Additional File 1 Prevalence of anthropometric measurements among children in age-adjusted groups in all study subjects (N=840).

Stage 1 (No.=840)	6-<10 yrs no. (320)	10-<16 yrs no. (440)	16-<18 yrs no. (160)	Total No. (840)
			no. (%)	no. (%)
	no. (%)	no. (%)		
Boys	160(38.1)	220(52.4)	40(9.5)	420(50)
Girls	160(38.1)	220(52.4)	40(9.5)	420(50)
Underweight	11(3.4)	22(5.0)	5(6.3)	38 (4.5)
Normal weight	227(70.9)	267(60.7)	51(63.8)	545(64.9)
Overweight	42(13.1)	62(14.1)	15(18.8)	119(14.2)
Obese	40(12.5)	89(20.2)	9(11.3)	139(16.5)
Overweight and obese	82(25.6)	151(35.6)	24(30)	258(30.7)
Overweight boys	17(10.6)	25(11.4)	8(20.0)	50(11.9)
Obese boys	23(14.4)	50(22.7)	5(12.5)	78(18.6)
Overweight girls	25(15.6)	37(16.8)	7(17.4)	69(16.4)
Obese girls	17(10.6)	39(17.7)	4(10)	60(14.3)
WC IDF	17 (5.3)	40(9.1)	5(6.3)	62 (7.4)
WC NCEP	17 (5.3)	30 (6.8)	1 (1.3)	48 (5.7)

Out of 840 schoolchildren participated in the study, 30.7% were overweight and obese with significant increase in the prevalence of obesity (16.5%, 18.6% boys and 14.3% girls) and overweight (14.2%, 11.9% boys and 16.4% girls) among group aged 10-<18 compared to age group 6-<10 years (obesity 12.5%, 14.2% boys and 15.6% girls) and (overweight 13.1%, 10.6% boys and 15.6% girls))(p value <0.01). Central obesity in terms of waist circumferences (WC) was diagnosed in 7.4% of the children according to IDF definition and 5.7% according to the NCEP-ATP/III definition. Overweight, obesity central obesity, and blood pressure had increased with increasing age.

Additional File 2 Sex-specific differences in the mean of anthropometric measurement in study subjects (n=840) in all age-specific groups.

| Age group Year	Gender/ n		Weight (Kg)	Height (m)	BMI	WC (cm)
6-<10	Girls N=160	Mean	27.14	1.27	16.6	56.34
		SD	7.34	0.09	2.9	7.18
	Boys N= 160	Mean	27.12	1.27	16.5	55.05
		SD	6.82	0.09	2.7	7.53
10-<16	Girls N=220	Mean	47.76	1.54	20.7	66.23
		SD	12.46	0.11	4.1	8.39
	Boys N=220	Mean	47.87	1.53	20.5	68.15
		SD	16.27	0.12	4.61	11.77
16-<18	Girls N=40	Mean	57.58	1.61	22.21	67.25
		SD	9.14	0.05	3.75	6.15
	Boys N=40	Mean	67.38	1.75	21.94	78.28
		SD	12.31	0.06	3.88	8.23
Sex- specific anthropometric measurement were established for boys and girls and no statistical differences were determined in age groups 6-<10 years and age group 10-<18 years.						
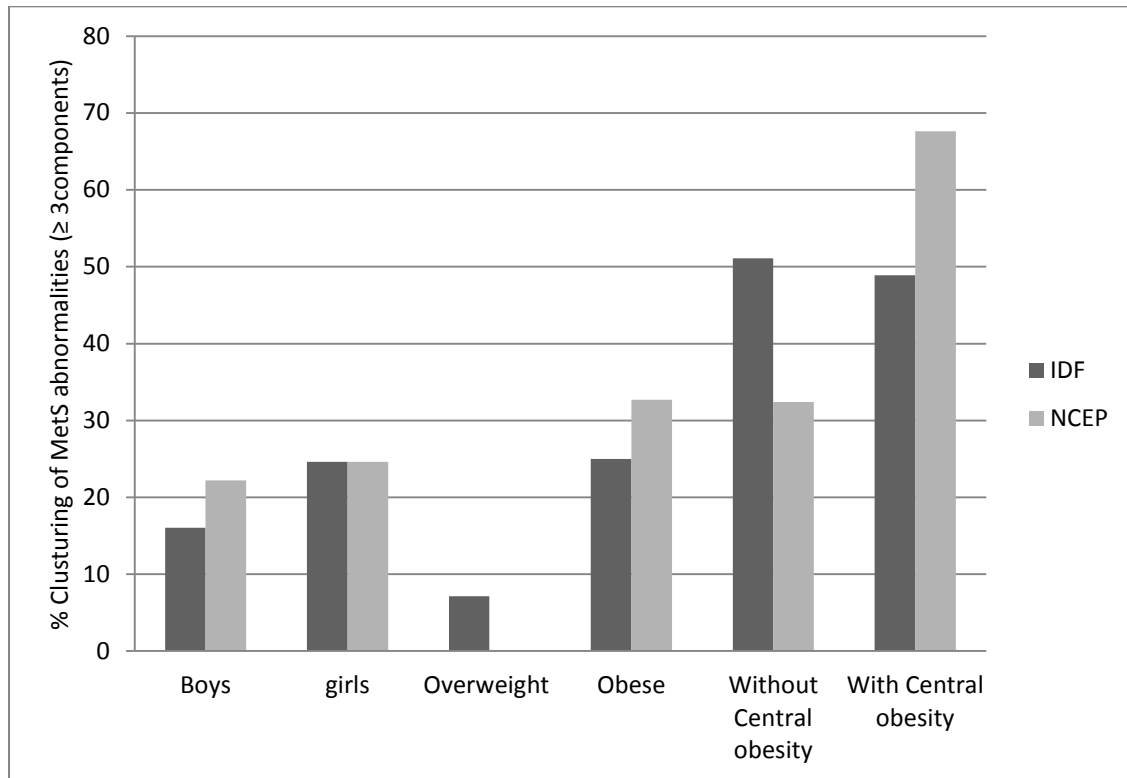
Figure 1 Clustering of MetS abnormalities (≥3 components) based on different risk factors using IDF and NCEP criteria.

Clustering of MetS abnormalities (≥ 3 components) based on different risk factors using IDF and NCEP criteria. Sex-specific clustering of MetS abnormalities (≥ 3 components) had shown no significant differences between boys and girls in culturing abnormalities using both IDF (p value 0.453) and NCEP criteria (p value 0.489). Clustering of MetS abnormalities based on BMI had shown that with increasing BMI, clustering of metabolic abnormalities had significantly increased according to IDF (p value 0.023) and NCEP (p value 0.000) criteria with no gender-specific differences (p value >0.05). Significant increase in clustering of MetS abnormalities was found also in obese children aged 10-<18 compared to overweight children using IDF (p value 0.003) and NCEP criteria (0.013). Clustering of MetS abnormalities based on central obesity had shown that children with increased central obesity had shown also significant increase in clustering of metabolic abnormalities according to NCEP (67.6%) (p value 0.000) and IDF criteria (48.9%) (p value 0.04).

Additional File 4 Association between body mass index (BMI) and other MetS abnormalities including waist circumferences (WC), blood pressure (BP), triglyceride (Trig), high density lipoprotein (HDL) , fast blood sugar (FBS).

	IDF					NCEP			
	Overweight no.(%)	Obese no.(%)	p value	OR (95%CI)		Overweight no.(%)	Obese no.(%)	pvalue	OR (95%CI)
WC	2(4.8)	45(43.3)	0.000***	15.25(3.5-66.49)	WC	1(2.4)	36(34.6)	0.000***	21.71(2.87-164.35)
BP	5(11.9)	18(17.3)	0.417	1.55 (0.54-4.49)	BP	9(21.4)	45(43.3)	0.013**	2.8 (1.22-6.43)
Trig	3(7.1)	12(11.5)	0.555	1.70 (0.45-6.3)	Trig	8(19.0)	29(27.9)	0.266	1.64 (0.68-3.97)
HDL	15(35.7)	69(66.3)	0.001**	2.44(1.44-4.18)	HDL	14(33.3)	68(65.4)	0.000***	3.78 (1.8-8.06)
FBS	18(42.9)	40(38.5)	0.623	0.83 (0.40-1.73)	FBS	4 (9.5)	19 (18.3)	0.189	2.12 (0.68-6.67)
MetS	1(2.4)	22(21.2)	0.005**	11.0 (1.43-84.49)	MetS	0(0)	34(32.7)	0.000***	1.49 (1.299-1.7)

With increasing BMI, clustering of metabolic abnormalities had significantly increased according to IDF and NCEP criteria. This includes central obesity according to both criteria (p value 0.000), BP according to NCEP criteria (p value 0.013), and reduced HDL according to both criteria (p value ≤0.001). MetS was significantly more prevalent in obese children than overweight children using IDF (p value 0.005) and NCEP criteria (p value 0.000).