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Morgan Potter

College of Saint Benedict/Saint John's University

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Relationship Between BMI, Exercise, and Milk Consumption

Morgan Potter and Mary Stenson, PhD
College of Saint Benedict/Saint John's University
Exercise Science and Sport Studies Department

Introduction

- Obesity is a multifactorial disease. Imbalances in energy intake and expenditure may be one of the major causes of obesity. Energy intake from beverages may especially go unaccounted for by many individuals.
- The USDA recommends that adults consume 24 oz of dairy per day. 24 oz of milk provides approximately 900mg of calcium.
- Researchers have noted that dairy calcium intake may help prevent excess weight gain and that milk consumption is inversely related to body fat (BF) and BMI in girls and college students. (Poddar, Abreu)
- The relationship between milk consumption and body fat has been researched in children, but is lacking in adult populations.

Purpose

- The purpose of this study was to examine the relationship between dairy consumption, body composition, and physical activity in males and females.

Methods

- 169 males and 344 females from a small college community were surveyed about their beverage consumption and exercise habits.
- The BevQ-15 was used to assess beverage consumption habits. Participants were asked to provide their height and weight as well as their average frequency, intensity, and duration of exercise.
- A bioelectrical impedance test for BF percentage was performed on a sub-group of volunteers from the survey sample.
- 98 sub-sample subjects were measured for height and weight. Bioelectrical impedance testing was performed with a BodyStat QuadScan 4000. All subjects were euhydrated at time of testing (urine specific gravity \leq 1.020).
- Pearson product moment correlation coefficients were used to examine the relationships among milk consumption, BMI, BF, and minutes of exercise per week.

Results

Table 1. Descriptions of the two samples used in the study

	Survey Sample	Sub-Sample
N	Total= 513 Females= 344 Males= 169	Total= 98 Females= 58 Males= 40
Age	45% between 18-22	65% between 18-22
Milk*	oz. 79.1% drank LF milk	oz. 74.5% drank LF milk
BMI		

*Milk consumption values include low fat, reduced fat, and whole milk.

Results: Survey Data (N= 513)

Table 2. The relationships between milk consumption, BMI, and minutes of exercise per week in survey data

		Milk (oz)	BMI (kg/m ²)	Exercise (mins)
Milk (oz)	Pearson Corr. N	1.0 513		
BMI (kg/m ²)	Pearson Corr. N	-0.104* 513	1.0 513	
Exercise (mins)	Pearson Corr. N	0.179* 513	-.209* 513	1.0 513

*Indicates significant results ($p < 0.05$).

When the survey data was broken down by sex;

- significant inverse relationship was found between milk consumption and BMI for females ($r = -.015$; $p = .005$), but not for males ($r = -.142$; $p = .065$).
- Weak significant relationship was found between milk consumption and exercise per week (mins) for both males ($r = .219$; $p = .004$) and females ($r = .152$; $p = .005$).
- Significant relationship was found between BMI and exercise per week (mins) in females ($r = -.265$; $p < .05$) and the general survey ($r = .209$; $p < .05$) but was not found in males ($r = -.097$; $p = .207$).

Results: Sub-sample Data (N=98)

Table 3. The relationships between milk consumption, BF, and minutes of exercise per week in the sub-sample

		Milk (oz)	% BF	Exercise (mins)	BMI (kg/m ²)
Milk (oz)	Pearson Corr. N	1.0 98			
% BF	Pearson Corr. N	-.313* 98	1.0 98		
Exercise (mins)	Pearson Corr. N	.307* 98	-.131 98	1.0 98	
BMI (kg/m ²)	Pearson Corr. N	-.124 98	.258* 98	.013 98	1.0 98

*Indicates significant results ($p < 0.05$).

When sub-sample data was broken down by sex;

- a weak non-significant inverse relationship was found between milk consumption and BMI for females ($r = -.245$; $p = .064$) and a non-significant inverse relationship for males ($r = -.135$; $p = .405$).
- A moderate significant inverse relationship was found between milk consumption and %BF in males ($r = -.382$; $p = .015$) but not in females ($r = -.212$; $p = .110$).
- A moderate significant relationship was found between milk consumption and exercise/week (mins) in females ($r = .336$; $p = .010$) but not in males ($r = .305$; $p = .056$).
- Non-significant relationship was found between exercise per week (mins) and BMI in both males ($r = .168$; $p = .299$) and females ($r = -.081$; $p = .547$).
- Non-significant relationship between exercise per week (mins) and % BF in both males ($r = -.060$; $p = .712$) and females ($r = -.229$; $p = .084$).

Discussion

- Consistent with previous research, we found a significant, inverse relationship between milk consumption and BMI which was slightly stronger in women.^{1,2}
- Previously, researchers have suggested that calcium influences energy metabolism by decreasing fat absorption and increasing fat oxidation.²
- Low fat dairy intake may be associated with better overall diet quality. (Poddar)
- Additionally, protein content in milk may suppress appetite.²
- BF was significantly and inversely related to milk consumption in the sub-sample, but not significantly related to minutes of exercise per week.

Conclusions

- Milk consumption has a significant inverse relationship with BMI and BF in adult females.
- Minutes of Exercise per week does not have significant relationship with percent body fat.

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