



Research Article

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Research on aerobics influence to female college students physiological index and psychology based on SPSS factor analysis

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ABSTRACT

This paper makes research on the teaching, body building, aesthetic values of aerobics course that set up in colleges and universities according to female college students' physiology and psychology features. This paper carries on controlled trials to 45 female college students' aerobics training, discusses their fitness and body building training values in aerobics training. The research results indicate that aerobics training is relatively proper to female college students in sports impact, motion structures conform to female physiological and psychological features. Maintain a long-term aerobics training can strengthen heart and blood vessel as well as breathe function, remarkably enhance each body quality, and significant improve body shape and body quality.

Key words: Female college students, aerobics, SPSS factor analysis

INTRODUCTION

Aerobics combines gymnastics, music, dance, aesthetics into one, on the basis of aerobic training, reflects perfect connection between strength and beauty. It is a newly-developing entertainment, show-oriented sports item that achieves vigor, grace, fitness and mental health through bare-handed, light apparatus holding and special apparatus movement training, a stronger artistic mass gymnastics item, which exhibits outstanding art charms and attracts more and more college students' attentions and engagements by its superb techniques, enchanting motions, delicate and graceful postures as well as coordinated music accompanying [1-3]. Due to its difference from traditional bare-handed gymnastics training way, no high requirements to site and equipment, it can easily make people feel happy only with rhythmic bright lively music accompanying as well as dynastic training motions in training, which is well-received by mass youth especially female students [4,5].

Aerobics as one of lifelong exercise ways, plays an important role in cultivate especially female students' lifelong sports education consciousness and form into sports exercise habits. This topic makes research on aerobics influence to female college students' body shape, function, quality and mental health so as to promote sports teaching reform.

FEMALE COLLEGE STUDENTS' PHYSIOLOGICAL AND PSYCHOLOGICAL FEATURES IN ATTENDING SPORTS MOVEMENTS

Ages for female college students in this period are 18 to 20 years old, such stage college students' psychology and physiology are entering into maturity. They are vigorous, open to new ideas; therefore it is helpful for improving their lifelong sports education consciousness and establishes concepts.

Female college students' physiological features in engaged in physical activities

Female college students after entering into college, changes in their shape is gradually reducing, as height, bust, shoulder width, pelvis width and so on all reflect slow shape changing. And, female students' skeleton have already become firm and can bear great sports pressure. But compared to male students, female students' bone density is relative lower, bone muscle in their tissue has small volume and light weight features, their muscle strength is

naturally being weaker. While female students' muscle fiber is quite slender, fat layer is very thicker, so they have well-shaped body.

In function, female students heart pump has been strengthened, heart rate reduced, pulse output also increased, their hemoglobin content and erythrocyte numbers has been gradually closes to adults level in this stage. Female students physiological features have been gradually become remarkable, bust increased, lung capacity increased, strength increased with bust increasing, and lung capacity also increased. Female college students' brain structures and functions in this period have already conformed to adults' level, but neural system complex and brain working function are still in the stage of continuously improving.

Female college students' psychological features in engaged in physical activities

Female students that just enter into college, their cognitive level would be continuously promoted as knowledge increased. They will gradually aware the important relations between health and sports movements. Then, gradually focus on sports movements and fully understand its function and significance. Female students will proactive engage in some sports movements because they want to have good health that enable them to play their ability after enter into society, which is their motives in learning and engaging in training. There are some female students want to complete sports test required in college P.E. course. To these students, teachers should make proactive leading to let them recognize the importance of P.E. course from fundament, acknowledge sports important effects on their own development and establish lifelong sports education ideas.

Female students when enters into later-puberty, though body shape developments has come into stable stage, some body functions still have huge potentials and development space. All female students hope they have a symmetrical and graceful figure. With such thoughts, they more tend to understand body shape and willing to go in for aerobics items with stronger rhythms because it can let them have a graceful body and shape. On the contrary, they relatively resist power type and high-impact sports movements.

EXPERIMENTAL SECTION

Research objects

45 fresh students major in business administration in a college that enters in 2003.

Research method

(1) Document Literature method: Make full use of network information and search recently 10 years Chinese and foreign documents with regard to aerobics research, consults relative almanac. Through sorting such information, fully understand and size Chinese and foreign scientific research current situation about aerobics influence to students psychology and physiology research, master this fields research trends. Besides, read lots of sports professional books, make firm theoretical efforts for the experiment and provide clearly thought to experiment design.

(2) Interview method: Based on documents collecting and sorting, get relevant important theoretical basis, then combine with this research relative contents, design rational interview outline that conforms to research plan. Carry out fully communication with teachers and participants on their situations before and after aerobics training, with the purpose to get acknowledge and define aerobics influence factors through interviewing.

(3) Experimental measurement method: this method is according to plan and definite research index made by above research; carry on psychology, body shape and physical quality test and analysis on 45 female college students. Among them, analysis factors in psychology is summarization, compulsive, sensitive of interpersonal relationship, depressed, anxiety, hostility, horrible, paranoid, and psychosis so on. Body shape analysis factors are bust, waist circumference, hip circumference and thigh circumference. Physical quality test indexes are standing long jump (cm), seated forward flexion (cm), sit-up (times/min), 10m* 4 to and fro running (s) and 800m(s). The detailed experiment is to let female college students carry on 12 weeks aerobics training, twice per week, 80 min duration per time, the definite activities including warm-up, body training, movement pattern, cushion motions, relaxing. Select middle-impact sports with the purpose to maintain students' heart rate into 125 times to 150 times per min. Test above 3 dimensions of 45 students before and after experiment by adopting international common used Symptom Check List 90 SCL-90, then evaluate participant psychological conditions.

Data handling

This experiment uses SPSS 11.5 software to make data statistics, after analysis by utilizing t test; results based on remarkable criteria that $P \leq 0.05$.

RESULTS AND DISCUSSION

Aerobics training can increase students' confidence

After 12 weeks' totally 24 times aerobics experience, it can be found through interviewing that participants generally accept that they can make a initiative loud speaking in the public and perform aerobics motions in some large movements. These fully reflect that female college students confidence get general increased through aerobics training. The root cause is aerobics training can make students form into good health and adjust participants' psychological states. Through training, participants own a certain sense of achievements and then confidence increases.

Aerobics training influence to female college students' psychology

From below Table 1, it can be known that participants summarization, compulsive, sensitive of interpersonal relationship, depressed, anxiety, hostility, horrible, paranoid, and psychosis so on have changes after experiencing 24 times aerobics. Especially their summarization, sensitive of interpersonal relationship, anxiety and others such 4 factors have significant differences, because $P < 0.05$. It fully shows that aerobics possess ability to strengthen interpersonal communication, effective increase participants' confidence, enable to reduce anxiety and effectively improve anticipants' sleep and diet situations.

Table 1: Contrast Table of SCL-90 each factor average number, standard deviation before and after experiment (n= 45)

Factor name	Before experiment X \pm S	After experiment X \pm S	difference between average value	t	p
summarization	1.68721 \pm 0.393542	1.51041 \pm 0.427222	-0.178	-2.02123	< 0.05
compulsive	2.02721 \pm 0.495723	1.94562 \pm 0.508753	-0.0817	- 0.76376	> 0.05
sensitive of interpersonal relationship	2.01581 \pm 0.543633	1.77673 \pm 0.58421	-0.2391	- 1.98835	< 0.05
depressed	1.80653 \pm 0.591523	1.67813 \pm 0.496272	-0.1283	-1.10308	> 0.05
anxiety	1.60552 \pm 0.414442	1.79862 \pm 0.499293	0.1928	1.971988	< 0.05
hostility	1.61332 \pm 0.414272	1.69371 \pm 0.592552	0.0803	0.73577	> 0.05
horrible	1.51543 \pm 0.558263	1.56472 \pm 0.376221	0.0494	0.485713	> 0.05
paranoid	1.68171 \pm 0.472762	1.69741 \pm 0.536772	0.0156	0.14563	> 0.05
psychosis	1.65921 \pm 0.380532	1.6742 \pm 0.487573	0.0158	0.170527	> 0.05
others	1.78351 \pm 0.580192	1.57741 \pm 0.369881	-0.2058	-1.98553	< 0.05

Aerobics training influence to female college students' body shape

From Table 2, it can be seen that after 12 weeks 24 times aerobics experience, participants bust has slightly changes that is 0.92cm reduction. Through independent t test, discover that such index has no significant differences before and after training ($P > 0.05$). While hip circumference decreases 1.86 cm and results show that $P < 0.05$, it has significant difference. Besides, waist circumference and thigh circumference also have remarkable reduction that are respectively reduced 3.71cm, 1.88cm, and difference has high significant correlations ($P < 0.01$). That fully shows participants can arrive maximum oxygen intake, then make internal glycogen fully burn by oxidation, and can make energy supply form burning fat, promote body fast metabolisms, finally improve human function level by aerobics training. This test fully shows that female body shape features have fully changes after training.

Table 2: Contrast Table of body shape each dimensions changes before and after experiment (n=45, unit is cm)

Factor name	Before experiment X \pm S	After experiment X \pm S	differences between average value	t	p
bust	84.05 \pm 6.85	83.13 \pm 6.02	0.92	0.675204	> 0.05
Waist circumference	71.54 \pm 7.04	67.83 \pm 5.62	3.71	2.587492	< 0.01
Hip circumference	91.95 \pm 4.73	90.09 \pm 4.32	1.86	1.974312	< 0.05
Thigh circumference	53.75 \pm 3.73	51.87 \pm 3.08	1.88	2.63023	< 0.01

Aerobics training influence to female college students' physical quality

After making comparison of physical quality test indexes before and after experiment, it can be found from Table 3 that after 12 weeks total 24 times aerobics sports, female college students have changes in below some indexes. Standing long jump promotes 11.16cm, seated forward flexion promotes 4.999, 1min sit-up improves 8.34 times per min, 10m*4 to and fro running speed increases 2.138 seconds, besides 800m also increases 9.302 seconds. And through independent t testing, discover that $P < 0.01$, it indicates they have significant correlations. Above results fully show that participants can increase upper limb strength, strength flexibility, increase abdomen muscle strength, improve sensitive and also improve endurance through aerobics training. Such sports training, can maintain female college students health so that provide a guarantee of good health to heavy learning.

Table 3: Table of female college students' physical quality t test results before and after experiment (n= 45)

Index	Before experiment X ±S	After experiment X ±S	differences between average value	t	p
Standing long jump(cm)	164.112±11.351	175.272±10.421	- 11.16	- 4.80433	< 0.01
Seated forward flexion(cm)	5.853±2.072	10.852±4.381	-4.999	- 6.89247	< 0.01
Sit-up(time/ min)	17.352±2.323	25.692±3.282	- 8.34	- 13.7625	< 0.01
10 m* 4 to and fro running(s)	14.261±1.682	12.132±0.742	2.138	7.75223	< 0.01
800 m(s)	249.032±10.631	239.73±12.943	9.302	3.73438	< 0.01

AEROBICS INFLUENCE TO FEMALE COLLEGE STUDENTS PHYSIOLOGY AND PSYCHOLOGY

Aerobics training can let female students overcome shyness, to be free minded, increase confidence. And improve female college students' psychological conditions, reduce their anxiety, improve their sleep, and is helpful to keep a happy heart, increase confidence through training. By training, it is discovered that female college students have improvements in their psychological conditions, such as anxiety reduced, sleep quality gets better improving, and they are proactive to attend to interpersonal communication, some autonomously mutual aid appears. Besides, results show that aerobics training effectively promotes female college students body metabolism, reduces their body parts dimensions so that build elegant shape, largely promotes their strength, flexibility and sensitive as well as endurance, effectively achieve the purpose of fitness building. The specific influence can be divided into 3 dimensions, that is teaching value, body building value and aesthetic education value.

Teaching value

Through test, it can be found that aerobics training can play remarkable educational functions. It can increase participants' interests in sports so that intrigues them to actively go in for aerobics training. It can arouse female college students' interests in sports, propel them to actively attend to learning and training so that strengthen physical quality. Stronger rhythms and fast motions beat in some aerobics make female college students body sport load get huge increase. Maintain long-term training is helpful for cultivating their hardy and courageous fighting spirits, can improve their physical quality and enhance their willpower in training.

Body building value

Aerobics is a kind of aerobic physical movements. It can not only train human heart and lung function, but also improve body flexibility and sensitive. Aerobics motions has coordinate, fluency and elastic features. It can make female college students body get fully trained, meanwhile can also increase their body strength. And improve beauty identify and enjoy ability in training. All of these can meet female college students' physiological and psychological features and requirements. Through aerobic training, they can fully move each body joint so that make each part muscle get balanced training, enable to make shape more symmetrical and elegant. Due to aerobic sports can fully burn internal fat, weight can be reduced in this way, and let female college students maintain elegant figure.

Aesthetic value

Aerobics has a certain aesthetic value. Because it is a kind of sports item that combine artistic appreciation and integrated training into one, blend gymnastics, dance, and music into one unity with rich aesthetic contents." Health, strength, beauty" is the superb targets of physical quality that human pursuit. In aerobics, two categories item as normal aerobics and competitive aerobics both have remarkable features of "health, strength, beauty", it fully shows its internal artistic characteristics. By aerobics course learning and training, college students can get acknowledge of beauty's definition and connotation. They can deeply experience beautiful stance, beautiful body, beautiful movements, and beautiful dynamics. Besides, this sport can enhance woman heart and lung capacities, relieve spiritual press, and lubricate social connections. It is a kind of female college students' well-received sports.

CONCLUSION

Through experiment, it can be found that aerobics play an active role in both female college students' physiology and psychology. Learning and training of aerobics not only can effective improve female college students' physical quality, but also let them own stronger confidence, is helpful for their active learning. Therefore, actively develop aerobics course has an important significance that not only enrich sports education contents but also helpful for female college student' physical and mental development, let them establish correct sports learning ideas, so it is essential to active set up this course.

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