

## Correlation of selected fitness variables with fasting blood sugar

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### ■ ABSTRACT

With India having the highest number of diabetic patients in the world, the sugar disease is posing an enormous health problem in the country. Therefore, this study was undertaken to find out the relationship between selected fitness variables namely, cardio-respiratory endurance, muscular strength (leg and back), muscular endurance, flexibility and fasting blood sugar. Sixty healthy army soldiers with age 25 to 49 years, were randomly selected as a subject for the study from Gwalior (M.P.). All subjects were examined for cardio-respiratory endurance, muscular strength, muscular endurance, flexibility and fasting blood sugar by a standard procedure. The relationship between selected variables was determined with the help of Pearson product moment correlation using SPSS 19 version. Flexibility ( $r = -.405^*$ ;  $p < .05$ ) was found to be significantly correlated with fasting blood sugar while other variables were insignificantly related. It was concluded that flexibility was the only variable related to fasting blood sugar, indicating that this simple measurement may be useful as a marker of diabetes in the male.

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Currently, India is the diabetes capital of the world. It is estimated that over 40 million of those with diabetes are currently in India and that by 2025 that number will grow to 70 million. In other words, 1 in every 5 diabetics in the world will live in India. Simply diabetes was viewed as a disease of overfed, sedentary people of European ancestry. But it is now exploding around the world owing to the spread of western habits. A rise in living standards and the spread of calorie-rich, fatty, fast foods, cheaply available in cities to rich and poor alike on the other side increased sedentariness that has resulted from the replacement of manual labour by service jobs, and from the advent of video games, television and computers that keep people seated lethargically watching screens for hours every day are the reasons behind the diabetes epidemic worldwide (Diamond, 2011). In addition to fatness, physical activity and exercise have also shown to be crucial and effective in controlling major recurring conditions. Sedentary lifestyles have been linked to 23 per cent of deaths from leading chronic diseases, including heart disease and

Type 2 diabetes (Castaneda, 2003). These lifestyle choices have been linked to many chronic diseases. Because physical activity can help control weight, it can be utilized in preventing and treating chronic diseases. Various studies have shown that the high incidence of diabetes in India is mainly because of sedentary lifestyle, lack of physical activity, obesity, stress and consumption of diets rich in fat, sugar and calories. Hence, the purpose of the present study was to find out the relationship between health related physical fitness and fasting blood sugar among healthy army soldiers.

### ■ METHODOLOGY

Sixty (N=60) army soldiers with 25 to 49 years of age were selected as a subjects for the study from Gwalior city. They were measured for selected health related physical fitness variables namely, cardio-respiratory endurance, muscular strength, muscular endurance, flexibility and fasting blood sugar. Cardio-respiratory endurance was measured with the help of Cooper's 12 min run and walk test, Muscular

strength by leg and back Dynamometer, Muscular endurance by flexed arm hang and fasting blood sugar concentration was determined with a semiautomatic enzymatic analyzer, using testing kit made by Span Diagnostics Ltd. All these measurements were made on a consecutive days in morning between 06:30-10:00 AM. Subjects did not eat up to eight hours before testing as well as refrained from exercise for at least the previous twelve hours. Venous blood samples from the subjects were collected by phlebotomist and analyzed by a pathologist. Written consent was taken from each subject willing to participate before the start of study. Subjects were free to withdraw their names from study at any time without asking for any reason. Descriptive statistics and Pearson product moment correlation co-efficient as a statistical technique were employed to find out the relationship with the help of SPSS 19.0 version software.

### ■ OBSERVATIONS AND DISCUSSION

Table 1 reveals the characteristics of the subjects with the help of descriptive statistics namely, means and standard deviation. Table 2 shows the correlation matrix between anthropometric measures and fasting blood sugar. There was significant (-0.405;  $p < 0.05$ ) negative correlation between the fasting blood sugar and flexibility, while insignificant in case of rest of the anthropometric measures namely, cardio-respiratory endurance, muscular endurance and muscular strength. The importance of flexibility has been recognized for estimating cardio-vascular disease risk factors, particularly due to their relation with fasting blood sugar. The results of the present study in a line with several studies that have assessed the relation between physical fitness and fasting blood sugar (Sobngwi *et al.*, 2002; Elizabeth Graham, 2011).

Most individuals can benefit from improved flexibility, regardless of age or gender. With aging, muscles shorten (tighten), diminishing the range of motion in a joint, hindering or halting day-to-day activities and movements (Health and Wellness Guide, 2008).

Many of the individuals have been placing their health at risk through lifestyle choices. Being physically fit can contribute to healthy body fitness. Therefore, it is important to encourage physical activity throughout life as they play an important role in risks associated with increased incidence of chronic disease. The results of this present study indicated the need for early intervention of fitness to help individuals be aware of diabetes and engage in healthy choices to prevent them from developing diabetes. Among all the fitness variables, flexibility was strongly correlated with fasting blood sugar. This suggests that healthy lifestyle choices may improve the parameters of chronic disease, while those that do not engage in healthy lifestyle choices may see an increase in risk factors.

**Table 1 : Subjects characteristics**

Parameters	Mean	Std. deviation
Flexibility	2.15	4.04
Leg strength	108.21	20.08
Back strength	109.10	18.87
Cardio-respiratory endurance	2092.97	586.64
Muscular endurance	34.83	25.83
Fasting blood sugar	60.79	14.78

**Table 2 : Correlation of fasting blood sugar with selected fitness variables**

	Flexibility	Leg strength	Back strength	Cardio-respiratory endurance	Muscular endurance
Fasting blood sugar	-.405*	.143	-.134	-.095	-.137

N= 60; \*indicates significance of value at  $P=0.05$ ;  $r_{.05}(58) = .250$ ;  $p < 0.05$



**Conclusion:**

This study is novel in that it focused on using non-invasive, inexpensive, field-based fitness measures in relation to fasting blood sugar in healthy adults. It is especially unique in that it included a variety of health related physical fitness tests in the field based measures that may solve the cost factor problem of the individual. So, we come on the conclusion that as we concentrate on different body muscles flexibility of the individual, reduction in the risk of diabetes in healthy men will be achievable. Sports scientists and physical educationists must design programmes in such a way that they give more emphasis on to increase activity that helps in improving the flexibility through lifestyle modification, which may have significant effect in reducing the incidence of diabetes risk in these populations.

Several limitations of the present study warrant further discussion. Self-selection bias is a concern because participants volunteered for the study. Future investigations aimed at confirmation of finding from the present study should incorporate random sampling. A single sample of fasting blood sugar was obtained for each participant due to time and

resource considerations. Duplicate measures of these parameters would have strengthened our findings.

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