

การเสริมพลังเพื่อสร้างสุขภาพด้วยการเต้นแอโรบิก
ของนักศึกษาคณะบัญชี มหาวิทยาลัยรังสิต

THE EMPOWERMENT FOR HEALTH OF AEROBIC DANCE FOR
STUDENTS, FACULTY OF ACCOUNTANCY, RANGSIT UNIVERSITY

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บทคัดย่อ

การเสริมพลังเพื่อสร้างสุขภาพด้วยการเต้นแอโรบิกของนักศึกษาคณะบัญชี มหาวิทยาลัยรังสิต เป็นการศึกษาค้นคว้าเพื่อพัฒนาสมรรถภาพทางกายโดยการเปรียบเทียบผลการทดสอบสมรรถภาพทางกาย ก่อนและหลังการเต้นแอโรบิกในระยะเวลา 2 เดือน ผลการศึกษาพบว่า นักศึกษามีผลการพัฒนาสมรรถภาพทางกายที่ดีขึ้นในรายการทดสอบค่าดัชนีมวลกาย ค่าสัดส่วนรอบเอวต่อรอบสะโพก การแตะมือด้านหลังการนั่งงอตัว การนอนยกตัว การดันพื้น และการเดินของซีพจรหลังก้าวขึ้น-ลง กว่าก่อนเต้นแอโรบิกอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

คำสำคัญ: แอโรบิกส่งเสริมสุขภาพ การสร้างเสริมพลังอำนาจทางสุขภาพคณะบัญชีมหาวิทยาลัยรังสิต

Abstract

The empowerment for health of aerobic dance for students, Faculty of Accountancy, Rangsit University aimed to examine physical fitness before and after doing aerobic dance for two months. The results showed that students' physical fitness has been improved in Body Mass Index (BMI), Waist to Hip Ratio (WHR), shoulder girdle flexibility test, sit and reach test, abdominal curls, and push-ups and step test with statistically significant at 0.05.

Keyword: aerobic, health promotion, empowerment for health, Faculty of accountancy, Rangsit University

Introduction

Health promotion provides a window of opportunity for promoting self-care and self-monitoring in both individuals and society (Gibson, 1993; Gilbert, 1995). The World Health Organization defines health promotion as "The process of enabling people to increase control over their health, and its determinants, and thereby

improve their health” (WHO, 2005). Exercise promotes physical health and it has been made easy to do based on personal preference and abilities (Bandura, 1997). Action and commitment to sustainable development in health care begins with ourselves and expands to community. As reported in The Eleventh National Economic and Social Development Plan that strengthen adaptive quality of citizens, society and people’s health according with philosophy of Sufficiency Economy. This national plan aims to create balance and to build up their self-immunity among Thai people, promote ways of life on sufficiency economy, drive participatory approaches to development strategic plans to achieve good health system and well-being society (The National Economic and Social Development Board, 2012). In Thailand, health promotion strategies usually rely on health campaigns, training and knowledge transfer to raise awareness of people or community members, enabling them to realize factors affecting their health or personal conditions and to have knowledge and understanding of behavior change towards good health. Apart from using campaigns to raise awareness, support from government agencies is essential for health promotion since it is a concrete process of enhancing good health. Government agencies work together with communities, organizations and educational institutions to raise people’s awareness about desirable ways of life that lead to behavior change for sustainable good health (The Secretarial of the Cabinet, 2014). Improvement of public health service and people’s health quality with a focus on disease prevention is to promote physical strength through playing sports. A guideline for people’s health improvement is to promote benefits of physical activity. Health problem situations of the population aged 15-59 during 2011 – 2015 unfold Non-communicable diseases (NCD) mortality rates tended to increase from 22.47% in 2011 to 27.83% in 2014 (National Statistic Office, 2015). World Health Organization announced Thailand has the highest score for Non-communicable Diseases in Asia in 2017 (WHO, 2017). Non-communicable diseases occur from personal ways of life about consuming excess sugar, food and drinks high in fat and salt, inadequate consumption of fruit and vegetable, lacking of sleep and workout, bodily excretions, place of work and residential exposure to ambient air pollution. Thai people do moderate-intensity exercises. Overweight and obesity rates in Thai population increased more than 20% in 2008-2009 (Strategy and Planning Division, 2011). These situations are required suitable mechanisms that make up the solutions and enable good health for Thai people. Regular exercise reduces large number of health risks. It turns out that people who do not exercise to usually get sick. The studies have examined that the students at Faculty of Accountancy, Rangsit University

have a tendency to ignore their health. Most students always live their life in rush and affected from the stress of their work in university. Moreover, they never have annual checkups, but they wait until they're already sick then go to the doctor. Besides, they spend most of their time for playing game and chatting online which may increase chances of overweight. Based on BMI, thirty participants were classified as overweight obese I (BMI: 25.0 – 29.9). This group of participant does not meet the growth standards and healthy development accordingly. A widely-accepted health solution is proving that exercises are providing a variety of health benefits. Good health or good physical activity enables people to have wellbeing in daily routine. Exercises promote better health benefits (Varet, 2013). According to the situations of students at Faculty of Accountancy, Rangsit University, it is essential to develop health problems and health promoting campaign in the university. The researcher had created a research project: "The empowerment for health of aerobic dance for students, Faculty of Accountancy, Rangsit University", aimed to promote students' physical fitness, raise awareness on preventable diseases, lead student empowerment to manage health risk factors to promote healthy behaviors.

Materials and methods

The sample was purposively selected including 30 bachelor's degree students, currently studying at Faculty of Accountancy, Rangsit University in Academic Year 2016 with their willingness to participate in the aerobic dance project. Research instrument was Sports Authority of Thailand Simplified Physical Fitness Test (SATST) for working people between the ages of 17 and 59 (Sports Authority of Thailand, 2003). It was applied to test the students' physical fitness before and after doing exercises and to evaluate their figures, physical strength and physical fitness including with muscular strength, muscular endurance, speed, agility, flexibility and cardio respiratory endurance. The research tools were a weight scale, height measurement, a stopwatch, a metronome, a measuring tape, a 30-centimeter ruler, a 25-centimeter ruler, a cushion and a box. Physical fitness testing includes 7 assessments of BMI, WHR, shoulder girdle flexibility test, sit and reach test, 1-minute abdominal curls, 1-minute push – ups and 3-minute step test (Sports Authority of Thailand, 2003). This research was conducted for 10 weeks and divided into 3 parts. The 1st week was for pre-test, the 2nd week was for awareness raising activities and the 3rd-10th week was for experimental test. Participants were asked to do 8-week aerobic exercises —3 days a week (Charoensuk, 2009) (Srichompu, 2008). After 8 weeks of aerobic exercises, post-physical fitness test was carried out. Human rights protection was focused on research ethics, including

respect of human dignity and rights treat to human (This research have been reviewed and approved by Ethical Committee of Research Institute of Rangsit University based on the Declaration of Helsinki and Good Clinical Practice, December 1, 2016 – May 31, 2017). The researcher informed the students about research background, research objectives, conditions, activities and agreements in details. The students voluntarily decide whether or not to participate as a research participant. Names and details of each student were disclosed as confidential information. This study adopted the empowerment process to change health behavior, and self-care of students, to educate, realize, and inspire healthy behaviors. The researcher supported, encouraged, and informed the results of pre-and post-physical fitness tests to the students individually.

The method of recruitment the target group was purposively selected including 30 bachelor’s degree students, currently studying at Faculty of Accountancy, Rangsit University in academic year 2016 with their willingness to participate in the aerobic dance project. The analysis of physical fitness test results was conducted through mean and standard deviation of each physical fitness test score of the sampling. Measurements on physical fitness test before (pre-test) and after (post-test) doing aerobic dance and the empower process. Data on physical fitness test were collected twice; before and after the experiments. Statistical analysis consists of mean values, standard deviations, paired t-test, and content analysis.

Results

Part 1 Demographic data

This part provides the demographic characteristics of the sampling (N=30). The detail of the students who participated in the physical fitness test are as followed; mean age is equal to 20.06 (\bar{x} =20.06), mean weight is equal to 67.35 (\bar{x} =67.35), and mean height is equal to 165 (\bar{x} =165). (Table 1)

Table 1 Mean (\bar{x}), standard deviation (S.D.) of ages, weights, heights of the sample.

Background information	Male aged 17-19		Male aged 20-29		Female aged 17-19		Female aged 20-29		Total	
	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.
Age (years)	19	0.0	21.33	0.58	19	0.0	20.90	0.88	20.06	1.23
Weight (Kg.)	72.03	2.91	63.97	1.54	65.06	5.69	68.35	6.05	67.35	3.63
Height (cm.)	172.75	4.03	166.0	2.65	158.77	3.63	162.50	7.79	165.0	5.95

Remark n = 30, Male aged 17-19 (n = 4), Male aged 20-29 (n = 3), Female aged 17-19 (n = 13) Female aged 20-29 (n = 10) Total (n = 30)

Part 2 Pre-test

The 1st physical fitness test results in BMI of the students (before) was considered in obese 1 criteria ($\bar{x} = 25.88$), WHR was appropriate ($\bar{x} = 0.83$), shoulder girdle flexibility test (right hand on top) was low ($\bar{x} = 8.0$), shoulder girdle flexibility test (left hand on top) was moderate ($\bar{x} = 6.20$), sit and reach test was moderate ($\bar{x} = 14.40$), abdominal curls were very low ($\bar{x} = 30.40$), push-ups were moderate ($\bar{x} = 28.43$), 3-step test was very low ($\bar{x} = 149.17$). (Table 2)

Table 2 Mean (\bar{x}), standard deviation (S.D.), the results of each test from pre-test physical fitness test of the students from Faculty of Accountancy in Rangsit University (pre-test).

Test	Male aged 17-19 (n = 4)		Male aged 20-29 (n = 3)		Female aged 17-19 (n = 13)		Female aged 20-29 (n = 10)		Total (n = 30)		Criteria
	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	
	BMI (Kg/m ²)	24.14	0.84	23.84	1.10	26.50	1.92	26.38	2.93	25.88	
WHR (Inch)	0.81	0.02	0.95	0.06	0.81	0.03	0.83	0.07	0.83	0.06	Appropriate
Shoulder girdle flexibility test (Right on top) (cm.)	8.00	1.15	12.33	4.04	7.23	1.83	7.70	8.80	8.00	3.02	Low
Shoulder girdle flexibility test (Left on top) (cm.)	2.75	2.22	7.67	0.58	7.23	1.83	3.68	7.08	6.20	4.89	Moderate
Sit and reach test(Inch)	8.50	4.65	17.33	2.52	14.69	2.72	15.50	4.62	14.40	4.30	Moderate
Abdominal curls(Time)	28.0	5.72	40.67	3.06	26.46	6.08	33.40	10.9	30.40	8.79	Very low
Push-up (Time)	21.25	9.74	40.67	8.08	27.0	4.90	29.50	9.28	28.43	8.65	Moderate
Step test(Time)	115.2	4.57	115.7	1.15	152.7	16.9	168.2	32.4	149.2	29.2	Very low

Part 3 Post-test

The 2nd physical fitness test results in BMI of the students (after) was considered in obese 1 criteria ($\bar{x} = 25.38$), WHR was appropriate ($\bar{x} = 0.81$), shoulder girdle flexibility test (right hand on top) was moderate ($\bar{x} = 11.67$), shoulder girdle flexibility test (left hand on top) was moderate ($\bar{x} = 10.90$), sit and reach test was good ($\bar{x} = 19.60$), abdominal curls were low ($\bar{x} = 41.83$), push-ups were moderate ($\bar{x} = 34.70$), 3-minute step test was moderate ($\bar{x} = 106.50$). (Table 3)

Table 3 Mean (\bar{x}), standard deviation (S.D.), the results of each test in post-test physical fitness test of the students from Faculty of Accountancy in Rangsit University (post-test).

Test	Male aged 17-19 (n = 4)		Male aged 20-29 (n = 3)		Female aged 17-19 (n = 13)		Female aged 20-29 (n = 10)		Total (n = 30)		Criteria
	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	\bar{x}	S.D.	
BMI (Kg/m ²)	24.14	0.64	23.23	1.11	25.80	1.92	25.99	3.0	25.38	2.31	Obese1
WHR (Inch)	0.80	0.02	0.93	0.09	0.79	0.03	0.81	0.06	0.81	0.06	Appropriate
Shoulder girdle flexibility test (Right on top) (cm.)	10.75	2.63	14.67	2.08	10.31	3.66	12.90	5.74	11.67	4.38	Moderate
Shoulder girdle flexibility test (Left on top) (cm.)	9.25	8.42	11.33	2.08	12.0	3.54	10.40	3.66	10.90	4.26	Moderate
Sit and reach test(Inch)	20.0	1.15	20.67	1.15	19.15	1.68	19.70	2.36	19.60	1.83	Good
Abdominal curls(Time)	59.75	2.22	60.33	4.04	35.08	6.29	37.90	10.5	41.83	12.5	Low
Push-up (Time)	36.75	8.42	46.0	8.19	31.23	4.19	36.0	8.03	34.70	7.76	Moderate
Step test	91.50	3.70	92.0	4.36	113.6	15.1	107.6	11.5	106.5	14.6	Moderate

Part 4 Comparison of physical fitness between pre-test and post-test

The comparison of physical fitness test results of the students in the 2nd test was statistically different from the 1st test at .05, BMI (6.1709*), WHR (6.4429*), shoulder girdle flexibility reach (right hand on top) (8.6501*), shoulder girdle flexibility test (left hand on top) (5.6360*), sit and reach test (8.1208*), abdominal curls (6.6130*), push-ups (9.0814*) and 3-minute step test (11.9262*) according to the table below. (Table 4)

Table4 Comparison of pre-test and post-test of the physical fitness test results of the students on week 10.

Test	Pre-test		Criteria	Post-test		Criteria	t
	\bar{x}	S.D.		\bar{x}	S.D.		
BMI (Kg/m ²)	25.88	2.33	Obese1	25.38	2.31	Obese1	6.1709*
WHR (Inch)	0.83	0.06	Appropriate	0.81	0.06	Appropriate	6.4429*
Shoulder girdle flexibility test (Right on top) (cm.)	8.00	3.02	Low	11.67	4.38	Moderate	8.6501*
Shoulder girdle flexibility test (Left on top) (cm.)	6.20	4.89	Moderate	10.90	4.26	Moderate	5.6360*
Sit and reach test(Inch)	14.40	4.30	Moderate	19.60	1.83	Good	8.1208*
Abdominal curls(Time)	30.40	8.79	Very low	41.83	12.57	Low	6.6130*
Push-up (Time)	28.43	8.65	Moderate	34.70	7.76	Moderate	9.0814*
Step test(Time)	149.17	29.17	Very low	106.50	14.64	Moderate	11.9262

Remark n=30*significant at the 0.05 probability level

Discussions

The sample was the students who study at Faculty of Accountancy, Rangsit University in academic year 2016 continually participating in the 8-week aerobic exercises —1 hour a day, 3 days a week. Their BMI was considered in obese 1 criteria (\bar{x} =25.38) and their WHR was appropriate (\bar{x} =0.81). This showed that after 2-month

aerobic dance, abdominal fat around the stomach of the participants was appropriate. The physical fitness test results of sit and reach test was good. Again, it revealed the flexibility of hamstring and soleus muscle was at a good level. The physical fitness test results of shoulder girdle flexibility (right hand on top) and shoulder girdle flexibility (left hand on top) were moderate. This would be indicated that the flexibility of muscles and shoulder joints was at moderate level. The physical fitness test results of push-ups were moderate. It could be seen that the flexibility of upper body muscles was at moderate level. The physical fitness test results of 3-minute step test were moderate. This showed that the endurance of respiratory system and blood circulation was at moderate level. All the above mentioned have showed better results comparing to the ones before participating in this project. For example, abdominal curls were low since the endurance of abdominal muscle was low; however, the tests yielded better results comparing to results before participating in this project. The physical fitness after doing aerobics showed that it provided health benefits, physiological changes and body performance in relation to automatic nervous system. For instance, pulse rate would continuously adjust body performance system to the environmental conditions. In addition, it strengthened the body in many ways such as muscles became stronger and more firm, joints became more flexible, have good shape, improve blood circulation and feel more refreshed. These are consistent with notions of Srinawong & Klaphajone, (2000). Aerobic dance program differentiated the physical fitness which is consistent with the studies of Reamuang & Sukdee (2010) (Sukdee et al., 2012). However, the students' BMI was considered to be disproportionate due to their daily life habits. This research did not control eating habits of the students, but they were trained about food appropriateness and consumption. However, the empowerment process in this research can empower the students. This showed that the students had self-efficacy at a high level ($\bar{x} = 4.16$), and intended to improve their health at a high level ($\bar{x} = 4.40$).

Conclusions

The physical fitness of the students from Faculty of Accountancy in Rangsit University after participating in aerobic dance was as follows. Their figures measured through BMI were considered to be in obese 1 criteria ($\bar{x} = 25.38$) and their WHR was appropriate ($\bar{x} = 0.81$). Their flexibility of muscles, joints, muscular joints and moving angles of shoulder joints measured through shoulder girdle flexibility test (right hand on top) ($\bar{x} = 11.67$) and shoulder girdle flexibility test (left hand on top) ($\bar{x} = 10.90$)

was moderate. The flexibility of hamstring and soleus muscle measured through abdominal curls was good ($\bar{x} = 19.60$). The endurance of abdominal muscle measured through 1-minute push-ups was low ($\bar{x} = 41.83$). The endurance of upper body muscles measured through 1-minute push-ups was moderate ($\bar{x} = 34.70$). The endurance of respiratory system and blood circulation measured through 3-minute step test was moderate. Pulse rate used as an indicator was moderate ($\bar{x} = 106.50$).

The comparison of the physical fitness of the students from Faculty of Accountancy in Rangsit University before and after participating in aerobic dance was as follows. The 2nd test (after) was statistically significant at 0.05, consisting of 7 tests which were BMI (6.1709*), WHP (6.4429*), shoulder girdle flexibility test (right hand on top) (8.6501*), shoulder girdle flexibility test (left hand on top) (5.6360*), sit and reach test (8.1208*), abdominal curls (6.6130*), push-ups (9.0814*) and 3-minute step test (11.9262*).

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References

- Bandura A. Self-Efficacy: Toward a Unifying Theory of Behavioral Change, *Psychological Review*. 1997; 84(2); 194.
- Charoensuk S. *The Influence of 3 Models of Aerobic Dance on Arms and Legs Strength, V^oO₂max and Serum Lipids of Male College Students*. (Master's Thesis). Exercise and Sport Science, Graduate School, Burapha University, 2009.
- Gilbert T. Nursing: Empowerment and the problem of power, *Journal of Advanced Nursing*. 1995; 21; 865-871.
- Gibson CH. The process of empowerment in mothers of chronically ill children. *Journal of Advance Nursing*, 1993; 21: 1201-1210.
- National Economic and Social Development. 2012. *The Eleventh National Economic and Social Development Plan B.E. 2012-2016*. Available at: http://www.nesdb.go.th/download/article/article_20160323112431.pdf. Accessed August 14, 2016.
- National Statistic Office. 2015. *Field Operation Manual for the Health and Welfare Survey B.E. 2015 and the Survey of Sports and Exercise Behavior of the Population B.E. 2015*. National Statistic Office. Available at: http://164.115.22.104/NSOdatacenter/images/documents/doc_HealthS-58.Pdf. Accessed August 15, 2016.

- Reamuang S, Sukdee S. *Effects of Exercises Program to Physical Fitness and Body Mass Index for the Personnel of Mobile Development Unit 15, Uthai Thani Province*. (Master's thesis). Health Promotion Program, Faculty of Education, Nakhonsawan Rajabhat University, 2010.
- Sports Authority of Thailand. *Sports Authority of Thailand Simplified Physical Fitness Test*. Bangkok: New Thaimit Printing Co., Ltd, 2003.
- Srichompu M. *The Effect Exercise Different in Interval time of Aerobic Exercise Program on Physical Efficiency of the First Year Nursing students of Boromarajonani college of Nursing Sawanpracharak Campus Nakhon Sawan*. (Master's Thesis). Physical Education, Graduate School, Nakhon SawanRajabhat University, 2008.
- Srinawong C, Klaphajone J. Easy to do exercise, *Chewajit*. 2(30): 2000; 66-67.
- Strategy and Planning Division. 2011. *Thailand Healthy Lifestyle Strategic Plan, B.E.2011-2020*. Available at:http://bps.moph.go.th/new_bps/sites/default/files/thai_good_health.pdf. Accessed August 18, 2016.
- Sukdee S, Lohakoon, Sukdee T. Effect of Aerobic Dance Training Upon Health-Related Physical Fitness Level of The Overweight Students of Physical Education Institutes, *Journal of Faculty of Physical Education*. 2012: 15; 119-126.
- The Secretarial of the Cabinet. 2014. *Policy Statement of the Council of Ministers*. Available at: www.cabinet.thaigov.go.th. Accessed September 16, 2016.
- Varet S. *Effect of Walking Exercise on Body Mass Index and Fat Percentage of the Overweight Secondary Student's*. (Master's thesis). Learning Management in Physical Education, Graduate School, Srinakharinwirot University, 2013.