國軍軍事院校學官體適能與體脂肪之研究
—以國防大學為例

A Study on the Physical Fitness and Body Fat of the Student Officers in the ROC Military Schools-the National Defense University as an Example

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提　要

一、國防大學爲國軍軍事院校最高學府每年招考全國軍校級軍官，實施1年深造教育，除了研究戰略戰術外平時更實施每週2次的體能活動。
二、體適能與體脂肪又息息相關，肥胖與過多的體脂肪不利於運動表現更不利於身體健康。
三、本研究結果國防大學戰爭學院及管理學院戰略班學官體脂肪以8.6~17.4%；陸、海、空軍學院及管理學院指參班體脂肪以8.6~16%之範圍時爲其最佳體能表現，建議以此範圍作爲學官個人健康管理參考指標。

關鍵詞：體適能，體脂肪百分比

Abstract

1.The National Defense University (NDU) is the highest academy in the professional military education system of the ROC. Every year the NDU admits O4-O6 level officers for one-year long advanced education. During this period of time, in addition to the study of military tactics and strategies, the student officers also engage in physical activities twice a week.
2.Physical fitness is closely related to body fat. Corpulence and excessive body fat are adverse to sport performance and physical health.
3.This study concludes that the optimal percent body fat, for the student officers in the War College and in the Strategic Class of the Management College, and for the student officers in the Army, Naval, and Air Forces Command and Staff Colleges and in the Command and Staff Class of the Management College, falls in the ranges of 8.6~17.4% and 8.6~16% respectively, which will bring about the best individual physical performance. It is recommended that the optimal ranges of percent body fat be adopted as health management reference index for the student officers.

Key words: physical fitness, percent body fat

壹、緒　　論

一、研究背景

國防大學所屬戰爭學院、陸軍學院、海軍學院、空軍學院、理工學院、管理學院及95年9月加入的政戰學院等7所學院。理工學院、管理學院、政戰學院爲基礎及進修教育學院，而戰、陸、海、空軍學院及管理學院戰略班、指揮參謀班爲軍事深造教育班隊，須於基礎教育後至基層部隊歷練各項指揮參謀職務後才能報考進修。陸、海、空軍學院以招收國軍少校及中校曾任連級主官（管）1年以上者爲主，戰爭學院及管理學院戰略班則招考國軍中上校現役軍官並擔任中校級（含）以上主官（管）1年以上爲主。

1.Introduction

(1)Research Background

The National Defense University (NDU) comprises seven colleges, including the War College (WC), the Army Command and Staff College (ACSC), the Naval Command and Staff College (NCSC), the Air Force Command and Staff College (AFCSC), Chung-Cheng Institute of Technology, Management College and Fu Hsing Kang College. Fu Hsing Kang College was incorporated into the National Defense University in September 2006. The Chung-Cheng Institute of Technology, the Management College and Fu Hsing Kang College are in charge of basic and intermediate education. The military advanced education includes the classes of the War College, the Army, Naval and Air Force Command and Staff Colleges, and the Strategic Class and the Command and Staff Class of the Management College. Applicants for these classes are required to have finished basic education and assumed commanders or staff in base units. The Army, Naval and Air Force Command and Staff Colleges educate selected O4s and O5s who have served as company leaders or equivalent posts for at least one year. The War College and the Strategic Class of the Management College educate O5s and O6s who have been O5-level supervisors for at least one year.

陸軍學院教育任務爲：培育野戰用兵、備戰及建軍計畫、執行與整合專業人才，具備主動積極、負責創新之精神，使勝任聯合兵種戰術指揮官、旅、師級科長級軍團以上幕僚[註一]；海軍學院教育任務則爲：培養中上校指揮參謀幹部，具備支持國軍戰略及聯合作戰所需的海軍用兵策略思維與計畫作爲能力[註二]；空軍學院教育任務亦爲：培養武德及武藝兼修，建軍與用兵並重的中階軍官，使具空軍戰略、戰術與聯合作戰素養之幹部[註三]；管理學院指參班教育任務則是：培養軍種建軍備戰幹部所需國防資源管理、分配與運用人才，以及強化軍種作戰之後勤支援作爲能力[註四]；戰爭學院教育任務爲：培養軍事戰略思維與戰區用兵基本素養，具指揮三軍聯合作戰學能[註五]；管理學院戰略班教育目標：培養高階管理決策能力，以及建軍備戰策略規劃之思維邏輯，整合後勤管理，具有前瞻規劃與組織再造能力[註六]。而

註一 國防大學，陸軍學院九十五年教育計畫（桃園縣，國防大學，2005年），頁1-2。
註二 國防大學，海軍學院九十五年教育計畫（桃園縣，國防大學，2005年），頁1-2。
註三 國防大學，空軍學院九十五年教育計畫（桃園縣，國防大學，2005年），頁1-2。
註四 國防大學，管理學院指參班九十五年教育計畫（桃園縣，國防大學，2005年），頁1-2。
註五 國防大學，戰爭學院九十五年教育計畫（桃園縣，國防大學，2005年），頁1-2。
註六 國防大學，管理學院戰略班九十五年教育計畫（桃園縣，國防大學，2005年），頁1-2。

戰爭學院及管理學院戰略班須先進修完陸、海、空軍學院後才能報考，是國軍最高軍事學資。所以在校中高階軍官幹部們對自身體能更當自我要求，身體力行身先士卒以身作則爲幹部及部屬表率，成爲國軍未來優質將校。

The Army Command and Staff College produces graduates that can command troops in field operations, plan for preparedness and military build-up, execute operation plans and integrate various professional personnel. A graduate is supposed to be highly self-motivated, responsible and innovative and therefore will be qualified to assume combined arms tactical commander, or serve as O5-level chief in a brigade or division, or as a staff officer in an army or all units beyond. The Naval Command and Staff College is to prepare student officers for the jobs of O5- and O6-level command and staff officers who can make strategic plans for naval operations to suffice the need of national military strategy and joint operations. The Air Force Command and Staff College is tasked to produce middle-level officers with martial virtues and skills. The graduates will be capable of making plans for military build-up field operations, conversant in Air Force strategy and tactics, and qualified for joint operations. The Command and Staff Class of the Management College is to train selected student officers to become specialists in the management, distribution and application of defense resources. The graduates will engage in plans regarding the consolidation of individual Service's military build-up, preparedness and logistical support. The War College is to foster sophisticated military strategic thinking and basic accomplishments in theater operations. The graduates will demonstrate knowledge and capabilities required for joint operations of armed forces. The Strategic Class of the Management College is to promote high-level management and decision-making capabilities and to foster logical thinking capabilities for plans regarding military build-up and preparedness. The graduates will be able to integrate logistical management, be capable of advance planning and organization re-engineering. Only those who have finished education in the Army, Naval or Air Force Command and Staff Colleges can become applicants for admission to the War College or the Strategic Class of the Management College, which are the highest professional military education program in the ROC armed forces. Therefore, all the middle-level and high-level student officers and cadres in the National Defense University should pay more attention to their own physical strength. These promising officers should be committed to making themselves a model to be looked upon by their subordinates and soldiers.

本文就國軍現役中高階軍官戰爭學院89人、管理學院戰略班44人，陸、海、空軍學院及管理學院指參班373人，測驗1分鐘屈膝扶耳仰臥起坐、引體向上及3,000公尺徒手跑步，主要評量其上腹部及背部肌耐力、上肢肌耐力及心肺耐力，並測量其肱三頭肌及肩胛骨下緣之皮脂厚，研究其間之相關性。而體脂肪與體能成績表現又是密不可分息息相關，加上由於經濟繁榮社會變遷，國民所得提高，生活習慣的改變、生活水準的提升、物質不虞匱乏等因素所造成肥胖人口的提高，從醫學的觀點而言過多的體脂肪堆積所造成的肥胖，對身體的健康是有害，愈胖的人愈容易有脂肪肝，身體質量指數大於24者或腰圍≧90公分(男生)≧80公分(女生)，

罹患率達76%，易造成冠狀動脈硬化疾病、高血壓、糖尿病、高血脂等慢性病的風險，而且增加政府部門醫療支出並增加個人家庭負擔。肥胖或過多的體脂肪也不利於個人身體的健康亦不利於運動表現，預防方法除了控制飲食少吃油膩食物多吃青菜，另外最重要的是減重及多運動，高血壓、糖尿病、心血管疾病、中風等危險因子預防方法不外乎是減少攝取脂肪類食物、改善飲食、戒煙、避免壓力、修正生活習慣、減輕體重及良好的運動習慣。但究竟體脂肪百分比爲多少較爲適當呢？對於不同運動項目、不同種族、性別也會有不同體脂肪的規範。美國運動選手期望體脂肪百分比男生爲5~13%，女生爲12~22%，日本男運動選手體脂肪百分比爲5~10%，我國男運動選手爲8%[註七]，中國大陸空軍爲14.39%，而我國軍校學生體脂肪百分比平均爲13.0%，體脂肪介於11.8%~14.6%時其體能所表現爲最佳[註八]。對於不同運動項目、不同族群就會有不同的體脂肪百分比，雖然Huenmann[註九]（1966年）、Buskirk[註十]（1974年）與Nagamine[註十一]（1972年）等專家學者都設定體脂肪之臨界值，但其根據亦不明確，我國將男性體脂肪百分比達20%，女性達30%界定爲肥胖，行政院衛生署將BMI（身體質量指數）以18~24爲標準值，但BMI數值只能參考體重是否過重，卻無法判斷體內脂肪含量的多寡。對於國軍未來將校軍官所從事戰備訓練及裝備保修或將任高階指揮官而言，肥胖或過多的體脂肪將不利於軍人的健康與體能展現，肥胖或體重過重都不會是現代軍官身上所應展現出來的體態。

In this study, the test results of the physical strength performance of 89 student officers in the War College, 44 in the Strategic Class of the Management College, and 373 in the Army, Naval, Air Force Command and Staff Colleges and the Management College were recorded. The test items included sit-up and pull-up in one minute, and 3,000-meter running. The tests were primarily designed to assess the muscular endurance of the upper abdomen, the back, and the upper arm, and the cardio-respiratory endurance. The skinfold thickness of triceps and subscapular muscles is also measured. The results are analyzed to study the correlations in between. It has been proven that body fat is closely related to the performance of physical strength. The prosperity of economic society, the increment of national income, the change of living customs, the enhancement of living standards and the adequacy of material supply together contribute to the growth of corpulent population. From the perspectives of medical science, corpulence as a result of accumulation of excessive body fat is harmful to health. The fatter, the more likely to suffer from fatty liver. For those people whose body mass index (BMI) is over 24, or men and women whose waistline is over 90 cm and 80 cm respectively, the rate of contracting health problems is as high as 76%. They are subject to chronicle diseases such as coronary arteriosclerosis diseases, high blood pressure, diabetes and hyper-

註七 林正常，運動生理學實驗指引（臺北市，師大書苑，民國86）。

註八 謝聰頡，軍校學生體適能探討體脂肪的適當水準（臺北市立體育學院運動科學研究所碩士論文，民國90）。

註九 Haenemann, R.L., Hampton, M.C, Shapiro, L.R. and Behnke, A.R.(1960). Adolescent food practices associated with obesity. Fed. Proce. 25, p.4~10.

註十 Baskirk, E.R.(1974), Obesity: abrief overview with emphasis on exercise. Fed.Proc.33, p.1948~1951.

註十一 長嶺晉吉，皮下脂肪厚度與肥胖之判定（日本醫師會雜誌68期，1972）頁919~924。

lipidemia. The health problems not only pose a threat to the individuals, but also impose a burden on government medical spending and individual family budget alike. Furthermore, corpulence or excessive body fat is adverse to sport performance. To prevent illness associated with fatness, one has to control his diet: less fatty food and more vegetables. Most importantly, one has to lose weight and get exercise. For high blood pressure, diabetes, cardiovascular diseases and stroke, preventive measures are as follows: having less fatty food, improving dietary habit, quitting smoking, alleviating pressure, correcting living customs, losing weight and sticking to exercise habit. But how much percent body fat is appropriate? Different sports, ethnic groups and genders will lead to different body fat regulations. American male athletes expect a percent body fat of 5~13% and female athletes 12~22%. Japanese male athletes desire their percent body fat to fall in the range of 5~10%. In the Republic of China, our male athletes may want to maintain their percent body fat at 8%. The PRC Air Force expects a valeue of 14.39. Our cadets in the ROC military academies have an average percent body fat of 13.0%; when their body fat falls in the range of 11.8%～14.6%, they will have the best performance in physical strength. Different sports and ethnic groups require different percent body fat. Although some experts such as Huenmann (1966), Buskirk (1974) and Nagamine (1972) set up critical values for body fat, they did not provide conclusive grounds for the figures. In Taiwan, a man is categorized as corpulent if his percent body fat reaches or exceeds 20%, while a woman is corpulent if her percent body fat reaches or exceeds 30%. The ROC Department of Health sets 18~24 as standard body mass index (BMI). However, BMI figure can only serve as a reference to over weight of the body; it cannot provide information about the amount of fat contained in the body. Many student officers on the campus of the NDU will be promoted to O6s, O7s and all ranks beyond; they will be in charge of military preparedness, training, maintenance or even assume commanders of combatant troops. For these promising offices, corpulence or excessive body fat is neither suitable for their appearance nor beneficial to their physical health and strength.

二、研究目的

㈠由國防大學戰爭學院、陸軍學院、海軍學院、空軍學院及管理學院戰略班、指參班中了解基礎教育（大學）畢業任初官至各基層部隊服務10餘年後考取深造教育，其中高階軍官體能與體脂肪百分比分布情形。

㈡研究學官目前體能狀況並提出適當體脂肪百分比，做爲學官自我健康管理參考指標。

(2)Research Goals

A.To explore the performance of physical strength and the distribution of percent body fat of student officers who have graduated from the academies for more than ten years and are currently undergoing advanced education in the Army, Naval, Air Force Command and Staff Colleges, War College, and the Management College.

B.To explore current physical strength performance of the student officers and make recommendations about appropriate percent body fat as a reference for self-health management.

三、研究範圍與限制

㈠研究範圍

本研究以95年國防大學深造教育學官合計506人爲研究範圍。

㈡研究限制

本研究採普測取樣，僅適合本校深造教育學官，且僅測驗三項體適能（依國防部82年體能測驗實施綱要）。

(3)Scope and Limitations of the Study

A. Scope of the study: This study investigates the 506 student officers undergoing professional military education in the National Defense University.

B. Limitations of the Study: This study adopts general sampling; besides, only 3 items of physical fitness are conducted (in accordance with the 2003 Ministry of National Defense Outlines for the Tests of Physical Fitness).

四、名詞解釋

㈠深造教育班隊：指國防大學所屬包括戰爭學院、陸軍學院、海軍學院、空軍學院、管理學院戰略班及管理學院指參班等軍事教育班隊。

㈡體脂肪百分比(%fat)：指一個人身體脂肪的重量在全身所占的百分比。

㈢體適能：指適應人類生存和活動的基本能力。

㈣皮脂厚：皮下脂肪組織之厚度，旨在了解體脂肪的百分比。

(4)Glossary

A.Advanced education classes: The classes run by the War College, the Army, Naval, Air Force Command and Staff Colleges, and the Strategic Class and the Command and Staff Class of the Management College.

B.Percent body fat (% fat): Term used in body composition assessment; it indicates the percentage of the amount of fat in the body based on the total weight of a person.

C.Physical fitness: The basic capacity to favorably adapt to human existence and activities.

D.Skinfold thickness: The thickness of subcutaneous fat tissue (subcutis), useful in assessing percent body fat.

貳、研究方法

一、研究對象

以95年班戰爭學院男生89人、管理學院戰略班44人、陸軍學院158人、海軍學院90人、空軍學院66人及管理學院指參班59人爲研究對象。

2.Research Methodology

(1)Target of the Study

Participants in the survey include 89 student officers in the War College, 44 in the Strategic Class of the Management College, 158 in the Army Command and Staff College, 90 in the Naval Command and Staff College, 66 in the Air Force Command and Staff College, and 59 in the Command and Staff Class of the Management College.

二、研究時間及地點

本研究於中華民國95年3月9日至4月26日，假國防大學校本部及管理學院中山室及運動場實施。

(2)Time and Place of the Study

The survey was conducted on the main campus of the National Defense University and in the Daily Room and the sports field of the Management College from March 9 to April 26, 2006.

三、測驗方法

㈠介紹說明研究內容及一般規則並調查出生年月日。

㈡測量身高體重及皮脂厚（測量肱三頭

肌及肩胛骨下緣，同一位置測量3次取其平均值）

㈢測量器材

1.身高體重器：採用King fee scale牌，身高量距範圍爲0~200cm，最小精確值爲0.1cm；體重量距範圍爲0~100kg，最小精確值爲0.1kg。

2.皮脂夾：採用Lange Skinfold Caliper皮下脂肪測量器Beta標準型，量距範圍爲0~67mm，最小精確值爲1mm。

㈣體能測驗

1.男生1分鐘引體向上

⑴測驗目的：評量上肢肌力及肌耐力。

⑵動作要領：正握單槓，雙手伸直腳不可與地面接觸，引體向上至下巴超過橫槓，回復原姿勢身體，不可以擺振或踢（蹬）腳。

2.1分鐘屈膝扶耳仰臥起坐

⑴測驗目的：評量腹部肌耐力。

⑵動作要領：平躺、屈膝角度部大於90度、兩腳張開最大30公分，腳掌平貼地面由助理人員緊握足踝部位，雙手扶耳雙肘觸膝雙肩觸地爲1次，計算1分鐘內正確動作之次數爲其成績。

3.徒手跑步（男生3,000公尺）

⑴測驗目的：評量心肺耐力。

⑵動作要領：於堅實平坦地面進行，依個人能力在最短時間內跑完全程，並計算其成績。

(3)Survey method

A.Introduce and explain the contents of study, general rules and take down the birthdays of the participants.

B.Measure the height, weight and skinfold thickness (by measuring the skinfold thickness of triceps and subscapular muscles 3 times and finding the average reading.)

C.Measuring equipment

a.Height and weight scale: King Fee Scale is used to measure height ranging from 0 to 200 cm and weight ranging from 0 to 100 kg.

b.Skinfold caliper: Lange Skinfold Caliper (subcutaneous fat measurer, Beta mode) is used to measure subcutaneous fat ranging from 0 to 67mm.

D.Physical tests

a.Pull-up in 1 minute (for male)

(A)Test purpose: To assess the muscular strength and endurance of the upper arm.

(B)Instructions: Both hands grab the bar frontwards; straighten both arms and keep both legs above the ground. Pull the body up until the chin passes the bar. Then restore to the original posture. Neither body shaking nor legs kicking is allowed.

b.Sit-up in 1 minute

(A)Test purpose: To assess the muscular endurance of the abdomen.

(B)Instructions: Lie down horizontally. Bend the knees more than 90 degrees. Spread the legs no more than 30 cm. Bottoms of both feet stick to the ground flatly. Both hands hold the ears. An assistant grabs the ankle of the testee. When sitting up, the testee has to touch the knees with his elbows; his shoulders have to touch the ground when lying down. Calculate the number of valid cycles completed by the testee in one minute.

c.3000-meter running (for male)

(A)Test purpose: To assess cardio-respiratory endurance.

(B)Instructions: Running is conducted on hard and flat ground. The testee runs as quick-

ly as he can. Take down the time the runner spends to finish 3000-meter running and calculate the score accordingly.

四、資料處理：以SPSS9.0套裝軟體運用處理分析資料

㈠以敘述統計求出體脂肪百分比的次數分配圖。

㈡求出三項體能的平均數和標準差。

㈢體脂肪百分比＝（4.57÷體密度－4.142）×100（Brozet的公式）由日本學者Nagamine Shinkichi公式求出體密度，皮脂厚對照表如附表一。

(4)Data processing: The result is analyzed with statistics software SPSS 9.0.

A.Draw charts to illustrate the count distribution of percent body fat.

B.Find out the mean and the standard deviation of the 3 physical tests.

C. Percent body fat = (4.57 ÷ body density －4.142)×100 (Brozet's formula). Body density is calculated in accordance with the formula developed by Japanese scholar Nagamine Shinkichi; see table 1 for the contrast table of skinfold thickness.

表一　皮脂厚對照表（肱三頭肌+肩胛骨下緣皮脂肪厚度：摘取長領）

皮脂厚(mm)	6	7	8	9	10	11	12	13	14
男性(%)	7.3	7.7	8.2	8.6	9.1	9.5	10.0	10.4	10.9
女性(%)	8.3	8.8	9.3	9.8	10.4	10.9	11.4	11.9	12.5
皮脂厚(mm)	15	16	17	18	19	20	21	22	23
男性(%)	11.4	11.8	12.3	12.7	13.2	13.7	14.1	14.6	15.1
女性(%)	13.0	13.5	14.1	14.6	15.1	15.7	16.2	16.8	17.3
皮脂厚(mm)	24	25	26	27	28	29	30	31	32
男性(%)	15.5	16.0	16.5	16.9	17.4	17.9	18.4	18.8	19.3
女性(%)	17.8	18.4	18.9	19.5	20.0	20.6	21.1	21.7	22.2
皮脂厚(mm)	33	34	35	36	37	38	39	40	41
男性(%)	19.8	20.3	20.7	21.2	21.7	22.2	22.7	23.2	23.6
女性(%)	22.8	23.3	23.9	24.0	25.0	25.6	26.1	26.7	27.3
皮脂厚(mm)	42	43	44	45	46	47	48	49	50
男性(%)	24.1	24.6	25.1	25.6	26.1	26.6	27.1	27.6	28.1
女性(%)	27.8	28.4	29.0	29.6	30.1	30.7	31.3	31.9	32.4

Table 1　Skinfold thickness (skinfold thickness of triceps and subscapular muscles: source: Nagamine)

skinfold thickness (mm)	6	7	8	9	10	11	12	13	14
male (%)	7.3	7.7	8.2	8.6	9.1	9.5	10.0	10.4	10.9
female (%)	8.3	8.8	9.3	9.8	10.4	10.9	11.4	11.9	12.5
skinfold thickness (mm)	15	16	17	18	19	20	21	22	23
male (%)	11.4	11.8	12.3	12.7	13.2	13.7	14.1	14.6	15.1
female (%)	13.0	13.5	14.1	14.6	15.1	15.7	16.2	16.8	17.3
skinfold thickness (mm)	24	25	26	27	28	29	30	31	32
male (%)	15.5	16.0	16.5	16.9	17.4	17.9	18.4	18.8	19.3
female (%)	17.8	18.4	18.9	19.5	20.0	20.6	21.1	21.7	22.2
skinfold thickness (mm)	33	34	35	36	37	38	39	40	41
male (%)	19.8	20.3	20.7	21.2	21.7	22.2	22.7	23.2	23.6
female (%)	22.8	23.3	23.9	24.0	25.0	25.6	26.1	26.7	27.3
skinfold thickness (mm)	42	43	44	45	46	47	48	49	50
male (%)	24.1	24.6	25.1	25.6	26.1	26.6	27.1	27.6	28.1
female (%)	27.8	28.4	29.0	29.6	30.1	30.7	31.3	31.9	32.4

參、結果與討論

一、各院測驗基本資料

㈠戰爭學院

表二　戰爭學院基本資料表(N=89)

變項	最小值	最大值	平均數	標準差
身高	160	192	172.2	5.7
體重	55	90	73.4	7.6
年齡	36	47	40.3	2.4
BMI	19.3	30.5	24.7	2.3
引體向上	0	14	4.2	2.9
仰臥起坐	25	57	35.8	7
3,000公尺跑步	772秒	1,228秒	956.9秒	86.7秒
體脂肪%	8.6	23.2	14.5	2.4

由表二中得知所測驗（量）戰爭學院89人的平均身高172.2±5.7公分、體重平均73.4±7.6公斤、年齡平均40.3±2.4歲、BMI平均24.7±2.3、引體向上平均4.2±2.9次、

仰臥起坐平均35.8±7次、3,000公尺徒手跑步平均956.9±86.7秒、體脂肪平均14.5±2.4%。

3.Result and discussion

(1)Physical Test Results of the Colleges

A.The War College

Table 2 Test Results of the War College (N=89)

Items	Min	Max	Mean	Standard Deviation
Height	160	192	172.2	5.7
Weight	55	90	73.4	7.6
Age	36	47	40.3	2.4
BMI	19.3	30.5	24.7	2.3
pull-up	0	14	4.2	2.9
sit-up	25	57	35.8	7
3000-meter running	772 seconds	1,228 seconds	956.9 seconds	86.7 seconds
body fat%	8.6	23.2	14.5	2.4

Table 2 shows that of the 89 participants in the War College, the average height is 172.2±5.7 cm, average weight 73.4±7.6 kg, average age 40.3±2.4 years old, average BMI 24.7±2.3, average pull-up 4.2±2.9 times, average sit-up 35.8±7 times, average time spent for 3000-meter running 956.9±86.7 seconds, average body fat 14.5±2.4%.

㈡管理學院戰略班

表三 管理學院戰略班基本資料表(N=44)

變項	最小值	最大值	平均數	標準差
身高	161	186	171.3	5.7
體重	57	95	72.3	8.1
年齡	35	46	41.1	2.7
BMI	18.6	31.5	24.5	2.5
引體向上	2	18	6.5	2.8
仰臥起坐	29	50	35.9	4.8
3,000公尺跑步	812秒	1,162秒	951.9秒	74.5秒
體脂肪%	9.5	17.9	13.6	2.0

由表三中得知所測驗（量）管理學院戰略班44人的平均身高171.3±5.7公分、體重平均72.3±8.1公斤、年齡平均41.1±2.7歲、BMI平均24.5±2.5、引體向上平均6.5±2.8次、仰臥起坐平均35.9±4.8次、3,000公尺徒手跑步平均951.9±74.5秒、體脂肪平均13.6±2.0%。

B.The Strategic Class of the Management College

Table 3 Test Results of the Management College (N=44)

Items	Min	Max	Mean	Standard Deviation
Height	161	186	171.3	5.7
Weight	57	95	72.3	8.1
Age	35	46	41.1	2.7
BMI	18.6	31.5	24.5	2.5
pull-up	2	18	6.5	2.8
sit-up	29	50	35.9	4.8
3000-meter running	812 seconds	1,162 seconds	951.9 seconds	74.5 seconds
body fat%	9.5	17.9	13.6	2.0

Table 3 shows that of the 44 participants in the Strategic Class of the Management College, the average height is 171.3±5.7 cm, average weight 72.3±8.1 kg, average age 41.1±2.7 years old, average BMI 24.5±2.5, average pull-up 6.5±2.8 times, average sit-up 35.9±4.8 times, average time spent for 3000-meter running 951.9±74.5 seconds, average body fat 13.6±2.0%.

㈢陸軍學院

表四 陸軍學院基本資料表(N=158)

變項	最小值	最大值	平均數	標準差
身高	160	185	172.4	5.4
體重	55	102	73.8	9.6
年齡	29	49	33	2.4
BMI	18.8	32.5	24.8	2.8
引體向上	0	15	5.1	2.9
仰臥起坐	27	59	36.9	5.8
3,000公尺跑步	737秒	1,137秒	916.6秒	69.3秒
體脂肪%	8.6	21.7	14.1	2.6

由表四中得知所測驗（量）陸軍學院158人的平均身高172.4±5.4公分、體重平均73.8±9.6公斤、年齡平均33±2.4歲、BMI平均24.8±2.8、引體向上平均5.1±2.9次、仰臥起坐平均36.9±5.8次、3,000公尺徒手跑步平均916.6±69.3秒、體脂肪平均14.1±2.6%。

C.The Army Command and Staff College

Table 4 Test Results of the Army Command and Staff College (N=158)

Items	Min	Max	Mean	Standard Deviation
Height	160	185	172.4	5.4
Weight	55	102	73.8	9.6
Age	29	49	33	2.4
BMI	18.8	32.5	24.8	2.8
pull-up	0	15	5.1	2.9
sit-up	27	59	36.9	5.8
3000-meter running	737 seconds	1,137 seconds	916.6 seconds	69.3 seconds
body fat%	8.6	21.7	14.1	2.6

Table 4 shows that of the 158 participants in the Army Command and Staff College, the average height is 172.4±5.4 cm, average weight 73.8±9.6 kg, average age 33±2.4 years old, average BMI 24.8±2.8, average pull-up 5.1±2.9 times, average sit-up 36.9±5.8 times, average time spent for 3,000-meter running 916.6±69.3 seconds, average body fat 14.1±2.6%.

㈣海軍學院

表五 海軍學院基本資料表(N=90)

變　項	最小值	最大值	平均數	標準差
身高	160	187	171.8	5.7
體重	56	105	73.4	9.5
年齡	31	38	33.9	1.5
BMI	19.2	32	24.8	2.6
引體向上	0	15	4.7	3.2
仰臥起坐	28	60	40.4	7.2
3,000公尺跑步	743秒	1,152秒	928秒	73.5秒
體脂肪%	9.1	20.3	14.9	2.2

由表五中得知所測驗（量）海軍學院90人的平均身高171.8±5.7公分、體重平均73.4±9.5公斤、年齡平均33.9±1.5歲、BMI平均24.8±2.6、引體向上平均4.7±3.2次、仰臥起坐平均40.4±7.2次、3,000公尺徒手跑步平均928±73.5秒、體脂肪平均14.9±2.2%。

D.The Naval Command and Staff College

Table 5 Test Results of the Naval Command and Staff College (N=90)

Items	Min	Max	Mean	Standard Deviation
Height	160	187	171.8	5.7
Weight	56	105	73.4	9.5
Age	31	38	33.9	1.5
BMI	19.2	32	24.8	2.6
pull-up	0	15	4.7	3.2
sit-up	28	60	40.4	7.2
3000-meter running	743 seconds	1,152 seconds	928 seconds	73.5 seconds
body fat%	9.1	20.3	14.9	2.2

Table 4 shows that of the 90 participants in the Naval Command and Staff College, the average height is 171.8±5.7 cm, average weight 73.4±9.5 kg, average age 33.9±1.5 years old, average BMI 24.8±2.6, average pull-up 4.7±3.2 times, average sit-up 40.4±7.2 times, average time spent for 3,000-meter running 928±73.5 seconds, average body fat 14.9±2.2%.

㈤空軍學院

表六 空軍學院基本資料表(N=66)

變　項	最小值	最大值	平均數	標準差
身高	165	183	173.6	4.3
體重	60	95	74.8	7.8
年齡	31	38	35	1.6
BMI	19.1	30	24.8	2.2
引體向上	0	15	4	3
仰臥起坐	15	58	36.8	7
3,000公尺跑步	766秒	1,141秒	964.9秒	76.1秒
體脂肪%	9.5	18.4	13.8	2

由表六中得知所測驗（量）空軍學院66人的平均身高173.6±4.3公分、體重平均74.8±7.8公斤、年齡平均35±1.6歲、BMI平均24.8±2.2、引體向上平均4±3次、仰臥起坐平均36.8±7次、3,000公尺徒手跑步平均964.9±76.1秒、體脂肪平均13.8±2%。

E.The Air Force Command and Staff College

Table 6　Test Results of the Air Force Command and Staff College (N=66)

Items	Min	Max	Mean	Standard Deviation
Height	165	183	173.6	4.3
Weight	60	95	74.8	7.8
Age	31	38	35	1.6
BMI	19.1	30	24.8	2.2
pull-up	0	15	4	3
sit-up	15	58	36.8	7
3000-meter running	766 seconds	1,141 seconds	964.9 seconds	76.1 seconds
body fat%	9.5	18.4	13.8	2

Table 6 shows that of the 66 participants in the Air Force Command and Staff College, the average height is 173.6±4.3 cm, average weight 74.8±7.8 kg, average age 35±1.6 years old, average BMI 24.8±2.2, average pull-up 4±3 times, average sit-up 36.8±7 times, average time spent for 3,000-meter running 964.9±76.1 seconds, average body fat 13.8±2%.

㈥管理學院指參班

表七　管理學院指參班基本資料表(N=59)

變　項	最小值	最大值	平均數	標準差
身高	163	184	173.3	5.1
體重	57	98	75.1	8.8
年齡	31	43	36.5	3
BMI	18.6	30.1	24.9	2.4
引體向上	3	19	8.2	3.6
仰臥起坐	26	64	39.4	7.3
3,000公尺跑步	748秒	1,063秒	935.4秒	72.2秒
體脂肪%	9.5	17.4	13.4	1.9

由表七中得知所測驗（量）管理學院指參班59人的平均身高173.3±5.1公分、體重平均75.1±8.8公斤、年齡平均36.5±3歲、BMI平均24.9±2.4、引體向上平均8.2±3.6次、仰臥起坐平均39.4±7.3次、3,000公尺徒手跑步平均935.4±72.2秒、體脂肪平均13.4±1.9%。

F.The Command and Staff Class of the Management College

Table 7　Test Results of the Command and Staff Class of the Management College (N=59)

Items	Min	Max	Mean	Standard Deviation
Height	163	184	173.3	5.1
Weight	57	98	75.1	8.8
Age	31	43	36.5	3
BMI	18.6	30.1	24.9	2.4
pull-up	3	19	8.2	3.6
sit-up	26	64	39.4	7.3
3000-meter running	748 seconds	1063 seconds	935.4 seconds	72.2 seconds
body fat%	9.5	17.4	13.4	1.9

Table 7 shows that of the 59 participants of the Command and Staff Class of the Management College, the average height is 173.3±5.1 cm, average weight 75.1±8.8 kg, average age 36.5±3 years old, average BMI 24.9±2.4, average pull-up 8.2±3.6 times, average sit-up 39.4±7.3 times, average time spent for 3,000-meter running 935.4±72.2 seconds, average body fat 13.4±1.9%.

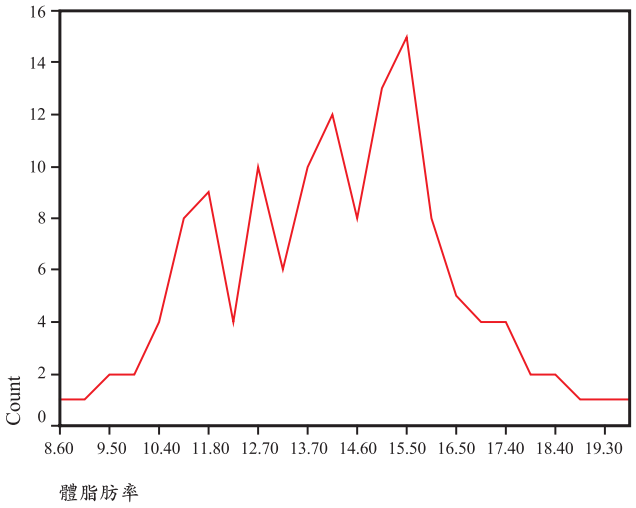
二、體脂肪分配情形

㈠以國防大學召訓對象爲區分：圖一爲戰爭學院及管理學院戰略班受試者體脂肪百分比的次數分配圖，由次數分配圖分析體脂肪分布較爲散亂，但大部份體脂肪集中於10.4~16.5%。

(2)Distribution of Body Fat

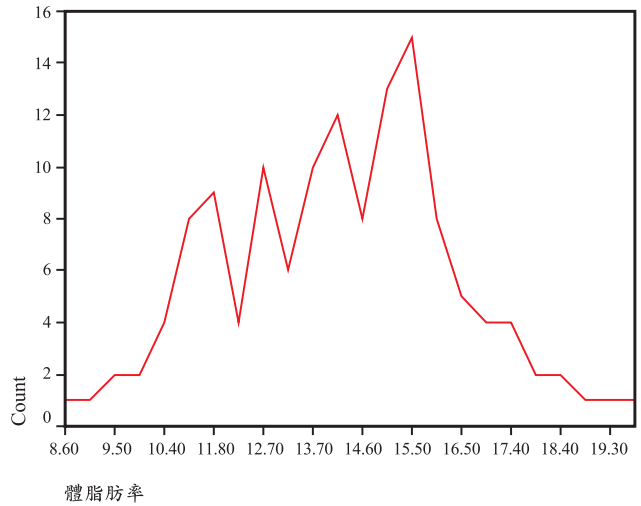
A.The participants are divided into two

圖一　戰爭學院及管理學院戰略班全體體脂肪百分比次數分配圖



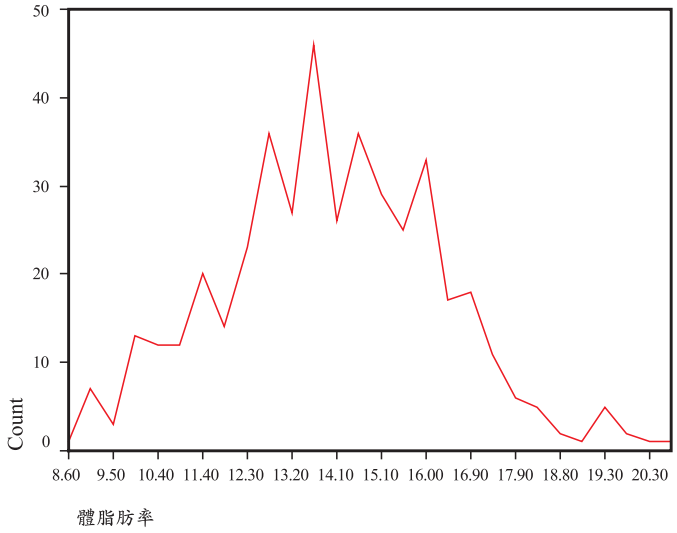
groups. Chart I shows the count distribution of percent body fat of the participants undergoing advanced education in the War College and in the Strategic Class of the Management College. The chart reveals that the distribution of body fat is fairly desultory. However, body fat primarily falls between 10.4~16.5%.

Chart 1　Count distribution of percent body fat of all advanced-education-level participants in the War College and in the Strategic Class of the Management College.



㈡圖二爲陸、海、空軍學院及管理學院指參班受試者體脂肪百分比的次數分配圖，

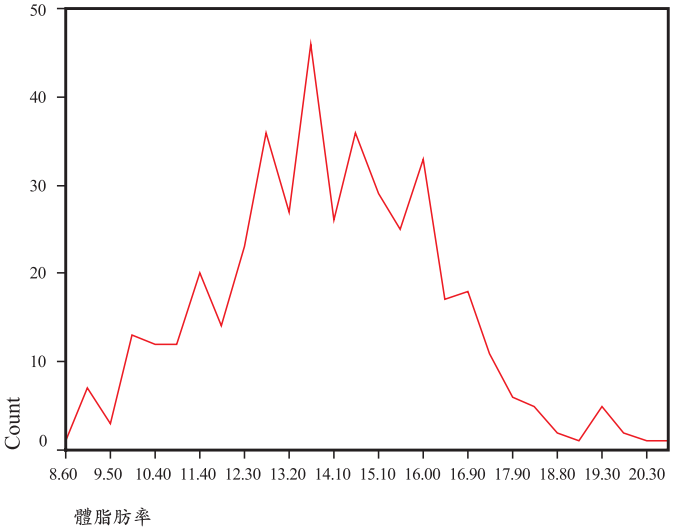
圖二　陸、海、空軍學院及管理學院指參班全體體脂肪百分比次數分配圖



大部分體脂肪集中於12.3~16%。

B.Chart 2 shows the count distribution of percent body fat of the participants undergoing education in the Army, Naval, Air Force Command and Staff Colleges and in the Command and Staff Class of the Management College. The chart reveals that the participants' body fat primarily falls between 12.3~16%.

Chart 2　Count distribution of percent body fat of all participants in the Army, Naval, Air Force Command and Staff Colleges and in the Command and Staff Class of the Management College.



三、戰爭學院及管理學院戰略班體脂肪與三項體能之相關性

表八　戰爭學院及管理學院戰略班體脂肪百分比與體能之相關係數表

變　　項	個數	相關係數
引體向上	133	-.393**
仰臥起坐	133	-.048
3,000公尺跑步	133	.32**
體脂肪%		
**P<0.01		

由表八戰爭學院及管理學院戰略班男生中得知體脂肪百分比與引體向上之相關係數爲r＝-.393達顯著差異且呈負相關(P<0.01)，表示體脂肪大者其引體向上所做的次數愈少，成績較差；體脂肪百分比與仰臥起坐之相關係數爲r＝-.048雖未達顯著水準但呈負相關，表示體脂肪大者其仰臥起坐所做的次數愈少；體脂肪百分比與3,000公尺徒手跑步之間相關係數爲r＝.32達顯著差異呈現正相關(P<0.01)，表示體脂肪百分比大者其3,000公尺跑步秒數愈多，成績愈差。

(3)The Correlation between Physical Performance (of 3 tests) and Body Fat of participants undergoing advanced education in the War College and in the Strategic Class of the Management College

Table 8　Correlation Coefficient between Physical Performance and Body Fat of participants undergoing advanced education in the War College and in the Strategic Class of the Management College

Items	Number	Correlation Coefficient
pull-up	133	-.393**
sit-up	133	-.048
3000-meter running	133	.32**
body fat%		
**P<0.01		

According to Table 8, the correlation coefficient between percent body fat and pull-up is -.393, which indicates both a conspicuous difference and a negative correlation (P<0.01), indicating the more the body fat, the fewer the pull-ups and the less the score. The correlation coefficient between percent body fat and sit-up is -.048, which does not indicate a conspicuous difference but still represents a negative correlation, meaning the more the body fat, the fewer the sit-ups and the worse the score. The correlation coefficient between percent body fat and 3,000-meter running is .32, which indicates both a conspicuous difference and a positive correlation, meaning that the higher the percent body fat, the longer it takes to finish 3,000-meter running and the worse the performance.

四、陸、海、空軍學院及管理學院指參班體脂肪與三項體能之相關性

表九　陸、海、空軍院及管理學院指參班體脂肪百分比與體能之相關係數表

變　　項	個數	相關係數
引體向上	432	-.369**
仰臥起坐	432	-.132**
3,000公尺跑步	432	.289**
體脂肪%		
**P<0.01		

由表九陸、海、空軍學院及管理學院指參班男生中得知體脂肪百分比與引體向上之相關係數爲r＝-.369達顯著差異且呈負相關，表示體脂肪大者其引體向上所做的次數愈少，成績較差；體脂肪百分比與仰臥起坐之相關係數爲r＝-.132達顯著差異且呈負相關，仍表示體脂肪大者其仰臥起坐所做的次數愈少；體脂肪百分比與3,000公尺徒手跑步之間相關係數爲r＝.289亦達顯著差異呈現正相關(P<0.01)，表示體脂肪百分比大者其3,000公尺跑步秒數愈多，成績愈差。

(4)The Correlation between Physical Performance (of 3 tests) and Body Fat of partici-

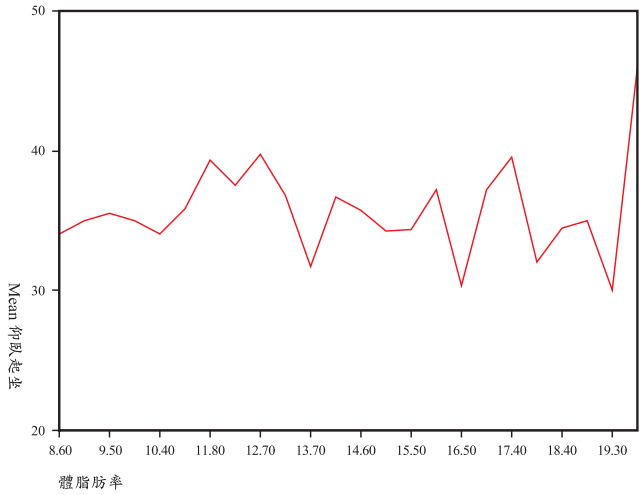
pants undergoing education in the Army, Naval, Air Force Command and Staff Colleges and in the Command and Staff Class of the Management College

Table 9 Correlation Coefficient between Physical Performance and Body Fat of participants undergoing education in the Army, Naval, Air Force Command and Staff Colleges and in the Command and Staff Class of the Management College

Items	Number	Correlation Coefficient
pull-up	432	-.369**
sit-up	432	-.132**
3000-meter running	432	.289**
body fat%		
**P<0.01		

According to Table 9, the correlation coefficient between percent body fat and pull-up is -.369, which indicates both a conspicuous difference and a negative correlation (P<0.01), indicating the more the body fat, the fewer the pull-ups and the less the score. The correlation coefficient between percent body fat and sit-up is -.132, which indicates both a conspicuous difference and a negative correlation, meaning the more the body fat, the fewer the sit-ups and the worse the score. The correlation coefficient between percent body fat and 3,000-meter running is .289, which indicates both a conspicuous difference and a positive correlation (P<0.01), meaning that the higher the percent body fat, the longer it takes to finish 3,000-meter running and the worse the performance.

圖三 戰爭學院及管理學院戰略班體脂肪百分比與仰臥起坐相關圖



五、體脂肪與體能表現之關係

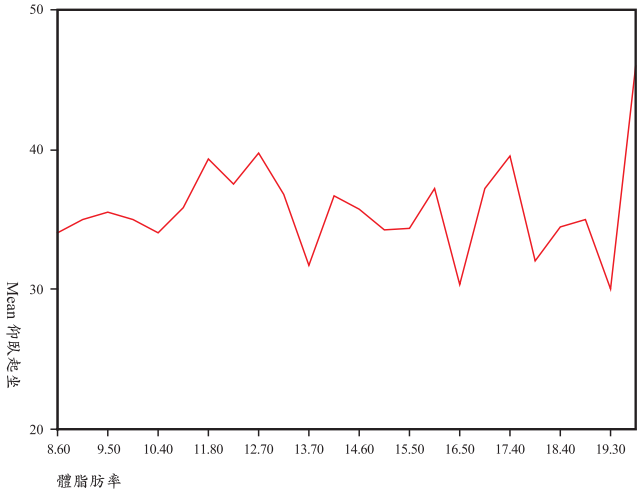
㈠戰爭學院及管理學院戰略班體能表現與體脂肪相關圖

圖三爲戰爭學院及管理學院戰略班體脂肪百分比10.4~12.7%之間仰臥起坐表現較好高於平均數35.9次，16.5%及19.3%圖中亦高於平均數，整體而言仰臥起坐與體脂肪的多寡影響較不明顯。

(5)The Relationship between body fat and physical performance

A.The Correlation between physical performance and body fat for War College and the Strategic Class of the Management College

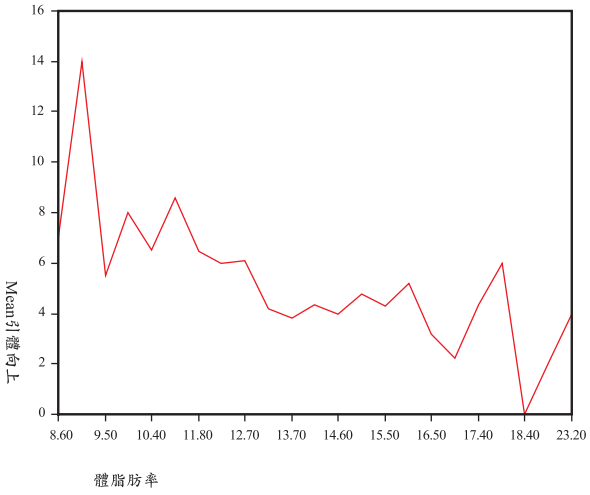
Chart 3 The Correlation between percent body fat and sit-up for the War College and the Strategic Class of the Management College.



According to Chart 3, among the student officers in the War College and the Strategic Class of the Management College, participants with percent body fat ranging between 10.4% and

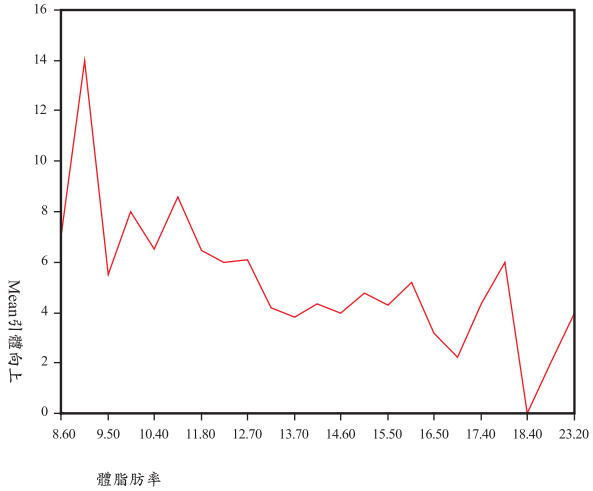
12.7% perform better in sit-up than average 35.9 times. The participants with percent body fat ranging between 16.5% and 19.3% also do better than average. As a whole, the amount of body fat does not have remarkable influence upon the performance in sit-up.

圖四　戰爭學院及管理學院戰略班體脂肪百分比與引體向上相關圖



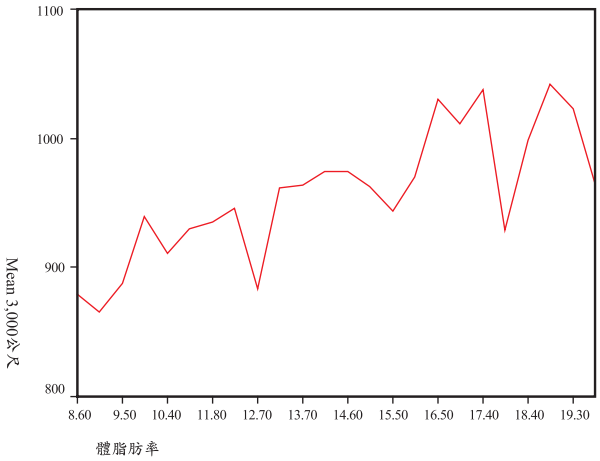
圖四爲戰爭學院及管理學院戰略班體脂肪百分比8.6~12.7%之間引體向上表現較好高於平均數5.4次，體脂肪高於12.7%以上時引體向上明顯下降。

Chart 4　The Correlation between percent body fat and pull-up for the War College and the Strategic Class of the Management College



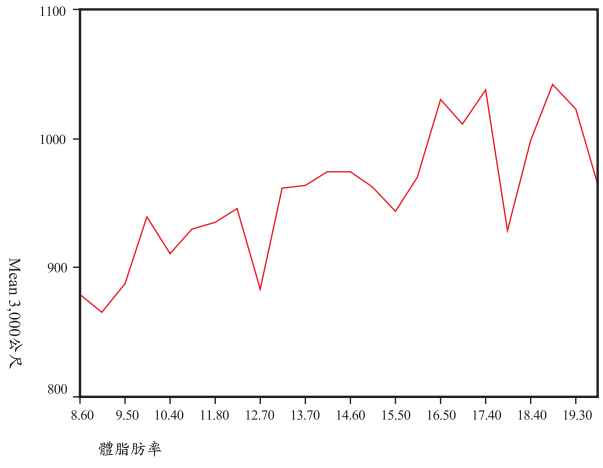
According to Chart 4, among the student officers in the War College and the Strategic Class of the Management College, participants with percent body fat falling between 8.6% and 12.7% perform better in pull-up than average 5.4 times. If body fat exceeds 12.7%, the performance in pull-up drops remarkably.

圖五　戰爭學院及管理學院戰略班體脂肪百分比與3000公尺跑步相關圖



圖五爲戰爭學院及管理學院戰略班體脂肪百分比8.6~14.6%之間3,000公尺跑步低於平均數954.4秒，體脂肪百分比16.5%以上時3,000公尺跑步表現明顯成績較差。

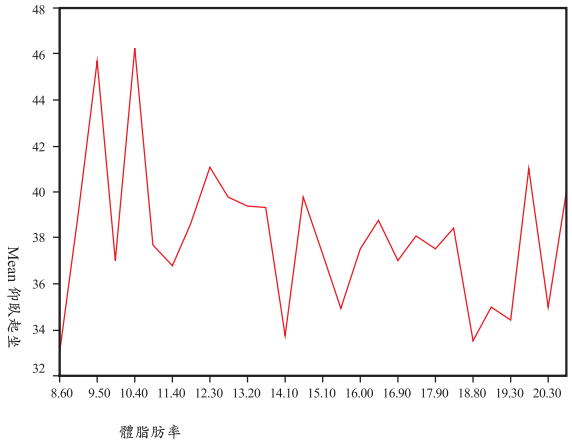
Chart 5　The Correlation between percent body fat and 3,000-meter running for the War College and the Strategic Class of the Management College



According to Chart 5, among the student officers in the War College and the Strategic Class of the Management College, participants with percent body fat falling between 8.6% and 14.6% perform better in 3,000-meter running than average 954.4 seconds. If percent body fat exceeds 16.5%, the performance in 3,000-meter running drops significantly.

㈡陸、海、空軍學院及管理學院指參班體能表現與體脂肪相關圖

圖六　陸、海、空軍學院及管理學院指參班體脂肪百分比與仰臥起坐相關

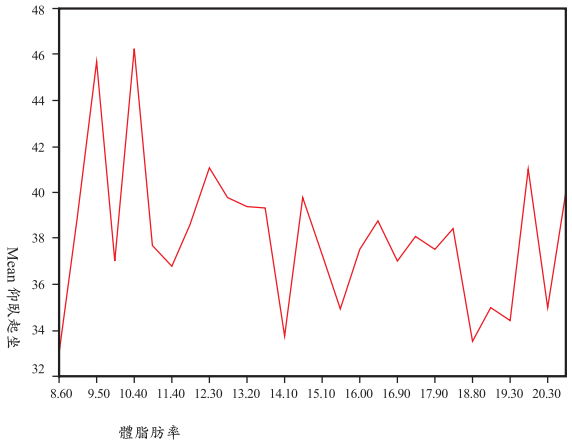


圖六爲陸、海、空軍學院及管理學院指參班體脂肪百分比9.5、10.4~13.2%之間仰臥起坐表現較好高於平均數37.9次，但其分部較爲散亂，其影響較不明顯。

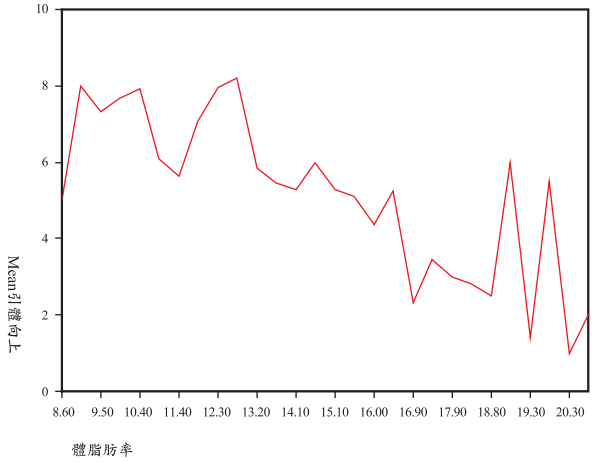
B.The Correlation between physical performance and body fat for the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College

According to Chart 6, among the student officers in the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College, participants with percent body fat of 9.5% and between 10.4% and 13.2% perform better in sit-up than average 37.9 times. However, the distribution is fairly desultory; there is no significant influence of body fat upon sit-up.

Chart 6　The Correlation between percent body fat and sit-up for the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College



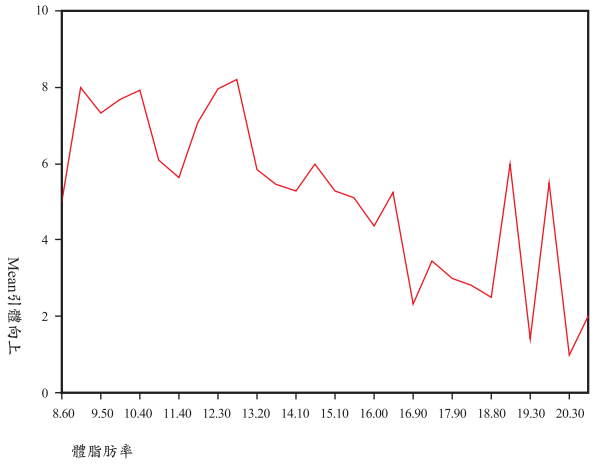
圖七　陸、海、空軍學院及管理學院指參班脂肪百分比與引體向上相關圖



圖七爲陸、海、空軍學院及管理學院指參班體脂肪百分比8.6~15.1%之間引體向上表現較好高於平均數4.8次，但體脂肪百分比13.2%以上則明顯呈現下降趨勢，顯見體脂肪百分比越高者越不利上肢肌耐力發揮。

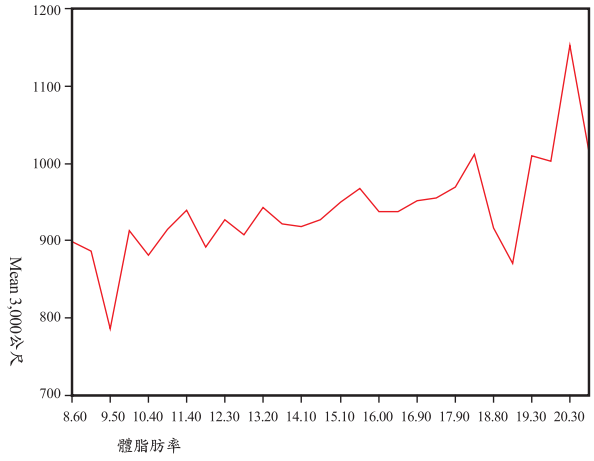
According to Chart 7, among the student officers in the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College, participants

Chart 7 The Correlation between percent body fat and pull-up for the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College



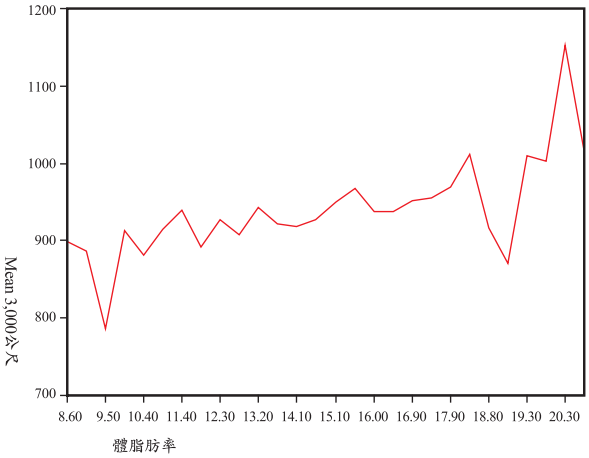
with percent body fat falling between 8.6% and 15.1% perform better in pull-up than average 4.8 times. However, if percent body fat exceeds 13.2, the performance declines significantly. Obviously, the higher the percent body fat, the more adverse it is to the muscular endurance of the upper arm.

圖八 陸、海、空軍學院及管理學院指參班脂肪百分比與3,000公尺跑步相關圖



圖八爲陸、海、空軍學院及管理學院指參班體脂肪百分比8.6~14.1%之間3,000公尺跑步表現較好低於平均數929.7秒，體脂肪百分比19.3%以上則明顯變差，顯見體脂肪百分比越高者不利心肺耐力的發揮。

Chart 8 The Correlation between percent body fat and 3,000-meter running for the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College



According to Chart 8, among the student officers in the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College, participants with percent body fat falling between 8.6% and 14.1% perform better in 3,000-meter running than average 929.7 seconds. However, if percent body fat exceeds 19.3%, the performance declines significantly. Obviously, the higher the percent body fat, the more adverse it is to cardio-respiratory endurance.

肆、結論與建議

一、結論

4.Conclusion and Recommendations

(1)Conclusion

㈠95年戰爭學院及管理學院戰略班體脂肪百分比大部分集中在10.4~16.5%之間，陸、海、空軍學院及管理學院指參班體脂肪百分比大部分集中於12.3~16%。

A.The percent body fat of the student officers in the War College and the Strategic Class of the Management College primarily falls between 10.4~16.5%. For those studying in the Army, Naval, Air Force Command and Staff Colleges and in the Command and Staff Class of the Management College, their percent body fat primarily falls between 12.3 and 16%.

㈡戰爭學院及管理學院戰略班體脂肪百分比10.4~17.4%之間仰臥起坐表現較好高於平均數；體脂肪百分比少於14.4%引體向上表現較好且高於平均數；體脂肪百分比8.6~14.6%之間3,000公尺跑步低於平均數。體脂肪百分比16.5%以上時3,000公尺跑步表現明顯成績較差。

B.Among the student officers in the War College and the Strategic Class of the Management College, participants with percent body fat between 10.4% and 17.4% perform better in sit-up than average; those with percent body fat below 14.4% perform better in pull-up than average; those between 8.6% and 14.6% perform better in 3,000-meter running than average. If percent body fat exceeds 16.5%, the performance in 3,000-meter running drops significantly.

㈢陸、海、空軍學院及管理學院指參班體脂肪百分比9.5~13.2%之間仰臥起坐表現較好高於平均數，但其分布較爲散亂，體脂肪對於仰臥起坐之運動表現影響較不明顯；但體脂肪百分比8.6~15.1%之間引體向上表現較好高於平均數，體脂肪百分比13.2%以上時則呈現下降趨勢，顯見體脂肪百分比越高者越不利上肢肌耐力發揮；體脂肪百分比8.6~14.1%之間3,000公尺跑步表現較好且低於平均數，而體脂肪百分比19.3%以上則明顯變差，顯見體脂肪百分比越高者不利心肺耐力的發揮。

C.Among the student officers in the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College, participants with body fat between 9.5% and 13.2% perform better in sit-up than average. Yet the distribution is somewhat irregular; that is, body fat does not have remarkable influence upon the participant's performance in sit-up. But, participants with body fat between 8.6% and 15.1% perform better in pull-up than average; if percent body fat exceeds 13.2, the performance declines significantly. Obviously, the higher the percent body fat, the more adverse it is to the muscular endurance of the upper arm. Participants with percent body fat falling between 8.6% and 14.1% perform better in 3000-meter running than average. However, if percent body fat exceeds 19.3%, the performance declines significantly. Obviously, the higher the percent body fat, the more adverse it is to cardio-respiratory endurance.

㈣戰爭學院及管理學院戰略班男生中得知體脂肪百分比與引體向上之相關係數爲r＝-.393達顯著差異且呈負相關(P<0.01)，表示體脂肪大者其引體向上所做的次數愈少，成績較差；體脂肪百分比與仰臥起坐之相關係數爲r＝-.048雖未達顯著水準但呈負相關，表示體脂肪大者其仰臥起坐所做的次數愈少；體脂肪百分比與3,000公尺徒手跑步之間相關係數爲r＝.32達顯著差異呈現正相關(P<0.01)，表示體脂肪百分比大者其3,000公尺跑步秒數愈多，成績愈差；陸、海、空軍院及管理學院指參班男生中得知體脂肪百分比與引體向上之相關係數爲r＝-.369達顯著差異且呈負相關，表示體脂肪大者其引體向上所做的次數愈少，成績較差，不利於上臂肌耐力發揮；體脂肪百分比與仰臥起坐之

相關係數爲r＝-.132達顯著差異且呈負相關，表示體脂肪大者其仰臥起坐所做的次數愈少，不利於腹部肌耐力展現；體脂肪百分比與3,000公尺徒手跑步之間相關係數爲r＝.289亦達顯著差異呈現正相關(P<0.01)，表示體脂肪百分比大者其3,000公尺跑步秒數愈多，成績愈差，不利於心肺肌耐力表現。

D.For the male student officers in the War College and the Strategic Class of the Management College, the correlation coefficient between percent body fat and pull-up is -.393, which indicates both a conspicuous difference and a negative correlation (P<0.01), indicating the more the body fat, the fewer the pull-ups and the less the score. The correlation coefficient between percent body fat and sit-up is -.048, which does not indicate a conspicuous difference but still represents a negative correlation, meaning the more the body fat, the fewer the sit-ups and the worse the score. The correlation coefficient between percent body fat and 3,000-meter running is .32, which indicates both a conspicuous difference and a positive correlation (P<0.01), meaning that the higher the percent body fat, the longer it takes to finish 3,000-meter running and the worse the performance. For the male student officers in the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College, the correlation coefficient between percent body fat and pull-up is -.369, which indicates both a conspicuous difference and a negative correlation (P<0.01), indicating the more the body fat, the fewer the pull-ups and the less the score and the more adverse it is to the muscular endurance of the upper arm. The correlation coefficient between percent body fat and sit-up is -.132, which indicates both a conspicuous difference and a negative correlation, meaning the more the body fat, the fewer the sit-ups and the worse the score and the more adverse it is to the muscular endurance of the abdomen. The correlation coefficient between percent body fat and 3,000-meter running is .289, which indicates both a conspicuous difference and a positive correlation (P<0.01), meaning that the higher the percent body fat, the longer it takes to finish 3,000-meter running and the worse the performance and the more adverse it is to the cardio-respiratory muscular endurance.

二、建議

㈠基於本研究分析後，建議國防大學戰爭學院及管理學院戰略班學官體脂肪以8.6~17.4%；陸、海、空軍院及管理學院指參班體脂肪以8.6~16%之範圍爲其健康管理參考指標。

(2)Recommendations

A.In accordance with the analysis of this study, it is recommended that the War College and the Strategic Class of the Management College set the optimal range of percent body fat for their student officers as 8.6~17.4, and that the Army, Naval, Air Force Command and Staff Colleges and the Command and Staff Class of the Management College set the optimal range of percent body fat as 8.6~16%. These optimal ranges of percent body fat should be adopted as health management reference index for individuals.

㈡有鑑於目前國軍軍官幹部因缺乏運動且工作勤務繁重，衍生體重過重，體脂肪過多，本研究宜持續至全國各軍種追蹤或縱向調查，以做爲日後之比較分析。

B.Due to heavy workload and lack of exer-

cise, the ROC officers are subject to overweight and illnesses associated with corpulence. It is recommended that all Services continue and conduct such surveys for future comparison and analysis.

㈢國防大學每週二、四下午16時後，統一集合帶操並實施體能活動，有益於學官養成運動習性、增進體能及維護健康，如能將體育課程排入正課並教導部分運動技能，成效必能更顯著。

C.In the National Defense University, the student officers are required to assemble, do exercise and engage in physical activities at 4 pm on Tuesday and Thursday afternoon. This helps the student officers build up the habit of exercise, enhance physical strength and maintain health. If physical education can be scheduled as part of the curriculum and sports skills can be taught, there will be significant improvement in the performance of student officers' physical strength.

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