthy mentality. Conclusion: It is recommended that teachers and interested departments actively organize students at home to perform corresponding gymnastics and use sports to ward off bad lifestyle habits and anxiety, promoting good physical and psychological function during home isolation. ***Level of evidence II; Therapeutic studies - investigating treatment outcomes.***

Keywords: COVID-19; Sports; Gymnastics.

RESUMO

Introdução: A ginástica tornou-se um esporte viral graças ao isolamento doméstico e devido a suas baixas exigências para locais e equipamentos esportivos. Porém ainda faltam evidências de que a ginástica em casa possa manter a estabilidade da função física e psicológica, ainda que executada corretamente. Objetivo: Analisar os efeitos da ginástica doméstica durante as restrições da covid-19. Métodos: Este experimento adota o método de controle intragrupo, cinco vezes por semana durante quatro semanas. Antes e depois do experimento, os dados relevantes como qualidade física basal, forma corporal, composição corporal e índices de exercício são coletados. Os dados são comparados e analisados estatisticamente. Resultados: A ginástica em casa pode efetivamente melhorar a composição corporal dos seus praticantes, melhorar o metabolismo basal, melhorar sua forma corporal, melhorar a função cardiopulmonar, e fazer com que os esportistas mantenham boa capacidade de exercício, bons hábitos de vida e mentalidade saudável. Conclusão: Recomenda-se aos professores e departamentos interessados a organizarem ativamente os estudantes em casa para realizar a ginástica correspondente e usar o esporte para afastar os maus hábitos de vida e a ansiedade, promovendo uma boa função física e psicológica durante o isolamento doméstico. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *COVID-19; Esportes; Ginástica.*

RESUMEN

Introducción: La gimnasia se ha convertido en un deporte viral gracias al aislamiento doméstico y a sus escasas necesidades de instalaciones y equipamiento deportivo. Sin embargo, todavía no hay pruebas de que la gimnasia doméstica pueda mantener la estabilidad de la función física y psicológica, incluso si se realiza correctamente. Objetivo: Analizar los efectos de la gimnasia domiciliaria durante las restricciones de covid-19. Métodos: Este experimento adopta el método de control intragrupo, cinco veces por semana durante cuatro semanas. Antes y después del experimento, se recogen datos relevantes como la calidad física de referencia, la forma corporal, la composición corporal y los índices de ejercicio. Los datos se comparan y se analizan estadísticamente. Resultados: La gimnasia en casa puede mejorar eficazmente la composición corporal de sus practicantes, mejorar el metabolismo basal, mejorar su forma corporal, mejorar la función cardiopulmonar y hacer que los deportistas mantengan una buena capacidad de ejercicio, buenos hábitos de vida y una mentalidad saludable. Conclusión: Se recomienda a los profesores y a los departamentos interesados que organicen activamente a los alumnos en casa para que realicen la gimnasia correspondiente y utilicen el deporte para alejar los malos hábitos de vida y la ansiedad, promoviendo un buen funcionamiento físico y psicológico durante el aislamiento en casa. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *COVID-19; Deportes; Gimnasia.*

DOI: http://dx.doi.org/10.1590/1517-8692202329012022_0533 Article received on 09/21/2022 accepted on 10/25/2022

INTRODUCTION

As covid-19 epidemic continues to spread in China, the situation of epidemic prevention and control in China is very serious, and home isolation has become a common phenomenon.[1] When people are isolated at home, because their mentality changes and daily work and rest are different from usual, their enthusiasm for sports will be greatly reduced. Due to the lack of sports, they will increase their weight and decline their physical function. The long-term use of electronic products and the reduction of their amount of exercise will also change their mentality, which will affect their mental health during isolation.[2] Therefore, due to the prevalence of covid-19 epidemic, we can carry out appropriate exercise while cooperating with the government's epidemic prevention policy at home. Due to everyone's different exercise habits, the types and quantity of basic fitness equipment at home are different. Simple gymnastics has become a common exercise that can be carried out in home isolation due to its low requirements for venues and sports equipment.[3] The long-term isolation at home will also increase the use time of electronic products, resulting in physical discomfort such as stiff muscles and muscle soreness. Therefore, an appropriate amount of gymnastics at home can make everyone's sports body fully active through the full stretching and movement of neck muscles and other sports bodies, which can not only alleviate the stiffness and soreness of the body after using electronic products for a long time.[4] At the same time, it can also burn off excess fat through aerobic exercise such as gymnastics, and keep fit during home isolation. At the same time, this way of exercise can also adjust everyone's mental changes in home isolation.[5]

METHOD

In order to explore home Gymnastics during the popularity of covid-19, this paper first arranges and analyzes the situation of home Gymnastics during covid-19 by means of questionnaire, and investigates the sports psychology of the screened population with home gymnastics behavior and determines the relevant indicators. Firstly, by means of questionnaire survey, this paper analyzes the sports motivation of home Gymnastics during the popularity of covid-19, and discusses it on a 12 point scale from five aspects: health motivation, appearance motivation, fun motivation, ability motivation and social motivation. Through the distribution and recovery of the questionnaire, it can be seen that home gymnastics is highly popular. A total of 500 questionnaires were distributed and 477 questionnaires were recovered, including 470 valid questionnaires and 204 questionnaires existing in home gymnastics. The study and all the participants were reviewed and approved by Chengdu College of Arts and Sciences (NO.20CDCAS72-QN).

In this experiment, the same group of people were compared before and after to carry out home gymnastics for one month. Gymnastics is mainly non instrument gymnastics and simple instrument gymnastics. Athletes complete it by unarmed means or with the help of simple instruments at home. Because its exercise intensity is relatively low, it adopts the form of five times a week for four weeks to complete this experiment. Before and after the experiment, collect relevant data such as basic physical quality, body shape, body composition and exercise indicators, and compare and analyze the data.

RESULTS

Psychology of home Gymnastics during the popularity of covid-19

In order to analyze the situation of home Gymnastics during covid-19, firstly, by means of questionnaire survey, this paper investigates the students of several colleges and universities, and analyzes the situation of home gymnastics. Then, excluding the objects who did not carry out home gymnastics, 204 objects who had home gymnastics were investigated on sports psychology and sports motivation.

As shown in Figure 1, during the popularity of covid-19, most of the research objects were in the state of home. Therefore, in the sports motivation of gymnastics, it was more to have fun or adjust their own health, while some simple gymnastics had a good effect of improving body shape and improving body function, and had less requirements on the site. Therefore, it was very popular during home isolation.

Effect analysis of home Gymnastics

In the previous research, it is mentioned that home gymnastics has many benefits for the improvement of body shape and body function. Therefore, in this section, the basic physical quality, body shape, body composition, sports indicators and other aspects are discussed.

As shown in Table 1, in terms of basic physical fitness, the height changed from (162.443 ± 5.266) cm to (162.443 ± 5.267) cm, and there was almost no change before and after exercise. The lean weight decreased by about 0.4623kg from (44.428 ± 6.113) kg to (43.298 ± 6.108) kg, $P > 0.05$, indicating that there was no significant difference. The body weight decreased by about 6.5195kg from (64.346 ± 6.330) kg to (55.138 ± 3.622) kg, $P < 0.05$; BMI decreased by about 2.4154 from (24.742 ± 4.692) kg / m2 to (22.098 ± 2.749) kg / m2, $P < 0.05$; The body fat rate decreased by about 1.9010 from (29.343 ± 7.650)% to (25.721 ± 5.740)%, $P < 0.05$. It can be seen that home gymnastics has a good regulatory effect on the basic quality of the body, can reduce weight, improve BMI index and body fat rate, so as to prevent the adverse effects of home isolation on the body.

As shown in Table 2, in terms of body shape, the thigh circumference decreased by about 0.8070 from (54.322 ± 3.234) cm to (53.504 ± 3.506) cm, $P > 0.05$, the calf circumference decreased by about 0.2915 from (35.476 ± 2.956) cm to (34.662 ± 3.454) cm, $P > 0.05$, and the upper arm circumference decreased by about 0.8735 from (27.864 ± 2.038) cm to (28.028 ± 2.115) cm, $P > 0.05$, indicating that there is no significant difference. Chest circumference decreased by about 0.2216 from (94.924 ± 5.721) cm to (94.377 ± 5.289) cm, $P > 0.05$, waist circumference decreased by about 9.9690 from (96.364 ± 4.848) cm to (80.541 ± 7.021) cm, $P < 0.05$, hip circumference decreased by about 2.9869 from (102.403 ± 4.766) cm to (97.405 ± 7.059) cm, $P < 0.05$, waist hip ratio decreased by about 0.1881 from (0.950 ± 0.361)

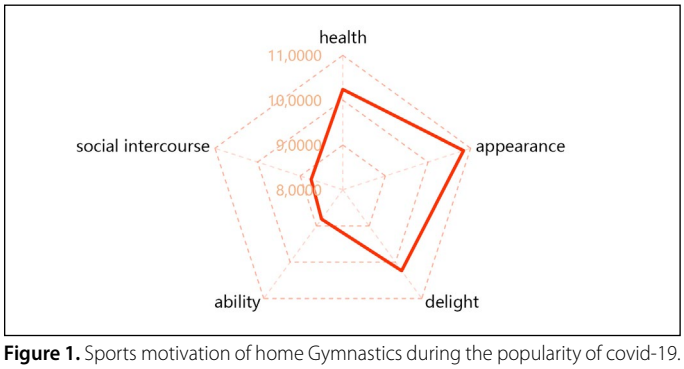

Figure 1. Sports motivation of home Gymnastics during the popularity of covid-19.

Table 1. Influence of home gymnastics on basic physical fitness during covid-19 popularity.

Options	Before exercise	After exercise	T	P
Height (cm)	162.443±5.266	162.443±5.267	0.0000	>0.05
Weight (kg)	64.346±6.330	55.138±3.622	6.5195	<0.05
BMI (kg/m2)	24.742±4.692	22.098±2.749	2.4154	<0.05
Body fat percentage (%)	29.343±7.650	25.721±5.740	1.9010	<0.05
Lean body mass (kg)	44.428±6.113	43.298±6.108	0.4623	>0.05

cm to (0.822 ± 0.040) cm, P < 0.05. It can be seen from the table that home gymnastics can make the body shape more symmetrical and prevent obesity and other problems caused by long-term lack of exercise at home.

As shown in Table 3, in terms of body composition, bone decreased by about 0.3405 from (3.028 ± 0.361) to (2.757 ± 0.181), P < 0.01, and skeletal muscle increased by about 2.9322 from (30.513 ± 4.653) to (27.634 ± 2.076), P < 0.01, indicating a very significant difference. Fat content decreased by about 0.7610 from (19.164 ± 7.491) to (17.660 ± 7.019), basal metabolism increased by about 284.2175 from (1039.157 ± 63.174) to (1305.174 ± 31.965), P < 0.05, muscle decreased by about 1.8431 from (42.148 ± 6.464) to (40.497 ± 4.548), P < 0.05. Water content decreased by about 0.8825 from (32.673 ± 4.364) to (31.573 ± 4.467), P > 0.05, and protein decreased by about 0.4839 from (9.295 ± 1.415) to (9.074 ± 1.192), P > 0.05, indicating that there was no significant difference. It can be seen from the table that home gymnastics can effectively improve the body composition of athletes, reduce fat content and improve basic metabolism, so as to form a virtuous cycle of the body to resist the impact of bad living habits in home isolation.

As shown in Table 4, in terms of exercise indexes, the quiet heart rate decreased by about 23.6193 / min from (95.658 ± 2.669) to (72.654 ± 2.962) per minute, P < 0.05, and the sit ups increased by about 10.2569 from (13.975 ± 1.201) to (23.698 ± 1.938), P < 0.05. The forward flexion of sitting body increased by about 3.6467 from (9.235 ± 0.529) cm to (13.009 ± 0.743) cm, P < 0.05, and the vital capacity increased by about 287.5316ml from (2321.679 ± 601.681) ml to (2617.037 ± 589.965) ml, P > 0.05, indicating that there was no significant difference.

It can be seen that home gymnastics can better maintain the physical function of athletes, improve cardiopulmonary function, improve the flexibility of athletes, and make them maintain good motor function.

Table 2. Influence of home gymnastics on body shape during covid-19 popularity.

Options	Before exercise	After exercise	T	P
Thigh circumference (cm)	54.322±3.234	53.504±3.506	0.8070	>0.05
Calf circumference (cm)	35.476±2.956	34.662±3.454	0.2915	>0.05
Upper arm circumference (cm)	27.864±2.038	28.028±2.115	0.8735	>0.05
Bust(cm)	94.924±5.721	94.377±5.289	0.2216	>0.05
Waist(cm)	96.364±4.848	80.541±7.021	9.9690	<0.05
Hips (cm)	102.403±4.766	97.405±7.059	2.9869	<0.05
waist to hip ratio	0.950±0.361	0.822±0.040	0.1881	<0.05

Table 3. Influence of home gymnastics on body composition during covid-19 popularity.

Options	Before exercise	After exercise	T	P
Fat content	19.164±7.491	17.660±7.019	0.7610	<0.05
Moisture	32.673±4.364	31.573±4.467	0.8825	>0.05
Protein (kg)	9.295±1.415	9.074±1.192	0.4839	>0.05
Basal metabolism	1039.157±63.174	1305.174±31.965	-284.2175	<0.05
Skeleton	3.028±0.361	2.757±0.181	0.3405	<0.01
Muscle	42.148±6.464	40.497±4.548	1.8431	<0.05
Skeletal muscle	30.513±4.653	27.634±2.076	2.9322	<0.01

Table 4. Influence of home gymnastics on Sports indexes during covid-19 popularity.

Options	Before exercise	After exercise	T	P
Lung capacity (ml)	2321.679±601.681	2617.037±589.965	-287.5316	>0.05
Resting heart rate (beats/min)	95.658±2.669	72.654±2.962	-23.6193	<0.05
Crunches (pieces)	13.975±1.201	23.698±1.938	-10.2569	<0.05
Sitting forward flexion (cm)	9.235±0.529	13.009±0.743	-3.6467	<0.05

DISCUSSION

Home gymnastics movements during the popularity of covid-19

The home gymnastics adopted during home isolation can flexibly adjust the actions of home gymnastics according to their previous exercise volume and personal exercise basis. In home gymnastics, the head and neck can be moved first, and the neck joints can be driven through the swing of the head, so as to fully move the neck joints in gymnastics, Relieve the tension of neck muscles caused by using electronic products for a long time in isolation for 10 years, and effectively prevent cervical spondylosis. Secondly, you can fully stretch your upper limb movement body through the lateral stretching of upper limb muscles. During the lateral stretching of upper limb muscles, you can effectively control the movement range through your previous exercise habits and muscle flexibility, and extend your hands upward, It can effectively drive the extension of upper limb muscles, so as to have a stretching effect. During home isolation, we should also pay attention to the effective stretching and full exercise of the lower limb body through the use of gymnastics. We can exercise our lower limb body by stretching both legs in situ and lateral stretching of both legs. Through gymnastics, we can exercise the muscle quality and muscle ductility of the body cluster. Gymnastics can also improve people's core strength and improve their core strength effectively. At the same time, during exercise, you can increase the exercise amplitude and frequency to improve the exercise heart rate during exercise, so as to achieve a good fat burning effect. During home gymnastics, you can play background music with strong rhythm to improve the excitement of personal sports.

Injury prevention of home Gymnastics during the popularity of covid-19

During the period of home isolation, due to the changes of work and rest habits and human psychology, we should also pay attention to the prevention of possible injuries during home gymnastics. The common types of injuries include muscle soreness, muscle strain, joint sprain and other sports injuries. In the face of these possible sports injuries, we should take the following measures to effectively prevent them: first, make reasonable planning for the exercise before gymnastics, gradually increase the training intensity from low intensity to high intensity, and fully warm up before exercise to make the body function reach a good exercise state, During exercise, we should pay attention to the range of exercise of gymnastics to avoid muscle strain caused by excessive stretching of our body muscles. At the same time, we should also pay attention to the exercise intensity and avoid excessive exercise to make our muscles reach the overload fatigue state, resulting in muscle fatigue pain. After exercise, we should also fully stretch our muscles to achieve a relaxed state. In case of sports injury, Appropriate ice compress can be tried to alleviate the inflammation of the injured part. During exercise, if there is physical discomfort, the exercise should be stopped immediately. If there is physical muscle pain after the exercise, appropriate massage or static muscle contraction can be carried out to prevent the body muscle from remaining stiff. During home isolation, we should also pay attention to the time of home gymnastics. Usually, it can be carried out three to five times a week, and each training time is about one hour. During exercise, we should also make the sports body fully exercise, so as to avoid excessive exercise of a single part, resulting in excessive fatigue of the training body.

CONCLUSION

Through the research of this paper, it can be seen that the simple home gymnastics movement is less limited by the venue, which is

convenient for athletes to complete relevant exercises according to their own needs. The experimental results show that home gymnastics can effectively improve the body composition of athletes, improve their basic metabolism, improve their body shape, improve their cardiopulmonary function, and make athletes maintain good exercise ability, so as to effectively resist the negative effects of bad living habits and repressed life psychological emotions on athletes during home isolation, So that athletes can maintain good living habits and home mentality during home isolation. Therefore, relevant teachers and relevant departments should actively organize people at home to carry out corresponding gymnastics, such as compiling simple home isolation exercises for promotion, so as to maximize the benefits of home gymnastics, use sports to fight against bad living habits and anxiety, and make residents have good physical function and psychological state during home isolation.

All authors declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: The author has completed the writing of the article or the critical review of its knowledge content. This paper can be used as the final draft of the manuscript. Every author has made an important contribution to this manuscript. Shuang Guo: writing and execution. Li Lin: data analysis and article reviews.

REFERENCES

1. Lewnard JA, Lo NC. Scientific and ethical basis for social-distancing interventions against COVID-19. Lancet Infect Dis. 2020;20(6):631-3.
2. Narici M, De Vito G, Franchi M, Paoli A, Moro T, Marcolin G, et al. Impact of sedentarism due to the COVID-19 home confinement on neuromuscular, cardiovascular and metabolic health: Physiological and pathophysiological implications and recommendations for physical and nutritional countermeasures. Eur J Sport Sci. 2021;21(4):614-35.
3. Cowling BJ, Ali ST, Ng TWY, Tsang T, Li JCM, Fong MW, et al. Impact assessment of non-pharmaceutical interventions against coronavirus disease 2019 and influenza in Hong Kong: an observational study. Lancet Public Health. 2020;5(5):e279-288.
4. Woods J, Hutchinson NT, Powers SK, Roberts WO, Gomez-Cabrera MC, Radak Z, et al. The COVID-19 Pandemic and Physical Activity. Sport Med Health Sci. 2020;2(2):55-64
5. Huremović D (ed). Psychiatry of pandemics: a mental health response to infection outbreak. New York: Springer; 2019.