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

A thesis presented in partial fulfilment of the requirements

for the degree of

Master of Aviation

at Massey University, Manawatu, New Zealand

Lkhagvasuren Togtokhbayar

2012

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.

ACKNOWLEDGEMENTS

I am indebted to a number of people for their help and support throughout the course of my research.

First of all, I wish to thank you my supervisor, Dr Andrew Gilbey, at the School of Aviation, Massey University, who provided valuable guidance.

A special thanks to the New Zealand Government for offering me the New Zealand Development Aid Scholarship for my study, and the staff of the International Students Support Office and the School of Aviation, Massey University for their continuing support during my study.

I would like to acknowledge and extend my gratitude to Mr. Naranbold Nergui and Mr. Baasansukh Ulziibat, they are standing for all the colleagues at Air Navigation Services Division (ANSD) of the Mongolian Civil Aviation Authority (MCAA) who professionally provided me with useful inputs and advice. My thanks also go to all the air traffic controllers of ANSD of the MCAA who participated in the survey. Their ideas and spirit are at the core of this thesis. To Mr. Batmunkh Sanjaajav - Director General of MCAA, to Mr. Munkhjargal Purevjal - First Deputy Director General of MCAA, Mr. Altantsom Baldandorj- Deputy Director General of MCAA, who allowed me to conduct research at ANSD of MCAA, and to the departmental managers. I thank you all.

Most especially to my friends who supported me during the process of writing this thesis, and to my daughters Alice Anu Lkhagvasuren and Khongorzul Lkhagvasuren whose encouragement and help have made the completion of this thesis possible. Thanks to all of you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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