

**SHIFT WORKERS' PSYCHOSOCIAL WELL-BEING AND ITS  
ASSOCIATION WITH PHYSICAL ACTIVITY AND EATING  
HABITS AMONG HEALTHCARE WORKERS IN KLANG  
VALLEY AND THE DEVELOPMENT OF SHIFT MODULE**

**NOR AMIRA SYAHIRA BINTI MOHD AZMI**

**UNIVERSITI SAINS ISLAM MALAYSIA**

**SHIFT WORKERS' PSYCHOSOCIAL WELL-BEING AND ITS  
ASSOCIATION WITH PHYSICAL ACTIVITY AND EATING  
HABITS AMONG HEALTHCARE WORKERS IN KLANG  
VALLEY AND THE DEVELOPMENT OF SHiFT MODULE**

Nor Amira Syahira binti Mohd Azmi

Thesis submitted in fulfilment for the degree of  
MASTER OF MEDICAL SCIENCE

UNIVERSITI SAINS ISLAM MALAYSIA

January 2023

## ACKNOWLEDGEMENT

Alhamdulillah, Allahuakbar, all praise to Allah (S.W.T) upon His permission to give me the opportunity to complete this study successfully. First and foremost, I would like to dedicate millions of thanks to the most important person and the backbone of this study which is my greatest idol and my principal supervisor, Associate Professor Dr. Norsham Juliana binti Nordin, who always be there for me, having trust in me, giving me endless support and encouragement. Special thanks to my co-supervisors; Associate Professor Dr. Nur Islami binti Mohd Fahmi Teng, Associate Professor Dr. Mohd Azmani bin Sahar and Dr. Nizam bin Baharom, who have guided me throughout the journey in completing this study. Thank you so much Drs for all the useful advice, guidance, attention, support, and suggestions given to me throughout the period of this study conducted.

I would like to express my special gratitude to my beloved husband and soul-mate, Dr. Mohamed Esmail bin Abdul Azeez, who always be my number one supporter and motivator; my precious little caliph, Zayn Eidlan bin Mohamed Esmail, who always inspire me, and be the big why for me to continue this journey. This is for both of you, my dear. My sincere appreciation are also dedicated to my parents; Dr. Hj. Norhailani binti Mohamad and Ir. Hj. Mohd Azmi bin Ali, and my parents-in-law; Mrs. Jahanara Begum binti Mohd Iesha and Mr. Abdul Azeez bin Seeni Mohamed, all my siblings, and my whole beloved family and family-in-laws who always motivate me and keep me in their prayers.

Special thanks to the faculty and all the respondents who give their best commitment throughout this study. This study was funded by the grant of USIM/FRGS/FPSK/055002/50419, FRGS/1/2019/SS05/USIM/02/3. My utmost appreciation also dedicated to my postgraduate support group and my close friends, for sharing and exchanging ideas and experiences in order to complete this study. I would like to further extend my gratitude to the future readers and I honestly hope that this study can be beneficial as an upcoming reference for other research projects.

## ABSTRAK

### Kesejahteraan Psikososial Pekerja Syif dan Hubungannya Dengan Aktiviti Fizikal dan Tabiat Pemakanan Dalam Kalangan Pekerja Kesihatan di Lembah Klang dan Pembangunan Modul SHiFT

**Pengenalan:** Perkhidmatan dua puluh empat jam telah menjadi keutamaan dalam kebanyakan industri dan pertubuhan perniagaan termasuklah bidang kesihatan yang memerlukan para pekerja untuk direkrut dalam sistem syif. Fakta yang membimbangkan adalah bekerja dalam sistem syif menyumbang kepada ketidakselarasan irama sirkadian, dan seterusnya mendedahkan pekerja kepada pelbagai penyakit secara psikologi dan fizikal. Kajian ini bertujuan untuk mengenal pasti kesejahteraan psikososial pekerja syif dan hubungannya dengan aktiviti fizikal dan tabiat pemakanan pekerja syif hospital di Lembah Klang.

**Metod:** Fasa I adalah kajian keratan rentas yang melibatkan 413 responden, dengan penggunaan borang soal selidik yang terdiri daripada *International Physical Activity Questionnaire-Short Form Malay (IPAQ-M)*, *Dutch Eating Behaviour Questionnaire (DEBQ)*, *Malay Depression, Anxiety, Stress Scale-21 (Malay-DASS-21)*, *Malay 36-Item Short Form Survey (Malay-SF-36)*, *WHO-5 Well-Being Index Malay (WHO-5-Malay)*, *Utrecht Work Engagement Scale Malay (UWES-M)* dan *Pittsburgh Sleep Quality Index Malay (PSQI-M)*. Fasa II merupakan pembangunan modul SHiFT untuk penjagaan kesejahteraan psikososial, termasuk proses kesahan kandungan dan kesahan muka.

**Keputusan:** Secara keseluruhannya, Fasa I menunjukkan bahawa majoriti pekerja syif hospital dalam kajian ini diklasifikasikan sebagai tidak aktif secara fizikal (31.7%) dan aktif minimum (43.6%). Kebanyakan daripada mereka juga mempunyai tabiat pemakanan secara emosi yang baik, tetapi tabiat pemakanan secara luaran dan terkawal yang lemah. Merujuk kepada kesejahteraan psikososial pekerja syif hospital, kekerapan kemurungan, kebimbangan dan stres adalah sebanyak 27.4%, 34.6% dan 11.6% dari segi kesihatan mental. Kualiti hidup yang baik, penglibatan kerja yang sederhana tetapi kualiti tidur yang lemah (58.1%) telah dikenal pasti dalam kalangan pekerja syif hospital. Terdapat perkaitan yang signifikan antara faktor umur, jantina, bangsa, agama, status perkahwinan, posisi pekerjaan, tempat kerja, aktiviti fizikal, indeks jisim badan (BMI), tabiat pemakanan dan kualiti tidur dengan kesihatan mental pekerja. Kualiti hidup pula adalah berkait secara signifikan dengan komorbiditi, posisi pekerjaan, tempat kerja, tabiat pemakanan dan kualiti tidur. Pelbagai faktor dikaitkan secara signifikan dengan penglibatan kerja, termasuklah aktiviti fizikal, tabiat pemakanan dan kualiti tidur. Jantina, posisi pekerjaan, tempat kerja dan status merokok merupakan faktor yang signifikan bagi kualiti tidur. Hasil kajian Fasa I menyumbang kepada pembangunan modul SHiFT dalam Fasa II yang menitikberatkan peningkatan kualiti tidur pekerja syif hospital melalui pengubahsuaian beberapa faktor berkaitan yang boleh diubah suai, dengan tujuan bagi memberi impak yang baik kepada kesejahteraan psikososial mereka. Analisa kesahan kandungan menunjukkan bahawa modul tersebut mencapai tahap yang memuaskan dengan indeks kesahan kandungan (CVI) iaitu I-CVI (0.89 – 1.00), S-CVI/Ave (0.978), dan S-CVI/UA (0.80). Peratusan bagi semua item dalam analisis kesahan muka juga adalah melebihi 80%. Hal ini menunjukkan modul SHiFT diterima dalam kalangan pekerja syif hospital.

**Konklusi:** Kesimpulannya, kesejahteraan psikososial pekerja syif hospital terbukti berkait secara signifikan dengan kualiti tidur, aktiviti fizikal dan tabiat pemakanan. Modul SHiFT ialah satu inisiatif bagi mencapai kesejahteraan psikososial yang disyorkan. Penyelidikan pada masa hadapan haruslah bertumpukan kepada pengesahan modul yang dicadangkan dan menentukan kesannya dalam mengekalkan kehidupan sihat dan kesejahteraan para pekerja syif.

UNIVERSITI SAINS ISLAM MALAYSIA  
جامعة العلوم الإسلامية  
ISLAMIC SCIENCE UNIVERSITY OF MALAYSIA

## ABSTRACT

**Introduction:** Twenty-four-hour services have become vital in the majority of industries and business establishments, including healthcare, which requires the workers to be employed in shifts system. The worrying fact is that working in shifts contributes to circadian rhythm misalignment, and subsequently leads to the development of various disorders psychologically and physically. The study aims to determine the shift workers' psychosocial well-being and its association with the physical activity and eating habits of hospital shift workers in Klang Valley.

**Methodology:** Phase I was a cross-sectional study involving 413 respondents, with the utilisation of self-administered questionnaires comprise of the International Physical Activity Questionnaire-Short Form Malay (IPAQ-M), Dutch Eating Behaviour Questionnaire (DEBQ), Malay Depression, Anxiety, Stress Scale-21 (Malay-DASS-21), Malay 36-Item Short Form Survey (Malay-SF-36), WHO-5 Well-Being Index Malay (WHO-5-Malay), Utrecht Work Engagement Scale Malay (UWES-M) and Pittsburgh Sleep Quality Index Malay (PSQI-M). Phase II was the development of the SHiFT module for psychosocial well-being maintenance, including the processes of content and face validity.

**Results:** Overall, Phase I demonstrated that the majority of the hospital shift workers in this study were classified as physically inactive (31.7%) and minimally active (43.6%). Most of them also had good emotional eating habit, but poor external and restrained eating habits. Zooming on the psychosocial well-being of the hospital shift workers, the prevalence of depression, anxiety and stress were 27.4%, 34.6% and 11.6%, respectively for the mental health. Good quality of life, average work engagement but poor sleep quality (58.1%) were observed among the hospital shift workers. There were significant associations between factors of age, gender, ethnicity, religion, marital status, healthcare position, workplace, body mass index (BMI), physical activity, eating habits and sleep quality with mental health. Quality of life was found to be strongly associated with the presence of comorbidity, healthcare position, workplace, eating habits and sleep quality. Multiple factors were significantly associated with work engagement, including physical activity, eating habits and sleep quality. Gender, healthcare position, workplace and smoking status were the strong predictors of sleep quality. The findings of Phase I contributed to the development of SHiFT module in Phase II which primarily focuses on improving the sleep quality of hospital shift workers by modification of a few associated factors that are modifiable, with the intention to give a beneficial impact on their psychosocial well-being. The analysis of content validity showed that the module achieved a satisfactory level with the content validity index (CVI) of I-CVI (0.89 – 1.00), S-CVI/Ave (0.978), and S-CVI/UA (0.80). The percentages for all items in the analysis of face validity was also more than 80%. This indicated the acceptability of the SHiFT module among the hospital shift workers.

**Conclusions:** In a nutshell, the psychosocial well-being of hospital shift workers is proven to be significantly associated with their sleep quality, physical activity and eating habits. The SHiFT module is an initiative to attain recommended psychosocial well-being. Future research must focus on the validation of the module proposed and determining its impact in maintaining the healthy lives and well-being of shift workers.

## الملخص

الرفاه النفسي والاجتماعي لعمال المناوبة وارتباطه بالنشاط البدني والعادات الغذائية بين العاملين في مجال الرعاية الصحية في وادي كلانج

**المقدمة:** أصبحت خدمات على مدار أربع وعشرين ساعة حيوية في غالبية الصناعات والمؤسسات التجارية بما في ذلك الرعاية الصحية، والتي تتطلب توظيف العمال في نظام المناوبة. والحقيقة المقلقة هي أن العمل في نوبات يساهم في اختلال إيقاع الساعة البيولوجية، ويؤدي لاحقاً إلى تطور اضطرابات مختلفة نفسياً وجسدياً. تهدف الدراسة إلى تحديد الرفاهية النفسية والاجتماعية لعمال المناوبة وارتباطها بالنشاط البدني والعادات الغذائية لعمال الورديات في المستشفى في وادي كلانج.

**المنهجية:** كانت المرحلة الأولى دراسة مستعرضة شملت 413 مجيباً، مع استخدام الاستبيانات ذاتية الإدارة التي تتكون من استبانة النشاط البدني الدولية-نموذج قصير باللغة الملايوية (IPAQ-M)، واستبيان سلوك الأكل الهولندية (DEBQ)، ومقياس الاكتئاب والقلق والضغط النفسي باللغة الملايوية (Malay-DASS-21)، والمسح الصحي القصير المكون من 36 بنداً باللغة الملايوية (Malay-SF-36)، ومؤشر الرفاه الخمسة لمنظمة الصحة العالمية باللغة الملايوية (WHO-5)، ومقياس أوترخت للمشاركة في العمل باللغة الملايوية (UWES-M)، ومؤشر جودة النوم لبيتسبرغ باللغة الملايوية (PSQI-M). وتمثلت المرحلة الثانية في تطوير وحدة "شيفت" للحفاظ على الرفاه النفسي والاجتماعي، بما في ذلك عمليات صحة المحتوى والوجه.

**النتائج:** بشكل عام، أوضحت المرحلة الأولى أنه تم تصنيف غالبية العاملين في نوبات المستشفى في هذه الدراسة على أنهم غير نشطين بدنياً (31.7%) ونشطين قليلاً (43.6%). كان لدى معظمهم أيضاً عادات أكل عاطفي جيدة، لكن عاداتهم الأكل الخارجي والأكل المقيد بالوقت سيئة. وبالنظر إلى الرفاه النفسي الاجتماعي للعاملين في نوبات المستشفى، فإن انتشار الاكتئاب والقلق والتوتر كان 27.4% و 34.6% و 11.6% على التوالي بالنسبة للصحة العقلية. تمت ملاحظة نوعية الحياة الجيدة،

ومتوسط المشاركة في العمل، ولكن مع نوعية النوم الرديئة (58.1%) بين العاملين في نوبات المستشفى. وكانت هناك ارتباطات كبيرة بين عوامل العمر، والجنس، والعرق، والدين، والحالة الزوجية، ووضع الرعاية الصحية، ومكان العمل، والنشاط البدني، ومؤشر كتلة الجسم، والعادات الغذائية، وجودة النوم مع الصحة العقلية. وجدت الدراسة أن جودة الحياة مرتبطة ارتباطاً وثيقاً بوجود الاعتلال المشترك، ووضع الرعاية الصحية، ومكان العمل، والعادات الغذائية، وجودة النوم. وارتبطت عوامل متعددة بشكل كبير بالمشاركة في العمل، بما في ذلك النشاط البدني والعادات الغذائية وجودة النوم. كان الجنس، ووضع الرعاية الصحية، ومكان العمل، وحالة التدخين من العوامل القوية التي تنبئ بجودة النوم. ساهمت نتائج المرحلة الأولى في تطوير وحدة "شيفت" في المرحلة الثانية والتي تركز بشكل أساسي على تحسين جودة نوم العاملين في نوبات المستشفى من خلال تعديل بعض العوامل المرتبطة القابلة للتعديل، بهدف إعطاء تأثير مفيد على رفاههم النفسي والاجتماعي. وقد أظهر تحليل صلاحية المحتوى أنه حققت الوحدة مستوى مرضٍ مع مؤشر صلاحية المحتوى (CVI) لـ I-CVI (-0.89) و S-CVI/Ave (0.978)، و S-CVI/UA (0.80). وكانت النسب المئوية لجميع العناصر في تحليل صحة الوجه أكثر من 80%. مما يشير إلى مقبولية وحدة "شيفت" بين العاملين في نوبات المستشفى.

**الخلاصة:** باختصار، قد ثبت أن الرفاه النفسي والاجتماعي للعاملين في نوبات المستشفى مرتبط بشكل كبير بجودة نومهم ونشاطهم البدني وعاداتهم الغذائية. ووحدة "شيفت" هي مبادرة لتحقيق الرفاه النفسي والاجتماعي الموصى به. ويجب أن تركز الأبحاث المستقبلية على التحقق من صحة الوحدة المقترحة وتحديد تأثيرها في الحفاظ على حياة صحية ورفاهية عمال النوبات.

## TABLE OF CONTENTS

Contents	Page
<b>AUTHOR DECLARATION AND COPYRIGHT</b> .....	<b>i</b>
<b>ACKNOWLEDGEMENT</b> .....	<b>ii</b>
<b>ABSTRAK</b> .....	<b>iii</b>
<b>ABSTRACT</b> .....	<b>v</b>
املخص.....	vi
<b>TABLE OF CONTENTS</b> .....	<b>viii</b>
<b>LIST OF TABLES</b> .....	<b>xii</b>
<b>LIST OF FIGURES</b> .....	<b>xvi</b>
<b>LIST OF APPENDICES</b> .....	<b>xvii</b>
<b>ABBREVIATION</b> .....	<b>xviii</b>
<b>CHAPTER ONE: INTRODUCTION</b> .....	<b>1</b>
1.1 Background of the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Research Questions.....	5
1.4 Research Hypotheses .....	6
1.5 Objectives of the Study.....	6
1.6 The Significance of the Study .....	7
1.7 Conceptual Definition of Variables .....	9
<b>CHAPTER TWO: LITERATURE REVIEW</b> .....	<b>10</b>
2.1 Overview of Shift Work.....	10
2.2 Consequences of Shift Work .....	12
2.3 Physical Activity of Shift Workers .....	14
2.4 Eating Habits among Shift Workers .....	16

2.5	Relationship of Physical Activity and Eating Habits with Psychosocial Well-Being .....	19
2.6	Psychosocial Well-being in Shift Workers .....	22
2.6.1	Mental Health.....	22
2.6.2	Quality of Life.....	24
2.6.3	Work Engagement.....	26
2.6.4	Sleep Quality.....	27
<b>CHAPTER THREE: METHODOLOGY .....</b>		<b>30</b>
3.1	Study Design.....	30
3.2	Overview of Healthcare Workers.....	31
3.3	Sampling and Study Population.....	32
3.3.1	Sample Size.....	33
3.3.2	Inclusion/Exclusion Criteria .....	34
3.4	Phase I: Cross-sectional Study .....	34
3.4.1	Study Instruments.....	34
3.4.2	Data Collection and Research Ethics .....	43
3.4.3	Data Analysis .....	45
3.5	Phase II: Module Development .....	45
3.5.1	Development of SHiFT Booklet Module .....	47
3.5.2	Validation of SHiFT Booklet Module .....	51
3.6	Research Theoretical/Conceptual Framework.....	55
3.7	Study Flowchart.....	56
3.8	Operational Definition of Terms and Variables .....	57

<b>CHAPTER FOUR: RESULTS.....</b>	<b>62</b>
4.1 Introduction .....	62
4.2 Socio-Demography of Hospital Shift Workers .....	63
4.3 Body Mass Index (BMI) of Hospital Shift Workers.....	69
4.4 Physical Activity Level and Eating Habits of Hospital Shift Workers in Klang Valley.....	70
4.4.1 Physical Activity Level of Hospital Shift Workers.....	70
4.4.2 Eating Habits of Hospital Shift Workers .....	72
4.5 Psychosocial Well-Being Status of Hospital Shift Workers in Klang Valley	73
4.5.1 Mental Health of Hospital Shift Workers.....	74
4.5.2 Quality of Life of Hospital Shift Workers .....	76
4.5.3 Work Engagement of Hospital Shift Workers .....	77
4.5.4 Sleep Quality of Hospital Shift Workers .....	79
4.6 Associated Factors (Socio-Demographic Factors, Physical Activity, and Eating Habits) with Psychosocial Well-Being of Hospital Shift Workers in Klang Valley.....	80
4.6.1 Associated Factors with Mental Health Status .....	81
4.6.2 Associated Factors with Quality of Life.....	107
4.6.3 Associated Factors with Work Engagement.....	122
4.6.4 Associated Factors with Sleep Quality .....	147
4.7 Validation of SHiFT Module.....	153
4.7.1 Content Validity of SHiFT Module.....	154
4.7.2 Face Validity of SHiFT Module .....	162
<b>CHAPTER FIVE: DISCUSSIONS .....</b>	<b>166</b>
5.1 Physical Activity of Hospital Shift Workers.....	170
5.2 Eating Habits of Hospital Shift Workers.....	174
5.3 Psychosocial Well-being Status and the Associated Factors .....	177

5.3.1	Mental Health.....	177
5.3.2	Quality of Life.....	182
5.3.3	Work Engagement.....	187
5.3.4	Sleep Quality.....	189
5.4	Validation of SHiFT Module.....	192
5.5	Limitations of the Study.....	195
<b>CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS.....</b>		<b>196</b>
6.1	Conclusions and Research Findings .....	196
6.2	Strength of the Study.....	198
6.3	Future Research Recommendations.....	199
<b>REFERENCES .....</b>		<b>200</b>
<b>APPENDICES .....</b>		<b>230</b>

## LIST OF TABLES

<b>Tables</b>	<b>Page</b>
Table 1: Prevalence of Overweight and Obesity among Shift Workers from Different Parts of the World (Azmi et al. 2020)	13
Table 2: The Cut-off Scores for Severity Labels of Depression, Anxiety and Stress	40
Table 3: The Cut-off Scores for the Domains of UWES-M	42
Table 4.1: Background of Respondents, $n = 413$	64
Table 4.2: Physical Activity MET-Minutes/Week Scores, $n = 413$	71
Table 4.3: Eating Habits of Respondents based on DEBQ, $n = 413$	73
Table 4.4: Malay-DASS-21 Subscales of Self-Perceived Depression, Anxiety and Stress, $n = 413$	75
Table 4.5: Quality of Life based on WHO-5-Malay and Malay-SF-36 Scores, $n = 413$	77
Table 4.6: Work Engagement based on UWES-M Scores, $n = 413$	78
Table 4.7: Association of Factors Affecting Depression based on Malay-DASS-21 Scores, $n = 413$	82
Table 4.8: Significant Factors Affecting Depression based on Malay-DASS-21 Scores, $n = 413$	86
Table 4.9: Association of Factors Affecting Anxiety based on Malay-DASS-21 Scores, $n = 413$	89

Table 4.10:	Significant Factors Affecting Anxiety based on Malay-DASS-21 Scores, $n = 413$	93
Table 4.11:	Association of Factors Affecting Stress based on Malay-DASS-21 Scores, $n = 413$	95
Table 4.12:	Significant Factors Affecting Stress based on Malay-DASS-21 Scores, $n = 413$	99
Table 4.13:	Association of Factors Affecting All Depression, Anxiety and Stress based on Malay-DASS-21 Scores, $n = 413$	101
Table 4.14:	Significant Factors Affecting All Depression, Anxiety and Stress based on Malay-DASS-21 Scores, $n = 413$	105
Table 4.15:	Association of Factors Affecting Quality of Life based on WHO-5-Malay Scores, $n = 413$	108
Table 4.16:	Significant Factors Affecting Quality of Life based on WHO-5-Malay Scores, $n = 413$	112
Table 4.17:	Association of Factors Affecting Quality of Life based on Malay-SF-36 Physical Domain, $n = 413$	114
Table 4.18:	Significant Factors Affecting Quality of Life based on Malay-SF-36 Physical Domain, $n = 413$	117
Table 4.19:	Association of Factors Affecting Quality of Life based on Malay-SF-36 Mental Domain, $n = 413$	119
Table 4.20:	Significant Factors Affecting Quality of Life based on Malay-SF-36 Mental Domain, $n = 413$	121
Table 4.21:	Association of Factors Affecting Total Score of UWES-M, $n = 413$	123

Table 4.22:	Significant Factors Affecting Work Engagement for Total Score of UWES-M, $n = 413$	128
Table 4.23:	Association of Factors Affecting Vigour Domain of UWES-M, $n = 413$	130
Table 4.24:	Significant Factors Affecting Work Engagement for Vigour Domain of UWES-M, $n = 413$	134
Table 4.25:	Association of Factors Affecting Dedication Domain of UWES-M, $n = 413$	136
Table 4.26:	Significant Factors Affecting Work Engagement for Dedication Domain of UWES-M, $n = 413$	141
Table 4.27:	Association of Factors Affecting Absorption Domain of UWES-M, $n = 413$	143
Table 4.28:	Significant Factors Affecting Work Engagement for Absorption Domain of UWES-M, $n = 413$	146
Table 4.29:	Association of Factors Affecting Sleep Quality based on PSQI-M, $n = 413$	148
Table 4.30:	Significant Factors Affecting Quality of Sleep based on PSQI-M Scores, $n = 413$	152
Table 4.31:	Socio-Demographic Information of the Panel Experts for Content Validity of SHiFT Module, $n = 9$	155
Table 4.32:	Analysis of Content Validity of SHiFT Module among the Expert Panels, $n = 9$	157
Table 4.33:	Analysis of Content Validity of SHiFT Module among the Expert Panels, $n = 9$	159

Table 4.34:	Socio-Demography of Respondents for the Face Validity of SHiFT Module, $n = 20$	163
Table 4.35:	Analysis of Face Validation of SHiFT Module among the Respondents with Health Sciences Related Background and Hospital Shift Workers [Presented as $n$ (%)]	165



## LIST OF FIGURES

<b>Figures</b>		<b>Page</b>
Figure 1:	Flow Chart of Module Development	54
Figure 2:	Conceptual Framework (Adapted From Nea et al. 2015; Nakata et al. 2012)	55
Figure 3:	Study Flowchart	56
Figure 4.1:	Percentage of Respondents' Working Hospitals, $n = 413$	66
Figure 4.2:	Percentage of Respondents' Department, $n = 413$	67
Figure 4.3:	Percentage of Respondents' Healthcare Position, $n = 413$	68
Figure 4.4:	Percentage of Respondents' Body Mass Index, $n = 413$	69
Figure 4.5:	Percentage of Respondents' Level of Physical Activity based on IPAQ-M, $n = 413$	71
Figure 4.6:	Percentage of Intentional Exercise among Respondents, $n = 413$	72
Figure 4.7:	Mental Health Status of Respondents, $n = 413$	76
Figure 4.8:	Histogram of PSQI-M Global Score of the Respondents, $n = 413$	79
Figure 4.9:	Sleep Quality Categories of the Respondents based on PSQI-M, $n = 413$	80

## LIST OF APPENDICES

Appendices	Page
Appendix 1 : Ethical Approval	230
Appendix 2 : Consent Form and Patient Information Sheet of Phase I	236
Appendix 3 : Questionnaires of Phase I	244
Appendix 4 : Scoring Instructions of PSQI-M	261
Appendix 5 : Consent Form and Patient Information Sheet for Content Validity and Face Validity of Phase II	264
Appendix 6 : Questionnaires of Content Validity and Face Validity of Phase II	276
Appendix 7 : SHiFT Module Version 1	291
Appendix 8 : SHiFT Module Version 2	307
Appendix 9 : List of Conference	323
Appendix 10 : List of Publications	327

## ABBREVIATION

AOR	Adjusted Odds Ratio
ASEAN	Association of Southeast Asian Nations
BMI	Body Mass Index
CI	Confidence Intervals
COVID-19	Coronavirus Disease-2019
DEBQ	Dutch Eating Behaviour Questionnaire
HEPA	Health-Enhancing Physical Activity
IPAQ-M	International Physical Activity Questionnaire Malay
MET	Multiples Of Resting Metabolic Rate
MOH	Ministry Of Health
MVPA	Moderate-To-Vigorous Physical Activity
OR	Odds Ratio
PDF	Portable Document Format
PSQI-M	Pittsburgh Sleep Quality Index Malay
Ref	Reference
SD	Standard Deviation
Malay-DASS-21	Malay Depression, Anxiety, and Stress Scale 21
Malay-SF-36	Malay 36-Item Short Form Survey
SHiFT	Sleep Healthily Focus Training
UWES-M	Utrecht Work Engagement Scale Malay
WHO	World Health Organisation
WHO-5-Malay	WHO-5 Well-Being Index Malay