**Report on Application of multiple regression to explore factors that impact on people’s level of daytime sleepiness.**

1. **How much of the variance in total sleepiness scores is explained?**

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| **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .540a | .291 | .278 | 8.900 |
| a. Predictors: (Constant), physical fitness, age, sex, HADS Depression | | | | |

Comment

The result of R square from the model summary is 0.291, thus this explains that the 29.1% of the total variation or variance of total sleepiness is explained by the predictor variables such as age, sex, physical fitness and depression.

1. **Which of the variables make a unique significant contribution?**

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| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 7156.847 | 4 | 1789.212 | 22.590 | .000b |
| Residual | 17424.593 | 220 | 79.203 |  |  |
| Total | 24581.440 | 224 |  |  |  |
| a. Dependent Variable: sleepy & assoc sensations scale | | | | | | |
| b. Predictors: (Constant), physical fitness, age, sex, HADS Depression | | | | | | |

Comment

From the output above, we can deduce from the result that there is significance variance impact of sex age, physical fitness and depression on daytime sleepiness scores. [F (220) =22.590, P <.05].

So, in accessing the best unique variables that makes a better significant impact we use the estimate table

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| **Coefficientsa** | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| B | Std. Error | Beta |
| 1 | (Constant) | 35.138 | 3.504 |  | 10.028 | .000 |
| sex | -2.968 | 1.224 | -.139 | -2.424 | .016 |
| age | -.129 | .047 | -.158 | -2.772 | .006 |
| HADS Depression | 1.440 | .214 | .403 | 6.722 | .000 |
| physical fitness | -1.083 | .368 | -.178 | -2.942 | .004 |
| a. Dependent Variable: sleepy & assoc sensations scale | | | | | | |

Comment

From the result above we can see that depression will make a significant impact on daytime sleepiness, judging from its level of significance and beta estimates.

The beta estimate: For every unit increase in level of depression there is an increase of 1.440 on daytime sleepiness, hence there is significant variance contribution of depression on sleepiness scores [T (220) =6.772, P<0.05]

1. **Hierarchical multiple regression controlling the demographic variables of sex and age. Do the other two predictor variables make a significant contribution to explaining variance in sleepiness score.**

First model = age sex physical fitness vs Sleepiness scores

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| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 3585.435 | 3 | 1195.145 | 12.624 | .000b |
| Residual | 21016.706 | 222 | 94.670 |  |  |
| Total | 24602.142 | 225 |  |  |  |
| a. Dependent Variable: sleepy & assoc sensations scale | | | | | | |
| b. Predictors: (Constant), physical fitness, age, sex | | | | | | |

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| **Coefficientsa** | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| B | Std. Error | Beta |
| 1 | (Constant) | 45.484 | 3.443 |  | 13.212 | .000 |
| sex | -3.116 | 1.336 | -.146 | -2.332 | .021 |
| age | -.136 | .051 | -.165 | -2.661 | .008 |
| physical fitness | -1.865 | .381 | -.306 | -4.891 | .000 |
| a. Dependent Variable: sleepy & assoc sensations scale | | | | | | |

Comment

The results above show that there is significant contribution of Physical fitness in explaining the variance in sleepiness score [T (222) = -4.891, P<.05].

Second model = age sex Depression vs Sleepiness scores

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| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 6517.777 | 3 | 2172.592 | 26.468 | .000b |
| Residual | 18386.732 | 224 | 82.084 |  |  |
| Total | 24904.509 | 227 |  |  |  |
| a. Dependent Variable: sleepy & assoc sensations scale | | | | | | |
| b. Predictors: (Constant), HADS Depression, age, sex | | | | | | |

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| **Coefficientsa** | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| B | Std. Error | Beta |
| 1 | (Constant) | 27.166 | 2.326 |  | 11.681 | .000 |
| sex | -3.451 | 1.230 | -.161 | -2.806 | .005 |
| age | -.118 | .047 | -.145 | -2.525 | .012 |
| HADS Depression | 1.631 | .206 | .455 | 7.906 | .000 |
| a. Dependent Variable: sleepy & assoc sensations scale | | | | | | |

Comment

The results above show that there is significant contribution of depression in explaining the variance in sleepiness score [T (224) = 7.906, P<.05].

Conclusion

Both the two predictor has a significant contribution in explaining the variance in daytime sleepiness scores.

1. **How much additional variance in sleepiness is explained by physical fitness and depression, after controlling sex and age?**

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| **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .382a | .146 | .134 | 9.730 |
| a. Predictors: (Constant), physical fitness, age, sex | | | | |

Comment

The result of R square from the model summary is 0.146, thus this explains that the 14.6% of the total variation or variance of total sleepiness is explained by the predictor variables such as age, sex, and physical fitness. Thus, the first block model does add 14.6% to the variance of sleepiness score.

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| **Model Summary** | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .512a | .262 | .252 | 9.060 |
| a. Predictors: (Constant), HADS Depression, age, sex | | | | |

Comment

The result of R square from the model summary is 0.262, thus this explains that the 26.2% of the total variation or variance of total sleepiness is explained by the predictor variables such as age, sex, and depression. Thus, the second block model does add 26.2% to the variance of sleepiness score.