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CARDIORESPIRATORY FITNESS OF PRINTING WORKERS

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ABSTRACT

Background - Cardiorespiratory fitness states to the capacity of the circulatory and respiratory systems to deliver oxygen to skeletal muscles during extended physical activity. The most essential statistic is VO2MAX. IN 2016, THE AMERICAN HEART ASSOCIATION released an official scientific statement claiming that cardiorespiratory fitness is a critical marker that should be assessed frequently in clinical practice.

Materials & Methods: A cross-sectional study was undertaken among the printing factory's employees. A total of 40 volunteers, both male and female, ranging in age from 18 to 45 years, took part in the study. The physical health facility in Delhi NCR conducted the research. The Astrand Treadmill Test was used to determine VO2max. The formula for calculating VO2max is VO2max = (Time 1.444) + 14.99. Data was gathered using Google Forms and analyzed using SPSS 21 and MS Excel.

Results: The results are quite apparent and reveal that there is an influence on the printing industry's lung health since the VO2 max is lower than it should be. (35-45 ml/kg/min>27.4721.0381) Vo2max vs Age has a negative correlation of -.206 (Negative correlation), meaning that as age increases, the Vo2 max level decreases, and Vo2 max vs BMI has a negative correlation of -.148 (Negative correlation), meaning that as BMI rises, the Vo2 max level decreases

Conclusion: As a result of the research, we can conclude that printing plant workers' lung health is affected and that their health is related to their age and body weight. Their gowns and pulmonary health must be addressed.

INTRODUCTION

The ability of the circulatory and respiratory systems to provide oxygen to skeletal muscle mitochondria for energy synthesis during physical activity is referred to as cardiorespiratory fitness (CRF). CRF is a powerful, independent predictor of cardiovascular disease (CVD) and all-cause mortality in persons with a low or unhealthy CRF.(1) CRF is a predictor of a multitude of health indices in children and adolescents, including cardiometabolic health, CVD risk, academic achievement, and mental health. Unfortunately, only 40% of 12- to

15-year-olds worldwide are believed to have a healthy CRF at this time. CRF has also dropped over the last six decades, both in the United States and abroad. Obesity, more inactive time, lower levels of moderate to severe physical activity, and societal and economic changes may have all had a role in this drop, even though the causes are unknown(2).

The ability of the circulatory and respiratory systems to give oxygen to skeletal muscle mitochondria for energy synthesis during physical activity is referred to as cardiorespiratory endurance, cardiovascular fitness, aerobic capacity, and aerobic fitness. The body's ability to exert maximal force against an external resistance (muscular strength) or repeatedly under submaximal loads (muscular fitness) is the second component (i.e. local muscular endurance). Third, an individual's range of motion around a joint or collection of joints is referred to as flexibility. (3) Flexibility is required to avoid musculoskeletal injuries, preserve functional independence, and participate in sports and daily activities. Body composition or the percentage of total body mass made up of fat, fat-free tissue, and total body water is the fourth component(4).

Increased blood volume, myocardial contractility, ventricular compliance, and angiogenesis all lead to an increase in cardiac output, hence exercise-induced improvements in CRF may be explained by structural and functional modifications leading to a better oxygen delivery system. Rowland and colleagues observed that the cardiac index (cardiac output divided by body surface area) of trained juvenile cyclists was significantly higher than that of their non-trained peers. On the other hand, there appears to be little difference in maximal oxygen extraction between trained and untrained youth and it's unclear whether exercise-induced increases in stroke volume are due to changes in heart dimensions. Physical activity and CRF are two separate yet related concepts that are sometimes confused. (5) Physical activity is defined as skeletal muscle movement that results in energy expenditure. Exercise and training are a type of physical activity that aims to improve performance, health, or both. CRF can reflect a person's past physical activity as well as their ability to be physically active (a person with a higher CRF has more aerobic physical activity capacity), creating a virtuous cycle of an active-fit lifestyle. Physical activity is thus a habit (will do), whereas CRF is a measure of an individual's ability (can do) to engage in particular types of aerobic physical activity. (6)

STATEMENT QUESTION

Is there any effect on the cardiorespiratory fitness of printing workers?

AIMS AND OBJECTIVES OF THE STUDY

The main aim of the study is to find out cardiorespiratory fitness in printing workers.

The main objective of this study is to find out cardiorespiratory fitness in printing workers.

HYPOTHESIS

NULL HYPOTHESIS: No lack of cardiorespiratory fitness of printing workers.

RESEARCH HYPOTHESIS: Lack of cardiorespiratory fitness of printing workers.

TOOLS USED:

1. Astrand Treadmill Test

Astrand Treadmill Test

Description: You can use the Astrand Treadmill Test to get a quick and accurate measurement of VO2max. The Astrand protocol maintains a constant running speed with a 2.5% increase in gradient every two minutes, until exhaustion. This test protocol was first described by Per-Olof Astrand (1952). (29)

METHODOLOGY

Type of study: An Experimental Study

Sampling: Simple Random Sampling

Area of Project: Delhi NCR

Sampling Method:

- No of Sample:61
- Sample place: Multicentric Grounds

Inclusion Criteria:

1} Age 30-50 years

2) Printing workers

Exclusion Criteria:

1) Unhealthy workers

2) Involved in fitness training

Instrumentation:

1.Clipboard and pen

PROCEDURE

The volunteers who agreed to participate in the study were there. Everyone was assured that their information would be kept private. All participants completed the consent form and gave their consent for the study before filling out demographic information such as their name, age, height, weight, gender, and occupation. Following this, the following measures were implemented:

1.Consent Form: This form included information on the study's goal and proposed outcomes, as well as a way for participants to express their consent and participate anonymously. The subjects were assured that their information would be kept private and that they would not be compensated or given credit for their involvement in the study because it was voluntary.

2. Following the completion of the consent form, demographic information was collected, including name, age, gender, height, occupation, and address.

3. Then the subjects were asked to walk on treadmill speed is set to 5 miles/hr (8 km/hr)

4. The subject runs at this speed for three minutes, at 0% grade. The gradient is then increased to 2.5% while maintaining the same speed.

5. After every two minutes thereafter, the gradient is increased by 2.5% (keeping the same speed)

6. When the person is unable to continue, it was stopped the stopwatch and records the time.

7. The scores were calculated of the readings VO2max

FIG 3.1: SUBJECT PERFORMING ASTRAND TREADMILL TEST

RESULTS

The results are quite apparent and reveal that there is an influence on the printing industry's lung health since the VO2 max is lower than it should be. (35-45 ml/kg/min>27.4721.0381) Vo2max vs Age has a negative correlation of -.206 (Negative correlation), meaning that as age increases, the Vo2 max level decreases, and Vo2 max vs BMI has a negative correlation of -.148 (Negative correlation), meaning that as BMI rises, the Vo2 max level decreases.

LIST OF TABLES:

TABLE NO 1: DEMOGRAPHIC DESCRIPTIVE STATISTICS

	AGE	HEIGHT(cm)	WEIGHT	BMI
Mean	23.13	164.4434	65.05	23.874
N	61	61	61	61
Std. Deviation	1.812	10.52960	13.325	3.2038

TABLE NO 2: GENDER RATIO

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	33	54.1	54.1	54.1
	Male	28	45.9	45.9	100.0
	Total	61	100.0	100.0	

TABLE NO 3: VO2 MAX(KG/ML/MIN) STATISTICS

	MEAN±SD	T-TEST	P-VALUE
vo2 max(kg/ml/min)	27.472±1.0381	206.684	P<0.005

TABLE NO 4. CORRELATION OF AGE VS VO2 MAX AND BMI

	VO2 MAX(KG/ML/MIN)
AGE	-.206
BMI	-.148

DISCUSSION

This study aimed at studying the pulmonary heath in printing workers. This study was designed to see whether there are any effects on the lung's heath of working in a printing factory. The results revealed that there are effects on pulmonary health of the workers working in printing factories. The study shows a lower Vo2max level in the workers.

This result is similar to the study by Ryan Donovan et al. published in 2009 that came to the same conclusion. The goal of this study was to document the levels of cardiorespiratory fitness and metabolic syndrome in firemen, as well as to see if there was a link between the two. In male firefighters, higher levels of cardiorespiratory fitness are linked to a better metabolic profile. For firefighters' health and safety, comprehensive cardiovascular disease risk factor management and cardiorespiratory fitness enhancement are critical(6).

This study is likewise similar to the 2015 study by Orjan Ekblom et al. The researchers wanted to look at the independent relationship between cardiorespiratory fitness and physical activity pattern and the metabolic syndrome (MetS), as well as the predictive value of uniaxial and triaxial accelerometry. The discovery that different types of physical activity have independent relationships with the MetS opens up new avenues for behavior change, with an emphasis on both exercise and everyday life. It is recommended that tri-axial accelerometry be utilized when determining a patient's risk status(1).

M Karpansalo et al. published a study in 2002. To see if strong cardiorespiratory fitness can keep Finnish middle-aged men from retiring due to impairment. Physical fitness is adversely related to the likelihood of receiving a disability pension, particularly for those suffering from cardiovascular disorders(10).

LIMITATIONS OF THE STUDY:

1}The sample size included in the study could have been more.

2}The physical activity performed could be more vigorous.

FUTURE RESEARCH:

1}The study can be used for other factory workers.

2}Further researches can be done with a properly structured exercise program.

CONCLUSION

As a result of the research, we can conclude that printing plant workers' lung health is affected and that their health is related to their age and body weight. Their gowns and pulmonary health must be addressed.

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