**Supplementary Material 2**

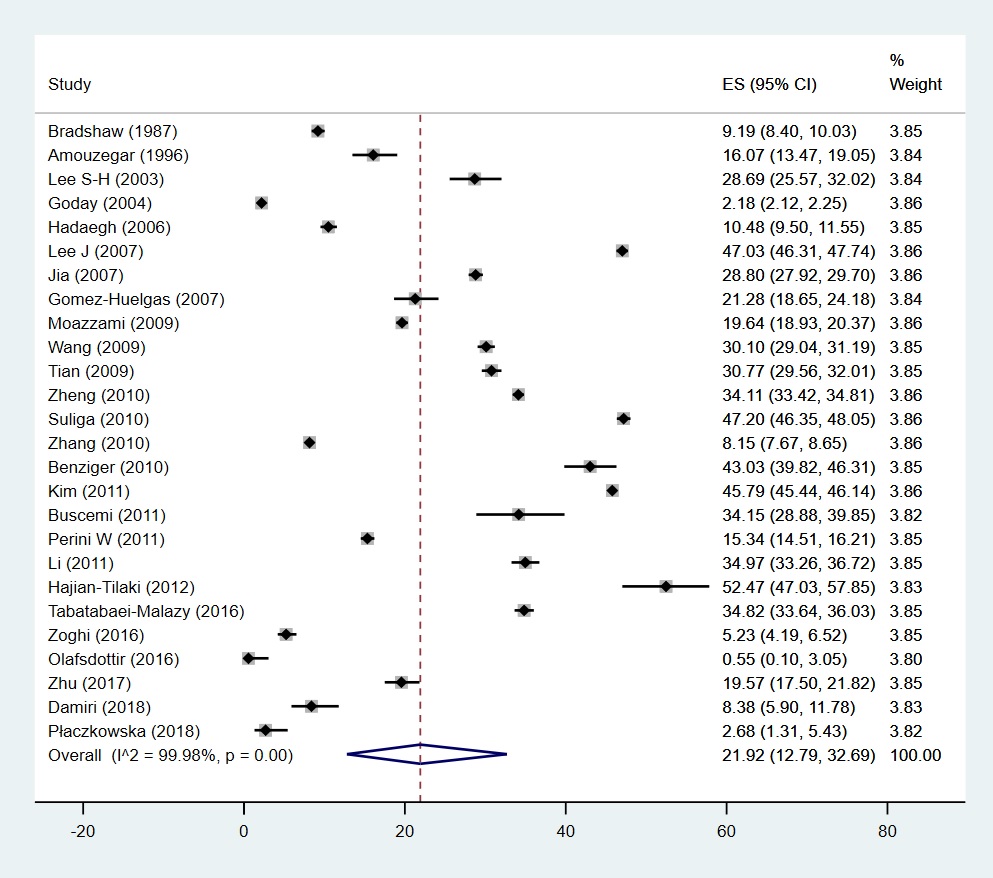
**Table 1.** Studies Truly Representative and With a Justified Sample Size According to the Newcastle-Ottawa Scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Studies (first author)** | **Representativeness** | **Sample size** | **Non-response rate** | **Assessment of the outcome** | **Statistical test** |
| Amouzegar (1996) [1] | A | A | B | C | A |
| Hadaegh (2006) [2] | A | A | A | C | A |
| Lee (2007) [3] | A | A | A | C | A |
| Jia (2007) [4] | A | A | A | C | A |
| Moazzami (2009) [5] | A | A | A | C | A |
| Wang (2009) [6] | A | A | C | C | A |
| Suliga (2010) [7] | A | A | A | C | A |
| Benziger (2010) [8] | A | A | A | C | A |
| Perini (2011) [9] | A | A | C | C | A |
| Zhu (2017) [10] | A | A | A | C | A |

**Table 2.** Other Criteria Used to Define Metabolic Alterations

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Lee [3]** | **Kim [11]** | **Buscemi [12]** |
| Absolutely required | None | None | None |
| Criteria | At least 1 | At least 1 | At least 2 |
| Blood pressure | ≥ 140/90 mm Hg | ≥ 130/85 mm Hg | ≥ 130/85 mm Hg |
| Fasting triglycerides | - | ≥ 150 mg/dL | ≥ 150 mg/dL |
| High-density lipoprotein (HDL) cholesterol | - | < 40 mg/dL (men)  < 50 mg/dL (women) | < 40 mg/dL (men)  < 50 mg/dL (women) |
| Total cholesterol | ≥ 240 mg/dL | - | > 200 mg/dL |
| Higher fasting blood sugar | ≥ 126 mg/dL | ≥ 100 mg/dL | - |
| Other | HOMA-IR score ≥ 2.5 | Ultrasound-based presence of fatty liver |  |

**Figure 1.** Forest plot of the prevalence of all the studies.



**References**

1. Amouzegar A, Kazemian E, Abdi H, Mansournia MA, Bakhtiyari M, Hosseini MS, et al. Association Between Thyroid Function and Development of Different Obesity Phenotypes in Euthyroid Adults: A Nine-Year Follow-Up. Thyroid. 2018;28(4):458–64. doi:10.1089/thy.2017.0454

2. Hadaegh F, Zabetian A, Harati H, Azizi F. Metabolic syndrome in normal-weight Iranian adults. Ann Saudi Med. 2007;27(1):18–24. doi:10.5144/0256-4947.2007.18

3. Lee S-H, Ha H-S, Park Y-J, Lee J-H, Yim H-W, Yoon K-H, et al. Identifying metabolically obese but normal-weight (MONW) individuals in a nondiabetic Korean population: the Chungju Metabolic disease Cohort (CMC) study. Clin Endocrinol (Oxf). 2011;75(4):475–81. doi:10.1111/j.1365-2265.2011.04085.x

4. Jia A, Xu S, Xing Y, Zhang W, Yu X, Zhao Y, et al. Prevalence and cardiometabolic risks of normal weight obesity in Chinese population: A nationwide study. Nutr Metab Cardiovasc Dis. 2018;28(10):1045–53. doi:10.1016/j.numecd.2018.06.015

5. Moazzami K, Lima BB, Sullivan S, Shah A, Bremner JD, Vaccarino V. Independent and joint association of obesity and metabolic syndrome with depression and inflammation. Health Psychol. 2019;38(7):586–95. doi:10.1037/hea0000764

6. Wang B, Zhuang R, Luo X, Yin L, Pang C, Feng T, et al. Prevalence of Metabolically Healthy Obese and Metabolically Obese but Normal Weight in Adults Worldwide: A Meta-Analysis. Horm Metab Res. 2015;47(11):839–45. doi:10.1055/s-0035-1559767

7. Suliga E, Kozieł D, Głuszek S. Prevalence of metabolic syndrome in normal weight individuals. Ann Agric Environ Med. 2016;23(4):631–5. doi:10.5604/12321966.1226858

8. Benziger CP, Bernabé-Ortiz A, Gilman RH, Checkley W, Smeeth L, Málaga G, et al. Metabolic Abnormalities Are Common among South American Hispanics Subjects with Normal Weight or Excess Body Weight: The CRONICAS Cohort Study. PLoS One. 2015;10(11):e0138968. doi:10.1371/journal.pone.0138968

9. Perini W, Kunst AE, Snijder MB, Peters RJG, van Valkengoed IGM. Ethnic differences in metabolic cardiovascular risk among normal weight individuals: Implications for cardiovascular risk screening. The HELIUS study. Nutr Metab Cardiovasc Dis. 2019;29(1):15–22. doi:10.1016/j.numecd.2018.09.004

10. Zhu X, Hu J, Guo H, Ji D, Yuan D, Li M, et al. Effect of Metabolic Health and Obesity Phenotype on Risk of Diabetes Mellitus: A Population-Based Longitudinal Study. Diabetes Metab Syndr Obes. 2021;14:3485–98. doi:10.2147/DMSO.S317739

11. Kim M-H, Chang Y, Jung H-S, Shin H, Ryu S. Impact of Self-Rated Health on Progression to a Metabolically Unhealthy Phenotype in Metabolically Healthy Obese and Non-Obese Individuals. J Clin Med. 2019;8(1):34. doi:10.3390/jcm8010034

12. Buscemi S, Chiarello P, Buscemi C, Corleo D, Massenti MF, Barile AM, et al. Characterization of Metabolically Healthy Obese People and Metabolically Unhealthy Normal-Weight People in a General Population Cohort of the ABCD Study. J Diabetes Res. 2017;2017:9294038. doi:10.1155/2017/9294038