Letter to the Editor:
Positive Predictive Value of Diabetes Mellitus Risk Assessment

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Dear Editor

Diabetes mellitus (DM) is an important public health challenge [1]. Different studies have predicted that the frequency of diabetic patients will be increased to 642 million throughout the world by 2040 [2]. A notable percentage of diabetic patients are not aware of their disease (approximately 30% in Iran) [3]. Lag in the diagnosis of DM raises the expense of controlling disease and makes the prognosis poorer [4]. The importance of diabetic risk assessment as a screening test has been indicated for high-risk populations. However, most of the screening methods to detect high-risk people are invasive [5]. Therefore, detecting a population at high risk of developing DM in an easy way that can be applied by health care providers in the health centers may lead to preventive measures of public health magnitude [4].

Griffin et al. developed a questionnaire according to the risk factors commonly collected in clinical practice and evaluated the characteristics of the questionnaire. They reported a positive predictive value (PPV) of 11% for the diabetes screening questionnaire in England and Wales [6]. In Iran, primary health care providers in rural regions were called “Behvarz”. They performed diabetes mellitus risk assessment as a screening program in health houses. They worked in the “Health Houses,” which are the small health centers in the rural areas of Iran. In the present study, we evaluated DM risk assessment PPV on 30 years and older rural populations. The PPV is the probability of diabetes in a person with a positive risk assessment result [7].

$$(PPV=\frac{True\ positive}{True\ positive+False\ positive})$$

A cross-sectional study was done in three villages of Bostanabad, one of the cities in East Azerbaijan, Iran. Three villages out of more than fifteen hundred villages in the Bostanabad were selected. In these three villages, Behvarzes performed screening activities for diabetes between March 2019 and January 2020. Screening for diabetes was regarded for all individuals older than 30 years of age living in chosen villages. Participants were interviewed and asked about the presence of risk factors of DM. Risk factors contained a family history of DM, overweight or obesity (BMI >25), and already detected pre-diabetes. Among persons who took part in screening tests, those even with one risk factor were regarded positive and they were visited by a primary care physician for detection of individuals with unknown DM.

The total population of the three villages, namely Saeid Abad, Tikmedash, and Kordkandy was 5137. More than half of them (57.62%) aged more than 30 years in these

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villages. Out of 1305 people, who had at least one risk factor, 57 persons were diabetics. Accordingly, 57 was truly positive. The value of 1305 was the sum of true positive and false positive. The calculated PPV was 4.36%. Thus, the PPV of the risk factor assessment was low. In conclusion, the ability of the risk factor assessment to predict individuals with DM was quite poor (96% of people with risk factors were not diabetic) and the risk assessment did not work well to identify at-risk individuals.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflicts of interests.

References

[1] Esteghamati AR, Larijani B, Haji Aghajani M, Ghaemi F, Kermanchi J, Shahrami A, et al. Diabetes in Iran: Prospective analysis from first nationwide diabetes report of National Program for Prevention and Control of Diabetes (NPPCD-2016). Scientific Reports. 2017; 7:13461. [DOI:10.1038/s41598-017-13379-z] [PMID] [PMCID]

[2] Animaw W, Seyoum Y. Increasing prevalence of diabetes mellitus in a developing country and its related factors. PloS One. 2017; 12(11):e0187670. [DOI:10.1371/journal.pone.0187670] [PMID] [PMCID]

[3] Mirzaei M, Rahmaninan M, Mirzaei M, Nadjarzadeh A, Dehghani Tafti AA. Epidemiology of diabetes mellitus, pre-diabetes, undiagnosed and uncontrolled diabetes in Central Iran: Results from Yazd health study. BMC Public Health. 2020; 20:166. [DOI:10.1186/s12889-020-8267-y] [PMID] [PMCID]

[4] Patel P, Macerollo A. Diabetes mellitus: Diagnosis and screening. American Family Physician. 2010; 81(7):863-70. [PMID]

[5] Saudek CD, Herman WH, Sacks DB, Bergenstal RM, Edelman D, Davidson MB. A new look at screening and diagnosing diabetes mellitus. The Journal of Clinical Endocrinology & Metabolism. 2008; 93(7):2447-53. [DOI:10.1210/jc.2007-2174] [PMID]

[6] Griffin ME, Coffey M, Johnson H, Scanlon P, Foley M, Stronge J, et al. Universal vs. risk factor-based screening for gestational diabetes mellitus: Detection rates, gestation at diagnosis and outcome. Diabetic Medicine. 2000; 17(1):26-32. [DOI:10.1046/j.1464-5491.2000.00214.x] [PMID]

[7] Shenoy KD, Rao SS. Positive predictive value of pulse oximetry in the screening of critical congenital heart defects in term neonates. International Journal of Contemporary Pediatrics. 2017; 4(3):832-6. [DOI:10.18203/2349-3291.ijcp20171523]