

COMPARISON OF UPPER BODY STRENGTH
AND ENDURANCE IN THE
20 TO 50-YEAR-OLD
AGE GROUP

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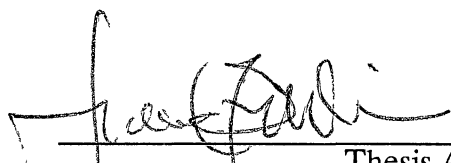
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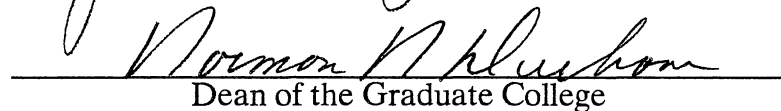
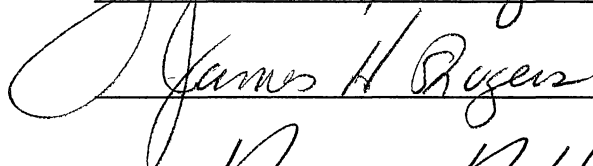
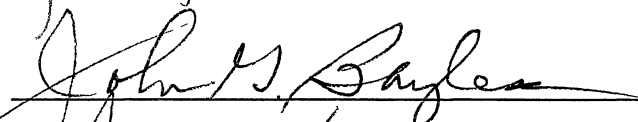
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CHAPTER I

INTRODUCTION

Testing for muscular strength and endurance has always been an integral part of physical fitness testing.

The National YMCA muscular strength and endurance test measures the maximum number of bench press repetitions that a subject can perform using a fixed weight.

The Y's Way Bench Press Test starts at a weight where most people can do at least one repetition. Other tests measuring upper body strength and endurance such as chin-ups and push-ups, are difficult to the subject because they are extremely difficult to perform.^[10]

This investigation focused on age related changes in upper body muscular strength and endurance in the 20 to 50 year old age range. A total of 322 subjects, 190 men and 132 women, were studied for this project.

Statement of the Problem

The purpose of this study was to investigate possible differences in the upper body strength and endurance in a sample of 20 to 50 year olds grouped by decade.

Justification

It is a popular opinion of physical educators and exercise specialists that upper body strength and endurance, in this case elbow extension, declines with age.

MacNeil and Teague^[18] state that peak muscle strength occurs between the ages of 20 to 30 years.

However several recent studies, including those by Neiman^[20] and Petrofsky and Lind^[21] have shown at least some strength variables may be maximized during the mid third decade of life and perhaps beyond. What makes this an extremely interesting study is that no active weight training has taken place among the subjects. Thus, in a sample of 'untrained' subjects, upper body strength and endurance may not decline as rapidly as once thought.

Hypothesis

The following hypothesis will be tested at the .05 level using the Y's Way Bench Press Test: (1) There will be no significant difference in the number of completed repetitions performed by males grouped by decade between 20 to 50 years of age. (2) There will be no significant difference in the number of completed repetitions performed by females grouped by decade between 20 to 50 years of age.

Delimitations

The following delimitations were made for this study: (1) the study was delimited to the Y's Way bench press upper body strength and endurance test protocol; (2) subject selection was delimited to 322 healthy male and female subjects over a 78 month period from January of 1984 to June of 1990; (3) subject selection was delimited to members of the Downtown Tulsa YMCA;

Limitations

The following limitations apply: (1) other than insuring lack of participation in weightlifting programs, no attempt was made to control extracurricular activity of

subjects; (2) no attempt was made to control diet of subject; (3) subjects were not tested for drugs or ergogenic aids.

Assumptions

The following assumptions were made:

- (1) The testing conditions were equal for all subjects during the administration of the tests.
- (2) All subjects achieved maximal effort at the conclusion of the test.

Definition of Terms

A Completed Repetition in this study is defined as a complete bench press movement from the barbell resting on the chest to a complete elbow extension of the arm.

A Timed Repetition refers to a two-second interval during completed repetitions.

A Failed Repetition refers to a repetition which has not been properly completed because of time or technique requirements.

The Y's Way Bench Press Test is a test which measures the total number of completed and timed supine bench press repetitions until muscle fatigue precludes additional repetitions.

Muscular Strength is the maximum amount of force which can be exerted against a resistance.

1RM (one repetition maximum) is the maximum amount of force which can be exerted against a resistance one time.

Muscular Endurance is the application of sub-maximal muscular force until the muscle is fatigued.

Static Strength is the maximum force that can be applied to a fixed object from a defined, immobile position.

Isometric Contraction is a contraction which occurs against an immovable object.

A Dynamometer is a device used to measure musculoskeletal force.

Dynamic Strength refers to the application of maximal force through a specified range of joint motion with the body in some defined position.

Isotonic Muscular Movement involves the contraction of the muscle against resistance with movement.

Explosive Strength refers to the ability to exert maximum energy in one explosive act.

Power is the capacity to exert physical force in terms of the rate at which it is or can be exerted.

Vertical Jump Test is a test which measures maximum vertical jumping power from a two foot takeoff.

VO₂ Max or Maximal Oxygen Uptake is the greatest rate at which oxygen can be consumed during exercise at sea level.

A Bench Press refers to the movement of a weight which is lifted from chest level to arms extended position from a supine position on a bench.

Flexed Arm Hang Test is a test where the subject holds a flexed arm position on a horizontal bar until fatigue forces the arms to straighten.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The popularity and participation in weight training and bodybuilding has increased dramatically over the past decade. The attainment of strong and defined muscles are goals of many Americans.

Upper body strength and endurance testing has been performed since the turn of the century by physical educators, college researchers and exercise physiologists. Among the most popular tests used to measure upper body strength and endurance are push-ups, chin-ups, military barbell presses and supine barbell bench presses.^[2] For this study, the supine barbell bench press was chosen for its positive correlation to total body strength.^[10] Several recent studies have also ascertained that upper body strength and endurance does not decline with age as rapidly as once thought.^[20,21] Most of the world weightlifting records were set by the former Russian great, Victor Alexseev, when he was in his mid to upper thirties.^[19]

The purpose of this study is to compare the upper body strength and endurance in the 20 to 50-year-old age group by using the National YMCA bench press test.

Muscular Strength and Muscular Endurance

Various types of physical fitness tests have been used over the last century to measure muscular strength and endurance.

Muscular strength testing can be divided into at least three subcomponents: static strength, dynamic strength, and explosive strength.^[22] An example of a static strength test, would be a hand dynamometer test, in which the subject grips the dynamometer with maximum exertion to achieve a score. The static strength test also illustrates a maximum isometric contraction. A common dynamic strength test is the bench press test, where an isotonic muscular movement occurs. A third type of strength test measures explosive strength or power. Examples of this type of strength test include the high jump, shotput and vertical jump test, all of which measure maximum muscular force unleashed over a short, definitive period of time.

The two types of Muscular endurance tests identified include static and dynamic muscular endurance.^[22] Examples of static muscular endurance tests would be holding a heavy object as long as possible, or the flexed arm hang test from a pullup bar. In both these examples, no muscular range of motion takes place. Dynamic muscular endurance tests including pushups, chinups and bench presses to fatigue, illustrate isotonic muscular movement.

The validity and reliability for the Y's Way bench press test was developed by a group of experts headed by Dr. Larry Golding, Director of Exercise Physiology at The University of Nevada, Las Vegas. Golding^[10] explains several reasons why the Y's Way Bench Press Test, which measures muscular strength and endurance, was chosen for the study:

- (1) Grip strength was found to be poorly related to total body strength and is not a good predictor or indicator of the body's general muscular strength.
- (2) Tests that measure a single greatest action involving a cable, dynamometer, or free weights are examples of just strength tests. However, when

tests are administered which involve more than one repetition, muscular endurance is being assessed.^[10]

A drawback to 1RM (Repetition Maximum) maximum strength testing, is that it usually takes a great deal of time to ascertain an individual's 1 RM lift, especially those inexperienced in lifting weights.^[10] Research by Harrison Clarke ^[3] indicated a fair correlation between elbow flexion and extension and total body strength. Push-ups, chin-ups, military presses and bench presses all fall within the category of elbow extension exercises. These tests in reality measure both muscular strength and muscular endurance by moving the body's weight or a fixed weight.^[10]

The experts who developed the Y's Way Bench Press Test realized that both chin-ups and pushups are extremely difficult to perform even for most people. However, in the Y's Way Bench Press Test, the fixed weight adopted for both men and women is light enough for almost everyone to do at least one repetition and yet heavy enough that the most people cannot exceed 35 to 40 repetitions. The Y's Way Bench Press Test, with fixed weights at 35 lbs. for women and 80 lbs. for men, was designed to elicit an average of about 15 repetitions. This would be few enough to eliminate competitiveness and hence a potential loss of a reliable test score.^[10]

Golding also refutes the claim by many strength training professionals that the Y's Way Bench Press Test does not take into account the individual's body weight, even though body weight is thought by many experts to be related to strength. Golding's study found no correlation between body weight and the scores on the bench test.^[10] The bench press scores were thus reported as all the other YMCA fitness scores, namely by age and sex.

The Relationship of Age and Sex to Muscular Strength and Endurance

It is a commonly known fact that most physiologic functions of the body decrease in efficiency and performance as one ages. This diminished performance generally follows a gently downward sloping linearity. As an example, VO_2 max normally declines 8 to 10% per decade after 30 years of age.^[20] The great majority of literature also states that muscular strength and endurance levels decline with advancing age.^{[25],[12],[3],[20]} Some of the musculo-skeletal and body composition changes which take place include: 1) decrease in lean body weight (muscle loss); 2) increase in fat weight; 3) decrease in bone mineral mass; 4) decrease in joint flexibility.^[20] All of these factors contribute to reduced levels of muscular strength and endurance.

However, world records have been set by athletes who were supposedly past their prime. A world record marathon time was recorded by Carlos Lopes of Portugal, when he was 37 years of age at the time.^[11] Victor Alexseev, the great Russian power lifter, set most of his world records in his thirties.^[19] These records demonstrated the benefits of tremendously efficient cardiovascular and muscular endurance systems respectively. In both cases, these athletes trained with tremendous dedication, discipline, and intensity to achieve such outstanding results. Their age was not a deterrent to these outstanding achievements.

A recent study indicated that female muscular strength and endurance can be maintained at relatively high levels in older subjects. In a study by Dummer, Clarke, Goldfarbe and Sockler in 1985^[7], 73 female master swimmers were tested for muscular endurance and, surprisingly, the 50 to 59-year-old age group scored the highest. However, overall female muscular strength and endurance levels are generally lower than males, primarily because of decreased levels of the male hormone testosterone, and decreased muscle mass.^[15]

Obviously, many factors besides age and gender are responsible for an individual's muscular strength and endurance level. Heredity, weight training, health status, physical activity, nutrition, and motivation are all important factors in determining one's muscular strength and endurance levels.[5],[20],[24],[15]

Summary

After reviewing the literature, the following statements follow: 1) Individual upper body strength and endurance is dependent on several factors including age, health, heredity, gender, nutrition and motivation; 2) No definitive conclusions presently exist as to the extent of decline in upper body strength and endurance in males and females as they age; 3) certain studies have indicated that older female age groups score higher in muscular endurance testing than younger female age groups; and 4) the Y's Way Bench Press Test, which measures upper body strength and endurance, was chosen because it is probably the best overall test in terms of validity and test administration.

This study will attempt to add to the existing body of knowledge of upper body strength and endurance levels of both men and women in the 20 to 50-year-old age group.

CHAPTER III

METHODS

The purpose of this study was to investigate and analyze upper body strength and endurance in a group of 322 men and women aged 20-50 years. In order for this study to be completed fairly, all 322 tests would be administered as identically as possible to insure the best possible test validity.

Subject Selection

322 Downtown Tulsa YMCA males and females completed the YMCA bench press test, which is part of the National YMCA physical fitness test battery. All subjects read and signed an informed consent form prior to attempting the Y's way Bench Press Test. (See Appendix A) All subjects were between the ages of 20 and 50 years at the time of testing, and all subjects were apparently healthy as stated on the informed consent form. Subjects were from a variety of lifestyles and occupations, though the vast majority were from white collar jobs as opposed to blue collar jobs. 93% or 177 of the 190 male subjects held white collar jobs including professional, management, technical and administrative positions. 97% or 128 of the 132 female subjects held white collar jobs in clerical, technical, professional and administrative positions.

An important part of this study was the criteria used to select the subjects. All subjects were asked to divulge their exercise habits by both completing a brief medical/health/exercise questionnaire (Appendix B) and were also interviewed orally. None of the subjects were engaged in a regular or organized weight training

program. Thus both the test validity and criteria used to select subjects, were key factors in this study.

Test Protocol

All subjects were administered the Y's Way to Physical Fitness strength and endurance test (Y's Way Bench Press Test), which measures the total number of supine bench press repetitions that each subject could perform.

After a thorough explanation and demonstration of the test, each subject was told that the objective of the test was to perform as many correct bench presses as possible at the rate of one every two seconds with no time limit. Subjects were then instructed to take a supine position on the bench with their head near the rack holding the barbell. The tester then placed the weight on the subject's chest, with the hands placed shoulder width apart. When the weight was secured by the subject, the command 'go' was given by the tester. The subject then performed as many bench press repetitions as possible. The barbell weight was 80 lbs. for men and 35 lbs. for women. (Figures 1, 2, 3, 4) The same bench was utilized to perform all 322 tests. The test was deemed completed when either the subject could not complete additional repetitions due to muscle fatigue or the subject was unable to keep up the pace of one repetition every two seconds.

All subjects were told not to eat at least three hours prior to the test and all signed an informed consent form (See Appendix A) before the test was commenced. Standard exercise clothing was required for all subjects including T-shirts, sweats, gym shoes or some acceptable substitute. A non-competitive atmosphere was emphasized during the testing and no verbal coaching or encouragement was given.

All testing was performed at the Downtown Tulsa YMCA, 515 South Denver, Tulsa, Oklahoma. The test administrator, Bill Beisiegel (Health and Fitness Director of the Downtown Tulsa YMCA), was certified as a Y's Way to Physical Fitness

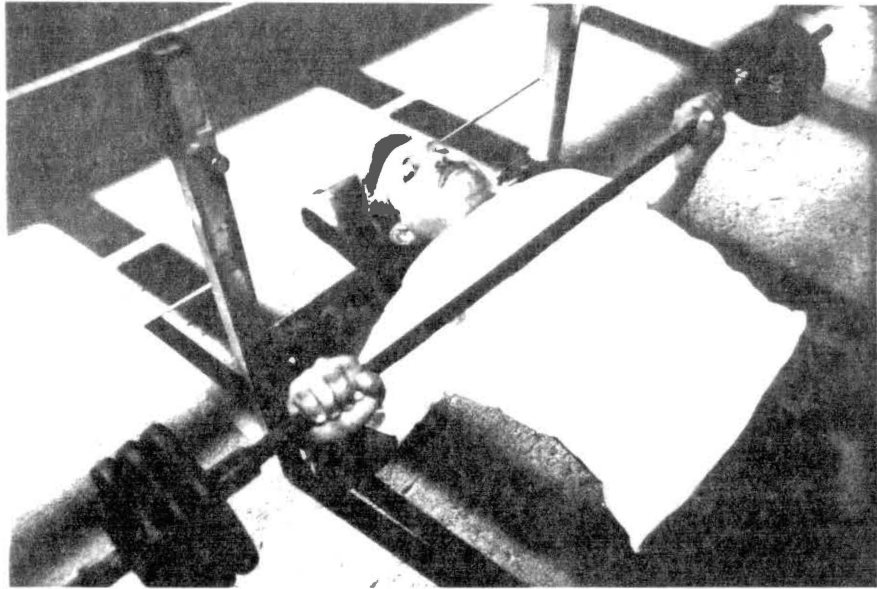


Figure 1. Start Position Male 80 lb. Weight



Figure 2. Finish Position Male 80 lb. Weight

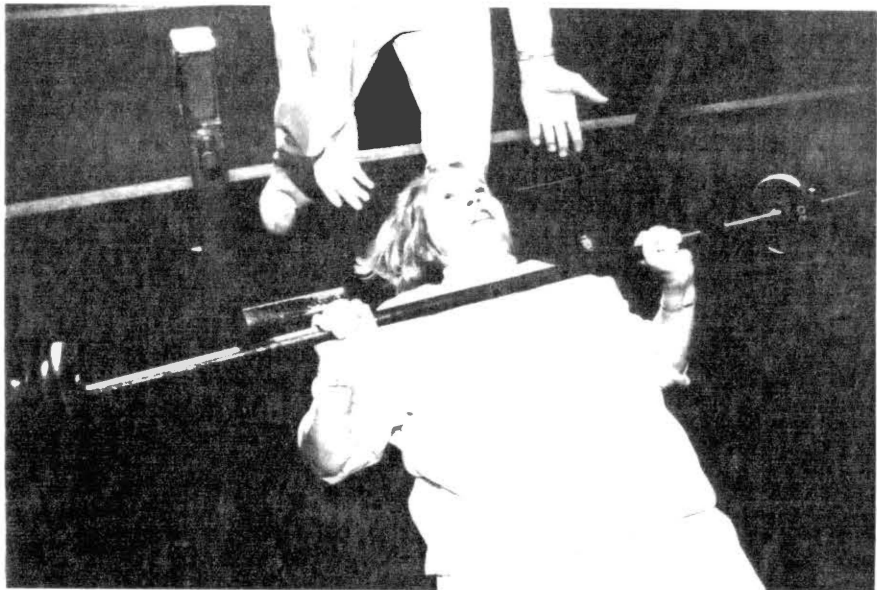


Figure 3. Start Position Female 35 lb. Weight



Figure 4. Finish Position Female 35 lb. Weight

Specialist, which is a requirement to administer the Y's Way to Bench Press Test or any other YMCA physical fitness test.

All tests were performed over a seventy-six month period, from January of 1984 to April of 1990, as part of the ongoing YMCA National Fitness Testing Program available at the Downtown Tulsa YMCA.

Recording of Results

All results for the 322 subjects tested were recorded on IBM Fortran formatting forms which recorded the subjects' name, age, sex and score. Of the 322 subjects, 190 were male and 132 female.

Statistical Treatment of the data

Variables will be analyzed using both descriptive and predictive statistics. Means and standard deviations will be computed and scores will be compared using repeated measures analysis of variance for both the male and female age groups. The Newman-Keuls Multiple Range Test will be utilized if necessary, in order to locate significant differences of scores between age groups.

CHAPTER IV

RESULTS AND DISCUSSIONS

Introduction

The purpose of this investigation was to compare muscular strength and endurance for three different age groups using the Y's Way Bench Press Test. These age groups were 20 to 29 years of age, 30 to 39 years of age, and 40 to 49 years of age for both males and females. The age range was from 20 to 49 years of age. The testing was performed under the Y's Way Bench Press Test protocol which tested the maximum number of bench press repetitions each subject could perform until fatigue precluded additional repetitions.

Subjects

322 male and female subjects were tested. 190 were male and 132 were female. All subjects performed the testing on a voluntary basis as part of the ongoing physical fitness testing program offered by the Downtown Tulsa, Oklahoma YMCA. The 190 male subjects mean age was 34.57 ± 6.39 years. 132 female subjects mean age was 33.09 ± 7.37 years. There were 50 subjects in the male 20 to 29 year old age group and the mean age was 26.78 ± 2.55 years. There were 93 subjects in the male 30 to 39 year age group and the mean age was 34.45 ± 2.74 years. There were 47 subjects in the male 40 to 49 year old age group and the mean age was 43.08 ± 2.38 years. There were 51 subjects in the female 20 to 29 year old age group and the mean age was 25.82 ± 2.55 years. There were 51 subjects in the 30 to 39 year old female age group and the mean age was 34.08 ± 2.84 years. There were 30 subjects

in the 40 to 49 year old female age group and the mean age was 43.77 ± 2.80 years.
(Table 1).

TABLE 1
SUBJECT DATA BY AGE: AGE GROUP
MEAN AGES FOR MALES AND
FEMALES TOTAL NUMBER
OF SUBJECTS: 322

Sex (Age Group)	Mean Age	N(# of Subjects)
Total Males	$x = 34.57$ $SD = \pm 6.39$	190
Male (20 to 29)	$x = 26.78$ years of age $SD = \pm 2.55$	50
Male (30 to 39)	$x = 34.45$ years of age $SD = \pm 2.74$	93
Male (40 to 49)	$x = 43.08$ years of age $SD = \pm 2.38$	47
Total Females	$x = 33.09$ $SD = \pm 7.37$	132
Female (20 to 29)	$x = 25.82$ years of age $SD = \pm 2.55$	51
Female (30 to 39)	$x = 34.08$ years of age $SD = \pm 2.84$	51
Female (40 to 49)	$x = 43.77$ years of age $SD = \pm 2.80$	30

Descriptive Statistical Analysis

The mean number of bench press repetitions was computed for: 1) both the total number of males and females and 2) the 20 to 29, 30 to 39, and 40 to 49 year old age groups of both sexes (Figures 5,6)

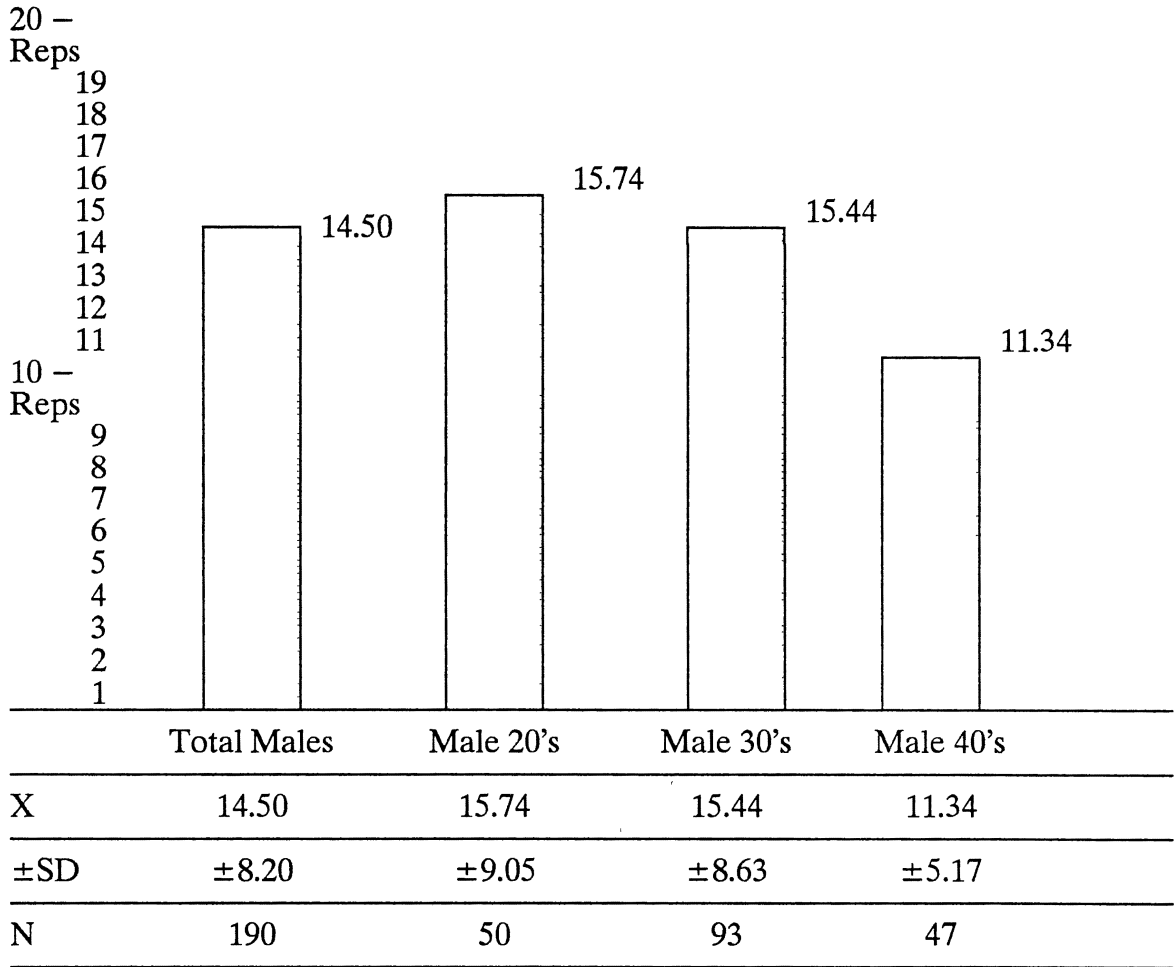


Figure 5. Group Mean Bench Press Repetitions for Males in the 20, 30 and 40 Year Old Age Groups.

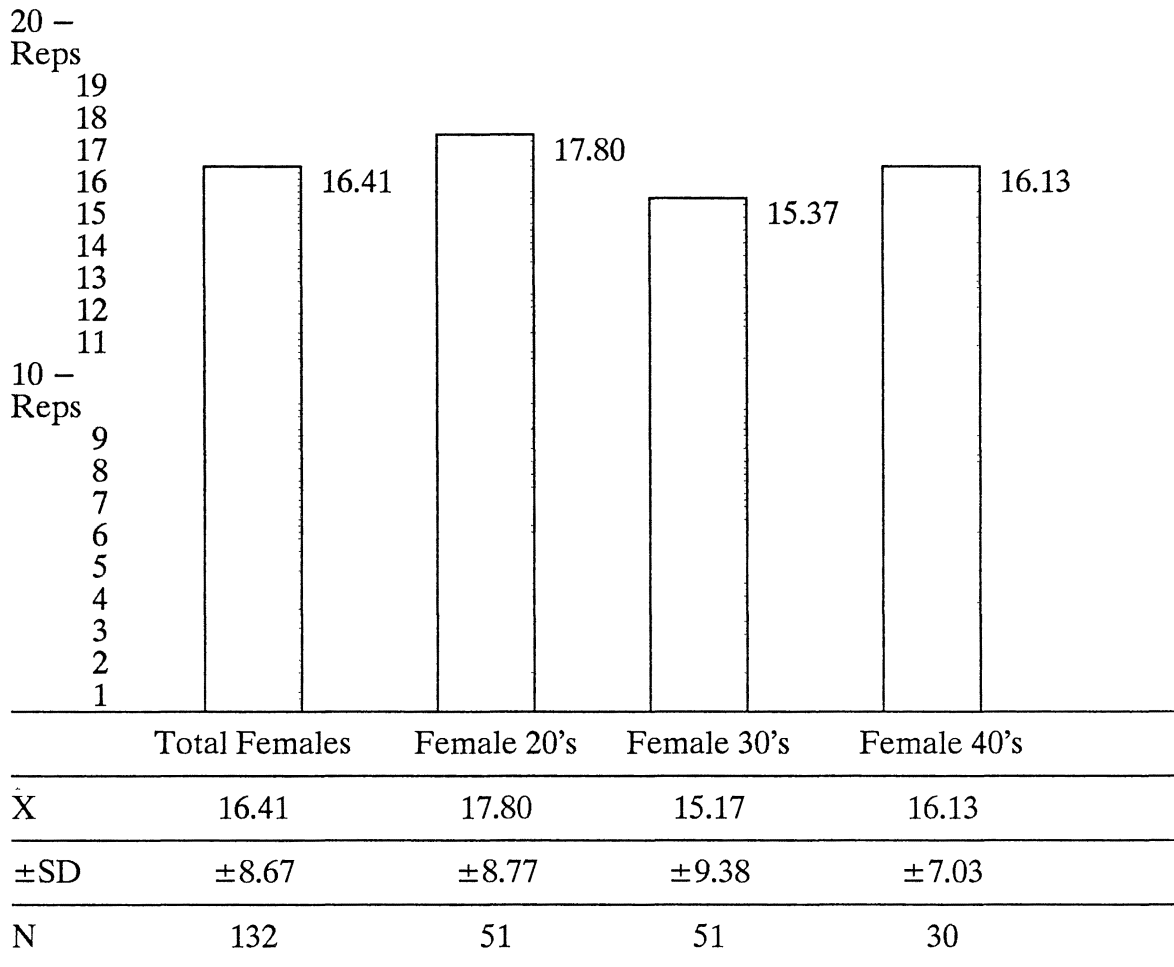


Figure 6. Group Mean Bench Press Repetitions for Females in the 20, 30 and 40 Year Old Age Groups.

Repeated Measures Analysis of Variance for Males

Repeated Measures Analysis of Variance and the Newman-Keuls Range Test were computed at the .05 level, in order to determine whether a statistically significant amount of variation occurred in bench press repetitions between the three male and three female age group scores. Using this format, columns were subject age groupings and rows were completed repetitions.

In the analysis of the 190 male bench press scores (Table 2), the F ratio of 5.19891 showed a statistically significant variation among the three age group scores to the .05 level. ($P < .05$)

TABLE 2
REPEATED MEASURES ANALYSIS OF VARIANCE
FOR MALE BENCH PRESS SCORES

Source of Variance	ss	df	MS	F
Between	670.2031	2	335.1016	*5.19891
Within	12053.29	187	64.45612	
Total	12723.5	189		

*Significant at .05 level ($p < .05$)

Repeated Measures Analysis of Variance For Females

Table 3 shows Repeated Measures Analysis of Variance for the 132 female scores. The 1.72955 F ratio showed no statistically significant variation at the .05 level. Thus, there was no statistically significant variation among female age groups.

TABLE 3
 REPEATED MEASURES ANALYSIS OF VARIANCE
 FOR FEMALE BENCH PRESS SCORES

Source of Variance	ss	df	MS	F
Between	176.5352	2	88.26758	1.172955
Within	9707.545	129	75.25229	
Total	9884.08	131		

The Newman-Keuls Range Test

Results of the Neuman-Keuls Range Test for male scores indicated a statistically significant variation in scores in the male 40 to 49 year old age group as compared to the 20 to 29 and 30 to 39 year old age groups. There was no difference between male 20 to 29 and 30 to 39 year age groups. ($P > .05$).

Discussion

Using the Y's Way Bench Press Test, the results indicate that male upper body strength and endurance, declines significantly in the 40 to 49 year old age group as compared to the 20 to 29 and 30 to 39 year old age groups. However, the results show no significant decline in female upper body strength and endurance for all three age groups (20 to 29, 30 to 39, 40-49). In fact, the female 40 to 49 year old age group had a higher mean score than did the 30 to 39 year old age group. (16.13 repetitions to 15.37 repetitions).

The decline in male scores in the 40 to 49 year old age group is related not only to the musculoskeletal changes related to the aging process, but also to the fact

that men in this age group are often less physically active than their younger counterparts (males 20-39). This lack of muscular skeletal activity, increases the rate of decline of muscular strength and endurance levels.^[1]

Why does a decline in physical activity take place on the male 40 to 49 age group? There are several reasons but the most common factors seem to be: 1) lack of motivation to exercise; 2) the physical demands of both home life and work are less taxing; 3) energy levels are lower than younger men; 4) are less active in vigorous sports and recreation.^{[1],[12]}

A fifth decade male (age 40 to 49) may also be psychologically influenced by society's image of a forty year or older man. Such cliches as 'over the hill' and 'middle-aged' contribute to a feeling of physical decline and motivation to exercise, even though it may only be a subconscious thought.

The three female age groups showed surprisingly similar muscular strength and endurance levels. This supports a similar study^[7] done in 1985, where a sample of 50 to 59 year master female swimmers scored the highest on a muscular endurance test as compared to the younger age group females in the study.

The similarity of the muscular strength and endurance levels of the 20, 30 and 40 year old decade females in this study may be associated with similar physical demands placed on their musculoskeletal systems. Certain physical activities such as cooking, housecleaning, shopping, and raising a family, usually are engaged in through the 20 to 50 year old age range.

Unlike many males who reach their fifth decade (40 to 49 years of age), fifth decade females physical activity levels often do not drop off as drastically as their male counterparts. This explains to some extent why their muscular strength and endurance levels stay at a similar level when compared to their younger female counterparts (females aged 20 to 39). For fifth decade males (age 40 to 49) however,

muscular strength and endurance levels seem to drop off more drastically compared with their younger counterparts (males age 20 to 39).^[5]

The superiority of male upper body strength and endurance is also demonstrated by the results of this study. Even though the 190 male subjects had a mean score of 14.50 repetitions as compared to a mean score of 16.41 repetitions for the 132 females, the males lifted over two times as much weight (80 lbs. to 35 lbs.). Gender differences including lean muscle mass, and the hormone testosterone, are the prime factors for greater male muscular strength and endurance.^{[15],[1]} Since this sample of subjects in this study was limited primarily to untrained subjects, results from a random sample of similar age range subjects, performing the Y's Way Bench Press Test, might produce different results.

The validity of the Y's Way to Bench Press Testing was a key factor in producing reliable test results. All test conditions and procedures were closely monitored for each subject. As discussed previously in the Review of Literature, many experts feel that elbow extension, in this case the Y's Way Bench Press Test, shows a high positive correlation to upper body strength and endurance.^[10]

The Y's Way to Bench Press Test is a test which has several advantageous features: 1) It is easily administered, 2) takes very little equipment and 3) the test protocol is easily understood by the subject. The test elicits an accurate measure of upper body strength and probably to a greater extent, upper body muscular endurance.^[10] It can be used for mass testing in virtually any setting and should be considered one of the better tests available to the Physical Educator or Health and Fitness Specialist involved in physical fitness testing and evaluation.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary

322 voluntary male and female exercise naive subjects between the ages of 20 and 49 years of age formed the database for this investigation, which compared upper body muscular strength and endurance in both males and females in three separate age groups: 20 to 29 years of age, 30 to 39 years of age, and 40 to 49 years of age. Each subject performed the Y's Way to Bench Press test, which involved pressing a barbell weight (35 lbs. for women and 80 lbs. for men) from their chest to the arms extended position for as many correct repetitions as possible until fatigue precluded any additional repetitions. The repetitions were timed verbally or with a metronome at the rate of every two seconds to ensure no rest periods between lifts. Each subject was spotted carefully to insure safety of the test.

Findings

1. The 20 to 29 year old age groups for both male and females, recorded the highest group mean scores as opposed to the 30 to 39 and 40 to 49 year old age groups.
2. There was no statistically significant variance in women's scores among the three age groups (20 to 29, 30 to 39 and 40 to 49 years of age).
3. Men's scores in the 40 to 49 year old age group were significantly lower compared to the 20 to 29 or 30 to 39 year old age group scores.

4. There was no significant difference between men in the 20 to 29 and 30 to 39 year groups.

Conclusions

Within the limitations of this study, the following conclusions were made:

1. Female upper body muscular strength and endurance levels as measured by the Y's Way to bench Press test and within the parameters of this investigation, showed no significant changes in the 20 to 50 year old range.

2. A significant decrease was shown in upper body strength and endurance in the male 40 to 49 year old age group, as compared to the male 20 to 29 and 30 to 39 year old groups.

3. In males, there was found to be no significant decrease in upper body strength and endurance from the 20 to 29 year old decade to the 30 to 39 year old decade.

4. Upper body strength and endurance did not decline significantly, between 20 to 39 years of age in males, and 20 to 49 years of age in females.

Recommendations

1. To further investigate upper body strength and endurance through the Y's Way Bench Press test, by including the 50 to 70 year old age range.

2. To determine the effect of a weight training program to increase upper body strength and endurance on a controlled group of exercise naive subjects.

3. To identify other upper body strength and endurance tests and to compare results with this investigation for the same age range.

4. To investigate the role of body weight and its relation to upper body strength and endurance.

5. To promote the Y's Way to Fitness testing and Y's Way to Bench Press testing to greater populations including schools, universities and community centers, so as to add to the body of knowledge of upper body strength and endurance for both sexes and all age groups.

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APPENDIXES

APPENDIX A
INFORMED CONSENT

YMCA OF GREATER TULSA
DOWNTOWN BRANCH HEALTH EVALUATION

CONSENT FORM

The tests used in this personal health evaluation include the following:

- 1) Resting heart rate
- 2) Resting blood pressure
- 3) Body composition - to determine the percent body fat and thus, one's healthy weight level
- 4) Cardiovascular fitness (aerobic power)
- 5) Flexibility
- 6) Muscular strength and endurance

The test for aerobic power is the most demanding and takes place on an ergometer (stationary bike). If, during the course of any of the tests, you become dizzy, weak, or light-headed, please let the tester know and we will cease the evaluation immediately.

In signing this consent form you state that you have read and understood the description of the tests involved and their complications. Any questions which occur to you have been answered to your satisfaction. Every effort will be exerted to insure your health and safety. You enter into the evaluation willingly and may withdraw at any time. Please tell us any medical information which might affect the results of this testing.

Signature of Applicant

Date of Evaluation

Name and Address of Family Physician

APPENDIX B

**BRIEF MEDICAL, HEALTH
AND EXERCISE HISTORY**

BRIEF MEDICAL, HEALTH AND EXERCISE HISTORY

DATE: _____ OCCUPATION: _____
NAME: _____ AGE: ___ HEIGHT: ___ WEIGHT: ___
ADDRESS: _____ HOME PHONE: _____
ZIP: _____ BUS. PHONE: _____

I. PREVIOUS DISEASES OR AILMENTS (Check any that have occurred in the past five (5) years)

- A. Tuberculosis: Have you ever had active TB? ___ Skin Test? _____
 - B. Heart Disease _____
 - C. High Blood Pressure _____
 - D. Rheumatic Fever or acute Arthritis _____
 - E. Nephritis or Kidney Disease _____
 - F. Hernia or Rupture _____
 - G. Infantile Paralysis _____
 - H. Low Back Aches _____
 - I. Diabetes _____
 - J. Deformities: Weakness from injuries or disease _____
 - K. Heart Disease in family _____
 - L. Arthritis _____
 - M. Goiter or overactive Thyroid _____
 - N. Cholesterol Level _____
 - O. Triglyceride Level _____
 - P. Frequent Colds ___ Sore Throat _____
 - Q. Nasal Trouble _____
 - R. Fatigue (describe) _____

 - S. Stroke _____
 - T. Ear Trouble _____
 - U. Eye Trouble _____
 - V. Heart Murmur _____
 - W. Confined to house or bed _____
- DATES _____

OTHER (Not listed above) _____

MEDICATIONS _____

II. HEALTH HABITS:

- A. Sleep
 - 1. Hours per night _____
 - 2. Regular Sleep Periods _____
 - 3. Irregular Sleep Periods _____
 - 4. Restlessness during sleep _____
 - 5. Refreshed upon arising _____
 - 6. Tired upon arising _____

B. Stimulants:

1. Cups of coffee or tea per day__
2. Cokes per day_____

C. Smoking:

1. Cigars per day_____
2. Cigarettes per day_____
3. Pipe_____

D. Dietary Habits:

1. Where do you eat?
Home__ Restaurant__

2. Check foods eaten: F-Frequently (5 or more times/wk), A-Average (3 times/wk), R-Rarely (1 or 2 times/wk), N-Never

- | | |
|---------------------------|----------------------|
| a. Fresh Fruits_____ | k. Potatoes_____ |
| b. Eggs_____ | l. Bread_____ |
| c. Red Meat_____ | m. Cheese_____ |
| d. Chicken, Fowl_____ | n. Fruit Juices_____ |
| e. Fish_____ | o. Butter_____ |
| f. Fresh Vegetables_____ | p. Margarine_____ |
| g. Cooked Vegetables_____ | q. Snacks_____ |
| h. Vitamins_____ | (Chips, etc.) |
| i. Milk_____ | r. Desserts_____ |
| j. Soft Drinks_____ | s. Alcohol_____ |

3. Are you on a diet? If so, explain_____

4. Explain the symptoms or any bothersome phase of your health which would suggest you are not physically fit in that respect

E. Exercise Program:

1. Average amount of time spent in exercise each day_____
2. Average amount of time spent in exercise each week_____
3. What type of exercise (Example-Jogging, Swimming, Weight training, etc.)

F. Emotional:

1. Can you relax easily?_____
2. Are you tense most of the time?__
3. Are you easily excited or upset?__

III. CHRONIC COMPLAINTS: (CHECK THOSE WHICH APPLY)

A. Abdominal and Pelvic Areas:

Digestive upsets ___ Heartburn ___ Stomach Ache ___
Hernia ___ Hemorrhoids ___ Constipation ___ Abdominal pain ___

B. Cardio-Respiratory:

Shortness of breath (standing or lying) ___ Shortness of breath
after chest pain (resting) ___ Chest Pain after exertion ___
Heart Palpitation ___ Coughing ___ Coughing producing blood ___
Enlarged Heart ___ Dizziness ___ Fainting ___

C. Muscular - Skeletal:

Abnormal or swollen joints ___ Flat feet ___ Painful feet or joints ___
Muscle Injury ___ Joint Injury ___ Muscle Pain ___

D. Fatigue:

Morning ___ Noon ___ Night ___

IV. MEDICAL CLEARANCE:

A. When did you have your last Medical examination? _____

Urinalysis? Yes ___ No ___ Result _____

Blood Analysis? Yes ___ No ___ Result _____

B. Physician Waiver (To be filled out by Personal Physician)

Physician Name _____

Address _____

Phone # _____

Dear Doctor:

YMCA Fitness Tests administered to _____

will include: Resting Heart Rate and Blood Pressure

Body Composition

Cardiovascular Fitness Test

Flexibility and Muscular Strength

Endurance Tests.

Results are available from the Downtown YMCA upon request.

Are there contraindications pertaining to this person for participation in a moderately vigorous exercise program? Yes ___ No ___

Pertinent information: _____

Pertinent Results of Resting EKG _____

Pertinent Results of Stress EKG _____

V. PERSONAL APPLICATION TO TULSA YMCA FITNESS PROGRAM

I, _____ do hereby make application and give release to the Tulsa Downtown YMCA, its professional Staff and Fitness Program leadership, to be accepted to participate in its Physical Fitness Program.

VI. Signature of Applicant _____

Date _____

Thank you for your time,

Bill Beisiegel
YMCA Health and Fitness Director
583-5201 Ext. 24, 25

BB:jsh

VITA¹

William Paul Beisiegel

Candidate for the Degree of
Master of Science

**Thesis: COMPARISON OF UPPER BODY STRENGTH AND ENDURANCE
IN THE 20 TO 50-YEAR-OLD AGE GROUP**

Major Field: Health, Physical Education and Leisure

Biographical:

Personal Data: Born in New Haven, Connecticut, June 8, 1949, the son of William Roland and Dorothy Louise Beisiegel.

Education: Graduated from Cheshire High School, Cheshire, Connecticut, in June, 1967; received Bachelor of Science Degree in Health, Physical Education and Recreation from Springfield College, Springfield, Massachusetts in 1971; completed requirements for the Master of Science Degree at Oklahoma State University in May, 1991.

Experience: 19 years YMCA Health and Physical Education professional in three different YMCA's: Hartford, Connecticut, Lubbock, Texas and Tulsa, Oklahoma from 1971 to 1990; Have held various local, state and regional YMCA Physical Education offices, including South Central USA YMCA Physical Education President and Recognitions Chairman; YMCA program and administrative experience includes the areas of program development, Health & Fitness testing and counseling, Fitness class and sport skill class instruction, public speaking, financial, managerial and personnel supervision; Present position is Assistant Executive and Health and Fitness Director of the Downtown Tulsa, Oklahoma YMCA.