

# Hubungan demam dan riwayat demam dengan infeksi malaria pada anak sekolah dasar di Kabupaten Malaka, Nusa Tenggara Timur, Indonesia = Association between fever and history of fever with malaria infection among schoolchildren in Malaka District, Nusa Tenggara Timur, Indonesia.

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## Abstrak

**Pendahuluan:** World Health Organization (WHO) melaporkan ratusan juta jiwa di seluruh dunia terinfeksi malaria setiap tahunnya. Nusa Tenggara Timur merupakan salah satu Provinsi di Indonesia dengan prevalensi malaria tertinggi. Di daerah endemis, malaria menjadi salah satu penyebab utama demam pada anak. Namun, hingga saat ini penelitian di Indonesia mengenai infeksi malaria dan hubungannya dengan demam belum pernah dilakukan. Penelitian ini bertujuan untuk meneliti hubungan antara demam dan riwayat demam dengan infeksi malaria pada kelompok usia anak sekolah dasar di Nusa Tenggara Timur. **Metode:** Penelitian potong-lintang ini melibatkan anak sekolah dasar, berusia 6-16 tahun pada 5 SD di Kecamatan Wewiku, NTT. Parasit malaria terdeteksi dengan mikroskop dan RT-PCR. Demam didefinisikan sebagai suhu  $37,5^{\circ}\text{C}$  diukur saat dilakukan wawancara dengan termometer telinga. Riwayat demam didefinisikan menderita demam 1 minggu terakhir. Data dianalisis menggunakan SPSS dengan uji Chi-square dan uji lanjutan Post-Hoc untuk analisis hubungan antara infeksi malaria dengan demam atau riwayat demam. Selain itu, uji Kruskal-Wallis untuk analisis hubungan densitas parasit dengan demam atau riwayat demam.

**Hasil:** Di antara 348 anak sekolah dasar, ditemukan prevalensi infeksi malaria sebesar 34,8% dengan proporsi seimbang antara infeksi mikroskopik (16,4%) dan infeksi submikroskopik (18,4%). Secara keseluruhan, infeksi *P. vivax* (82,6%) lebih tinggi dari *P. falciparum* (15,7%). Proporsi demam didapatkan 4,3% dan riwayat demam 17,5%. Infeksi mikroskopik 4,6 kali lebih banyak menyebabkan demam atau riwayat demam daripada yang tidak terinfeksi (OR = 4,601; 95% CI = 2,4428,670;  $p < 0,01$ ). Sebaliknya, infeksi submikroskopik lebih banyak tidak menimbulkan demam atau riwayat demam dibandingkan infeksi mikroskopik (76,6% vs 54%;  $p = 0,009$ ). Pada infeksi *P. falciparum*, penderita dengan demam atau riwayat demam mengandung jumlah parasit lebih tinggi daripada kelompok yg tidak demam (2.499 vs 5.001 vs 77). Namun hal ini tidak berlaku pada infeksi *P. vivax* (242 vs 272 vs 168).

**Simpulan:** Densitas parasit Plasmodium yang lebih tinggi cenderung menyebabkan demam atau riwayat demam. Temuan ini mendukung riwayat demam dijadikan sebagai tambahan indikator diagnosis malaria.

.....**Introduction:** World Health Organization (WHO) reports that hundreds of millions of people worldwide are infected with malaria each year. East Nusa Tenggara is one of provinces in Indonesia with the highest prevalence of malaria. In endemic areas, malaria is one of the main causes of fever in children. However, until now research in Indonesia regarding malaria infection and its relationship with fever has not been conducted. This study aims to examine the relationship between fever and history of fever with malaria infection among school-age children in East Nusa Tenggara, Indonesia.

**Methods:** This cross-sectional study involved elementary school children, aged 6-16 years at 5 elementary schools in Wewiku District, NTT. Malaria parasites were detected by microscope and RT-PCR. Fever was

defined as a temperature  $37.5^{\circ}\text{C}$ , measured at the time of interview with an ear thermometer. History of fever was defined as having had fever in the last 1 week by asking history taking the subject. The data were analyzed using SPSS with Chi-square test and Post-Hoc follow-up test to analyze the relationship between malaria infection and fever or a history of fever. In addition, the Kruskal-Wallis test to analyze the relationship between parasite density and fever or history of fever.

Results: Among 348 primary school children, it was found that the prevalence of malaria infection was 34.8%, with a balanced proportion between microscopic infection (16.4%) and submicroscopic infection (18.4%). Overall, the proportion of infection was higher in *P. vivax* (82.6%) compared to *P. falciparum* (15.7%). The proportion of fever was 4.3% and a history of fever was 17.5%. Microscopic infections were 4.6 times more likely to cause fever or a history of fever than those who were not infected (OR = 4.601; 95% CI = 2.4428.670;  $p < 0.01$ ). In contrast, submicroscopic infections were more likely to not cause fever or history of fever than microscopic infections (76.6% vs 54%;  $p = 0.009$ ). In *P. falciparum* infection, patients with fever or a history of fever contained a higher number of parasites than the non-fever group (2.499 vs 5.001 vs 77). However, this did not apply to *P. vivax* infection (242 vs 272 vs 168).

Conclusion: Higher Plasmodium parasite density were associated with higher risk of fever and history of fever. These findings support the history of fever as an additional indicator of malaria diagnosis.