ORIGINAL ARTICLE

Dance-exercise and dietary habits impact on physical parameters in female college students

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ABSTRACT

This study aimed to compare the physical characteristics, body composition, and dietary preferences of female college students majoring in dance and those from non-dance disciplines, in order to identify potential differences linked to their distinct lifestyles and training backgrounds. This cross-sectional study analysed multiple parameters, including anthropometric measurements (height and BMI), body composition (BFM, VFL, VFA, BAI, WHR, and PBF), and foundational body components (TBW, protein, minerals, SLM, FFM, SMM, and BMR). Dance training history and weekly hours of physical activity were recorded. Dietary preferences were assessed through FFQ, focusing on the consumption of fruits, vegetables, dairy products, beverages, and alcohol. Dance majors were significantly taller (168.75 ± 3.83 cm) than non-dancers (165.03 ± 6.04 cm; p = .0033) and had lower BMI values (19.81 ± 1.69 vs. 21.96 ± 3.66; p = .0029). They also exhibited significantly lower values in fat-related indices compared to their non-dancer counterparts. No significant differences were found in foundational body composition measures between the two groups. Regarding dietary habits, dancers reported a frequent intake of yogurt, fruits, and vegetables, and preferred carbonated drinks, while consuming minimal amounts of alcohol. Non-dancers more commonly drink milk on a weekly basis, as well as a high intake of carbonated beverages, but similarly low alcohol consumption. Female dance majors differed significantly from non-dance majors in terms of height, fat-related indices, and dietary patterns. These discrepancies likely reflect the impact of long-term dance training and associated lifestyle factors on physical and nutritional profiles.
Keywords: Sport medicine, Dance students, Body composition, Dietary habits, Exercise training.

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INTRODUCTION

In contemporary college populations, the interplay among dietary behaviours, body composition (including metrics such as body fat percentage and muscle mass), and overall health has garnered considerable attention (Rosselli et al., 2021; Zhou et al., 2024). Among these people, female undergraduates represent a key demographic whose eating patterns and body composition could offer valuable insights into the general health profile of the student body. However, it is noted that these patterns are not uniform, which are shaped by various factors like academic specialty, daily habits, and cultural food practices (Lees et al., 2017; Robbeson et al., 2015).

Specifically, female students majoring in dance are subject to unique professional demands that usually result in remarkable differences in dietary choices and physical characteristics compared to their non-dance peers. The rigorous training, performance expectations, and aesthetic ideals inherent in dance education necessitate a tailored approach to nutrition and body management (Brown et al., 2020). Consequently, any discrepancies between daily dietary preferences and physiological needs among these students can significantly influence their physical fitness and overall well-being.

Such discrepancies can have profound implications for health, with persistent deviations from normal weight ranges or excessive body fat levels potentially leading to heightened health risks (Ballarin et al., 2021; Leal et al., 2019). Accordingly, a comparative analysis of the dietary habits and body shape indicators of female non-dance undergraduates against those of dance majors not only provides empirical data but also offers insights for developing health education strategies and targeted interventions (Ballarin et al., 2021; Friesen et al., 2011).

This study recruited 35 female dance majors and 35 female non-dance majors. Through administering a Food Frequency Questionnaire (FFQ) (Liu et al., 2022) and employing InBody measurements, we conducted a comprehensive analysis of the participants' dietary habits, seeking to elucidate potential effects of both nutrition and dance-specific training on body composition parameters.

METHODS

Participants

A total of 70 healthy female undergraduate students were recruited through an on-campus online platform. Participants were evenly divided into two groups: 35 dance majors with regular dance training (dancer group) and 35 non-dance majors without formal dance training or established physical activity habits (non-dancer group). Eligibility criteria included the absence of chronic illnesses, metabolic disorders, or recent use of medications that could potentially influence metabolism or body composition.

Food Frequency Questionnaire (FFQ)

Dietary intake over the preceding six months was evaluated using a semi-quantitative FFQ in this study, which was adapted from the NHANES Food Questionnaire (Liu et al., 2022) and modified to reflect local dietary characteristics with several items being revised or excluded. The final version of the FFQ comprised 36 items, organized into six major categories: Dairy Products, Grains and Staple Foods, Vegetables, Fruits, Non-Alcoholic Beverages, and Alcoholic Beverages. Each food item was presented with a standard portion size, with food models provided to assist participants in estimating their typical intake. Participants were requested to report both the frequency and approximate quantity of each food item consumed over the past six months. The FFQ was administered by trained personnel to ensure clarity and completeness of the responses.

InBody measurements

Body composition was assessed using the InBody 970 multi-frequency bioelectrical impedance analysis system, which applies high-frequency currents to measure various physiological components.

The assessed parameters included InBody Score, Weight Control, Body Fat Mass (BFM, kg), BFM Control, Visceral Fat Level (VFL), Visceral Fat Area (VFA, cm^2), Fat Mass Index (FMI), Body Adiposity Index (BAI), Obesity Degree, Skeletal Muscle Mass (SMM, kg), SMM/Weight ratio (SMM/WT), Soft Lean Mass (SLM, kg), Fat-Free Mass (FFM, kg), Total Body Water (TBW, L), TBW/WT, protein (kg), minerals (kg), Basal Metabolic Rate (BMR, kcal/day), Skeletal Muscle Mass–Visceral Fat Area Ratio (SVR), segmental lean mass and fat mass in arms, legs, and trunk, as well as circumference measures (arm, neck, chest, abdomen, waist, hip, thigh), and standardized T- and Z-scores of BMI, SMM/WT, FMI, PBF, VFA, TBW/WT, and WHR. All measurements were conducted under standardized conditions. Participants were instructed to fast for at least two hours and to refrain from vigorous physical activity for 12 hours prior to the measurement session. These precautions were taken to enhance measurement accuracy and reliability.

Training records

Participants in the dancer group completed an additional questionnaire to document their training background, including the total number of years of formal dance experience and the average weekly hours dedicated to dance training and other forms of physical exercise over the past three months.

Correlation analysis

Pearson correlation analysis was performed to examine the association between dance training and InBody parameters. Independent variables include age, hours of sleep per night, years of dance training, weekly hours of dance training, weekly hours of non-dance physical activity, and total training hours. Dependent variables covered the parameters of InBody, such as InBody Score, SMM/WT, BFM, PBF, VFA, FMI, SVR, segmental lean and fat distribution, circumference measures, and relevant T- and Z-scores, and so on. This allowed a comprehensive assessment of how different aspects of training are associated with body composition and proportional indices.

Statistical analysis

Data analysis was performed using independent samples *t*-tests to compare physical characteristics, body composition, and dietary patterns between the two groups. A *p*-value of less than .05 was considered statistically significant. All data are presented as mean ± standard deviation unless otherwise specified.

RESULTS

Basic characteristics

As shown in Table 1, female dance students had a significantly greater height compared to non-dance students (168.75 ± 3.83 cm vs. 165.03 ± 6.04 cm, $p = .0033$) and a lower BMI (19.81 ± 1.69 vs. 21.96 ± 3.66, $p = .0029$), these baseline differences were consistent with the inherent anthropometric characteristics of dance-major students. Regarding weight distribution, 88.24% of female dance students had a normal weight, 11.76% were underweight, with 82.35% categorized as moderate BMI and 17.65% as low BMI. In contrast, 14.29% of non-dance female students were underweight, 60.00% had a normal weight, and 25.71% were overweight, with 62.86% having a moderate BMI, 20.00% low BMI, and 17.14% high BMI (Fig. 1). The dancer students report a mean dance training duration of 8.80 ± 4.08 years, on average, dancer students devote 16.76 ± 12.51 hours per week to dance classes or self-directed practice, reflecting considerable variability in training commitment (Table 2). Some students invest substantial weekly hours in professional practice, whereas others may train less frequently. Moreover, the mean weekly time spent on non-dance athletic activities is 2.26 ± 2.41 hours, indicating that although these students primarily focus on dance training, they also engage in other forms of physical exercise to some degree.

Table 1. Basic characteristics of female college students majoring in dance and non-dance (Mean ± SD).

	Dancer (n = 35)	**non-Dancer (n = 35)**	***p*-value**
Age (year)	19.34 ± 0.83	19.60 ± 0.80	.1967
Height (cm)	168.75 ± 3.83	165.03 ± 6.04	.0033
Current weight (kg)	56.38 ± 5.03	60.04 ± 11.72	.0969
BMI (kg/m^2)	19.81 ± 1.69	21.96 ± 3.66	.0029

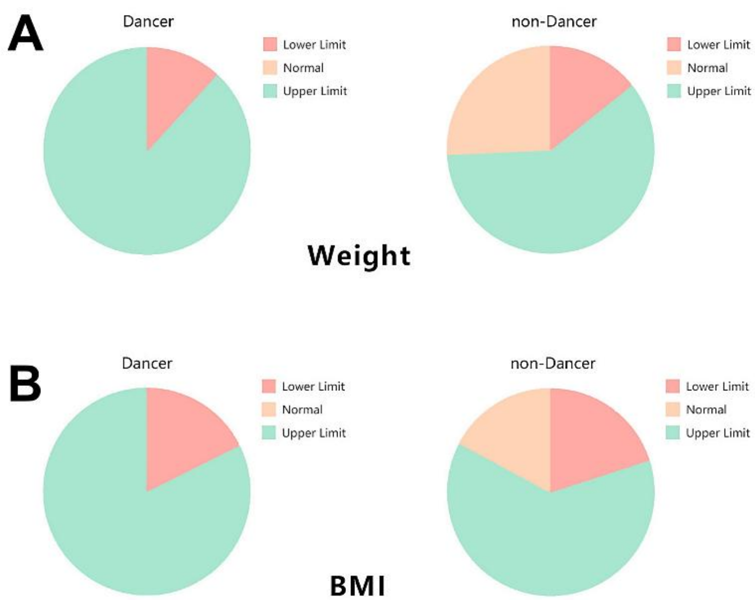

Figure 1. Comparison of weight (A) and BMI (B) distribution in dancer and non-dancer.

Table 2. Training records of dance students.

	Mean(n = 34*)	**SD**
Dance training(year)	8.80	4.08
Dance classes or self-training (hours/week)	16.76	12.51
non-Dance athletic training (hours/week)	2.26	2.41

*Note. *: One dancer student InBody data and training records were missing, resulting in n = 34.*

Human body characteristic

As shown in Table 3, Dancers had a significantly greater height, measuring 168.75 ± 3.83 cm compared to 165.03 ± 6.04 cm in non-dancers (p = .0033). However, there was no statistical difference in body weight, with dancers averaging 56.38 ± 5.03 kg and non-dancers averaging 60.04 ± 11.72 kg (p = .0982). Correspondingly, the BMI was notably lower in dancers at 19.81 ± 1.69, compared to 21.96 ± 3.66 in non-dancers (p = .0027), indicating that dancers tend to have a leaner physique.

Regarding overall body composition, dancers achieved a higher InBody Score of 73.24 ± 3.72, versus 70.06 ± 4.05 for non-dancers (p = .0012). Additionally, dancers exhibited significantly better Weight Control scores (3.62 ± 4.92 vs. –1.66 ± 8.44, p = .0023) and BFM Control (-1.00 ± 2.62 vs. –5.93 ± 5.50, p < .0001). Although there were no noteworthy differences in BMR, protein, minerals, FFM, SMM, or SLM, the SMM/WT was considerably higher in dancers, measuring 39.99 ± 1.93 compared to 36.93 ± 2.49 in non-dancers (p < .0001). This underscores the greater proportion of lean mass in dancers relative to their body weight.

Segmental analysis demonstrated clear advantages in the dancer group. The lean mass percentages of both legs were significantly higher in dancers, with values of 108.55 ± 5.21% for the right leg compared to 99.14 ± 7.91% for the control group (p < .0001), and 108.31 ± 5.23% for the left leg versus 99.10 ± 7.82% (p < .0001). In contrast, fat mass percentages were consistently lower across all body regions. For example, dancers exhibited significantly lower body fat mass percentages in the arms (69.56 ± 12.83% for the right arm compared to 98.61 ± 29.12% for the control group, p < .0001; 70.15 ± 12.37% for the left arm vs. 98.23 ± 28.71%, p < .0001), trunk (120.34 ± 24.30% vs. 175.35 ± 58.66%, p < .0001), and legs (83.08 ± 11.42% for the right leg vs. 98.40 ± 18.52% for the control, p = .0042; 83.21 ± 11.28% for the left leg vs. 98.49 ± 18.62%, p = .0045). These findings reinforce that dancer exhibit significantly reduced segmental adiposity and improved lean mass distribution.

Additionally, dancers showed consistently lower indices of central adiposity. Their VFL was significantly lower at 5.47 ± 1.24 compared to 8.49 ± 3.33 in the control group (p < .0001). The visceral fat area was also lower in dancers, measuring 59.46 ± 11.45 cm² compared to 89.28 ± 33.33 cm² in the control group (p < .0001). PBF was lower as well, with values of 26.16 ± 3.23% versus 31.65 ± 4.94% (p < .0001). Derived indices, including FMI (5.20 ± 0.92 vs. 7.09 ± 2.09, p < .0001), BAI (23.50 ± 1.84 vs. 25.77 ± 2.99, p = .0003), Obesity Degree (94.21 ± 8.11 vs. 104.54 ± 17.40, p = .0025), and SVR (0.39 ± 0.07 vs. 0.27 ± 0.08, p < .0001), all indicate better body composition in dancers.

In terms of TBW content, there was no significant difference in absolute litres between the groups (30.4 ± 2.61 vs. 29.74 ± 4.74, p = .482). However, the TBW/WT was significantly higher in dancers (53.98 ± 2.38% vs. 49.98 ± 3.67%, p < .0001), indicating a more favourable body water proportion relative to body weight. Dancers also exhibited greater segmental TBW in both legs, with the right leg showing 5.46 ± 0.46 litres compared to 5.01 ± 0.84 litres in the other group (p = .0079) and the left leg showing 5.45 ± 0.47 litres compared to 5.01 ± 0.85 litres (p = .0101). Differences in TBW for the arms and trunk were not significant: right arm (1.43 ± 0.20 vs. 1.47 ± 0.35, p = .4976), left arm (1.42 ± 0.19 vs. 1.46 ± 0.35, p = .5030), and trunk (13.84 ± 1.13 vs. 14.00 ± 2.19, p = .6966). Additionally, T- and Z-scores for TBW/WT were also higher in dancers, with T-scores of 0.67 ± 0.55 compared to −0.26 ± 0.86 (p < .0001) and Z-scores of 0.23 ± 0.45 compared to −0.15 ± 0.65 (p = .0057).

Circumference measurements further supported the finding of reduced central adiposity in the dancer group. Neck circumference was lower in dancers (30.97 ± 1.22 cm vs. 32.38 ± 2.44 cm, p = .0035), as was chest circumference (83.02 ± 3.29 cm vs. 86.96 ± 7.23 cm, p = .0051), and abdominal/waist circumference (74.19 ± 3.64 cm vs. 81.84 ± 9.39 cm, p < .0001). However, hip circumference did not show any significant difference. This is consistent with the significantly lower WHR (0.82 ± 0.02 vs. 0.88 ± 0.05, p < .0001) and waist-to-height ratio (0.44 ± 0.02 vs. 0.50 ± 0.05, p < .0001) observed in the dancer group.

Finally, standardized T- and Z-scores confirmed these findings. Dancers consistently displayed lower scores related to adiposity (e.g., BMI, FMI, PBF, VFA, and WHR) and higher scores related to lean mass (e.g., SMM/WT). These consistent differences across absolute values, segmental distribution, circumference measures, and standardized indices collectively demonstrate that female dance students maintain a significantly leaner and more favourable body composition profile compared to their non-dance counterparts.

Table 3 Human body characteristic parameters in dancer and non-dancer (Mean ± SD).

Item	Dancer (n = 34)	non-Dancer (n = 34)	*p*-value	*q*-value
Height	168.75 ± 3.83	165.03 ± 6.04	.0033	.0123
Weight	56.38 ± 5.03	60.04 ± 11.72	.0982	.0107
BMI	19.81 ± 1.69	21.96 ± 3.66	.0027	.0142
InBody Score	73.24 ± 3.72	70.06 ± 4.05	.0012	.0098
Weight Control	3.62 ± 4.92	-1.66 ± 8.44	.0023	.0123
BFM Control	-1 ± 2.62	-5.93 ± 5.5	<.0001	.0017
BMR (Basal Metabolic Rate)	1268.26 ± 77.44	1248.71 ± 140.88	.4793	.2278
Protein	8.12 ± 0.72	7.96 ± 1.29	.5336	.2387
Minerals	3.07 ± 0.27	2.97 ± 0.5	.3226	.2219
FFM (Fat Free Mass)	41.59 ± 3.58	40.68 ± 6.52	.4779	.2289
SMM (Skeletal Muscle Mass)	22.54 ± 2.15	22.04 ± 3.9	.5172	.2320
SMM/WT	39.99 ± 1.93	36.93 ± 2.49	<.0001	.0001
SLM (Soft Lean Mass)	39.03 ± 3.37	38.19 ± 6.12	.4852	.2278
Lean Mass of Right Arm	1.83 ± 0.25	1.89 ± 0.45	.4891	.8913
Lean Mass (%) of Right Arm	89.44 ± 7.21	91.17 ± 10.56	.4283	.9534
Lean Mass of Left Arm	1.82 ± 0.24	1.88 ± 0.46	.5055	.8855
Lean Mass (%) of Left Arm	88.75 ± 6.76	90.32 ± 10.98	.4803	.9901
Lean Mass of Trunk	17.74 ± 1.46	17.99 ± 2.81	.6571	.9893
Lean Mass (%) of Trunk	95.6 ± 3.88	96.56 ± 4.6	.3541	.7619
Lean Mass of Right Leg	7.02 ± 0.6	6.44 ± 1.09	.0081	.0107
Lean Mass (%) of Right Leg	108.55 ± 5.21	99.14 ± 7.91	<.0001	.0001
Lean Mass of Left Leg	7 ± 0.6	6.44 ± 1.09	.0102	.0107
Lean Mass (%) of Left Leg	108.31 ± 5.23	99.1 ± 7.82	<.0001	.0001
PBF (Percent Body Fat)	26.16 ± 3.23	31.65 ± 4.94	<.0001	.0001
BFM (Body Fat Mass)	14.8 ± 2.57	19.37 ± 6.03	.0001	.0076
BFM% of Whole Body	111.34 ± 28.78	171.51 ± 66.49	<.0001	.0014
BFM of Right Arm	0.98 ± 0.19	1.39 ± 0.51	<.0001	.0022
BFM% of Right Arm	97.31 ± 19.24	144.47 ± 50.27	<.0001	.0006
BFM of Left Arm	1 ± 0.19	1.41 ± 0.5	<.0001	.0019
BFM% of Left Arm	98.78 ± 19.45	146.82 ± 50.3	<.0001	.0006
BFM of Trunk	6.77 ± 1.36	9.48 ± 3.34	<.0001	.0037
BFM% of Trunk	120.34 ± 24.3	175.35 ± 58.66	<.0001	.0013
BFM of Right Leg	2.55 ± 0.42	3.03 ± 0.8	.0032	.0144
BFM% of Right Leg	99.74 ± 16.67	123.16 ± 30.86	.0002	.0077
BFM of Left Leg	2.56 ± 0.42	3.02 ± 0.8	.0038	.0164
BFM% of Left Leg	99.75 ± 16.7	123.15 ± 31.04	.0002	.0087
Arms/Legs Fat	7.08 ± 1.2	8.86 ± 2.6	.0005	.0107
VFL (Visceral Fat)	5.47 ± 1.24	8.49 ± 3.33	<.0001	.0006
VFA (Visceral Fat Area)	59.46 ± 11.45	89.28 ± 33.33	<.0001	.0008
FMI (Fat Mass Index)	5.2 ± 0.92	7.09 ± 2.09	<.0001	.0014
BAI (Body Adiposity Index)	23.5 ± 1.84	25.77 ± 2.99	.0003	.0049
Obesity Degree	94.21 ± 8.11	104.54 ± 17.4	.0025	.0124
SVR(Skeletal Muscle Mass-Visceral Fat Area Ratio)	0.39 ± 0.07	0.27 ± 0.08	<.0001	<.0001
TBW (Total Body Water)	30.4 ± 2.61	29.74 ± 4.74	.482	.2278
TBW/WT	53.98 ± 2.38	49.98 ± 3.67	<.0001	.0001
TBW of Right Arm	1.43 ± 0.2	1.47 ± 0.35	.4976	.8970
TBW of Left Arm	1.42 ± 0.19	1.46 ± 0.35	.503	.8745
TBW of Trunk	13.84 ± 1.13	14 ± 2.19	.6966	1.0000
TBW of Right Leg	5.46 ± 0.46	5.01 ± 0.84	.0079	.0107
TBW of Left Leg	5.45 ± 0.47	5.01 ± 0.85	.0101	.0107

AC (Arm Circumference)	26.16 ± 1.36	27.85 ± 3.05	.0043	.0141
AMC (Arm Muscle Circumference)	22.71 ± 1.06	23.53 ± 2.19	.0512	.0894
Measured Circumference of Neck	30.97 ± 1.22	32.38 ± 2.44	.0035	.0107
Measured Circumference of Chest	83.02 ± 3.29	86.96 ± 7.23	.0051	.0180
Measured Circumference of Abdomen	74.19 ± 3.64	81.84 ± 9.39	<.0001	.0014
WC (Waist Circumference)	74.19 ± 3.64	81.84 ± 9.39	<.0001	.0014
Measured Circumference of Hip	90.91 ± 2.89	92.73 ± 6.5	.1398	.3629
Measured Circumference of Right Arm	26.28 ± 1.39	28.04 ± 3.05	.0031	.0128
Measured Circumference of Left Arm	26.16 ± 1.36	27.85 ± 3.05	.0043	.0141
Measured Circumference of Right Thigh	49.75 ± 2.27	50.14 ± 4.5	.655	.9538
Measured Circumference of Left Thigh	49.8 ± 2.26	50.14 ± 4.56	.702	.9053
WHR (Waist-Hip Ratio)	0.82 ± 0.02	0.88 ± 0.05	<.0001	<.0001
WHtR (Waist-Height Ratio)	0.44 ± 0.02	0.5 ± 0.05	<.0001	.0001
ABSI (A Body Shaped Index)	0.08 ± 0	0.08 ± 0	<.0001	.0001
Conicity Index	1.18 ± 0.03	1.25 ± 0.05	<.0001	<.0001
BMI_T score	-0.71 ± 0.62	0.09 ± 1.36	.0026	.0146
SMI(SMM/Wt) T score	0.71 ± 0.61	-0.24 ± 0.78	<.0001	.0001
SMI(SMM/Wt) Z score	0.25 ± 0.5	-0.16 ± 0.6	.0032	.0350
FMI_T score	-0.72 ± 0.46	0.21 ± 1.04	<.0001	.0017
PBF_T score	-0.7 ± 0.56	0.25 ± 0.84	<.0001	.0001
VFA_T score	-0.54 ± 0.4	0.49 ± 1.15	<.0001	.0006
VFA_Z score	-0.2 ± 0.35	0.3 ± 0.93	.0044	.0472
TBW/WT_T Score	0.67 ± 0.55	-0.26 ± 0.86	<.0001	.0001
TBW/WT_Z Score	0.23 ± 0.45	-0.15 ± 0.65	.0057	.0292
WHR_T score	-0.5 ± 0.52	0.86 ± 1.01	<.0001	<.0001
WHR_Z score	-0.18 ± 0.34	0.46 ± 0.83	.0001	.0031

Food frequency analysis

Based on the six-month FFQ (Table 4), dancers more frequently reported weekly yogurt (51% vs 37%) and melon (29% vs 20%), whereas non-dancers more often consumed milk (71% vs 32%), bananas (21% vs 12%), onions (46% vs 24%), and cucumbers (32% vs 0%). Both groups relied on rice as a staple (97% vs 94%) and toast/bread (70% vs 64%), with oatmeal uncommon (≤6%). Cooked greens were prevalent (77% vs 88%), while raw greens were less frequent among dancers (12% vs 34%); broccoli and cauliflower were similar (broccoli: 40% vs 48%, cauliflower: 29% vs 32%), with dancers reporting more corn (40% vs 29%). Carbonated beverages were reported weekly by a notable minority in both cohorts but were higher in non-dancers (43% vs 35%); fruit juices were generally infrequent (each ≤24%). Alcohol intake was low overall (beer 3% vs 6%; wine 0% vs 6%; liquor 0% in both). Synthesizing across categories, dancers tended toward fermented dairy and selected fruits/vegetables perceived as lighter, alongside markedly lower frequencies of certain raw/pungent items and slightly lower carbonated-drink prevalence; non-dancers showed higher milk, banana, and carbonated-drink frequencies.

Table 4. Food frequency survey in dancer and non-dancer.

Items	Dancer (35)		non-Dancer (35)	
	≥1 time/week	<1 time/week	≥1 time/week	<1 time/week
Dairy products				
Yogurt	51%	49%	37%	62%
Milk	32%	69%	71%	28%
Grains and staple foods				
Oatmeal	3%	98%	6%	94%
Rice	97%	3%	94%	6%
Toast (bread)	70%	32%	64%	38%

Vegetables				
Cooked green	77%	24%	88%	12%
Raw green	12%	88%	34%	65%
Carrots	24%	76%	24%	77%
String beans	15%	86%	21%	79%
Peas	12%	89%	20%	81%
Corn	40%	60%	29%	71%
Broccoli	40%	60%	48%	52%
Cauliflower	29%	72%	32%	68%
Onions	24%	77%	46%	54%
Cucumbers	0%	80%	32%	68%
Tomatoes	23%	77%	18%	83%
Summer squash	9%	92%	9%	92%
Fruits				
Apple	18%	83%	21%	80%
Pear	12%	88%	12%	88%
Banana	12%	88%	21%	80%
Pineapple	12%	88%	9%	91%
Peach	12%	88%	12%	89%
Grape	9%	91%	12%	89%
Melon	29%	71%	20%	80%
Strawberry	20%	80%	20%	80%
Orange	29%	72%	35%	65%
Grapefruit	6%	94%	6%	94%
Non-alcoholic beverages				
Tomato juice	6%	94%	9%	91%
Orange juice	20%	80%	24%	77%
Apple juice	9%	91%	12%	88%
Grape juice	6%	94%	12%	89%
Meal replacement drink	6%	95%	6%	94%
Carbonated beverage	35%	66%	43%	57%
Alcoholic beverages				
Beer	3%	98%	6%	94%
Wine	0%	100%	6%	95%
Liquor	0%	100%	0%	100%

Effects of dance training on body composition

Within the Dancer group, Pearson correlation analysis (Fig. 2) showed that Age was significantly positively associated with Lean Mass (%) of Left Arm ($p < .05$), significantly negatively associated with WHR Z score ($p < .05$), and highly positively associated with SMM/WT Z Score and TBW/WT Z Score (both $p < .001$). Age also demonstrated a highly significant positive association with VFA Z score ($p < .001$). Moreover, Years of dance training was significantly positively correlated with WHR, WHtR, Measured Circumference of Right Arm, Measured Circumference of Chest, Measured Circumference of Abdomen, WC, and VFL ($p < .05$). The results suggest that within dancer group, higher age is linked to proportional gains in muscle and body-water indices but also to greater visceral adiposity, and that longer training duration relates positively to several indices of central adiposity and upper-torso/upper-limb circumferences.

Figure 2. Correlation analysis of training duration of dancer students and InBody parameters.

DISCUSSION AND CONCLUSIONS

Dance training influences body composition in various ways. It includes both aerobic and anaerobic elements, which increase metabolic demands and help maintain a lean physique (Brooks et al., 2023; Chaikali et al., 2023; Lu et al., 2020). This study found that dancers had lower levels of body fat and more favourable fat distribution compared to non-dancers, highlighting how rigorous practice can improve body composition. Although dance students showed significant differences in fat-related measures, they did not differ substantially from their non-dancing counterparts in terms of total body water, protein content, mineral density, skeletal muscle mass, or basal metabolic rate (Lu et al., 2020). One possible explanation for this is that the increased intensity of their training is often balanced by a corresponding dietary intake, which helps preserve overall lean tissue (Challis et al., 2020; Deng et al., 2024; Duarte et al., 2023; Gammone & D'Orazio, 2020). Additionally, fundamental factors like skeletal mass tend to remain relatively stable after skeletal maturity is reached, indicating a point of balance that dance training may not significantly alter (Kim et al., 2019; Lambert et al., 2020).

On average, participants in dance majors had 8.80 years of specialized dance experience and practiced about 16.76 hours per week, demonstrating a high level of commitment. Extended and intense training regimens can result in significant improvements in musculoskeletal function and cardiorespiratory efficiency, which may help explain their advantages in managing body fat and maintaining physical form (Leal et al., 2019; Lim et al., 2015; Milanese et al., 2022; Wang et al., 2023). The results of this study revealed that dancers often consumed yogurt, a variety of fruits (such as melon, orange, strawberry, and apple), and certain cooked vegetables. This may indicate a preference for foods that are considered light or nutrient-rich. However, their inclination toward carbonated beverages should be approached with caution due to potential metabolic implications. In contrast, non-dancers preferred milk, bananas, onions, and other produce, which might reflect their usual choices or sociocultural influences. These differing preferences emphasize how lifestyle and personal taste can influence dietary habits and, consequently, energy balance.

For dancers, maintaining low body fat can enhance aesthetics and performance, but it also poses the risk of inadequate energy availability if nutritional needs are not met. Non-dancers with higher body fat face different concerns, particularly increased risks for cardiometabolic disorders. Preventive strategies for both groups should include balanced meal plans, mindful hydration, and personalized workout prescriptions. Monitoring energy intake and expenditure is crucial for dancers to protect their bone density and hormonal health, while non-dancers may benefit from gradual exercise regimens and reduced consumption of sugary beverages (Saenz et al., 2024).

Our study compares the dietary behaviours, body composition, and training durations of dance students with non-dance students. The findings provide valuable guidance for promoting nutritional well-being among the wider student population and offer critical insights into optimizing training management and nutrition support for dance students. Future research could adopt longitudinal or interventional designs to systematically track how dance training affects body composition, dietary habits, and health outcomes over extended periods. Such studies could inform evidence-based strategies that encourage both dancers and non-dancers to adopt healthier lifestyles.

AUTHOR CONTRIBUTIONS

Caifang Qiu conceived and designed the study, drafted the manuscript, conducted data collection, and performed the data analysis. Juanmin Gao was responsible for revising the thesis and providing research funding.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

AVAILABILITY OF DATA AND MATERIALS

Data will be available by the author upon reasonable request.

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