

# Resident Duty Hours and Their Impact on Quality of Life and Residents' Happiness

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# Resident Duty Hours and Their Impact on Quality of Life and Residents' Happiness

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## Abstract

**Background:** Resident duty hours have been regulated in many countries. However, its impact on residents' quality of life and level of happiness was not conclusive.

**Objectives:** (1) To determine the current status of resident duty hours in Thailand, (2) To evaluate the relationship between resident duty hours and their quality of life, and their level of happiness.

**Material and Methods:** We conducted a survey of 801 residents in a large university-based hospital, asking for: (1) demographic data and estimated duty hours, (2) quality of life using an abbreviated WHO Quality of Life scale (WHOQOL-BREF), and (3) level of happiness using the Oxford Happiness Questionnaire (OHQ).

**Results:** There were 282 (35%) returned questionnaires. The average duty hours was 124 hours per week. There was a negative correlation between the duty hours and the quality of life,  $r = -0.22$ ,  $p < 0.01$ . There was no correlation between the duty hours and the level of happiness,  $r = 0.10$ ,  $p = 0.09$ .

**Conclusion:** With no duty hour regulations, residents were on duty more than generally acceptable standard, which has a negative impact on their quality of life, but no impact on their level of happiness.

**Key words:** Duty hours, Quality of life, Happiness, Questionnaires

## Introduction

Residency training traditionally involved hard work with long duty hours. This view has been challenged in the past few decades due to a growing concern over resident well-being and patient safety<sup>(1-3)</sup>. Many countries set limits to the number of hours a resident can be on duty. However, these resident work-hour restrictions have been met with controversial debates. Proponents of work-hour restrictions claimed that these regulations led to improved resident well-being, cognitive function, and in-training examination scores with no significant impact on morbidity and mortality of patients<sup>(3-10)</sup>. Opponents of the restrictions suggested

that these regulations reduced valuable clinical experience in many areas, especially among junior residents<sup>(11-14)</sup>. Some researchers have revealed significant increase in complication rates and decrease in examination scores after the implementation of work-hour restrictions<sup>(15-17)</sup>. Furthermore, survey of program directors and residents revealed that restricted duty hours led to delayed maturation and decreased self confidence of residents without any significant improvement in sleepiness and fatigue-related errors<sup>(18-22)</sup>.

Quality of life of residents is one of the main reasons for the restriction of duty hours. Duty-hour restrictions result in more time for residents to spend with family and friends, to take care of other non-medical responsibilities, to get rest, and should lead to better quality of life. Residents generally reported improved quality of life after the implementation of duty-hour restriction<sup>(22-26)</sup>. However, the limited duty hours also leads to disruption of patient care continuity, increased work on communication, and faster pace of work. Some researchers revealed no significant changes in quality of life of residents, and some even reported poorer quality of life of residents after the implementation of duty-hour restrictions<sup>(27-28)</sup>. Thus, the impact of duty hours on residents' quality of life is inconclusive.

Residents' happiness is an important aspect of training that has not received much attention. Happiness is very important to residents when they choose the residency training program<sup>(29)</sup>. Happiness is also related to longevity<sup>(30)</sup>. One commonly held assumption is that quality of life is an indicator of happiness. Thus, most studies of resident duty hours focused on residents' quality of life. However, research studies have revealed that happiness might be influenced by other factors as well. A study on happiness in the workplace identified five factors of happiness, which were job inspiration, organization's shared value, relationship, quality of work life, and leadership<sup>(31)</sup>. A study on happiness among family practice residents identified seven factors of happiness, which were positive relationships, goal achievement, accentuation of the positive, balanced lifestyle, religious commitment, feedback, and sense of control<sup>(32)</sup>. These findings might help explain why work-hour restrictions resulted in mixed responses from residents. Despite the good intention to improve their work-life balance, these work-hour restrictions might have negative impact on other aspects of happiness, such as job inspiration, relationship with co-workers and patients, leadership, and goal achievement. Thus, the impact of resident duty hours on their happiness should be explored.

Thailand is a developing country with a shortage of physician workforce, with an estimated physician to population ratio of 1:1,814 in 2015<sup>(33)</sup>. Most physicians in Thailand put in much more hours in medical services than the regulated duty hours in western society.

Residents are among the groups of physicians that have the hardest work. There are currently no regulations on resident duty hours in Thailand. The number of hours that Thai residents work each week has never been formally studied either. The lack of information of current resident duty hours makes it difficult for policy making.

The objectives of this study were (1) to determine the current status of resident duty hours in Thailand, (2) to evaluate the relationship between resident duty hours and their quality of life, and (3) to evaluate the impact of resident duty hours on their level of happiness.

## **Material and Methods**

### *Research design*

We carried out a cross-sectional survey of residents in a large university-based hospital in Bangkok. We distributed the questionnaires to all residents, which included 801 residents from 15 departments. Residents chose to participate on voluntary basis with no undue pressure. For those who wanted to participate, they returned the questionnaires back to the office of education of their departments. Our research protocol and questionnaires have been reviewed and approved by the institutional review board (IRB) of Siriraj hospital.

### *Questionnaire design*

The questionnaire was composed of three sections: (1) demographic data and estimated duty hours, (2) quality of life, and (3) level of happiness.

We collected the following demographic data: gender, age, the year of training, and the specialty of respondents. We asked the respondents to fill in the estimated time for each activity in a regular work week, including patient care, consultation, on-call duty, sleep, and education.

We evaluated the quality of life of respondents using a Thai version of abbreviated WHO Quality of Life scale (WHOQOL-BREF-THAI). The full version of the WHOQOL employed 100 items to assess quality of life in six domains: physical capacity, psychological, level of independence, social relationship, environment, and spirituality/religion/personal beliefs<sup>(34)</sup>. WHOQOL-BREF increased participants' willingness to participate by reducing the questionnaire to 26 items, assessing quality of life in four domains: physical, psychological, social relationships, and environment<sup>(34)</sup>. The Ministry of Public Health of Thailand has translated the WHOQOL-BREF into Thai language. The WHOQOL-BREF-THAI has been validated, revealing high internal consistency reliability (Cronbach's Alpha 0.84) and correlation of 0.65 with WHOQOL-100<sup>(35)</sup>.

The WHOQOL-BREF-THAI contains 26 items. The respondents were asked to provide responses to each statement on a five-point rating scale (not at all, not much, moderately, a great deal, and completely) based on their experience with life over the past two weeks. The scores obtained from the WHOQOL-BREF-THAI ranged from 26 to 130. The scores of 26 – 60, 61 – 95, and 96 - 130 indicated poor, average, and good quality of life, respectively<sup>(35)</sup>.

We evaluated the level of happiness of respondents using the Oxford Happiness Questionnaire (OHQ). This is a validated instrument assessing the level of happiness of individuals using 29 items, each was rated on a six-point agreement rating (strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree, and strongly agree). The scale was highly reliable (Cronbach's Alpha 0.91). The scores obtained from OHQ correlated well with scores obtained from the standard Oxford Happiness Inventory with correlation ranging from 0.26 to 0.69<sup>(36)</sup>. We translated the instrument into Thai language and confirmed the accuracy of translation by back translation to English. The scores obtained from OHQ ranged from 1 – 6, where one indicated the total lack of happiness, and six indicated the maximum level of happiness. Average level of happiness of individuals is four.

## **Analyses**

We defined duty hours in reference to the Accreditation Council for Graduate Medical Education criteria, which included all time spent in clinical and academic activities in the hospital, including patient care, in-house on-call duty, and all administrative duties related to patient care<sup>(37)</sup>. We compared the duty hours per week of residents from different specialties. We then examined the Pearson's correlation between duty hours, quality of life, and the level of happiness under the assumption of Type I error rate of 0.05.

## **Results**

From 801 questionnaires distributed, we got 282 completed questionnaires back (35% response rate). Respondents were 97 men and 185 women. The distribution of their specialties was shown in Table 1.

[INSERT TABLE 1]

The duty hours of participating residents ranged from 43 to 168 hours per week, with an average of 124 hours per week (Table 2). The specialty with the highest duty hours was

surgery (143 hours). Surgical residents worked significantly more than residents in other specialties (average difference 23 hours per week,  $t(280) = 6.50, p < 0.01$ ).

[INSERT TABLE 2]

Respondents had quality of life scores ranged from 41 – 120 with an average of 84.11 (Table 3). Rehabilitation residents were the ones with the highest quality of life score (average 96.50), while surgical residents were the ones with the lowest quality of life score (average 79.44). There was a negative correlation between the duty hours and the quality of life of residents,  $r = -0.22, p < 0.01$ .

[INSERT TABLE 3]

The level of happiness of respondents ranged from 2.48 to 5.28 with an average of 3.49 (Table 4). There was no correlation between the duty hours and the level of happiness of residents,  $r = 0.10, p = 0.09$ .

[INSERT TABLE 4]

## **Discussion**

This study has demonstrated that in the setting of a large university hospital with no regulations of duty hours, there was a big difference in how much residents work. Surgical residents were physicians who had the longest duty hours. Although residents in other specialties did not spend as much time in the duty as surgical residents, they worked much longer hour than what is accepted in western society. The average duty hours at this hospital was 124, which was 55% more than the 80-hour limitation of the Accreditation Council for Graduate Medical Education (ACGME)<sup>(1)</sup>. Some regulations to control the duty hours should be considered. However, with the current situation of long duty hours and vast difference between specialties, setting the limit at 80 hours would be unrealistic. A more acceptable approach would be to gradually reduce the resident duty hours with different targets for different specialties. Residents generally accepted that different groups of trainees might need different duty hours<sup>(38)</sup>.

Our study of residents' quality of life concurred with the findings from most of the previous studies that revealed the improvement of residents' quality of life after limitation of

the duty hours. We revealed a significantly negative relationship between duty hours and quality of life. The longer duty hours one has, the poorer one's quality of life is. Interestingly, we found a broad range of quality of life scores (41 – 120) of these residents. The residency training program should find ways to improve the quality of life of those in poor condition. One possible solution is to reduce the residents' duty hours<sup>(23-26)</sup>.

Despite the negative impact the duty hours have on the quality of life, there is no correlation between the duty hours and the level of happiness of residents. This finding corresponded with existing literature that revealed many factors that influenced happiness. Most of these components of happiness have no direct relationship with the number of duty hours. A resident who worked very long hours could be very happy if he/she had job inspiration, good relationship with his/her colleagues, and worked with faculty members with good leadership<sup>(31)</sup>. Thus, a faculty member who wants to make residents happy should be aware of the many aspects of happiness and should not focus only on reducing the duty hours.

The findings from this study should help the program directors and the hospital administrators make decision about the direction of residency training. Letting the residents work on average 124 hours per week is too much and this level of duty negatively impacted their quality of life. Nevertheless, implementing the duty hour restriction should also be done with caution. With lessons learned from prior studies that duty hour restriction might negatively impact residents' learning experience<sup>(11-13, 16-17)</sup>, careful planning is needed when implementing any duty hour restrictions. Flexibility, organization, and scheduling of duty hours were considered to be more important to training quality than the number of duty hours<sup>(39)</sup>. Implementing duty hour restriction with no proper changes in work process could lead to increased errors<sup>(40)</sup>. The benefits to patients being treated by less tired residents could be offset by communication failures from poor handoffs<sup>(41)</sup>. Thus, we should implement duty hour regulations along with proper changes in work process to improve the communication, to reduce errors, and to provide adequate learning experience for residents. The training programs that implemented the duty hour restriction with proper monitoring and supervision of clinical experience have demonstrated non-decreasing operative volume among trainees, with no increase in morbidity and mortality among patients<sup>(8-9, 26, 42-43)</sup>.

There are some limitations in this study. First, not all the questionnaires were completed and returned for analysis. The response rate was 35%. Although this level of response is normal for survey studies with no measures to enforce subjects to response, we acknowledged that the lack of responses from some residents posed some limitations to the

generalizability of the findings. From 15 departments being surveyed, there were no questionnaires returned from Departments of Dermatology, Forensic medicine, and Pathology. Thus, the duty hours of residents from these three departments remained unknown. Another limitation is that our study relied on self-report data which might not always be accurate. Although we did not see any reasons that respondents would intentionally falsify their responses in the existing unregulated duty hours with the anonymity of responses, there may be recall bias or misinterpretation of the number of hours they were on duty. Researchers have noted both under- and over-report of duty hours by residents<sup>(44-45)</sup>.

## **Conclusion**

In a setting of a large university-based hospital with no duty hour regulations, residents were on duty 124 hours per week on average. There was a negative correlation between the duty hours and quality of life of residents, but no correlation with their level of happiness.

## **What is already known on this topic?**

Resident duty hours have been limited based on the assumption that less duty hours would lead to improved quality of life.

## **What this study adds?**

Resident duty hours have negative correlation with the quality of life, but no correlation with the level of happiness of residents. A training program can use duty hours regulation to improve the quality of life of residents. However, reducing duty hours alone would not make residents happier.

## **Acknowledgement**

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## **Potential conflicts of interest**

None



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## ชั่วโมงการทำงานของแพทย์ประจำบ้านและผลกระทบต่อคุณภาพชีวิตและระดับความสุข

เชิดศักดิ์ ไอรณรัตน์ , ศุภลภา ภาสุรวณิช

**ภูมิหลัง:** หลายประเทศควบคุมชั่วโมงการทำงานของแพทย์ประจำบ้าน อย่างไรก็ตามผลกระทบของการควบคุมชั่วโมงการทำงานต่อคุณภาพชีวิตและระดับความสุขของแพทย์ประจำบ้านยังไม่มีข้อสรุปที่ชัดเจน

**วัตถุประสงค์:** (๑) เพื่อประเมินสถานการณ์ปัจจุบันของปริมาณชั่วโมงการทำงานของแพทย์ประจำบ้านในประเทศไทย, (๒) เพื่อประเมินความสัมพันธ์ระหว่างชั่วโมงการทำงานของแพทย์ประจำบ้านกับคุณภาพชีวิตและระดับความสุขของแพทย์ประจำบ้าน

**วัสดุและวิธีการ:** ผู้วิจัยแจกแบบสอบถามให้แพทย์ประจำบ้าน ๘๐๑ คนในโรงพยาบาลของมหาวิทยาลัยขนาดใหญ่ โดยถามถึง (๑) ข้อมูลลักษณะพื้นฐานของผู้ตอบแบบสอบถาม และชั่วโมงการทำงานโดยประมาณ, (๒) คุณภาพชีวิต โดยใช้เครื่องชี้วัดคุณภาพชีวิตขององค์การอนามัยโลกชุดย่อ และ (๓) ระดับความสุข โดยใช้แบบสอบถามระดับความสุขของอีออกซฟอร์ด

**ผลการศึกษา:** ผู้วิจัยได้รับแบบสอบถามคืน ๒๘๒ ฉบับ (ร้อยละ ๓๕) แพทย์ประจำบ้านทำงานเฉลี่ย ๑๒๔ ชั่วโมงต่อสัปดาห์ พบว่ามีความสัมพันธ์เชิงลบระหว่างปริมาณชั่วโมงทำงาน กับคุณภาพชีวิต,  $r = -0.22$ ,  $p < 0.01$  ไม่พบความสัมพันธ์ระหว่างปริมาณชั่วโมงทำงานกับระดับความสุข,  $r = 0.00$ ,  $p = 0.09$

**สรุป:** เมื่อไม่มีการควบคุมชั่วโมงการทำงาน แพทย์ประจำบ้านปฏิบัติงานมากกว่ามาตรฐานที่ยอมรับกันโดยทั่วไป ซึ่งส่งผลกระทบต่อคุณภาพชีวิต แต่ไม่มีผลกระทบต่อระดับความสุขของแพทย์ประจำบ้าน

**Table 1.**The distribution of the specialties of respondents

Specialties	N	Percent
Surgery	55	19.5
Medicine	54	19.1
Pediatrics	40	14.2
Radiology	34	12.1
Anesthesiology	32	11.3
Ophthalmology	24	8.5
Obstetrics and gynecology	21	7.4
Otorhinolaryngology	10	3.5
Orthopedic surgery	5	1.8
Emergency medicine	3	1.1
Psychiatry	2	0.7
Rehabilitation	2	0.7
Total	282	100

**Table 2.** Estimated duty hours per week of residents from various specialties (sorted by average)

Specialties	N	Minimum	Maximum	Average	Std. Deviation
Surgery	55	105	168	142.85	20.01
Psychiatry	2	128	135	131.50	4.95
Otorhinolaryngology	10	98	164	128.05	20.11
Anesthesiology	32	96	168	127.80	18.43
Orthopedic surgery	5	100	142	125.50	16.61
Radiology	34	64	168	123.14	30.55
Pediatrics	40	64	168	121.38	23.96
Medicine	54	43	166	117.83	24.79
Ophthalmology	24	69	155	115.31	25.25
Obstetrics and gynecology	21	70	140	108.36	20.27
Rehabilitation	2	98	114	106.00	11.31
Emergency medicine	3	79	108	94.50	14.51
Total	282	43	168	124.33	25.234

**Table 3.** Quality of life of residents from various specialties (sorted by average)

Specialties	N	Minimum	Maximum	Average	Std. Deviation
Rehabilitation	2	95	98	96.50	2.12
Psychiatry	2	92	94	93.00	1.41
Emergency medicine	3	91	92	91.67	0.58
Otorhinolaryngology	10	67	118	89.20	17.20
Anesthesiology	32	73	107	88.69	8.42
Obstetrics and gynecology	21	66	99	86.52	9.23
Radiology	34	72	120	86.24	9.90
Medicine	54	51	110	85.70	11.71
Orthopedic surgery	5	64	117	83.00	20.59
Ophthalmology	24	68	98	81.29	7.89
Pediatrics	40	69	99	80.58	7.78
Surgery	55	41	95	79.44	11.72
Total	282	41	120	84.11	10.98

**Table 4.** Level of happiness of residents from various specialties (sorted by average)

Specialties	N	Minimum	Maximum	Average	Std. Deviation
Otorhinolaryngology	10	3.14	4.14	3.78	0.33
Psychiatry	2	3.62	3.69	3.66	0.05
Surgery	55	2.76	5.28	3.55	0.41
Orthopedic surgery	5	3.28	3.93	3.53	0.25
Pediatrics	40	2.79	5.00	3.52	0.42
Medicine	54	2.66	4.10	3.51	0.30
Rehabilitation	2	3.38	3.55	3.47	0.12
Anesthesiology	32	2.79	4.41	3.45	0.34
Ophthalmology	24	2.69	4.07	3.41	0.33
Radiology	34	2.62	4.07	3.40	0.38
Obstetrics and gynecology	21	2.48	3.90	3.36	0.32
Emergency medicine	3	2.72	3.66	3.32	0.52
Total	282	2.48	5.28	3.49	0.36