Original Article

Quality of Working Life (QoWL) among Doctors in the University Hospitals in the Northeastern Thailand

Soonthornvinit W, MD[1], Chaiear N, MD, MMedSc, PhD[1]

[1] Division of Occupational Medicine, Department of Community Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Objective: (1) To assess the quality of working life among doctors in the university hospitals in the northeastern Thailand. (2) To analyse the strength of association between personal and working factors and good quality of working life (QoWL).

Materials and Methods: A descriptive study was performed. The study population was 910 university doctors in 2 university hospitals. The self-administration Work-related Quality of Life Scale-2 Online Website (THQWL) questionnaire was used for collecting data. Descriptive statistics and multiple logistic regression with stratified analysis were used.

Results: There were 339 of 910 (37.3%) completed questionnaires. Majority of doctors (58.6%) rated their QoWL at average. As these were 7 dimensions of QoWL scales, the doctors rated employee engagement (EET), general well-being (GWB), job career satisfaction (JCS), and overall (OVL) as good down to average. Control at work (CAW) and working condition (WCS) were rated as average to good. Stress at work (SAW) was rated as average down to lower. Working hours and financial status were associated to good QoWL. Limitation of hours of work per week at 50, 60, 70, or 80 was all related to good QoWL. Limitation at 70 hours per week had the highest strength of association (AOR 3.84, 95% CI: 2.22, 6.62, $p<0.001$). The AOR of financial status of having savings was 2.12, 95% CI: 1.27, 3.56, $p = 0.004$ and the AOR of not having health hazards was 2.04, 95% CI: 1.08, 3.85, $p = 0.028$.

Conclusion: The university doctors had average to good QoWL. Factors positively affecting were their satisfaction with the training the doctors receive in order to perform their present job and the opportunity to use their abilities at work in JCS dimension. Factors negatively affecting were stress from being unable to achieve the deadlines and feeling of being under pressure at work in SAW dimension. In addition, limitation of working hours per week and having savings might be related to good QoWL.

Keywords: Quality of working life (QoWL), Work-related Quality of Life Scale, Doctors, University hospital

J Med Assoc Thai 2019;102(Suppl.1): S39-S46
Website: http://www.jmatonline.com

The main public hospitals providing services to the population in the northeastern Thailand are the hospitals under the permanent secretary, ministry of public health (MoPH) and the university hospitals[1,2]. Since the university hospitals are a tertiary care unit, the doctors working in the university hospitals had responsibility on both advance services and academic activities. The doctors moving the university hospitals are specialists or staff and residents. Their work load include giving medical services in the northeastern area to around 1 million patients per year, graduating about 200 medical doctors per year, and graduating about 100 specialists per year[3].

Working conditions were classified into five categories, workforce staffing, workflow design, personal/social factors, physical environment, and organizational factors. Workforce staffing referred to job assignments and includes four principal aspects of job duties, the volume of work assigned to individuals, the professional skills required for particular job assignments, the duration of experience in a particular job category, and work schedules. Workflow design focused on the job activities of health care workers, including interactions among workers and the nature and scope of the work as tasks are completed. Personal or social factors referred to individual and group factors such as stress, job satisfaction, and professionalism. Physical environment included aspects of the health care workplace such as light, aesthetics, and sound. Organizational factors are structural and process aspects of the organization as a whole, such as use of teams, division of labor, and shared beliefs. The importance of working conditions was either as resources that improved work quality or as demands that diminished work quality. Working conditions also potentially affected patient and personnel safety[4-7]. Assessing the personal or social factors in physicians could be done with various psychometric measurements. Especially of the residents, in which they encountered high level of occupational stress for 17%[8], burnout for 27 to 75% (depending on specialty)[9], high level of burnout for 5.6%[10], moderate level of quality of working

Correspondence to:

Chaiear N.

Division of Occupational Medicine, Department of Community Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.

Phone: +66-81-7081866

E-mail: naesinee@kku.ac.th

How to cite this article: Soonthornvinit W, Chaiear N. Quality of Working Life (QoWL) among Doctors in the University Hospitals in the Northeastern Thailand. J Med Assoc Thai 2019;102;Suppl.1: S39-S46.

life (QoWL) for 76.6%[11]. QoWL was well-known defined by Walton[12] as a state of human needs and aspirations, such as desire for socially responsive employer. The workers with good QoWL would be more satisfied to their jobs and they would be more productive.

At the present, there was no study about QoWL of the university physicians as a whole. Currently, there was a tool for assessing QoWL: Work-related Quality of Life Scale-2 Online Website (THQWL) by Chaiear[13] which was translated from Van Laar et al[14] into Thai version. The obtained content validity index was equal to 0.97[15]. The tool also included dimensions related to work and could be used to assess QoWL in the university physicians. Assessing QoWL helped recognizing actual information of problems and leading to increase improvement on QoWL. The aim of the present study was to assess the QoWL among doctors in the university hospitals in the Northeastern Thailand and to analyse the strength of association between personal and working factors and good QoWL.

Materials and Methods

Study design, setting, and sample size calculation

A descriptive study was conducted in 2 university hospitals in the northeastern Thailand from 15 May to 15 June 2017. Participants were the doctors in this hospital, including all genders, positions, specialties and work age. The inclusion criteria were Thai doctors working in these university hospitals for at least 3 months until the day of completing the questionnaire. The doctors on sabbatical leave were excluded. Then the study population was 910. The representative sample size was: $n = [(Z^2)(S^2)]/d^2$; where 'n' is the size of the representative sample; Z is the 95% confidence interval (Z = 1.96); S is the standard deviation (S = 14.8)[11]; and D is the acceptable difference (D = 1). The result was 841.5. The sampling frame formula is $n = (n_0)/[1+(n_0/N)]$; n = 437.2. The expected loss of subjects was 40% so that the expected 'n' was 729. However, as this number was closed to the study population so all 910 doctors were invited to complete the online questionnaire. The invitation forms were distributed to the doctors via the admin of the department and the author itself in the departmental meeting or academic activities of the department. There were no missing data because the must-enter function was use in the online questionnaire, meaning that all of responses would be filled completely before submission.

Tools

The data were collected from the self-administration online questionnaire containing 2 parts: work-related quality of life scale-2 online website (THQWL) and general and working data. The THQWL was developed from the paper-based Thai version of a work-related quality of life scale-2 (Thai WRQLS-2), which had been used in Thai doctors and nurses[10,13]. The THQWL contained 32 questions in total. Each question used a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), with 6 negative questions (reversed score). Of total score, good level was counted as good QoWL and average or lower levels were counted as not-good QoWL. The cut-point of the score was presented in the Table 1. The questions of general and working data were multiple choices questions, so that the continuous data was collected in a category form, such as age and working hours.

Data analysis

Stata 10.1 for Windows and Microsoft Excel 2016 (licensed to Khon Kaen University), were used for the analysis. The principal analyses determined: (1) the population characteristics of the sample. (2) the relationship between the working hours and QoWL-the crude odds ratios (COR) with 95% confidence intervals (95% CI) and adjusted odds ratios (AOR) with 95% CI were calculated by using multiple logistic regression and stratified analysis. To put the factors into the model, literature review, multicollinearity, result from backward Stepwise and result from stratified analysis were considered.

Ethical review

The study protocol was reviewed and approved to be exempted from full board review by the Ethics Committee for Human Research of the Khon Kaen University (EC KKU), No. HE591498. The data collection process was conducted

Table 1. The cut-point of the score of QoWL and its dimensions

Dimensions (amount of items)	Level of WRQLS-2		
	Lower	Average	Good
QoWL (32)	31 to 71	72 to 113	114 to 155
Employee engagement (EET) (3)	3 to 6	7 to 10	12 to 15
Control at work (CAW) (4)	4 to 8	9 to 14	15 to 20
Home-work interface (HWI) (4)	4 to 8	9 to 14	15 to 20
General well-being (GWB) (6)	6 to 13	14 to 21	22 to 30
Job and career satisfaction (JCS) (6)	6 to 13	14 to 21	22 to 30
Working condition (WCS) (4)	4 to 8	9 to 14	15 to 20
Stress at work (SAW) (4)	4 to 8	9 to 14	15 to 20
Overall (OVL) (1)	1	2 to 3	4 to 5

under the permission of the Hospital Directors. The participants could make a decision to answer the questionnaire freely.

Grant

This research was funded by the Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand (grant number: IN60206).

Results

Characteristics of the participants

From 910 distributed questionnaires, there were 339 completed questionnaires, making 37.3% response rate. Majority of the doctors were younger than 30 years old (59.9%) and had been working not more than 5 years (54.3%). Male and female ratio was almost equal. Two hundred and forty-six doctors (72.6%) were single or separate, and 135 (39.8%) were specialists.

Majority of the doctors had to do shiftwork not more than 100 hours per month (71.4%). As for the working hour per week, the doctors were mostly in the range of 41 – 50 hours per week (18%) and 51 – 60 hours per week (15.9%). For the financial status, about a half had savings (49.6%) and another half did not (50.4%). (Table 2)

About two third (219) of doctors had some underlying diseases. One hundred and ten (32.5%) had allergy. Fifty-three (15.6%) had non-communicable diseases. And one hundred and thirty (38.4%) had stress-related diseases.

Table 2. Characteristics of the participants (n = 339)

Characteristics	n (%)
Age group	
≤30 years	203 (59.9)
>30 to 40 years	69 (20.4)
>40 to 50 years	32 (9.4)
>50 years	35 (10.3)
Gender	
Male	163 (48.1)
Female	176 (51.9)
Marital status	
Single or separate	246 (72.6)
Married	93 (27.4)
Duration of employment	
≤5 years	184 (54.3)
>5 to 15 years	83 (24.5)
>15 years	72 (21.2)
Specialties	
Specialists	135 (39.8)
Interns or residents	204 (60.2)
Shiftwork	
≤100 hours per month	242 (71.4)
>100 hours per month	97 (28.6)
Working hours	
<40 hours per week	16 (4.7)
41 to 50 hours per week	61 (18.0)
51 to 60 hours per week	54 (15.9)
61 to 70 hours per week	44 (13.0)
71 to 80 hours per week	45 (13.3)
81 to 90 hours per week	37 (10.9)
91 to 100 hours per week	36 (10.6)
>100 hours per week	46 (13.6)
Finances	
Savings	168 (49.6)
No savings	171 (50.4)

Analysis of work-related quality of life scale-2 (WRQLS-2; QoWL)

Fifty-eight point six percent of doctors had an average level of QoWL and 38.4% had a good QoWL. The seven dimensions and overall (OVL) of the doctors were different from each other. About 3 quarters of doctors (271/339) had a good score of job and career satisfaction (JCS). Other dimensions with good down to average level were employee engagement (EET), general well-being (GWB), and overall (OVL). The dimensions with average to good level were control at work (CAW), home-work interface (HWI) and working condition (WCS). While the lowest level was stress at work (SAW) (Table 3).

Of the employee engagement, the majority agreed that "I am proud to tell others that I am part of this organization." (65.5%) and "I would recommend this organization as a good one to work for" (47.5%).

Of the control at work, the majority agreed that "I am involved in decisions that affect me in my own area of work" (56.0%), "I feel able to voice opinions and influence changes in my area of work" (50.1%).

Of the home-work interface, the biggest number of 156 doctors agreed that "My employer provides adequate facilities and flexibility for me to fit work in around my family life" (46.0%). A second biggest group agreed with "I am able to achieve a healthy balance between my work and home life" (40.7%).

Of the general well-being, the majority agreed that "Recently, I have been feeling reasonably happy all things considered" (59.9%), "Generally things work out well for me" (57.2%), "I feel well at the moment" (52.8%), and "I am satisfied with my life" (52.2%).

Of the job career satisfaction, the majority agreed that "I am satisfied with the training I receive in order to perform my present job" (65.5%), "I have the opportunity to use my abilities at work" (58.1%), and "I am satisfied with the career opportunities available for me here" (57.5%) (Table 4).

Of the working condition, the majority agreed that "The working conditions are satisfactory" (57.2%) and "I work in a safe environment" (45.7%).

Of the stress at work (negative questions), the majority were neutral to "I often feel excessive levels of stress at work" (43.4%), agreed that "I have unachievable deadlines" (39.2%), and were neutral to "I am pressured to work long hours" (37.5%) (Table 5).

Of the overall, the only question was "I am satisfied with the overall quality of my working life". One hundred and eighty doctors (53.1%) agreed with this question.

Table 3. Level of WRQLS-2 (QoWL) separated by seven dimensions and overall (OVL) (n = 339)

Dimensions	Level of WRQLS-2		
	Good, n (%)	Average, n (%)	Lower, n (%)
QoWL	127 (38.4)	204 (58.6)	8 (3.0)
Employee engagement (EET)	194 (54.5)	132 (42.1)	13 (3.5)
Control at work (CAW)	144 (44.7)	183 (51.8)	12 (3.5)
Home-work interface (HWI)	130 (39.5)	191 (54.5)	18 (6.1)
General well-being (GWB)	165 (47.9)	159 (46.4)	15 (5.6)
Job and career satisfaction (JCS)	271 (77.0)	65 (22.1)	3 (0.9)
Working condition (WCS)	148 (42.7)	181 (54.2)	10 (3.0)
Stress at work (SAW)	36 (12.2)	235 (67.7)	68 (20.2)
Overall (OVL)	203 (59.9)	128 (38.2)	8 (2.0)

Table 4. Job career satisfaction (JCS) questions

JCS questions (n = 339)	To what extent do you agree with the following?, n (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I have a clear set of goals and aims to enable me to do my job.	1 (0.3)	2 (0.6)	33 (9.7)	185 (54.6)	118 (34.8)
I have the opportunity to use my abilities at work.	1 (0.3)	6 (1.8)	33 (9.7)	197 (58.1)	102 (30.1)
When I have done a good job it is acknowledged by my line manager.	7 (2.1)	26 (7.7)	105 (31.0)	173 (51.0)	28 (8.3)
I am encouraged to develop new skills.	0 (0.0)	11 (3.2)	79 (23.3)	188 (55.5)	61 (18.0)
I am satisfied with the career opportunities available for me here.	1 (0.3)	12 (3.5)	78 (23.0)	195 (57.5)	53 (15.6)
I am satisfied with the training I receive in order to perform my present job.	2 (0.6)	10 (2.9)	71 (20.9)	222 (65.5)	34 (10.0)

Table 5. Stress at work (SAW) questions

SAW questions (n = 339)	To what extent do you agree with the following?, n (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I often feel under pressure at work*	7 (2.1)	52 (15.3)	121 (35.7)	118 (34.8)	41 (12.1)
I often feel excessive levels of stress at work*	13 (3.8)	68 (20.1)	147 (43.4)	84 (24.8)	27 (8.0)
I have unachievable deadlines*	8 (2.4)	68 (20.1)	100 (29.5)	133 (39.2)	30 (8.8)
I am pressured to work long hours*	14 (4.1)	55 (16.2)	127 (37.5)	113 (33.3)	30 (8.8)

* Negative question

Bivariate analysis of a relationship between personal and working factors and good QoWL

It was found that personal or working factors which had a relationship with good QoWL were being married (COR 2.89, 95% CI: 1.77, 4.73, $p<0.001$), having specialties (COR 3.27, 95% CI: 2.07, 5.18, $p<0.001$), having shift work not more than 100 hours per month (COR 2.25, 95% CI: 1.33, 3.82, $p = 0.003$), having maximum working hours per week of 50 (COR 4.45, 95% CI: 2.60, 7.62, $p<0.001$), 60 (COR 4.02, 95% CI: 2.52, 6.41, $p<0.001$), 70 (COR 5.21, 95% CI: 3.19, 8.52, $p<0.001$), and 80 hours (COR 5.08, 95% CI: 2.91, 8.86, $p<0.001$), and financial status of having savings (COR 2.67, 95% CI: 1.69, 4.21, $p<0.001$), and not having health hazards (COR 3.19, 95% CI: 1.82, 5.62, $p<0.001$) (Table 6).

Association of the personal or work factors and good QoWL

Multiple logistic regressions were performed. The factors that were statistically significant to good QoWL were

Table 6. Bivariate analysis of a relationship between personal/working factors and good QoWL

Factors	Good QoWL, n (%)	Crude OR	95% CI	*p*-value
Marital status				
Married (n = 93)	52 (55.9)	2.89	1.77, 4.73	<0.001
Single or separate (n = 246)	75 (30.5)			
Specialties				
Having specialties (n = 135)	73 (54.1)	3.27	2.07, 5.18	<0.001
No specialties; GP, intern, resident (n = 204)	54 (26.5)			
Shiftwork				
≤100 hours per month (n = 242)	103 (42.6)	2.25	1.33, 3.82	0.003
>100 hours per month (n = 97)	24 (24.7)			
Maximum working hours per week				
50 hours per week (n = 77)	50 (64.9)	4.45	2.60, 7.62	<0.001
60 hours per week (n = 131)	75 (59.1)	4.02	2.52, 6.41	<0.001
70 hours per week (n = 175)	96 (54.9)	5.21	3.19, 8.52	<0.001
80 hours per week (n = 220)	108 (49.1)	5.08	2.91, 8.86	<0.001
Finances				
Savings (n = 168)	82 (48.8)	2.67	1.69, 4.21	<0.001
No savings (n = 171)	45 (26.3)			

Table 7. Association of the personal or work factors and good QoWL (adjusted OR)

Factors	Crude OR	95% CI	Adjusted OR	95% CI	*p*-value
Being married	2.89	1.77, 4.73	1.63	0.93, 3.18	0.123
Having specialties	3.27	2.07, 5.18	1.52	0.91, 2.96	0.174
Shiftwork not more than 100 hr/mo	2.25	1.33, 3.82	1.17	0.60, 2.05	0.618
Maximum working hours 50 hr/wk	4.45	2.60, 7.62	3.74	2.10, 6.65	<0.001
Maximum working hours 60 hr/wk	4.02	2.52, 6.41	3.09	1.85, 5,15	<0.001
Maximum working hours 70 hr/wk	5.21	3.19, 8.52	4.19	2.45, 7.17	<0.001
Maximum working hours 80 hr/wk	5.08	2.91, 8.86	4.09	2.22, 7.56	<0.001
Having savings	2.67	1.69, 4.21	2.13	1.23, 3.38	0.004
Not having health hazards	3.19	1.82, 5.62	2.04	1.08, 3.85	0.028

having maximum working hours per week of 50 (AOR 3.41, 95% CI: 1.90, 6.13, $p<0.001$), 60 (AOR 2.88, 95% CI: 1.71, 4.84, $p<0.001$), 70 (AOR 3.84, 95% CI: 2.22, 6.62, $p<0.001$), and 80 hours (AOR 3.81, 95% CI: 2.05, 7.08, $p<0.001$), financial status of having savings (AOR 2.12, 95% CI: 1.27, 3.56, $p = 0.004$), and not having health hazards (AOR 2.04, 95% CI: 1.08, 3.85, $p = 0.028$). (table 7)

Discussion

Since the response rate was 37.3%, which was quite low, so that the selection bias might happen. Furthermore, after calculating back from the result, 474 responses were needed actually, but there were only 339 responses in this study, suggesting that the extrapolation to the population might be with caution. For the confounders of QoWL, there might be some factors missed from this study, such as life event, specific medical illness, or individual coping mechanism, due to not collecting the data and not putting in the exclusion criteria.

As for the characteristics of the participant, this was the first research on QoWL of Thai university doctors which included both staffs and interns/residents. Considering the comparable characteristics with the study of Somsila et al (2015), age group of the doctors was extended, maximum age of 35 year-old compared to an age group of over 50 year-olds, as well as the work age. Another obvious difference was the marital status, the number of married doctors was 4-fold in this study. On the other hand, either Somsila et al (2015) study[11] or this study found that about 35% of doctors had hours of work exceeding 80 per week.

Majority of the doctors rated WRQLS-2 as average and good (58.6% and 38.4%), being interpreted that university doctors were satisfied with 7 dimensions of QoWL, similar to study in Thai resident in northeastern Thailand[11] and study in doctors in public hospital in health area 7[16]. While most of the doctors rated a question of overall (OVL) as good and average (59.9% and 38.2%), similar to the study of doctors in public hospitals in health area 7[16], suggesting that only one question was not optimum for assessing QoWL.

In a similar result with the previous study in Thai resident[11], job career satisfaction dimension was rated for the highest level and the stress at work was rated for the

Table 8. Level of WRQLS-2 (QoWL) and its dimensions comparing with the study in the residents (R)[11]

Dimensions Residents (R), 2015 (n = 256) Univ doctors (UD), 2017 (n = 339)	Good, %		Average, %		Lower, %	
	R (2015)	UD (2017)	R (2015)	UD (2017)	R (2015)	UD (2017)
QoWL	21.9	38.4	76.6	58.6	1.5	3.0
Employee engagement (EET)	43.8	54.5	55.5	42.1	0.8	3.5
Control at work (CAW)	27.3	44.7	56.2	51.8	15.9	3.5
Home-work interface (HWI)	23.4	39.5	52.7	54.5	23.4	6.1
General well-being (GWB)	20.7	47.9	73.4	46.4	5.9	5.6
Job and career satisfaction (JCS)	63.3	77.0	36.7	22.1	0.0	0.9
Working condition (WCS)	20.7	42.7	69.5	54.2	9.8	3.0
Stress at work (SAW)	9.4	12.2	54.7	67.7	35.9	20.2
Overall (OVL)	N/A	59.9	N/A	38.2	N/A	2.0

lowest level. While other dimensions were rated for slightly better levels, from average-to-good to good-down-to-average (Table 8).

For the job career satisfaction, there was a higher percentage of good level in this study (77.0% vs. 63.3%). This might be because in this study the age of participants was older than in previous study[11], likewise, Pathman et al (2002) found that the older the age, the greater was job satisfaction[17]. For more about job career satisfaction, either Somsila et al study[11] or this study revealed that the doctors most agreed with "I am satisfied with the training I receive in order to perform my present job" (65.5%) and 10% of doctors strongly agreed with it in this study. In contrast with British physician associates, one of health workers training on history taking, physical examination, laboratory or radiologic investigation interpretation, diagnosis giving, and initial treatment giving, they were least satisfied with their ability to fulfill their training[18]. This might be because of the professional aspect; the doctors had clearer roles and duties in their field. Moreover, training programs for interns and residents needed to follow the standards announced by Thai Medical Council[19-21].

For the stress at work dimension, in contrast with the previous study on Thai resident in northeastern Thailand[11], in this study lesser number of doctors rated SAW in lower score (35.9% vs. 20.2%). Furthermore, the more doctors rated SAW in average score and good score (67.7% vs. 54.7% and 12.2% vs. 9.4%) in this study. To explore more in details of the questions in SAW, this study found that the doctors agreed plus strongly agreed with "I have unachievable deadlines" for 48% (39.2% and 8.8%), which was the highest percentage of agree and strongly agree together, while the previous study in residents reported 44.1% (37.1% and 7.0%). This trend was also found on other questions. This implied that the university doctors as a whole had better SAW in all 4 aspects. Interestingly, agreeing plus strongly agreeing with "I have unachievable deadlines" was in the fourth rank in the previous study, but in the first rank in this study. This might be a result from collecting data month of the academic year, September to December, 2013 in contrast with May to June, 2017. From May to June, this was the very last month of the academic year so that there would be the period to finish all procrastinated works for both interns or residents and staffs. Furthermore, the rate of "I am pressured to work long hours" was better in this study might be a result of some chief residents were in an off-service period, which was the period that they were allowed to work only in office hours and did not have to do the shiftwork. Considering "I often feel under pressure at work" rank, either in the previous or this study, it was in the second highest rank. This might be a result of the responsibility to other lives and high demand of the job[22].

Employee engagement was about feeling of the employees to their organization. This study showed the similar trend with slightly better rate than in the study of QoWL in residents[11] (54.5% vs. 43.8%). Mauno et al reported that job resources, especially job control, promoted the positive development of work engagement. Moreover, the study showed that the more professional in the work, the greater work engagement, such as the doctors or research staffs rather than other occupations in the hospital[23].

For control at work, it was striking that the doctors rated good level for 2-fold of the residents in previous study (44.7% vs. 27.3%)[11]. This might be due to involving staffs, who had authority in making decision, in this study and the period of data collection, which was the last month of the academic year so that interns or residents might be given an opportunity to make a decision more freely than other periods of the academic year.

Home-work interface (HWI) was linked between home or family and work, indicating the work-life balance[14,15]. HWI level was rated differently from the study in residents. Result of average to good was reported from this study, in contrast with average to both good and lower equally[11]. This might be a result of some chief residents were in an off-service period, which was the period that they were allowed to work only in office hours and did not have to do the shiftwork. Furthermore, about a half of doctors agreed with "My employer provides adequate facilities and flexibility for me to fit work in around my family life". This might be impacted by the change from a national government university to autonomous university since 2015. As a consequence, the

university doctors might be got facilities providing from the university following the university Act[24].

General well-being (GWB) was to do with living conditions and general feelings. This study reported that almost equal proportion of doctors rated good and average levels of GWB (47.9% and 46.4%), which was better rate than the study in residents[11]. Marriage was reported to have positive effects on well-being[25]. The present study found the number of married doctors in this study was about 4 times higher than the study in residents[11].

Working condition (WCS) level in the present study was better rate than the study in residents[11]. More than a half of doctors rated agree or strongly agree for "The working conditions are satisfactory" (57.2% and 6.5%) and "I work in a safe environment" (45.7% and 7.4%). Since the issuing of the Safety, Health, and Environment at Work Act, BE 2554[26], Occupational Health and Safety (OH&S) Office of faculty of medicine had played a determining role in the health and safety of the workers in the faculty, including the physicians, through the monitoring of health and improving of the workplace safety and environment.

As the standard deviation of QoWL was 16.0 in the present study, 474 participants were needed, stratified to 177 staffs and 297 residents. Whereas the actual number of participants took part in the study was 339. In 339 doctors, there were 135 staffs and 204 residents, meaning that interpretation of the result should be aware of the random error.

A result from binary analysis of the relationship between personal or working factors and good QoWL showed statistical significance of all 5 factors in the Table 5. Then the analysis with the multi covariate was done and the result suggested that working hours and financial status associated with good QoWL.

As explained above that random error might happen in the present study, the interpretation of association between working hours and good QoWL would also be aware of a too high maximum working hours per week. According to Ministry of Labour of Thailand[27] and International Labour Organization (ILO)[28], workers would not be allowed to work more than 48 hours per week; or ACGME of US[29] or Thai Medical Council[30], the guidelines recommended physicians not to work more than 80 hours a week; and another Thai physician organization, Thai College of Emergency Physicians, announced in the Residency training program in Emergency Medicine limiting the working hours to 60 hours per week[31]. The present study also supported working hours limitation in the university doctors, even 50, 60, 70, or 80 hours per week in terms of association to good QoWL.

For the financial status, there was also reported that residents whose financial status was negative would have higher burnout score[32], however one study suggested that income beyond what was required to meet basic needs do not have a significant effect on happiness of the doctors[25].

As the result showed that there were significantly more doctors with no health hazards had good QoWL. This was reasonable and explainable by that the health hazards were the personal/social factors (psychosocial hazards) and physical environment, which were parts of working conditions[4]. So that it could contribute to QoWL.

Conclusion

The university doctors had average to good QoWL. Factors positively affecting were their satisfaction with the training the doctors receive in order to perform their present job and the opportunity to use their abilities at work in JCS dimension. Factors negatively affecting were stress from being unable to achieve the deadlines and feeling of being under pressure at work in SAW dimension. In addition, limitation of working hours per week and having savings might be related to good QoWL.

What is already known on this topic?

Assessing QoWL helped recognizing actual information of problems and leading to increase improvement on QoWL. At the present, there was a study of QoWL of the residents in the university hospital using Work-related Quality of Life Scale-2[14] which was translated from Van Laar et al[13] into Thai version. The obtained content validity index was equal to 0.97[14]. There was no study assessing the QoWL among doctors in the university hospital in the northeastern Thailand.

What this study adds?

This study confirmed that generally the doctors were with average to good QoWL. On the one hand, working as a physician, in any position, revealed job career satisfaction was at the best dimension. On the other hand, stress at work was rated at the lowest.

Acknowledgements

The authors would like to thank the doctors participating in the study and Miss Nattamon Somsila. This research was funded by the Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand (grant number: IN60206). For assistance with the English-language presentation of the manuscript, the authors thanks to Mr. Bryan Roderick.

Potential conflict of interest

The authors declare no conflicts of interest.

References

1. Ministry of Public Health, Thailand. Geographic information system of health resourses [Internet]. 2018 [cited 2018 Apr 12]. Available from: http://gishealth.moph.go.th/healthmap/gmap.php#result.
2. Thai Medical Council. The list of hospital approved to be intern training institute B.E. 2560 the 5th network - Faculty of Medicine, Khon Kaen University [Internet]. 2017 [cited 2018 Apr 14]. Available from: https://www.tmc.or.th/pdf/file02-05-2560/H5.pdf.
3. KKU moving on to the biggest 5,000 bed-hospital in ASEAN [Internet]. Khon Kaen: Khon Kaen University; 2018 [cited 2018 Apr 14]. Available from: https://

www.youtube.com/watch?v=KZjQDyfVzRY.
4. Agency for Healthcare Research and Quality (US). AHRQ evidence report summaries [Internet]. Oregon; 2003 [cited 2018 Apr 9]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK11929/.
5. Ayas NT, Barger LK, Cade BE, Hashimoto DM, Rosner B, Cronin JW, et al. Extended work duration and the risk of self-reported percutaneous injuries in interns. JAMA 2006;296:1055-62.
6. Rothschild JM, Keohane CA, Rogers S, Gardner R, Lipsitz SR, Salzberg CA, et al. Risks of complications by attending physicians after performing nighttime procedures. JAMA 2009;302:1565-72.
7. Patel N. Learning lessons: the Libby Zion case revisited. J Am Coll Cardiol 2014;64:2802-4.
8. Bernburg M, Vitzthum K, Groneberg DA, Mache S. Physicians' occupational stress, depressive symptoms and work ability in relation to their working environment: a cross-sectional study of differences among medical residents with various specialties working in German hospitals. BMJ Open 2016;6:e011369.
9. Ishak WW, Lederer S, Mandili C, Nikravesh R, Seligman L, Vasa M, et al. Burnout during residency training: a literature review. J Grad Med Educ 2009;1:236-42.
10. Srikam S. Job burnout and related factors among residents of King Chulalongkorn Memorial Hospital [dissertation]. Bangkok: Chulalongkorn University; 2013.
11. Somsila N, Chaiear N, Boonjaraspinyo S, Tiamkao S. Work-Related Quality of Life among Medical Residents at a University Hospital in Northeastern Thailand. J Med Assoc Thai 2015;98:1244-53.
12. Walton RE. Improving quality of work life. Harv Bus Rev 1974; 52: 12□•"6.
13. Chaiear N. Work-related quality of life scale-2 (Thai WRQLS-2) [Internet]. Khon Kaen: Khon Kaen University; 2017 [cited 2017 May 25]. Available from: https://www.qowl.co.uk/researchers/WRQoL-2%20v2%20THAI%20080817.pdf.
14. Van Laar D, Edwards JA, Easton S. The Work-Related Quality of Life scale for healthcare workers. J Adv Nurs 2007;60:325-33.
15. Sirisawasd P, Chaiear N, Johns NP, Khiewyoo J. Validation of the Thai version of a Work-related Quality of Life Scale in the nursing profession. Saf Health Work 2014;5:80-5.
16. Soonthornvinit W. Working hours related to a good quality of work life among doctors working in the public hospitals in health area 7 [thesis]. Khon Kaen: Khon Kaen University; 2018.
17. Pathman DE, Konrad TR, Williams ES, Scheckler WE, Linzer M, Douglas J. Physician job satisfaction, dissatisfaction, and turnover. J Fam Pract 2002;51:593.
18. Ritsema TS, Roberts KA. Job satisfaction among British physician associates. Clin Med (Lond) 2016;16:511-3.
19. Thai Medical Council. Intern training program B.E.2560 (as the curriculum for intern certification B.E.2551) Handbook for operating the intern training program [internet]. 2017 [cited 2018 Mar 10]. Available from: http://www.tmc.or.th/training2017.php.
20. Thai Medical Council. Standard for resident and fellowship training programs [Internet]. 2017 [cited 2018 Apr 18]. Available from: http://www.tmc.or.th/pdf/file_2-13Jul2017.pdf.
21. Thai Medical Council. Postgraduate medical education WFME global standards for quality improvement [Internet]. 2017 [cited 2018 Apr 18]. Available from: http://www.tmc.or.th/pdf/file-1postgradute_09-08-2560.pdf.
22. ILO Manager. Demand/control model: a social, emotional, and physiological approach to stress risk and active behaviour [Internet]. 2018 [cited 2018 Apr 14]. Available from: http://www.iloencyclopaedia.org/component/k2/item/12-psychosocial-factors-stress-and-health.
23. Mauno S, Kinnunen U, Ruokolainen M. Job demands and resources as antecedents of work engagement: A longitudinal study. J Vocat Behav 2007;70:149-71.
24. Khon Kaen University Act, B.E. 2558 [Internet]. 2015 [cited 2018 Apr 2]. Available from: http://www.ratchakitcha.soc.go.th/DATA/PDF/2558/A/066/25.PDF.
25. Shanafelt TD, Sloan JA, Habermann TM. The well-being of physicians. Am J Med 2003;114:513-9.
26. Safety, Health, and Environment at Work Act, B.E. 2554 [Internet]. 2011 [cited 2018 Apr 2]. Available from: http://www.ratchakitcha.soc.go.th/DATA/PDF/2554/A/004/5.PDF.
27. The Labour Protection Act (No.2) B.E. 2551 [Internet]. 2008 [cited 2017 Dec 9]. Available from: http://www.labour.go.th/en/attachments/article/19/Labour_Protection_Act_BE2008.pdf.
28. International Labour Organization (ILO). C001 - Hours of work (industry) convention, 1919 (No. 1) [Internet]. 1996-2017 [cited 2017 Dec 9]. Available from: http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C001.
29. Nasca TJ, Day SH, Amis ES Jr. The new recommendations on duty hours from the ACGME Task Force. N Engl J Med 2010;363:e3.
30. Bunjongpak S. Guideline for Thai Physician's work time regulation. Region 4-5 Med J 2016;35:28-34.
31. Thai College of Emergency Physicians. Residency training program in Emergency Medicine for Diploma of the Thai Board of Emergency Medicine (EM101). 3rd ed. Bangkok: Thai College of Emergency Physicians; 2016.
32. West CP, Shanafelt TD, Kolars JC. Quality of life, burnout, educational debt, and medical knowledge among internal medicine residents. JAMA 2011;306:952-60.