

DETERMINING THE EFFECT OF GENDER AND RACIAL DIFFERENCES ON
MENTAL AND PHYSICAL TASKS

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Thanks to

*God for all the given opportunities and blesses,
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ABSTRACT

Occupational stress has attracted the attention of many researchers during recent years. Through studies of stress the level of efficiency of work performance can be increased while the level of human error can be decreased. Investigating stress without considering human factors such as gender and race cannot be effective and reliable. Many studies investigate these factors but findings show conflicts among investigation results. The aim of this research is resulted by gender and racial differences to investigate the effects on performance of mental and physical tasks. A total of 120 (non-smoking) participants consisted of 60 males and 60 female of different races such as Malay, Chinese, Iranian and Black-African. Two tasks were considered in the experiment: i) Mental, ii) Physical. The experiment consisted of three stages. The first and second stage were held in a non-stressful situation in a library and the third stage was held in a stressful-situation in a mechanical engineering workshop. Considering energy expenditure per tasks were accomplished consecutively in each stage. Heart rate was measured once before and once during each task, each measurement taking approximately thirty seconds. Mean heart rate numbers during thirty second periods were recorded for the analysis of baseline (non-stress) and stress situations. To measure heart rate, "Oxi-meter finger pulse" was applied. To measure nicotine rate in order to determine non-smoking subjects, "Smokerlyzer" was used. A questionnaire was administered to a random group of students before stages in order to determine an appropriate reward for the winner of each skill competition in third stage. The analysis heart rate reactivity, recall task efficiency and typing task efficiency were accomplished through SPSS 18. Mean heart rate in baseline and stress per subject was calculated. Correlation and regression were SPSS methods to analyze ($P_{\text{value}} < 0.05$). Gender differences clearly influenced heart rate reactivity, and mental task in baseline and stressful situation. Results demonstrated that stress decreased mental efficiency in females more than males, also that males adapted faster than females in stressful situations.

ABSTRAK

Stres pekerjaan telah menarik perhatian ramai penyelidik dalam beberapa tahun kebelakangan ini. Daripada kajian stress, tahap kecekapan prestasi kerja boleh ditingkatkan sambil mengurangkan tahap kesilapan manusia. Menyelidik bidang stress tanpa mengambil kira beberapa faktor seperti umur, jantina, kaum dan kadar merokok, ianya tidak boleh berkesan dan berguna. Banyak kajian dibuat untuk menyelidik faktor tersebut tetapi hasil menunjukkan percanggahan dengan keputusan penyelidikan. Tujuan kajian ini adalah hasil daripada perbezaan antara untuk menyelidik kesan jantina dan kaum, pada kecekapan tugas mental dan fizikal. Seramai 120 (tidak merokok) peserta terdiri daripada 60 lelaki dan 60 wanita dari berbagai kaum seperti Melayu, Cina, Iran dan Afrika-hitam. Dua tugas dikenal pasti dalam kajian: i) Mental, (ii) Tugas Fizikal. Ujikaji dijalankan dalam tiga peringkat. Peringkat pertama dan kedua dijalankan dalam sehari (tanpa stress) seperti dalam perpustakaan sementara peringkat ke tiga dijalankan dalam situasi stres iaitu makmal kejuruteraan mekanikal. Penggunaan tenaga dianggap telah digunakan secara berturutan bagi setiap peringkat. Kadar jantung diukur sekali sebelum dan semasa tugas dilakukan, dimana setiap ukuran diambil dalam setiap 30 saat. Kadar jantung bagi setiap 30 saat di catatkan untuk analisis pada paras asasnya untuk situasi (tanpa stres) dan stres. Untuk mengukur kadar denyutan jantung, "oxi-meter finger pulse" digunakan untuk mengukur kadar nikotin sebelum menentukan subjek yang tidak merokok "smokeanalysis" digunakan. Soal-selidik digunakan secara rawak dikalangan subjek sebelum peringkat menentukan habuan sesuai bagi setiap pemenang dalam pertandingan kemahiran dalam peringkat ke tiga. Analisis reaktiviti bagi kadar jantung, kecekapan tugas "recall" dan menaip dilakukan dengan SPSS versi 18. Purata kadar jantung bagi paras asas dan stres setiap subjek dikira. Korelasi dan regresi dengan kaedah SPSS versi 18 untuk analisis ($P_{\text{nilai}} < 0.05$). Perbezaan jantina dengan jelas mempengaruhi reaktiviti kadar jantung dan paras asas bagi tugas mental dan situasi yang sangat stres. Keputusan menunjukkan stres berkurangan dengan kecekapan mental dikalangan wanita melebihi lelaki, juga lelaki boleh menyesuaikan dengan cepat berbanding wanita dalam situasi sangat stres.