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# Effect of Kathak Dancing on Body Composition in Adult Bengalee Occupationally Engaged-Women of Kolkata

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## ABSTRACT

Dance, sequence of non verbal rhythmic body movements with creative nature and scope for expression, has been an enjoyable experience through centuries especially in females. Indian classical dancing has a glorious tradition and is still popular. Kathak is a typical form of Indian classical dancing originating in northern India. Besides rhythmic footwork, other basic elements of Kathak include linear and circular extension of the body with controlled coordination between body and hand and accordingly this dance form may have some impact on body composition. In this backdrop, a study was undertaken to assess the impact, if any, of regular practicing of Kathak dance for at least five years with daily practicing time of about half an hour, on body composition in occupationally-sedentary in nature - engaged Bengalee women. Similar measurements on body composition variables were taken from the women of comparable age and ethnic background, involved in similar sedentary work and not performing any form of physical exercise including Kathak or any other forms of dance. From the results, it has been found that women engaged in sedentary occupation, but practicing Kathak dance regularly have significantly ( $P < 0.05$ ) favorable body composition parameters, in terms of lower body weight, BMI and body fat percentage than their age matched counterparts. It may be concluded that regular practicing Kathak dance has significant beneficial effect on maintaining favorable body composition and thereby reduces the chance of metabolic abnormalities.

**Key words:** Indian dancing, body movement, sedentary occupation, Bengalee, body fat percentage

## INTRODUCTION

Obesity has a far-ranging negative effect on health. Reduced energy expenditure and intake of high calorie food are the major reasons behind it<sup>1</sup>. According to International Classification of Adult Underweight, Overweight and Obesity, a BMI of more than 25 indicates obesity. There is an increased risk of heart disease, type 2 diabetes, high blood pressure, osteoarthritis, breathing problems etc due to obesity<sup>2</sup>. Females, occupationally engaged - sedentary in nature – in Kolkata are also no exception<sup>3</sup>. On the other hand, physical activity, any form of muscular activity, results in the expenditure of energy proportional to muscular work and it is related to physical fitness. Exercise represents a subset of physical activity that is planned with

a goal of improving or maintaining fitness<sup>4</sup>. It is reported that reducing TV watching, drinking carbonated drink and increasing physical activity reduces childhood obesity<sup>5</sup>. It was observed that if small changes in physical activity were given to subjects who were having a sedentary lifestyle earlier, there were large health benefits with only minimal risk. Moderate to high levels of cardio respiratory fitness reduce the risk of death of all form<sup>6</sup>. Type 2 or insulin resistant diabetes occur later in life and is associated with upper body or android obesity. Diet and exercise are important parts of treatment program for type 2 diabetes to achieve weight loss and improve insulin sensitivity<sup>7</sup>.

Dance is a sequence of non verbal rhythmic body movements with creative nature and scope for expression. It has been an enjoyable experience through centuries especially in females. Dancing also reduces stress and increases stamina<sup>8</sup>. Kathak, a typical form of Indian classical dancing originates in northern India. It involves rhythmic footwork, linear and circular extension of the body with controlled coordination between body and hand. In this dance all the body parts move smoothly, and it demands high level of physical activity. There are some special movements like skips, jumps and turns in all direction which ensures better posture and flexibility. It also prevents back and neck pain in today's otherwise sedentary lifestyle where people spend long hours before the computer monitor. In Kathak dance, the dancer puts her weight on the floor and taps the feet to rhythm with ankle bells or 'ghunghroos' secured round the ankles. These ankle bells are very important for the dancer. It is very energy consuming and brings about an active lifestyle.

But adult and adolescent female population engaged in regular physical activity<sup>9</sup>(Biddle, 2005) or dancing is quite less. In this backdrop, the objective is to study the effect of regular Kathak dancing on body composition in adult Bengalee occupationally – sedentary- engaged females of Kolkata.

## **MATERIALS AND METHODS**

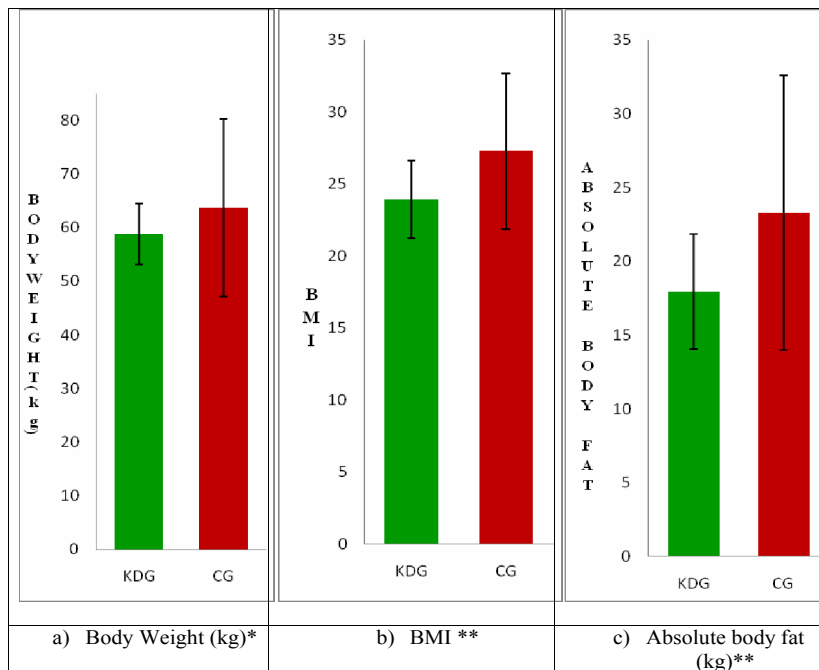
At first, institutions imparting training on Kathak dancing were approached for obtaining permission to work on the individuals receiving training on Kathak dancing. On obtaining initial consent, the names of volunteers were enlisted and the procedural requirement was explained to them elaborately. The inclusion criteria was that female individuals should be occupationally (sedentary in nature) engaged for a minimum period of 3 years, and they should receive training for a minimum period of 5 years in Kathak dance and practice it regularly for at least an hour for 6 days a week. The individuals satisfying the mentioned criteria volunteering for the study constituted the Kathak dancing group (KDG). Females of comparable age and socio-economic background, with similar occupational engagement, but not receiving training in any form of dance and also not exercising formally constituted the Control Group (CG). Information about their age (year), occupational engagement period (year), daily activities, food habits, socio-economic condition<sup>10</sup> were recorded in pre-designed schedule. Body

height(cm) using anthropometric rod with an accuracy of 0.1 cm, body weight (kg) using electronic scale with an accuracy of 0.1 kg with individuals in light clothing and without shoes, were measured and BMI was calculated. Waist circumference (WC) at the midpoint between the last rib and the iliac crest, with the subject standing, after complete exhalation<sup>11</sup> and Hip circumference (HC) at the maximum circumference over the buttocks with the arms relaxed at the sides<sup>12</sup> were measured using a non stretch measuring tape and waist hip ratio (WHR) was also calculated. Body fat was estimated<sup>13,14</sup> from skinfold measurement at three sites; tricep<sup>15</sup> (measured on the right upper arm, midway between the acromion and the olecranon), subscapula<sup>16</sup> (measured two fingers below the low point of the right scapula) and suprailiac<sup>17</sup> (measured at the diagonal fold located 1 cm above the anterior superior iliac crest) using skinfold calliper. The data of KDG and CG were compared to find out any significant difference. P value lower than 0.05 (P<0.05) was considered significant.

## RESULTS

There were 39 individuals in KDG, of age  $33.7 \pm 6.65$  year; and 72 volunteers constituted the CG; their age was  $35.3 \pm 6.26$ . The KDG and CG individuals were not differing significantly in respect of their age.

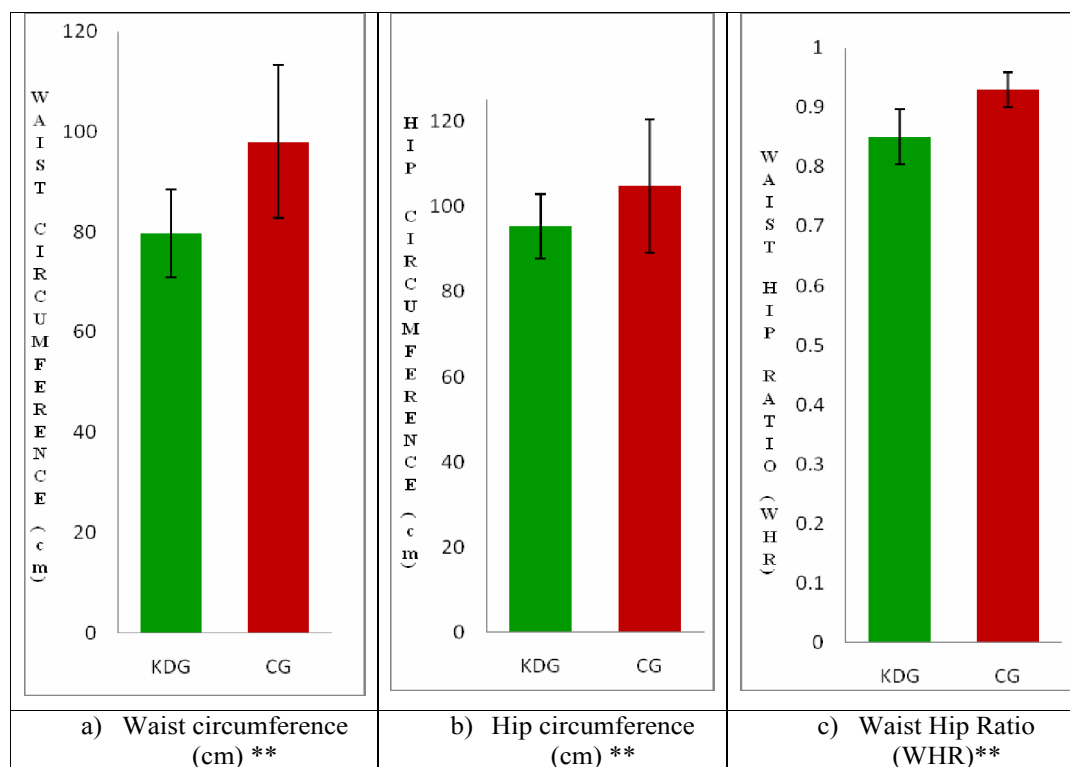
In fig 1, the body weight in kg (a), BMI (b) and absolute body fat in kg(c) data have been presented.



\*P< 0.05, \*\*P<0.01

**Fig 1: Comparison between KDG and CG individuals in respect of BW, BMI and BF**

In fig 2, the Waist circumference in cm (a) Hip circumference in cm (b) and Waist Hip Ratio (c) data have been presented.



\*\*P<0.01

**Fig 2: Comparison between KDG and CG individuals in respect of WC, HC and WHR**

## DISCUSSION

In Fig 1, the comparative results obtained in respect of Body Weight, BMI, and absolute Body Fat for KDG and CG individuals have been graphically presented.

The KDG individuals have significantly lower ( $P < 0.05$ ) body weight, compared to their CG counterparts [Fig 1 (a)].

The mean Body Mass Index (expressed in  $\text{kg.m}^{-2}$ ), an indicator of obesity, of KDG is  $23.9 \pm 2.77$  and CG is  $27.2 \pm 4.44$  [Fig 1 (b)]. BMI of KDG individuals is significantly lower ( $P < 0.01$ ), compared to their CG counterparts; the mean BMI of KDG individuals has just reached the lower limit of being referred to as overweight for Asians, as per WHO criteria, but the CG individuals has crossed the upper limit of being referred to as overweight.

As BMI grossly gives the obesity status of the body, which takes into account of the total body weight without considering the fat distribution<sup>18</sup>, a further detailed approach can be implemented by calculating total fat percentage. The mean absolute BF of KDG individuals is also significantly lower ( $P < 0.01$ ), compared to their CG counterparts [Fig 1 (c)], which is in agreement with the findings from an earlier study of similar type on the effect of Bharatnatyam dancing carried out on adult Bengalee females<sup>19</sup>.

In Fig 2, the results obtained in respect WC, HC and WHR, from the present study, have been graphically presented.

The waist circumference (WC), a marker of central obesity and cardiovascular risks<sup>20</sup>, is more important for Asians as they have lower BMI values but high levels of abdominal fat<sup>21</sup>. The mean WC, of KDG individuals is significantly lower ( $P < 0.01$ ), compared to their CG counterparts; the mean WC of CG individuals has crossed the cut off limit for Asians [Fig 2 (a)]. The recommended WC threshold values is 80 cm for Asian females and exceeding this value increases the risk of suffering from metabolic syndrome<sup>22</sup>.

The Hip Circumference (HC) has been found to be highly correlated with plasma CRP, which is an indicator of insulin resistance and metabolic disorder, in obese Taiwanese females<sup>23</sup>. The mean HC of KDG individuals is significantly lower ( $P < 0.01$ ), compared to their CG counterparts [Fig 2 (b)], which may prevent the KDG group individuals' suffering from metabolic disorders.

The mean Waist Hip Ratio (WHR), an important marker for abdominal obesity, of KDG individuals is significantly lower ( $P < 0.01$ ), compared to their CG counterparts [Fig 2(c)]; the mean WHR of CG individuals has crossed the cut off limit for Asians. The recommended value of WHR for Asian female is 0.85. High WHR values in females are associated with mortality and many clinical conditions such as cardiovascular diseases, type 2 diabetes, gall-bladder disease, lung function impairment, carcinomas and low fecundity<sup>24</sup>.

The present study indicates that Kathak dancing exercise might play an important role in the prevention of becoming overweight and obese reducing the risk of obesity in adulthood<sup>25</sup>. This also highlights that Kathak dancing helps to lose weight. The positive influence of this training on the reduction of the body fat could be noted<sup>26</sup>. The implemented dance model consisted of a combination of numerous movements and hand swings in different directions and on different plains with simultaneous skips and leg movements. These are probably the factors that led to the changes in body composition. Regular dancing activity prevents unhealthy weight gain and obesity, whereas sedentary behaviors such as watching television promote them. Regular exercise can markedly reduce body weight and fat mass without dietary caloric restriction in overweight individuals. An increase in total energy expenditure appears to be the most important determinant of successful exercise-induced weight loss<sup>27</sup>. These findings are in agreement with results of earlier studies carried out to observe the effect of Bharatnatyam dancing on adult Bengalee females conducted on different group of subjects

<sup>19, 21</sup>.

On the basis of the study it could be concluded that Kathak dancing exercise is a cost effective beneficial way of exercising which has specific beneficial impact on maintaining favorable body composition variables, adjudged anthropometrically in Bengalee females engaged in sedentary occupation and thereby lowering risk of suffering from Cardiovascular and other possible diseases.

To combat the epidemic of overweight and to improve cardiovascular health at a population level, it is important to develop strategies to increase habitual physical activity and to prevent overweight and obesity in collaboration with communities, families, schools, work sites, health care professionals, media and policymakers.

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