

ABSTRACT

Background: The increasing number of diabetes cases in Indonesia has led to a growing demand for blood glucose testing, while operational cost efficiency remains a major challenge for clinical laboratories. One of the cost-saving alternatives being explored is the reduction of reagent volume below the standard.

Objective: This study aims to determine the difference in blood glucose levels measured by the GOD-PAP method between the use of full and one-quarter reagent volumes.

Methods: This research employed a pre-experimental design with a posttest-only approach. A total of 33 residual serum samples from Puskesmas Bantul 1 were analyzed using a Mindray BA-88A spectrophotometer. Data normality was assessed using the Shapiro-Wilk test, and comparisons between groups were made using the Mann-Whitney U test, as the data were not normally distributed.

Results: The Shapiro-Wilk test indicated that the data were not normally distributed ($p=0.000$). The Mann-Whitney U test revealed a significant difference in blood glucose levels between the full volume and one-quarter volume groups ($p=0.041$). The mean blood glucose concentration increased from 119.88 mg/dL with full volume to 138.45 mg/dL with one-quarter volume, exceeding the maximum allowable deviation of $\pm 8\%$ according to CLIA standards.

Conclusion: These findings demonstrate that reducing the reagent volume to one-quarter results in significantly different blood glucose measurements. Therefore, the use of one-quarter reagent volume is not recommended for clinical blood glucose testing.

Keywords: blood glucose, GOD-PAP, reagent volume.

ABSTRAK

Latar Belakang: Peningkatan jumlah penderita diabetes di Indonesia mendorong tingginya kebutuhan pemeriksaan glukosa darah, sementara efisiensi biaya operasional menjadi tantangan bagi laboratorium klinik. Salah satu alternatif efisiensi yang diuji adalah penggunaan volume reagen yang lebih sedikit dari standar.

Tujuan: Untuk mengetahui perbedaan hasil kadar glukosa darah menggunakan metode GOD-PAP antara volume reagen penuh dan seperempat volume.

Metode: Penelitian ini merupakan penelitian *pre-eksperimental* dengan desain *posttest-only*, sebanyak 33 sampel serum sisa dari puskesmas Bantul 1 diperiksa menggunakan spektrofotometer Mindray BA-88A. Data diuji normalitas menggunakan uji *Shapiro-Wilk* dan perbandingan hasil dilakukan dengan uji *Mann-Whitney U* karena data tidak berdistribusi normal.

Hasil: Uji *Shapiro-Wilk* menunjukkan distribusi data tidak normal ($p=0,000$). Analisis *Mann-Whitney U* menunjukkan adanya perbedaan kadar glukosa darah antara penggunaan volume penuh dan seperempat volume ($p=0,041$). Rerata kadar glukosa darah meningkat dari 119,88 mg/dL menjadi 138,45 mg/dL pada penggunaan seperempat volume, melebihi batas deviasi maksimal $\pm 8\%$ sesuai standar CLIA

Kesimpulan: Temuan ini menunjukkan bahwa pengurangan volume reagen hingga seperempat volume menghasilkan hasil yang berbeda secara signifikan, sehingga tidak direkomendasikan dalam pemeriksaan glukosa darah.

Kata kunci: Glukosa darah, GOD-PAP, volume reagen.