**Supplementary Table 1:** Additional Study Information

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| **Author (date)** | **Research Question** | **Study Design** | **Screening procedures (a)** | **BMD assessment** | **Adipose assessment** | **Complete results reported? (b)** | **BMI range** | **PA related information?** | **Covariates included.** |
| **Abou Samra et al. 2005** 45 | To investigate the effect of obesity versus the leptin/insulin axis on bone metabolism in insulin resistant and sensitive women. | Cross-sectional | Yes | Hologic 4500A | DXA | Correlations were reported for absolute adipose mass but not relative (%BM) | 30 – 50.9 | Exclusion criteria included participation in strenuous physical activity. | None |
| **Aguirre et al. 2014** 46 | To determine the influence of body fat and circulating adipokines on BMD in elderly obese frail participants. | Cross-sectional | Yes | Hologic Delphi 4500/w | DXA | Correlations were reported with relative adipose mass (%BM), but not absolute (kg) | Not reported | Inclusion criteria included sedentary lifestyle, defined as not participating in regular exercise more than 2 times per week. | None |
| **Ballard et al. 2010** 47 | To examine the effects of body composition, behavioural and health history factors on BMD in immigrant Hispanic women. | Cross-sectional | Yes | Hologic Discovery C, software version 11.2 | Skinfold thickness of the triceps, suprailiac and thigh converted to body fat using the Siri equation. | Correlations were reported for total femur but not femoral neck. | Not reported | Assessed by PA questionnaire, descriptives not reported. BMD was not different across PA tertiles. | Correlations corrected for linear effect of age. |
| **Boyanov et al. 2014** 48 | To test the relative contribution of adipose and lean mass to BMD variability in Bulgarian women. | Cross-sectional | Yes | Hologic QDR 4500 A, software version 1.26 | DXA | Yes | Not reported | None reported. | None |
| **Campos et al. 2012** 49 | To test the relationships between visceral and subcutaneous fat with bone metabolism, anti-inflammatory adipokines and gender in obese adolescents. | Cross-sectional | Yes | Hologic QDR 4200 | DXA | No, only reported statistically significant findings. | Not reported | None reported | None |
| **Do Prado et al. 2009** 50 | To explore the combined and independent influence of body composition, leptin, insulin, glucose and HOMA-IR to BMD and BMD in Brazilian obese adolescents. | Cross-sectional | Yes | Hologic QDR4200 | DXA | Yes | Not reported | Exclusion criteria included participation in strenuous physical exercise. | None |
| **Gomez et al. 2009** 51 | To test the relationship between bone, body composition and related proteins and hormones in two cohorts of morbid obese patients, before and after bypass surgery. | Cohort study (data reported on pre-bariatric group only) | Yes | Lunar DXA-IQ, version 4.6c | DXA | Yes | Not reported | None reported. | None |
| **Hawamdeh et al. 2014** 52 | To assess the relative association between body composition, age and BMD in Jordanian women. | Retrospective cross-sectional | Yes | GE iDXA | Estimated from lumbar spine and femur DXA images using GE enCore software version 11.10 | Correlations reported with absolute adipose mass only. | 17.1 – 43.3 | None reported | None |
| **Ivuskans et al. 2013** 53 | To compare BMD in overweight and normal weight children. | Cross-sectional | Health status of the participants not confirmed. | Lunar Corporation DPX-IQ, software version 3.6 | DXA | Correlations reported with absolute but not relative adipose mass. | Not reported | None reported. | Yes, adjusted for age and pubertal status. |
| **Junior et al. 2013** 54 | To analyze the relationship between abdominal adipose tissue and BMD in obese children and adolescents. | Cross-sectional | Yes | GE Lunar DPX-NT | DXA | No, reported correlation with relative but not absolute adipose mass. | Not reported | Exclusion criteria included engagement in regular PA participation. | None |
| **Kang et al. 2014** 55 | To test the relationship between body composition and BMD by BMI levels in Northern Chinese men. | Cross-sectional | Yes | GE Lunar DXA, software 11.40.004 | DXA | Yes | Not reported | Assessed by questionnaire but descriptive not reported. | None |
| **Liu et al. 2014** 56 | To test the relationships between body composition and muscular strength with BMD in African American women with metabolic syndrome. | Cross-sectional | Yes | GE iDXA, encore 2006 software, version 13.11 | DXA | Yes | 25.1 – 45.1 | Exclusion criteria included participation in exercise, diet or weight loss programs. | None |
| **Morbeg et al. 2003** 57 | To explore the relationship between leptin and BMD in healthy obese and non-obese men. | Cross-sectional | Yes | Lunar DXA-IQ, software version 4.6c. | DXA | Correlations were reported for absolute, but not relative adipose tissue mass. | 23.2 – 56.4 | Recorded by retrospective questionnaire and included in regression models, but descriptive not reported. | None |
| **Mosca et al. 2014** 58 | To determine the effect of excess adipose tissue on bone mass in overweight and obese adolescents. | Cross-sectional | Yes | Hologic QDR 4500 Discovery A | DXA | Yes | Not reported | Exclusion criteria included regular practice of physical activity. | None |
| **Moseley et al. 2011** 59 | To investigate the effects of body composition on BMD in middle-aged men and women with uncomplicated noninsulin dependent diabetes mellitus. | Cross-sectional | Yes | GE Lunar Prodigy, encore 2010, version 13.31.016. | DXA | Correlations reported with absolute, but not relative adipose mass. | Not reported | Exclusion criteria included participation in regular physical activity. | None |
| **Remmel et al. 2016** 60 | To investigate the association between ghrelin, PYY and bone mineral characteristics in overweight and normal-weight boys. | Cross-sectional | Yes | Lunar DPX-IQ DXA, software version 3.6. | DXA | Correlations reported with absolute, but not relative adipose mass. | Not reported | Total PA (counts/min assessed by ActiGraph GT1M) was not different between over and normal weight boys, and was not correlated with BMD in either group. | None |

a Response was yes if screening procedures were described in sufficient detail to ensure that the study population met the inclusion/exclusion criteria of the meta-analysis. b Answered yes if all available results from the study were reported, and no if a selective reporting strategy was used.