



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



HANAA ALY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



HANAA ALY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



HANAA ALY



Prevalence of sleep-disordered breathing in Egyptian Railway drivers

Thesis

*Submitted for Partial Fulfillment of M.D. Degree in
Chest Diseases*

By

Mai Mossad Abdelazeem

M.Sc Ain Shams University

Under supervision of

Prof. Aya Mohamed AbdelDayem

Professor of Chest Diseases

Faculty of Medicine, Ain Shams University

Prof. Ashraf Mokhtar Madkour

Professor of chest diseases

Faculty of Medicine, Ain Shams University

Assist. Prof. Dr. Eman Badawy Abdelfattah

Assistant Professor of Chest Diseases

Faculty of Medicine, Ain Shams University

Faculty of Medicine

Ain Shams University

2021

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

سَبِّحْ اِنَّكَ لَا تَعْلَمُ لَنَا
اِلَّا مَا عَلَّمْتَنَا اِنَّكَ اَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgment

*First and foremost, I feel always indebted to **ALLAH**, the
Most Kind and Most Merciful.*

*I'd like to express my respectful thanks and profound
gratitude to **Prof. Aya Mohamed AbdelDayem**,
Professor of Chest Diseases, Faculty of Medicine, Ain Shams
University for her keen guidance, kind supervision, valuable
advice and continuous encouragement, which made possible the
completion of this work.*

*I am also delighted to express my deepest gratitude and
thanks to **Prof. Ashraf Mokhtar Madkour**, Professor of
Chest Diseases, Faculty of Medicine, Ain Shams University, for
his kind care, continuous supervision, valuable instructions,
constant help and great assistance throughout this work.*

*I am deeply thankful to **Assist. Prof. Dr. Eman
Badawy Abdelfattah**, Assistant Professor of Chest Diseases,
Faculty of Medicine, Ain Shams University, for her great help,
active participation and guidance.*

Mai Mossad

List of Contents

Title	Page No.
List of Abbreviations.....	i
List of Tables	iv
List of Figures	vii
Introduction	1
Aim of the Work.....	3
Review of Literature	
Definition and Overview of Sleep Breathing Disorder	4
Burden of Sleep Related Breathing Disorders.....	29
Subject and Methods.....	35
Results	52
Discussion	92
Summary	106
Conclusion	109
Recommendations	110
References	111
Arabic Summary	—

List of Abbreviations

Abb.	Full term
AASM	American Academy of Sleep Medicine
ABG	Arterial Blood Gases
AHI	Apnea–hypopnea index
ALS	Amyotrophic lateral sclerosis
ANOVA.....	One Way Analysis of Variance test
APAP	Autotitrating PAP
AUC	Area under curve
BMI.....	Body mass index
BQ.....	Berlin questionnaire
CI	Confidence interval
Co ₂	Carbon dioxide
CPAP	Continuous positive airway pressure
CSB.....	Cheyne-Stokes breathing
DBP	Diastolic blood pressure
DM	Diabetes mellitus
ECG	Electrocardiogram
EEG	Electroencephalogram
EMG	Electromyogram
EOG	Electrooculogram
EPAP	Exhalation
ESS	Epworth Sleepiness Scale
FTP	Friedman tongue position
GEE	Generalized estimating equations
HC.....	Hip circumference
HCO ₃	Bicarbonate level
HS	Highly significant
HST.....	Home Sleep Apnea Testing
HTN	Hypertension

List of Abbreviations Cont...

Abb.	Full term
ICSDII	International Classification of Sleep Disorders
IPAP	Inhalation
IQR	Inter-quartile range
MADs.....	Mandibular advancement devices
MMA.....	Maxillomandibular advancement
MOHP.....	Ministry of Health and population
MSLT.....	Multiple Sleep Latency Test
NC.....	Neck circumference
NPV	Negative predictive value
NS	Non significant
O ₂	Oxygen
OCST	Out of center sleep testing
ODI	O ₂ Desaturation index
OHS	Obesity hypoventilation syndrome
OR.....	Odds ratio
OSA.....	Obstructive sleep apnea
OSAHS.....	Obstructive sleep apnea and hypopnea syndrome
OSAS	Obstructive sleep apnea syndrome
PaCO ₂	Arterial partial pressure of carbon dioxide
PaO ₂	Arterial partial pressure of oxygen
PAP.....	Positive airway pressure
PPV.....	Positive predictive value
PSG.....	Polysomnography
QoL	Quality of life
RDI	Respiratory Disturbance Index
RERAs	Respiratory effort related arousals
ROC	Receiver operating characteristic curve

List of Abbreviations Cont...

Abb.	Full term
RTA.....	Road traffic accident
S.....	Significant
SaO ₂ %.....	O ₂ saturation in arterial blood
SBP	Systolic blood pressure
SBQ.....	STOP-Bang questionnaire
SDB.....	Sleep-disordered breathing
SpO ₂	Arterial oxygen saturation
SPSS	Statistical Package for Social Science
SQ	STOP Questionnaire
TST	Total sleep time
UPPP	Uvulopalatopharyngoplasty
US	United States
USA	United States of America
WC	Waist circumference
WHO	World Health Organization

List of Tables

Table No.	Title	Page No.
Table (1):	Showing the different symptoms associated with OSA.....	8
Table (2):	Demographic data and history of all the studied cases	54
Table (3):	Duration and frequency of smoking	55
Table (4):	Co-morbidities distribution among all the studied cases	56
Table (5):	Analysis of work environment & clinical evidence of sleep apnea of the studied cases	57
Table (6):	Analysis of anthropometric measures. examinations and arterial blood gases of the studied cases	59
Table (7):	Examination of hypertension.....	60
Table (8):	Body mass index (BMI)	60
Table (9):	Tonsillar size score grade and Friedman tongue position results among the studied cases.....	61
Table (10):	Analysis of STOPBANG, Berlin questionnaires and Friedman OSAHS score among the studied cases	62
Table (11):	Parameters of limited PSG.....	62
Table (12):	Parameters of full PSG.....	63
Table (13):	Comparison between negative and positive score or questionnaire results regarding demographic data of the studied cases	64
Table (14):	Comparison between negative and positive score or questionnaire results regarding co-morbidities.....	66

List of Tables Cont...

Table No.	Title	Page No.
Table (15):	Comparison between negative and positive score or questionnaire results regarding work environment and clinical evidence of sleep apnea.....	67
Table (16):	Comparison between negative and positive score or questionnaire results regarding anthropometric measurements, examinations and arterial blood gases.	70
Table (17):	Comparison between negative and positive score or questionnaire results regarding Tonsillar size score and Friedman tongue position.....	74
Table (18):	Comparison between non OSAS group and OSAS group regarding the demographic data.	76
Table (19):	Comparison between non OSAS group and OSAS group regarding co-morbidities.	78
Table (20):	Comparison between non OSAS group and OSAS group regarding work environment and clinical evidence of sleep apnea.	79
Table (21):	Relation between total sleep hours and incidence of sleep apnea.	80
Table (22):	Comparison between non OSAS group and OSAS group regarding anthropometric measurements, arterial blood gases and examinations.....	81
Table (23):	Comparison between non OSAS group and OSAS group regarding Tonsillar size score and Friedman tongue position.....	84

List of Tables Cont...

Table No.	Title	Page No.
Table (24):	Comparison between non OSAS group and OSAS group regarding STOPBANG questionnaire and Berlin questionnaire and Friedman OSAHS score	85
Table (25):	Comparison between non OSAS group and OSAS group regarding parameters of limited PSG	86
Table (26):	ROC curve for predictors of sleep apnea according to parameters of limited PSG.....	88
Table (27):	Analysis for risk factors between non OSAS group with OSAS group.	89
Table (28):	Univariate logistic regression analysis for risk factors associated with sleep apnea.	90
Table (29):	Relationship between BMI and sleep length.....	91
Table (30):	Prevalence of sleep apnea among the studied cases	91

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Numbers of train accident in last 12 years.....	1
Figure (2):	Neck circumference measurement.....	40
Figure (3):	Tonsil size score.....	41
Figure (4):	Friedman tongue position	41
Figure (5):	Flow chart of study results	53
Figure (6):	Comparison between negative and positive score or questionnaire results regarding age.	65
Figure (7):	Comparison between negative and positive score or questionnaire results regarding educational level.	65
Figure (8):	Comparison between negative and positive cases score or questionnaire results regarding duration of work as a driver.....	68
Figure (9):	Comparison between negative and positive score or questionnaire results regarding work environment and clinical evidence of sleep apnea.....	69
Figure (10):	a,b) Comparison between negative and positive score or questionnaire results regarding anthropometric measurements and examinations.....	72
Figure (11):	Comparison between negative and positive score or questionnaire results regarding blood pressure.....	73
Figure (12):	Comparison between negative and positive score or questionnaire results regarding blood gases.....	73

List of Figures Cont...

Fig. No.	Title	Page No.
Figure (13):	Comparison between negative and positive score or questionnaire results regarding Tonsillar size score grade.....	75
Figure (14):	Comparison between negative and positive score or questionnaire results regarding Friedman tongue position.....	75
Figure (15):	Comparison between non OSAS group and OSAS group regarding age.	77
Figure (16):	Comparison between non OSAS group and OSAS group regarding DM.....	78
Figure (17):	Comparison non OSAS group and OSAS group regarding weight and SBP.....	83
Figure (18):	Comparison between non OSAS group and OSAS group regarding blood gases.....	83
Figure (19):	Comparison non OSAS group and OSAS group regarding AHI.....	86
Figure (20):	Comparison between non OSAS group and OSAS group regarding O ₂ desaturation index.	87
Figure (21):	Comparison between non OSAS group and OSAS group regarding average SPO ₂	87
Figure (22):	Receiver operating characteristic curve (ROC) for AHI, O ₂ desaturation index and average SPO ₂ to differentiate between non OSAS group and OSAS group.....	88