A comparative assessment between Globorisk and WHO cardiovascular disease risk scores: a population-based study

Dehghan Azizallah, Rezaei Fatemeh, Aune Dagfinn

Abstract

The Globorisk and WHO cardiovascular risk prediction models are country-specific and region-specific, respectively. The goal of this study was to assess the agreement and correlation between the WHO and Globorisk 10-year cardiovascular disease risk prediction models. The baseline data of 6796 individuals aged 40–74 years who participated in the Fasa cohort study without a history of cardiovascular disease or stroke at baseline were included. In the WHO and Globorisk models scores were calculated using age, sex, systolic blood pressure (SBP), current smoking, diabetes, and total cholesterol for laboratory-based risk and age, sex, SBP, current smoking, and body mass index (BMI) for non-laboratory-based risk (office-based or BMI-based). In Globorisk and WHO risk agreement across risk categories (low, moderate, and high) was examined using the kappa statistic. Also, Pearson correlation coefficients and scatter plots were used to assess the correlation between Globorisk and WHO models. Bland–Altman plots were presented for determination agreement between Globorisk and WHO risk scores in individual's level. In laboratory-based models, agreement across categories was substantial in the overall population (kappa values: 0.75) and also for females (kappa values: 0.74) and males (kappa values: 0.76), when evaluated separately. In non-laboratory-based models, agreement across categories was substantial for the whole population (kappa values: 0.78), and almost perfect for among males (kappa values: 0.82) and substantial for females (kappa values: 0.73). The results showed a very strong positive correlation ($r \geq 0.95$) between WHO and Globorisk laboratory-based scores for the whole population, males, and females and also a very strong positive correlation ($r > 0.95$) between WHO and Globorisk non-laboratory-based scores for the whole population, males, and females. In the laboratory-based models, the limit of agreements was better in males (95%CI 2.1 to − 4.2%) than females (95%CI 4.3 to − 7.3%). Also, in the non-laboratory-based models, the limit of agreements was better in males (95%CI 2.9 to − 4.0%) than females (95%CI 3.2 to − 6.1%). There was a good agreement between both the laboratory-based and the non-laboratory-based WHO models and the Globorisk models. The correlation between two models was very strongly positive. However, in the Globorisk models, more people were in high-risk group than in the WHO models. The scatter plots and Bland–Altman plots showed systematic differences between the two scores that vary according to the level of risk. So, for these models may be necessary to modify the cut points of risk groups. The validity of these models must be determined for this population