

Physical Fitness of the Applied Thai Traditional Medical Students at Faculty of Medicine Siriraj Hospital, Mahidol University

Thawornchai Limjindaporn, M.D., Ph.D^{***}, Warit Ekpruchayakoon^{***}, Chayanit Manoonpol, M.S.^{**}, Numpone Singthong, B.S.^{*}, Ronnachai Subsatitkul, M.S.^{****}, Sunanta Chantakarn, M.D., Ph.D^{****}, Tawee Laohapand M.D.^{*****}, Tharnthip Pranootnarabhal, M.D.^{*}

^{*}Health Promotion, Sport and Recreation Unit, ^{**}Department of Anatomy, ^{***}Second Year Medical Student, Academic Year 2010, ^{****}Division of Student Affairs, ^{*****}Center of Applied Thai Traditional Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

ABSTRACT

Objective: This study was conducted to evaluate the fitness of applied Thai traditional medical (ATTM) students thereby obtaining data to promote a greater physical fitness in ATTM students.

Methods: Cardio-respiratory fitness, muscular strength, flexibility and body composition were measured in 208 ATTM students from years 1 to 4 in the academic year 2010. To determine their lifestyles, questionnaires were also answered by ATTM students.

Results: Firstly, although cardio-respiratory fitness of female ATTM students was within normal limit of Thai, cardio-respiratory fitness of male ATTM students was lower than that of Thai. Secondly, muscular strength of both male and female ATTM students was lower than those of Thai. Thirdly, flexibility of ATTM students was comparable to that of Thai. Fourthly, although BMI of ATTM students was comparable to that of Thai, the average waist to hip circumference ratio of female ATTM students was higher than that of female Thai. Finally, eighty four percent of ATTM students exercised less than three times a week and fifty percent of ATTM students ate less than three meals per day, respectively.

Conclusion: ATTM students need not only the training programs for cardio-respiratory fitness, and muscular strength but also need a breakfast campaign. Persuading them to pay more attention to their physical exercises and appropriate diets will eventually create the healthy ATTM practitioners in the future.

Keywords: Physical fitness, Applied Thai Traditional Medical Student, Faculty of Medicine Siriraj Hospital, Mahidol University

Siriraj Med J 2012; 64 (Suppl 1): S93-S95

E-journal: <http://www.sirirajmedj.com>

INTRODUCTION

Physical fitness is a suitable parameter to determine individual's health. Cardio-respiratory fitness, muscular strength, flexibility and body composition are important measurements of physical fitness. Firstly, cardio-respiratory fitness refers to the ability of the circulatory and respiratory systems to supply oxygen to skeletal muscles during sustained physical activity. Secondly, muscular strength refers to the ability of the individuals to exert maximum force. Thirdly, flexibility refers to the absolute range of movement in series of joints, and length in muscles that cross the joints. Finally, body composition refers to the different components that make up a person's body weight.

Applied Thai Medicine (ATM) is a recently established bachelor degree curriculum in Thailand. Students who graduate will be the practitioners giving the health care services with the art of Thai traditional medicine. Dhammanamai, which is a complete system that emphasizes the holistic approach, can promote health¹ and longevity using natural methods established by Professor Quay Ketusingh. One of the core concepts in the curriculum; therefore, involves a healthy body, a health mind and healthy behavior or healthy conduct of life. The awareness of the health promotion among the ATTM students is essential for their future clinical practices.

This study aimed to evaluate the physical fitness of ATTM students to gain information for a health promotion campaign among ATTM students.

MATERIALS AND METHODS

Populations

The study was approved by the Siriraj Institutional

Correspondence to: Thawornchai Limjindaporn
E-mail: limjindaporn@yahoo.com

Review Board (SIRB). Totally, 208 ATTM students from years 1 to 4 during academic year 2010 were recruited to the study.

Measurement of cardio-respiratory fitness

Cardiovascular fitness, which was evaluated by measuring heart rate before and after performing a step test technique, was performed by moving up and down using the 10 inches height platform. After both feet of subjects were on the platform, they immediately moved their feet down to the ground. These actions were performed repeatedly at the rate of 20 times per minute for 3 minutes. After finishing the test, subjects were asked to rest for 5 seconds and their heart rates were then measured. For respiratory fitness, peak flow meter was used to measure the size of a student's lung capacity. Data were collected and compared to normal values of the Thai population.

Measurement of muscular strength

Hand grip strength was performed by using hand grip (Takei model TKK 5401). Data were collected and compared to normal values of the Thai population.

Measurement of flexibility

Flexibility was evaluated by a sit and reach test, which was described by Wells and Dillon and specifically measures the flexibility of the lower back and hamstring muscles. Data were collected and compared to normal values of the Thai population.

Measurement of body composition

In order to measure the amount of body fat, body mass index (BMI) and a waist to hip circumference ratio were measured in the population. The body weight and height of each medical student was measured and BMI was calculated as body weight in kilogram/(height in meter).² In addition, a waist to hip circumference ratio, which reflects abdominal obesity, was obtained by measuring circumferences at waist (the midpoint of length between costal margin and anterior superior iliac spine) and hip (anterior superior iliac spine), respectively. Data were collected and compared to normal values of the Thai population.

Questionnaire

ATTM students carefully answered the questionnaires, which focused on their exercise, leisure time and nutritional status.

Statistical Analysis

Descriptive analysis was analyzed by using SPSS version 17.0 program.

RESULTS

Firstly, cardio-respiratory fitness of ATTM students was performed. The average lung capacity of male ATTM students was 44.00 cm³ per kilogram, which was lower than that of Thai² at the same age and sex (>45.80 cm³ per kilogram). In addition, the average heart rate after performing a step test of male ATTM students was 130.77 beats per minute, which was higher than that of Thai² at the same age and sex (99-113 beats per minute). The data suggest that male ATTM students had low cardio-respiratory fitness. In contrast, the average lung capacity of female ATTM students was 52.35 cm³ per kilogram,

which was comparable to that of Thai² at the same age and sex (>45.00 cm³ per kilogram). Also, the average heart rate after performing a step test of female ATTM students was 130.54 beats per minute, which was within normal limit of Thai² at the same age and sex (120-136 beats per minute).

Secondly, muscular strength of ATTM students was performed. Mean hand grip strength in male ATTM students was 0.47 kg per body weight in kg, which was lower than that of male Thai² at the same age (0.67-0.79 kg per body weight in kg). Also, mean hand grip strength in female ATTM students was 0.46 kg per body weight in kg, which was lower than that of female Thai² at the same age (0.49-0.59 kg per body weight in kg). Together, both male and female ATTM students had low muscular strengths.

Thirdly, flexibility of ATTM students was performed. Mean flexibility in male ATTM students was 7.52 cm, which was within normal limit of Thai² population (7-14 cm). Mean flexibility in female ATTM students was 7.87 cm, which was within normal limit of Thai² (7-14 cm). Therefore, flexibility of ATTM students was normal.

Fourthly, body composition of ATTM students was performed. The average BMI in male and female ATTM students was 21.61 kg/m² and 21.94 kg/m², respectively, which was within average BMI of Thai⁵, which was 18.5-24.9 kg/m². In addition, average waist to hip circumference ratio of male ATTM students was 0.83, which was within average waist to hip circumference ratio in male Thai² of the same age and sex (0.74-0.86). However, average waist to hip circumference ratio of the female ATTM students was 0.81, which was higher than that of female Thai² of the same age and sex (0.70-0.78) suggesting the obesity in female ATTM students.

Finally, eighty two percent of male ATTM students exercised less than three times a week. Also, eighty seven percent of female ATTM students exercised less than three times a week. ATTM students slept more than 6 hours per day. Fifty four percent of male ATTM students ate less than three meals per day. In addition, forty six percent of female ATTM students ate less than three meals per day. The missed meal of ATTM students was breakfast. Male ATTM students spent time in the internet three hours a day, which was more than that of female ATTM students, who spent time in the internet two hours a day.

DISCUSSION

Cardio-respiratory fitness was evaluated and male ATTM students had low cardio-respiratory fitness in this study. It was agreeable to a longitudinal study of the USA military medical students that their cardiovascular fitness also dropped obviously over a two-year period and dropped more quickly than normal population.³ However, it is different from a study of the second-year medical students at the Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand, that the medical students had high cardiovascular fitness.⁵

Muscular strength of both male and female ATTM students was lower than those of Thai. It was agreeable to two previous studies of Thai medical students^{3,5} that the average hand grip strength of Thai medical students was lower than that of Thai male⁵ and the previous study in academic year 2000, which although used different tools to measure physical fitness, it showed that medical students need more physical exercise, especially in muscular

strength trainings to improve their fitness.³

Although the average BMI in ATTM students was within average BMI of Thai, this study showed that the average waist to hip circumference ratio of the female ATTM students was higher than that of female Thai suggesting the obesity in female ATTM students. In contrast, the result of body composition test in medical students at the Faculty of Medicine Siriraj Hospital, BMI and averages waist to hip circumference of medical students were within normal range.⁵

Eighty four percent of ATTM students exercised less than three times a week. Similarly, sixty-six per cent of medical students exercised less than twice per week.⁵ Fifty per cent of ATTM students ate less than three meals per day and the missed meal of ATTM students was breakfast, which was similar to the lack of breakfast observed in Thai medical students' study.

In summary, ATTM students need not only the training programs for cardio-respiratory fitness, muscular strength but also need a breakfast campaign. Persuading them to pay more attention on their physical exercises and correct diets will eventually generate the healthy ATTM practitioners in the future.

ACKNOWLEDGMENTS

Thawornchai Limjindaporn is supported by Chalerm-phrakiat Grant, Faculty of Medicine Siriraj Hospital, Mahidol University.

REFERENCES

1. Laohapand T, Jaturatamrong U, Jantabut C, Tonglue T, Kamkaew P, Punpeng P, et al. Health Promotion with Thai Traditional Medicine: Dhammanamai. Thai Traditional Medicine in the Faculty of Medicine Siriraj Hospital. Bangkok: Supavanich Press; 57 p.
2. Kerdchantuk S. Physical Fitness Norms of Thai Population. Bangkok: Sports science division, Sports science department, Sports Authority of Thailand; 2002.
3. Kulthanan T, Soparat K, Junhom N. Physical fitness and physical activities profiles of second-year medical student : Faculty of Medicine Siriraj Hospital, Mahidol University. Siriraj Hosp Gaz. 2001 Nov;53:797-804.
4. Mitchell S, Eide R, Olsen C, Stephens M. Body composition and physical fitness in a cohort of US military medical students. J Am Board Fam Med. 2008 Mar;21(2):165-7.
5. Vatanashevanopakom C, Sathirawit P, Kosaisawe N, Chearskul S, Manoonpol C, Pranootnarabhal T, et al. Body Composition, Muscular Strength and Cardiovascular Strength of the Second-Year Medical Students at Faculty of Medicine Siriraj Hospital, Mahidol University. Siriraj Med J. 2010 Nov;62:241-44.