Measuring the Dancer's Growth and Development

Dr Nico Kolokythas, Performance Enhancement Coach atElmhurst Ballet School and Birmingham Royal Ballet, looks at a more reliable measurement to assess the developmental status of the adolescent dancer.

Elmhurst Ballet Companys Lucy Fox and Jakob Myers. Photo Andy Ross.

In the Autumn 2019 issue of One, Dr Carlo Bagutti discussed the importance of the assessment of the nutritional status of a dancer, through methods such as medical and gynaecological history, assessing body composition, carrying out diet questionnaires as well as physical examinations, whilst importantly highlighting the limitations of using Body Mass Index (BMI) as a sole measure. In this article we will focus on the developmental status of the adolescent dancer, as this is a crucial time of growth and maturation.

Traditionally, the Body Mass Index (BMI), an index developed for adults, has incorrectly been the go-to marker for the developmental status of the young dancer. The calculation of the BMI is derived from the weight and the height of the individual (weight/height2). However, even though the correlation of the index with bodyweight is strong, this correlation is low with the height of the individual. A strong correlation means that if the value of the bodyweight increases then the BMI increases, whereas, a weak correlation means that if the value of the height increases the BMI does not change.

Research also shows that BMI is of limited informative value due to the changes in the weight and height of the individual in relation to the body's composition (fatness/thinness) over time. This reduces the reliability of the BMI, i.e. the degree to which the measurement is accurate, as a comparable measurement from one age to another.

In the table opposite we present the data of six dancers, three females and three males, all of whom have a different body composition but the similar BMI. Each of these dancers are classified as 'underweight', a statement that can be misleading. BMI needs to be used with caution when used to assess the developmental status of the adolescent dancer. The calculation should be age and gender specific, as seen on the site nhs.uk/live-well/healthy-weight/bmi-calculator/, and should be given as a percentile. In other words, the results of the individual need to be compared with individuals of a similar age group through the use of growth charts.

"Considering that thinness is embedded in dance and in particular ballet culture, the use of appropriate measurements and language is paramount."

A different way to assess the nutritional status of the young dancer is by using the percentage of Weight-for-Height (%WFH) calculation, also known as %BMI or %Ideal Body Weight. Percentage of Weight for Height (%WFH) accounts for the changes in the adolescent's weight, height and relation to body fatness/thinness over time. Therefore, it is thought to be clinically more meaningful than BMI alone, especially in underweight children and adolescents. One major limitation, however, is that both the BMI and the %WFH cannot take muscle mass into account.

The calculation of the %WFH not only includes the bodyweight and height of the individual, but also includes age and gender. In addition, this algorithm draws data from existing growth charts and compares the individual's results with the median of matched age and gender individuals, making the calculation more reliable. Practitioners assessing adolescents with disordered eating patterns consider a %WFH <90 to be problematic. More specifically %WFH <90-85% is considered as mild malnutrition, 85-75% as moderate whereas >75% as severe malnutrition.

It is important to keep in mind, however, that these are arbitrary values for a general population of children and adolescents and not specifically for young dancers. The University of Wolverhampton, together with Elmhurst Ballet School, is currently working on an international collaborative project to create normative values for young dancers. Looking at the data in the table and comparing their BMI with their %WFH, the %WFH indicates that all dancers are of 'normal weight', with Dancer E being close to the ideal weight and Dancers A & D being above the ideal weight.

Dancers of different body compositions and similar Body Mass Index (BMI), showing varying % Weight For Height (%WFH).

	Gender	Age	Weight	Height (KG)	Fat (%) (CM)	BMI	%WFH
Dancer A	Female	12	42	150.1	24	18.6	103
Dancer B	Female	14	47.4	162.4	23	18	93
Dancer C	Female	15	45.2	158.1	26	18.1	90
Dancer D	Male	12	37.3	143	21	18.2	104
Dancer E	Male	14	55.1	172.5	14	18.5	99
Dancer F	Male	16	46.1	159.7	14	18.1	90

At Elmhurst Ballet School, we believe that monitoring growth and development is vital for the young dancer during this crucial time of maturation. Without close monitoring of both metric and behavioural aspects the risk of eating distress or disorder increases in both male and female dancers. It is, therefore, important not only to educate the young dancers on the benefits of health monitoring/screening but to also create a safe, non-judgemental environment for them where they can feel relaxed and empowered.

We bi-annually assess the body composition of the students with bioelectrical impedance analysis (BIA), and measure their growth (weight and height) three times per year. The measurements are always taken first thing in the morning to control potential measurement variability. As stated by Dr. Bagutti, the BIA has major limitations, however, when used longitudinally it can provide practitioners with some important information about the body composition of the young dancer.

Overall, the sensitivity over time of any marker and its ability to spot issues longitudinally need to be considered with caution and always as part of a more holistic approach for monitoring the health and wellbeing of the young dancer.

Dr Nico Kolokythas leading a physical education session at Elmhurst Ballet School

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