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*Examining the Relationship between Shift  
Pattern, Risk Perception, Fatigue,  
Subjective Well-Being and Stress  
among Mongolian Air Traffic Controllers*

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## ABSTRACT

The relationship between shift pattern, fatigue, unrealistic optimism, stress and subjective well-being, may affect the safety of air traffic controllers and their likelihood of continuing in the occupation.

The aim of this thesis was therefore to investigate the effect of shift pattern (fixed or rotating) on fatigue, unrealistic optimism, stress and subjective well-being among Mongolian air traffic controllers.

A battery of four separate questionnaires (and nine demographic items) was completed by 124 Mongolian air traffic controllers (response rate 71%), of whom there were 31 females and 93 males. Length of employment ranged from two months to 28 years.

The main findings were that air traffic controllers who work rotating shifts reported higher subjective fatigue, lower subjective well-being and higher stress compared to their colleagues working in fixed shifts. In addition, there was strong evidence of unrealistic optimism towards both general life and air traffic control specific events. Subsequent investigation revealed that unrealistic optimism towards an air traffic control specific events, was approximately two times less than that towards general life events. There was no evidence that shift pattern, fatigue, unrealistic optimism, stress and subjective well-being were related to the length of employment of participants or the likelihood of continuing in their chosen profession.

As unrealistic optimism may affect judgment and decision-making (and it can lead to unnecessary risk-taking in aviation), this lower level of unrealistic optimism towards air traffic specific negative events is considered to be a positive finding. However, it was noted that the overall mean of the perceived stress score of Mongolian air traffic controllers was higher than that of New Zealand air traffic controllers, although lower than New Zealand college students and a smoking-cessation sample.

Mongolian air traffic controllers are prey to both unrealistic optimism and the effect of shift pattern on their fatigue, stress and well-being. This thesis highlights the need to be aware that this might lead to compromised decision-making and subsequently, unnecessary risk taking.

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## **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

AAIIB	Aircraft Accident and Incident Investigation Bureau of Mongolia
AC	Advisory Circulars
AIP	Aeronautical Information Publications
AIS	Aeronautical Information Service
AMO	Approved Maintenance Organization
ANS	Air Navigation Services
ANSD	Air Navigation Services Division
ASD	Airport Services Department
ASRD	Aviation Safety and Regulations Department
ATC	Air Traffic Control
ATO	Aviation Training Organization
ATS	Air Traffic Service
CAA	Civil Aviation Authority
CAR	Civil Aviation Regulations
DME	Distance Measuring Equipment
GPS	Global Positioning System
GOM	Government of Mongolia
ICAO	International Civil Aviation Organization
MCAA	Mongolian Civil Aviation Authority
MCAR	Mongolian Civil Aviation Regulations
MIAT	MIAT Mongolian Airlines
NASA	National Aeronautics and Space Administration of the USA
NATS	National Air Traffic Services

NCMH	National Centre of Mental Health of Mongolia
NTSB	National Transportation Safety Board of USA
SHELL	Software, Hardware, Environment, Liveware and Liveware
SOE	State Owned Enterprise
SSR	Secondary Surveillance Radar
SWLS	Satisfaction With Life Scale
PSS	Perceived Stress Scale
USA	United States of America
VOR	VHF Omnidirectional Radio Range
WHO	World Health Organisation