

# Determinants of Sleep Quality in Air Force Cadets During Primary Flight Training



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## INTRODUCTION

Military flight training for Air Force cadets demands much mental and physical effort. Researchers had showed that poor sleep quality could lead to less training efficiency.

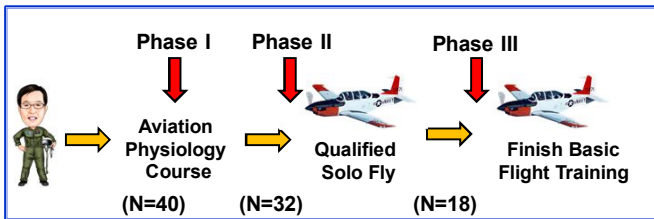
The characteristics of training during their basic flight training such as job stress, fatigue, depression may affect sleep quality. Few studies have examined their sleep quality and its determinants.

## PURPOSE

This study is to investigate the sleep quality of Air Force cadets and its determinants in this training phase..

## METHOD

In this longitudinal study, we followed a group of cadets; they completed the questionnaire at the time of training beginning, qualified for solo fly and finish basic flight Training.



- Demand-Control-Support and Effort-Reward Imbalance model were used to measure **job stress**.
- Else center for epidemiologic studies depression scale was used to evaluate **depression status**.
- Swedish occupational fatigue inventory questionnaire was used to evaluate **fatigue**.
- Pittsburg Sleep Quality Index was used to measure the **sleep quality**.

## RESULT

Table I. Demographic characteristics of Air Force cadets

Variables	Data
Age (years)	22.6±0.6
Smoke (%)	3 (15.8%)
Drink (%)	2 (10.5%)
Exercise (%)	15 (78.9%)
Sleep disorder (%)	1 (5.3%)

Table II. Univariate analysis of job stress, depression status, fatigue, and PSQI

Variables	Phase I	Phase II	Phase III	p-value
<b>Job stress</b>				
E/R ratio	0.6±0.2	0.6±0.2	0.7±0.2	0.285
E/R imbalance (%)	1(6.7%)	0(0%)	0(0%)	0.368
<b>Depression status</b>				
Score	11.2±8.5	14.1±7.5	16.3±9.3	0.041*
Moderate symptoms <sup>‡</sup> (%)	4(22.2%)	6(33.3%)	10(55.6%)	0.018*
<b>Fatigue</b>				
Score	2.0±1.8	2.6±1.8	2.9±1.8	0.078
<b>Sleep quality (PSQI)</b>				
Score	5.7±2.1	6.6±1.9	6.9±2.5	0.085
Bad sleep quality <sup>†</sup>	9(50%)	13(72.2%)	13(72.2%)	0.169

PSQI: Pittsburg Sleep Quality Index; E/R: Effort/Reward

‡ : depression score >16; † : PSQI score >5

- More than 50% of cadet was in poor sleep quality and even worse in latter training phase.
- Fatigue, job stress, depression and sleep quality were not determinants associated whether cadets complete basic flight training or not.

Table III. Multivariate analysis of PSQI score among cadets

Model	Variable	Group	Slope	95%CI	p-value
I	High temperature	Often vs never	5.5	2.7~8.3	<0.001
II	Uncomfortable bedding	Seldom vs never	1.9	0.3~3.5	0.019
III	Fatigue score		0.3	-0.1~0.6	0.087
IV	E/R imbalance	Yes vs no	-0.5	-3.14~2.24	0.743
V	Depression status	Moderate vs mild	1.6	0.5~2.8	0.007

PSQI: Pittsburg Sleep Quality Index; E/R: Effort/Reward

Variables in model I : High temperature.

model II : Uncomfortable bedding

model III : Fatigue score, stage of training, high temperature, uncomfortable bedding

model IV : E/R imbalance, stage of training, high temperature, uncomfortable bedding

model V : Depression status, stage of training, high temperature, uncomfortable bedding

- Environmental factors such as uncomfortable bedding and temperature increased PSQI 1.88 and 5.53 scores, respectively.
- After adjusted for environmental factors, job stress and fatigue were not associated with the sleep quality.

## DISCUSSION

Through the sleep quality and depression worse in the training course, but they did not affect the result of flight training. This may reflect their personality characteristics.

However, poor sleep quality will decrease human performance such as lack of alertness could threat the flight safety. It's still important for authorities to understand its determinants and to improve cadets' sleep quality.

**Keywords:** Air Force cadets, basic flight training phase, sleep quality, job stress, fatigue, depression