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BACKGROUND

Promotion of high peak bone mass is one of the strategies to prevent osteoporosis in adult life. Undergraduate students are still in the age group of mineral acquisition and, therefore, their lifestyle may influence this process.

OBJECTIVE

To evaluate bone mass in undergraduate students with different lifestyle.

METHODS

Observational study in 142 (62 males) undergraduate students aged 17 to 28 years (22.3 ± 2.9). Socio-demographic, clinical, and lifestyle variables were obtained through densitometric anamnesis. Bone mineral density (BMD) at lumbar spine (LS), total body (TB), femoral neck (FN) and total femur (TF) were evaluated by DXA (Explorer, Hollogig). Low PBM was defined as Z-score < -1 DP. Anthropometry was performed before the DXA examination. Statistical tests used were Student's t-test, Mann-Whitney U and Chi-square. Human Ethics Comity approved the study.

RESULTS

Table 1 and 2 presents demographic, life style, medical history, anthropometric and DXA data according students group. Physical education students dispended more time doing exercise than medical students. Moreover, frequency of regular practicing of physical was also higher in this group. Medical students presented higher frequency of low PBM in all sites except femoral neck (TB: 51.4% vs 85.3%; LS: 72.9% vs 91.2%; TF: 77.0% vs 92.6%; $p < 0.001$). BMD Z-score was lower in medical students in all sites. Z-score differences varied from 0.76 in TF to 0.92 in LS. High impact exercises was more frequent in physical education students (54.4% vs 33.8%; $p < 0.05$). Students with normal PBM presented more frequency of regular practicing of physical activity than those with low PBM (71.9% vs 50.0%; $p < 0.05$). There were no students with smoking history or calcium supplements use.

CONCLUSIONS:

Higher physical exercise level was associated to higher peak bone mass in Brazilian undergraduate students.

REFERENCES

- ✓ Bonjour JP, Chevalley T, Ferrari S, Rizzoli R. The importance and relevance of peak bone mass in the prevalence of osteoporosis. *Salud publica de Mexico*. 2009;51:s5-s17.
- ✓ Cosman F, De Beur SJ, LeBoff MS, Lewiecki EM, Tanner B, Randall S, Lindsay R. Clinician's guide to prevention and treatment of osteoporosis. *Osteoporosis international*. 2014;25(10):2359-2381.
- ✓ International Society for Clinical Densitometry. Combined Official Positions. 2015. Disponível em: <http://www.ISCD.org>.
- ✓ National Osteoporosis Foundation. Exercises for Strong bones. Disponível em: <http://nof.org/exercise>. Acesso em: 13 de abr. 2016.
- ✓ Sawyer AJ, Bachrach LK, Fung EB, editors. *Bone Densitometry in Growing Patients. Guidelines for Clinical Practice*. New Jersey: Humana Press, 2007.
- ✓ Weaver CM, Gordon CM, Janz KF, Kalkwarf HJ, Lappe JM, Lewis R, et al. The National Osteoporosis Foundation's position statement on peak bone mass development and lifestyle factors: a systematic review and implementation recommendations. *Osteoporosis International*. 2016;27(4):1281-1386.
- ✓ World Health Organization. *Global recommendations on physical activity for health*. 2010.

Table 1: Demographic, life style and medical history categories according student group.

		Physical Education		Medicine		p*
		n	%	n	%	
Gender	Female	33	48.5	47	64	0.720
	Male	35	51.5	27	37	
Regular menses	Yes	27	81.8	44	94	0.100
	No	6	18.2	3	6.4	
Calcium intake > 1000 mg/day	Yes	7	10.3	8	11	0.920
	No	61	89.7	66	89	
Vitamin D supplements	Yes	2	2.9	4	5.4	0.460
	No	66	97.1	70	95	
Clinically significant fracture (ISCD criteria)	Yes	24	35.3	21	28	0.370
	No	44	64.7	53	72	
Fragility fracture (WHO criteria)	Yes	4	5.9	4	5.4	0.900
	No	64	94.1	70	95	
Medications with impact on bone health	Yes	3	4.4	5	6.8	0.540
	No	65	95.6	69	93	
Osteoporosis in first-degree relative	Yes	5	7.4	6	8.1	0.860
	No	63	92.6	68	92	
Physical exercise > 150 minutes/week	Yes	62	91.2	30	41	<0.001
	No	6	8.8	44	60	
Peak bone mass (at least one site)	Normal	58	85.3	35	47	<0.001
	Low	10	14.7	39	53	

* chi-squared.

Table 2: Demographic, anthropometric and DXA data according student group.

		n	Mean	SD	p
Age (years)	Physical Education	68	22,3	3,3	0,563*
	Medicine	74	22,3	2,6	
Age at menarche (years)	Physical Education	68	12,8	1,7	0,733*
	Medicine	74	12,5	1,3	
Physical exercise (minutes/week)	Physical Education	68	481,2	442,6	<0,001*
	Medicine	74	128,1	139,0	
Calcium intake (mg/day)	Physical Education	68	644,6	402,3	0,470*
	Medicine	74	598,4	342,8	
BMI (kg/m ²)	Physical Education	68	23,4	2,9	0,107**
	Medicine	74	22,5	3,2	
Weight (kg)	Physical Education	68	68,3	12,5	0,188*
	Medicine	74	66,2	14,8	
Height (meters)	Physical Education	68	1,70	0,08	0,107*
	Medicine	74	1,71	0,10	
BMD Total Body (Z-score)	Physical Education	68	0,02	1,21	<0,001*
	Medicine	74	-0,81	0,90	
BMD Lumbar Spine (Z-score)	Physical Education	68	0,3	1,2	<0,001**
	Medicine	74	-0,4	1,1	
BMD Femoral Neck (Z-score)	Physical Education	68	1,0	1,2	<0,001**
	Medicine	74	0,2	1,1	
BMD Total Femur (Z-score)	Physical Education	68	0,6	1,1	<0,001**
	Medicine	74	-0,1	1,0	

* U Mann-Whitney test. ** Student t test.

