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VALIDITAS DIAGNOSTIK INDEKS TERKAIT LIPID DAN OBESITAS UNTUK DETEKSI SINDROM METABOLIK PADA TENAGA MEDIS
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INTISARI

Latar Belakang:
Sindrom metabolik merupakan kumpulan kelainan metabolik yang meliputi obesitas sentral, hipertensi, dislipidemia, dan gangguan metabolisme glukosa yang meningkatkan risiko diabetes melitus tipe 2 dan penyakit kardiovaskular. Diagnosis sindrom metabolik memerlukan kombinasi berbagai parameter klinis dan laboratorium sehingga diperlukan metode skrining yang lebih sederhana dan praktis. Indeks berbasis lipid dan antropometri, seperti *Lipid Accumulation Product* (LAP) dan *Triglyceride-Glucose Waist-to-Height Ratio* (TyG-WHtR), berpotensi digunakan sebagai metode skrining sindrom metabolic, namun performa diagnostik dan *cut-off* optimal kedua indeks tersebut dapat bervariasi antar-populasi dan belum tervalidasi secara spesifik pada populasi tenaga medis di Indonesia.
Tujuan:
Mengetahui validitas diagnostik indeks LAP dan TyG-WHtR dalam mendeteksi sindrom metabolik pada tenaga medis.
Metode:
Penelitian ini menggunakan desain observasional potong lintang dengan pendekatan uji diagnostik. Sebanyak 183 tenaga medis berusia ≥30 tahun yang menjalani pemeriksaan kesehatan diikutsertakan dalam penelitian. Sindrom metabolik ditentukan berdasarkan *Harmonized Criteria*. Analisis diagnostik dilakukan menggunakan kurva *receiver operating characteristic* (ROC) untuk menentukan *area under the curve* (AUC), sensitivitas, spesifisitas, dan *cut-off* optimal berdasarkan indeks Youden.
Hasil:
Sebanyak 56 subjek (30,6%) mengalami sindrom metabolik, sedangkan 127 subjek (69,4%) tidak mengalami sindrom metabolik. Kedua indeks menunjukkan kemampuan diagnostik yang baik dengan nilai AUC LAP dan TyG-WHtR masing-masing adalah 0,885 dan 0,872 dengan $p<0,001$. *Cut-off* optimal LAP sebesar 35,66 memiliki sensitivitas 92,86%, spesifisitas 74,02%, dan akurasi 79,78%, sedangkan TyG-WHtR dengan *cut-off* 4,79 memiliki sensitivitas 87,50%, spesifisitas 76,98%, dan akurasi 80,22%. LAP memiliki sensitivitas dan indeks Youden yang lebih tinggi, sedangkan TyG-WHtR memiliki spesifisitas dan akurasi yang sedikit lebih tinggi secara numerik.
Kesimpulan:
LAP dan TyG-WHtR memiliki validitas diagnostik yang baik untuk mendeteksi sindrom metabolik pada tenaga medis. LAP dengan *cut-off* 35,66 dan TyG-WHtR dengan *cut-off* 4,79 berpotensi digunakan sebagai metode skrining sederhana dan praktis untuk mendeteksi sindrom metabolik pada populasi tenaga medis.

Kata kunci: Sindrom metabolik, LAP, TyG-WHtR, validitas diagnostik, tenaga medis.

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ABSTRACT

Background:
Metabolic syndrome is a cluster of metabolic abnormalities comprising central obesity, hypertension, dyslipidemia, and impaired glucose metabolism, which increase the risk of type 2 diabetes mellitus and cardiovascular disease. The diagnosis of metabolic syndrome requires a combination of various clinical and laboratory parameters; therefore, simpler and more practical screening methods are needed. Lipid- and anthropometry-based indices, such as *Lipid Accumulation Product* (LAP) and *Triglyceride-Glucose Waist-to-Height Ratio* (TyG-WHtR), have the potential to be used as screening methods for metabolic syndrome. However, the diagnostic performance and optimal *cut-off* values of these indices may vary across populations and have not been specifically validated in Indonesian physicians.
Objective:
To determine the diagnostic validity of LAP and TyG-WHtR indices for detecting metabolic syndrome among Indonesian physicians.
Methods:
This study used a cross-sectional observational design with a diagnostic test approach. A total of 183 healthcare workers aged ≥30 years who underwent medical examinations were included in the study. Metabolic syndrome was determined based on the *Harmonized Criteria*. Diagnostic performance was evaluated using *receiver operating characteristic* (ROC) curve analysis to determine the *area under the curve* (AUC), sensitivity, specificity, and optimal *cut-off* values based on the Youden index.
Results:
A total of 56 subjects (30.6%) had metabolic syndrome, while 127 subjects (69.4%) did not. Both indices demonstrated good diagnostic performance, with AUC values for LAP and TyG-WHtR of 0.885 and 0.872, respectively ($p<0.001$). The optimal *cut-off* value for LAP was 35.66, with a sensitivity of 92.86%, specificity of 74.02%, and accuracy of 79.78%, whereas the optimal *cut-off* value for TyG-WHtR was 4.79, with a sensitivity of 87.50%, specificity of 76.98%, and accuracy of 80.22%. LAP demonstrated higher sensitivity and Youden index, whereas TyG-WHtR showed slightly higher specificity and accuracy.
Conclusion:
LAP and TyG-WHtR demonstrated good diagnostic validity for detecting metabolic syndrome among healthcare workers. LAP with a *cut-off* value of 35.66 and TyG-WHtR with a *cut-off* value of 4.79 have the potential to be used as simple and practical screening methods for detecting metabolic syndrome in the medical workforce population.

Keywords: Metabolic syndrome, LAP, TyG-WHtR, diagnostic validity, medical personnel.