

## ABSTRAK

**Latar Belakang :** *Heart Rate Variability* (HRV) merupakan metode non-invasif yang banyak digunakan untuk menilai fungsi sistem saraf otonom. HRV dapat mencerminkan keseimbangan antara aktivitas simpatis dan parasimpatis. Penurunan HRV telah dikaitkan dengan berbagai kondisi medis, termasuk penyakit ginjal kronis (CKD) dan depresi. Pasien CKD yang mengalami depresi berisiko lebih tinggi mengalami gangguan regulasi otonom yang dapat meningkatkan risiko kardiovaskular.

**Tujuan :** Untuk mengetahui hubungan antara *heart rate variability* dengan tingkat depresi pada pasien *chronic kidney disease* yang sedang menjalani hemodialisis rutin.

**Metode :** Penelitian ini menggunakan desain observasional analitik dengan pendekatan potong lintang. Sampel penelitian adalah pasien CKD yang menjalani hemodialisis rutin di RSUP Dr. Sardjito Yogyakarta, yang memenuhi kriteria inklusi dan eksklusi. Depresi dinilai menggunakan *Beck Depression Inventory* (BDI-II), sedangkan HRV diukur dengan *finger plethysmograph* dalam kondisi istirahat. Data dianalisis menggunakan uji komparatif dan korelatif sesuai distribusi data.

**Hasil :** Terdapat perbedaan bermakna pada nilai HRV antara kelompok pasien CKD dengan depresi dibandingkan tanpa depresi. Pasien dengan depresi menunjukkan penurunan signifikan pada HF norm, serta peningkatan LF norm dan rasio LF/HF yang menggambarkan dominasi simpatis dan penurunan aktivitas parasimpatis. Selain itu, terdapat korelasi positif antara skor BDI dengan rasio LF/HF, dan korelasi negatif antara skor BDI dengan HF norm.

**Kesimpulan :** Pasien CKD dengan depresi mengalami gangguan regulasi sistem saraf otonom yang ditandai dengan peningkatan LF norm, penurunan HF norm, serta peningkatan rasio LF/HF. HRV, khususnya rasio LF/HF, berpotensi digunakan sebagai biomarker dalam memantau status otonom dan keparahan depresi pada pasien CKD.

**Kata kunci :** *Heart Rate Variability*, *Chronic Kidney Disease*, Depresi, LF norm, HF norm, LF/HF ratio

## ABSTRACT

**Background :** Heart Rate Variability (HRV) is a non-invasive method widely used to assess autonomic nervous system function. HRV reflects the balance between sympathetic and parasympathetic activity. Reduced HRV has been associated with various medical conditions, including chronic kidney disease (CKD) and depression. CKD patients with depression are at higher risk of autonomic dysregulation, which may increase cardiovascular risk.

**Objective :** Determine the relationship between heart rate variability and the level of depression in patients with chronic kidney disease undergoing routine hemodialysis.

**Methods :** This study employed an observational analytic design with a cross-sectional approach. The study sample consisted of CKD patients undergoing routine hemodialysis at Dr. Sardjito General Hospital, Yogyakarta, who met the inclusion and exclusion criteria. Depression was assessed using the Beck Depression Inventory (BDI-II), while HRV was measured using a finger plethysmograph under resting conditions. Data were analyzed using comparative and correlational tests according to data distribution.

**Results :** Significant differences were found in HRV values between CKD patients with and without depression. Patients with depression showed a significant reduction in HF norm, along with an increase in LF norm and LF/HF ratio, indicating sympathetic dominance and reduced parasympathetic activity. In addition, BDI scores were positively correlated with the LF/HF ratio and negatively correlated with HF norm.

**Conclusion :** CKD patients with depression experience autonomic nervous system dysregulation characterized by increased LF norm, decreased HF norm, and increased LF/HF ratio. HRV, particularly the LF/HF ratio, has potential as a biomarker for monitoring autonomic status and depression severity in CKD patients.

**Keywords :** Heart Rate Variability, Chronic Kidney Disease, Depression, LF norm, HF norm, LF/HF ratio