

## Hubungan antara kadar hemoglobin dan beberapa faktor faali yang mempengaruhi waktu sadar efektif calon penerjun High Altitude Low Opening Paskhas TNI-AU dalam simulator ruang udara bertekanan rendah setara 20.000 kaki

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### Abstrak

Pada penerjunan High Altitude Low Opening, pasukan dipaparkan pada ketinggian 20.000 kaki. Pada ketinggian tersebut, manusia tanpa tambahan O atau alat pelindung masih dapat melaksanakan tugasnya dengan efektif (WSE: Waktu Sadar Efektif) selama 10-20 menit. Salah satu faktor yang dapat mempengaruhi WSE adalah kadar Hb. Penelitian ini memilih disain studi korelasi dengan jenis eksperimen laboratorium tanpa kontrol, yaitu dengan memaparkan sejumlah 100 anggota PASKHAS TN1-AU sebagai subyek dalam simulator ruang udara bertekanan rendah (RUBR) setara 20.000 kaki selama 26 menit, guna meneliti tentang hubungan antara kadar Hb dan WSE, serta melihat beberapa faktor faali terhadap WSE. Subyek diminta mengerjakan soal-soal tes penjumlahan secara vertikal sepasang angka random dua digit. Apabila subyek salah menjawab dua nomor berturut-turut, atau diam tidak mengerjakan soal selama 15 detik, atau tidak melaksanakan perintah pengawas berarti titik akhir WSE tercapai. Selanjutnya dibuat analisa hubungan antara kadar Hb dan WSE, serta dilihat pengaruh beberapa faktor faali terhadap WSE.

Hasil dan kesimpulan: Hasil penelitian menunjukkan bahwa rata-rata WSE 15,46 menit, rata-rata Hb 15.08 g% (Hb 12.2 - 17.8 g%). Secara statistik univariat Hb mempunyai regresi positif sedang ( $B = 0,55$ ,  $p = 0,08$ ). Pada model multivariat, Hb tidak dipengaruhi oleh variabel umur, sistolik, diastolik, denyut jantung, FVC). Denyut jantung mempunyai garis regresi negatif sedang ( $B = -0,07$ ,  $p = 0,05$ ), FVC mempunyai regresi positif lemah ( $B = 0,55$ ,  $p = 0,56$ ), Sistolik ( $B = -0,05$ ,  $p = 0,30$ ) dan diastolik ( $B = -0,08$ ,  $p = 0,28$ ) kedua-duanya mempunyai regresi negatif lemah.

.....During HALO dropping, the troops were deployed at the height of 20,000 feet. It was discovered that in this altitude without extra oxygen or any other protective equipment, human being can still survive and do their task effectively for and around 10 - 20 minutes. Hb content was concluded to be one of the factors that can influence the TUC. Correlative study design with laboratory experiment without control was chosen for this research. One hundred subjects (IAF - HALO - Paratroops Candidates) were deployed for 26 minutes into altitude chamber at simulated 20,000 feet high, to investigate the correlation between Hemoglobin and TUC. Other physiological factors, which might influence the TUC, were also investigated. The subjects were requested to do kind of additive test two digits paired random numbers, vertically arranged. The end points for determination of the TUC were either (1) two consecutive mistakes in the addition test, or (2) subject stop writing for more than 15 seconds or (3) subject did not respond to the observer's instructions. The result was analyzed to evaluate the correlation between Hemoglobin and TUC, and other physiology factors, which might influence the TUC.

Result and conclusion: The mean value of TUC was 15,46 minutes, the mean value of the Hemoglobin was 15.08 g . Statistically Hemoglobin has moderate positive regression ( $B = 0,55$ ,  $p = 0.08$ ). The result of

multivariate and univariate model analysis towards correlation between Hb and TUC were almost similar. This mean, Hb is not influence by other variables (age, systolic, diastolic, heart rate, FVC). It was concluded that Hemoglobin has moderate correlation with TUC, and heart rate has moderate negative regression ( $B = -0.07$ ,  $p = 0.05$ ). FVC has weak positive regression ( $B = 0,55$ ,  $p = 0,56$ ), systolic ( $B = -0,05$ ,  $p = 0,30$ ) and dyastolic ( $B = -0,08$ ,  $p = 0,28$ ) has weak negative regression.