

ABSTRACT

THE RELATIONSHIP BETWEEN HYDRATION STATUS, FLUID, PURINE, CALCIUM, SODIUM INTAKE, AND WORK DURATION WITH URINE CRYSTAL FORMATION AMONG RICE FARMERS IN GADINGREJO SUB-DISTRICT, PRINGSEWU REGENCY

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Background: Rice farmers are outdoor workers with high physical activity levels, which can lead to dehydration. Fluid imbalance and the intake of certain nutrients—such as purines, calcium, and sodium, can influence the formation of crystalluria. This study analyzes the relationship between hydration status, intake of fluids, purines, calcium, sodium, and work duration with crystalluria.

Methods: This analytical observational study employed a cross-sectional design and was conducted among 102 rice farmers in Gadingrejo Sub-district from January to March 2025. Samples were selected using consecutive sampling. Data were collected through 2×24-hour food records, urine specific gravity measurement using a refractometer, and microscopic examination of urine sediment. Data were analyzed using the Chi-Square test, Fisher's Exact Test, and Prevalence Ratio (PR) ($\alpha = 0.05$).

Results: Among the 102 respondents, 47.1% experienced crystalluria. Purine intake ($p \leq 0.001$; PR = 2.55; 95% CI: 1.48-4.41), calcium intake ($p = 0.025$; PR = 1.88; 95% CI: 1.42-2.84), and sodium intake ($p \leq 0.001$; PR = 2.46; 95% CI: 1.64-3.70) were significantly associated with crystalluria. These nutrients may increase urinary supersaturation and promote crystal precipitation. Meanwhile, hydration status ($p = 0.970$), fluid intake ($p = 0.143$), and work duration showed no significant association.

Conclusion: Purine, calcium, and sodium intake significantly increase the risk of crystalluria among rice farmers, while hydration status and work duration were not significantly associated..

Keywords: Calcium, crystalluria, hydration, purine, sodium

ABSTRAK

HUBUNGAN STATUS HIDRASI, ASUPAN CAIRAN, PURIN, KALSIMUM, NATRIUM, DAN DURASI KERJA TERHADAP PEMBENTUKAN KRISTAL URIN PADA PETANI PADI DI KECAMATAN GADINGREJO, KABUPATEN PRINGSEWU

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Latar Belakang: Petani padi merupakan pekerja luar ruangan dengan aktivitas fisik tinggi yang dapat menyebabkan dehidrasi. Ketidakseimbangan cairan tubuh serta asupan nutrisi tertentu, seperti purin, kalsium, dan natrium, dapat memengaruhi proses pembentukan kristaluria. Penelitian ini menganalisis hubungan status hidrasi, asupan cairan, purin, kalsium, natrium, dan durasi kerja terhadap kristaluria.

Metode: Penelitian observasional analitik dengan *desain cross-sectional* ini dilakukan pada 102 petani padi di Kecamatan Gadingrejo, Januari–Maret 2025. Sampel dipilih menggunakan *consecutive sampling*. Data dikumpulkan melalui food record 2×24 jam, pengukuran berat jenis urin dengan refraktometer, dan pemeriksaan sedimen urin secara mikroskopis. Analisis menggunakan uji Chi-Square, Uji Fisher Exact, dan *Prevalence Ratio* (PR) ($\alpha = 0.05$).

Hasil: Dari 102 responden, 47,1% mengalami kristaluria. Asupan purin ($p \leq 0.001$; PR = 2.55; CI 95%: 1.48-4.41), kalsium ($p = 0.025$; PR = 1.88; CI 95%: 1.42-2.84), dan natrium ($p \leq 0.001$; PR = 2.46; CI 95%: 1.64-3.70) berhubungan signifikan. Nutrien tersebut meningkatkan kejenuhan urin dan memicu pengendapan kristal. Status hidrasi ($p = 0.970$), asupan cairan ($p = 0.143$), dan durasi kerja tidak signifikan.

Simpulan: Status hidrasi dan konsumsi purin, kalsium, serta natrium secara signifikan meningkatkan risiko kristaluria pada petani padi.

Kata Kunci: Hidrasi, kalsium, kristaluria, natrium, purin