ORIGINAL ARTICLE

Measuring Health Clinics' Workload Pressure in Kelantan Using the Workload Indicator of Staffing Needs

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ABSTRACT

Introduction: Proper distribution of human resources is an important factor ensuring high-quality performance and sustained service quality. The aim of this study was determining the workload pressure among medical officers in health clinics (HCs) in Kelantan. **Method:** A record review survey was conducted between January and April 2019 using human resources data for 2018 involving HCs in Kelantan. It included all the HCs in Kelantan and excluded community clinics. Workload pressure was determined using a tool known as Workload Indicator of Staffing Needs, developed by World Health Organization. A high workload pressure was defined as a ratio between required and acquired medical officers of less than 1. The data were presented descriptively using as frequencies and percentages. **Results:** All 85 HCs in Kelantan were involved in the study; 90% (9/10) of the Kelantan districts recorded high workload pressure. Moreover, 68.2% (58/85) HCs had high workload pressure. Tanah Merah, Tumpat, Pasir Mas, and Kota Bharu had the most HCs with high workload pressure, and most such HCs were found in areas with a high-density population, requiring huge coverage. **Conclusion:** The Kelantan State Health Department should develop better human resource distribution strategies to ensure the sustainability of quality care in HCs.

Keywords: Workload indicator of staffing needs, Health clinics, Workload pressure, Kelantan

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INTRODUCTION

Primary health care (PHC) is the backbone of healthcare systems around the globe. It serves communities by delivering the first level of contact for medical attention. Apart from curative treatment, PHC also caters to health promotion, along with preventive and rehabilitative care. In Malaysia, PHC is a conjoint service between public and private institutions, and the vast proportion is contributed by Malaysia's Ministry of Health (MOH) (1). As the means to obtaining optimal health services, it is necessary to consider universal health coverage (UHC), which has implications for health services accessibility, lack of people's indebtedness in the context of catastrophic health expenditure, and last but not least, quality healthcare delivery (2). To implement quality health services, it is crucial to acquire equitable and sufficient human resources, especially in terms of medical officers.

Kelantan, as one of the states in northeastern Peninsular Malaysia, is laden with issues concerning medical officers. First, Kelantan has 0.74 –1.12 doctors per 1,000 population, way below the average of 1.80 doctors per 1,000 population in Malaysia (1, 3). This finding has made Kelantan as the poorest state in terms of ratio of doctors to the population in Peninsular Malaysia. Apart from the distribution of medical officers between states in Malaysia, the internal distribution of medical officers in health clinics (HCs) in Kelantan is another issue to be highlighted. A lack of medical officers, exacerbated by their inequitable distribution, will inevitably increase the workload pressure in HCs, and subsequently, impair service delivery.

In view of the highlighted issues, more objective measurement of the workload pressure is needed to alleviate the inequitable distribution. Basically, there are several methods of calculating workload pressure (4). The traditional methods of quantifying the workload pressure use population ratios (number of doctors, nurses and other staffs per 100,000 population), historical tracking, fixed staff schedules, and professional judgment (4). These methods can envisage the big picture, but they are not competent for differentiating local morbidities, facilities' workloads, and preferred health-seeking behaviors among the population. As a consequence, this method will eventually lead to disequilibrium, with understaffing in some facilities and overstaffing in others.

As for problem-solving mechanisms, the World Health Organization (WHO) has introduced the Workload Indicator of Staffing Needs (WISN). The WISN method is used to assess the suitable number of health workers needed by a facility to operate efficiently, plan staffing requirement based on workload and time required to deliver health services, and lastly, assess the workload pressure on staff. This is a preferred method, as it is simple to operate and use, applicable to all personnel categories, using not highly sophisticated process, and understandable by non-medical background managers (5).

The application of the WISN method has proven to be successful and beneficial around the globe, especially in developing countries (6-17). Hence, this study comes to measure the workload pressure of medical officers in HCs in Kelantan.

MATERIALS AND METHODS

A cross-sectional study was developed between January to April 2019 in HCs located in Kelantan. Kelantan has a total of 85 HCs distributed across the 10 following districts: Kota Bharu (17), Kuala Krai (7), Jeli (5), Machang (7), Pasir Mas (9), Pasir Puteh (7), Tanah Merah (5), Tumpat (9), Bachok (8), and Gua Musang (10) (18). No sampling method was applied, as all the HCs in Kelantan were included in the study. Throughout the study, we applied the WISN method and used secondary data on the annual workload from the returns of the Kelantan State Health Department for 2018. The data were comprised of annual patient attendances at HCs and medical officers' standard job descriptions.

There are eight steps needed to implement the WISN method. First, it was necessary to determine the priority cadres and health facility types. The subject investigated was the distribution of medical officers in HCs in Kelantan. To the best of our knowledge, no study has previously been implemented in Malaysia to define the workload pressure in HCs based on the number of medical officers (5).

The second WISN step was estimating the available working time (AWT). For medical officers, we estimated total working hours per year. After removing days for training and conferences, public holidays, sick leave, and vacations, we multiplied the remaining days by the working hours per day. As a result, we found that there were 205 working days, equal to 1,640 hours or 98,400 minutes in total.

The third step was setting the activity standard. The components included health service activities, support activities, and additional activities. In this study, for medical officers in HCs, the health services comprised of maternal health (new antenatal checkup, repeating antenatal checkup, postnatal checkup, procedures like inserting family planning instruments, and visits to community clinics), women's health (pre-pregnancy counselling, new family planning cases, and repeat family planning clients), child's health (new case checkup, repeat case visits, malnutrition cases, procedures like blood taking), primary care services (outpatient clients, methadone management therapy, and domiciliary care), attending emergency cases and school units (student assessment, thalassemia counselling, and health talks). In addition to the main tasks, there were supporting activities, such as quality activities, training / courses and health panels.

Fourth, each activity was set with the service standards, namely, an activity standard for health service activities. We calculated the optimum time-allocated "activity standard" by applying two mechanisms; service standards calculation according to the WISN guidelines (6) and the technical expert opinions from Maternal and Child Health (MCH) Unit, Primary Care Unit and Family Medicine specialists of the Kelantan State Health Department. For instance, in maternal health services, 15 minutes were allocated per patient for new antenatal checkups, 10 minutes per patient for postnatal checkups, 15 minutes per patient for inserting family planning instruments, and 4 hours per session for visits to community clinics. For support activities, allowance standards were used. The standards were divided into two components, namely, Category Allowance Standards (CASs) that segregated the support activities which were implemented by all medical officers, and Individual Allowance Standards (IASs) catered to certain activities that only done by a few of medical officers (5). For this study, we only chose CASs, as IAS is not applicable. For example, meetings were given 1 hour per week, technical reports for 1 day per year, and health talks for 1 hour per week.

Fifth, we established the standard workloads. A standard workload was the volume of works that a medical officer can deliver in a year. The standard workload was calculated using AWT per year divided by the unit time of working. For example, we needed 15 minutes per patient for new antenatal checkups. To determine the standard workload, 98,400 minutes (AWT) were divided by 15 minutes. Thus, the result demonstrated that 6,560 antenatal checkups were the optimum number prescribed for a year.

Sixth, the calculated allowance factors (CAFs) were determined. To calculate the CAFs, all CASs (meetings, technical reports, health talks, etc.) were summed into percentage form, then divided by 100. Then, the sum after division was subtracted from 1. Next, the CAF announced as 1 was divided by the result after subtraction.

Seventh, staff requirements were determined based on WISN. We accommodated each workload component

(from annual statistics) into the formula by dividing them with the standard workload. The calculated answers reflected the total basic requirement for medical officers. Next, the total basic requirement was multiplied by the CAF, producing the net requirements for medical officers. The results were rounded to the nearest definite number. Complete calculation examples are given in Table I.

As the eighth and final step, the WISN results were analyzed and interpreted. We analysed the results in two ways—comparing the in place supply and the demanded number of medical officers, and using ratios (dividing the current number of medical officers, a proxy measure for assessing the workload pressure of medical officers in each HC). Ratios below 1 indicated high workload pressure, while those greater than 1 signified low workload pressure. Ratios equal to 1 defined the perfect balance. Examples of the calculated results are shown in Table II.

RESULTS

We estimated the workload pressure of each HC in 10 districts of Kelantan. In total, there were 85 HCs all over Kelantan, served by 397 medical officers, as clarified in Table III.

In this study, we measured the average workload pressure in HCs according to district. As shown in Table IV, we found that all the districts in Kelantan had high

Table I: Examples of Workload Indicator of Staffing Needs Calculations

		DAY	205			
	AVAILABLE WORKING TIME	**HOUR**	1640			
		MINUTE	98400			
NO.	**ACTIVITIES**	**UNIT**	**ACTIVITY STANDARD**	**STANDARD WORKLOAD**	**ANNUAL WORKLOAD**	**BASIC STAFF REQUIREMENTS**
MATERNAL HEALTH						
1	New antenatal checkup	minutes/patient	15	6560	154	0.02
2	Repeated antenatal checkup	minutes/patient	10	9840	2622	0.27
3	Postnatal checkup	minutes/patient	10	9840	262	0.03
4	Procedures (IUCD, Implanon, speculum, etc.)	minutes/patient	20	4920	190	0.04
5	Visit to community clinics	hours/session	4	410	24	0.06
						0.41
WOMEN'S HEALTH						
6	Prepregnancy care (PPC)	minutes/patient	10	9840	272	0.03
7	New family planning receiver	minutes/patient	10	9840	78	0.01
8	Family planning services: continuation	minutes/patient	10	9840	1881	0.19
						0.23
CHILD HEALTH						
12	New case check-up	minutes/patient	15	6560	717	0.11
13	Follow-up cases	minutes/patient	15	6560	3764	0.57
14	Malnutrition cases	minutes/patient	20	4920	9	0.00
15	Procedures (blood taking, etc.)	minutes/patient	10	9840	36	0.00
						0.69
PRIMARY HEALTH						
16	Outpatient clients	minutes/patient	10	9840	5157	0.52
17	Methadone maintenance therapy (MMT)	minutes/patient	20	4920	0	0.00
18	Domiciliary programs	hours/patient	2	820	16	0.02
						0.54
EMERGENCY						
19	Emergency cases	minutes/patient	30	3280	25	**0.01**
SCHOOL UNIT						
20	Student checkup	minutes/patient	5	19680	0	0.00
21	Thalassemia counselling	minutes/patient	15	6560	0	0.00
22	Health talks	hours/session	3	547	0	0.00
						0.00
			TOTAL BASIC REQUIREMENT (a)			**1.88**
GENERAL (CATEGORY ALLOWANCE)						
23	Quality activities: healthy settings, innovation programs,	hours/week	0			-
24	Knowledge, Attitude & Practice (KAP) project					
25	Training/courses	day/year	7			3.41
26	Continuous Medical Education (CME)	hours/week	1			3.17
27	Meetings	hours/week	0			-
28	Community interventions	days/year	2			0.98
29	Health panels	days/year	2			0.98
30	Technical reports	days/year	0			-
	Health talks	hours/week	1			3.17
	Total percentage					11.7
	Basic requirements (a)			1.88		
	Total CAS			11.70		
	Category Allowance factor (b)	1/1 – (11.7/100) =		1.13		
	Corrected Staff Requirement (c) =	(a) X (b)		2.13		
	MO REQUIREMENT =			**2**		

Table II: Examples of the WISN Calculation Results

Staff Category: Medical Officers in HCs						
HC*s	**Current number**	**Required number, based on WISN**	**Shortage/ excess**	**Workforce problem**	**WISN ratio**	**Work-load pressure**
A	2	4	-2	Shortage	0.5	High
B	4	2	+2	Surplus	2.0	None
C	11	9	+2	Surplus	1.2	None
D	6	6	0	Balance	1.0	Normal

*Health clinics

Table III: Distribution of Health Clinics (n = 85) and Medical Officers (n = 397) in Kelantan

District	Health clinics n (%)	Medical officers n (%)
Bachok	8 (9.4)	37 (9.3)
Gua Musang	10 (11.8)	26 (6.5)
Jeli	5 (5.9)	13 (3.3)
Kota Bharu	17 (20)	112 (28.2)
Kuala Krai	7 (8.2)	27 (6.8)
Machang	7 (8.2)	32 (8.1)
Pasir Mas	9 (10.6)	55 (13.8)
Pasir Puteh	7 (8.2)	28 (7.1)
Tanah Merah	6 (7.1)	25 (6.3)
Tumpat	9 (10.6)	42 (10.6)
Total	85 (100)	397 (100)

Table IV: District Workload Pressure (n = 10)

District	Medical officers			Workload pressure
	Acquired	Required	Difference	
Bachok	37	53	–16	0.70
Gua Musang	26	39	–13	0.67
Jeli	13	15	–2	0.87
Kota Bharu	112	154	–42	0.73
Kuala Krai	27	40	–13	0.68
Machang	32	30	+2	1.1
Pasir Mas	55	65	–10	0.85
Pasir Puteh	28	45	–17	0.62
Tanah Merah	25	39	–14	0.64
Tumpat	42	78	–36	0.54
Total	397	558	+161	0.71

workload pressure except Machang. We identified Tumpat as the district with highest workload pressure (0.54). To achieve normal workload pressure for all the districts, 161 extra medical officers would be needed.

Out of 85 HCs in Kelantan, 58 (68.2%) had high workload pressure, 12 (14.1%) had normal workload pressure, and 15 (17.6%) had low workload pressure. The top four districts in which the HCs had high workload were Tanah Merah (100%), Tumpat (88.9%), Pasir Mas (77.8%), and Kota Bharu (76.5%). Machang had the lowest workload pressure (14.3%), as recorded in Table V.

For prioritizing the areas needing most attention, we identified the 14 HCs with the highest workload pressure, as listed in Table VI.

Table V: Distribution of Level of Workload Pressure According to District (n = 85)

District	Total HC*s	Workload pressure					
		High (%)		Normal	(%)	Low	(%)
Kota Bharu	17	13	(76.5)	1	(7.7)	3	(23.1)
Gua Musang	10	5	(50.0)	1	(20.0)	4	(80.0)
Pasir Mas	9	7	(77.8)	0	(0)	2	(28.6)
Tumpat	9	8	(88.9)	1	(12.5)	0	(0)
Bachok	8	5	(62.5)	1	(20.0)	2	(40.0)
Kuala Krai	7	5	(71.4)	2	(40.0)	0	(0)
Machang	7	1	(14.3)	3	(42.9)	3	(42.9)
Pasir Puteh	7	5	(71.4)	2	(40.0)	0	(0)
Tanah Merah	6	6	(100)	0	(0)	0	(0)
Jeli	5	3	(60.0)	1	(33.3)	1	(33.3)
Total	85	58	(68.2)	12	(14.1)	15	(17.6)

Health clinics

Table VI: List of the Top 14 Health Clinics with High Workload Pressure in Kelantan (n = 14)

District	HC*	Actual	Required	WP**
Tanah Merah	Kemahang	1	4	0.25
Gua Musang	Chiku 3	3	10	0.30
Pasir Mas	Kubang Kual	1	3	0.33
Tumpat	Bunohan	4	12	0.33
Tumpat	Bendang Kerian	1	3	0.33
Bachok	Beris Panchor	3	9	0.33
Gua Musang	Aring 2	1	3	0.33
Tumpat	Pengkalan Kubor	4	11	0.36
Tumpat	Sungai Pinang	4	11	0.36
Tumpat	Pasir Pekan	3	8	0.38
Pasir Puteh	Jeram	2	5	0.40
Gua Musang	Jeram Tekoh	2	5	0.40
Tanah Merah	Gual Ipoh	4	9	0.44
Kota Bharu	Ketereh	7	15	0.47

*Health clinics, **Workload pressure

DISCUSSION

We embarked on this study to explore the current capacity of HCs in delivering health services to the public. The focus was the workload pressure and capability of medical officers to serve the public in a high-quality and acceptable manner. To accomplish this, we assimilated the steps of the WISN formula with the secondary data gathered from Kelantan State Health Department.

Our findings indicated a significant burden among HCs

in Kelantan. This was in accordance with the national data, which stratified Kelantan as the worst state in Peninsular Malaysia in terms of the doctor–population ratio (19). To begin with, 90% of districts in Kelantan scored high for workload pressure, calculated as the average score for HCs in the respective district. The scoring according to district was diluted data, as it did not represent the real situation in the HCs. Nevertheless, the findings had portrayed the first impression on the ground.

According to the current study, we found that there were districts in which more than 75% of the HCs exhibited high workload pressure. Tanah Merah had the worst result (100%). The reason for this the surge may be due to the closure of the outpatient department at Tanah Merah Hospital in January 2015 (20). As a consequence of this, the burden of outpatient treatment had been diverted toward HCs (18). The district with the second highest workload pressure was Tumpat; this is the smallest district in Kelantan, but it has a high population, resulting in higher population density. Thus, it was understandable that there was high workload pressure there. For Pasir Mas, the population density is also high, leading to increased attendance at HCs (21). Kota Bharu, as the capital city of Kelantan and catering to the largest number of inhabitants, was in third position. In addition to its inhabitants, Kota Bharu received patients from nearby districts, such as Tumpat, Bachok, Pasir Mas, and Machang. The total population in Kota Bharu was estimated as 490,000 (22). However, during working hours, the population can reach 550,000 (23). In contrast, Machang recorded the lowest number of HCs with high workload pressure. Geographically, it is situated in the middle of the state, meaning that people in Machang tend to visit nearby clinics in other districts instead of seeking treatment at the primary health clinics in their own district.

As Malaysia is currently experiencing an economic downturn, civil servants are set for placement cutoffs, and this does not exclude the healthcare sector. Although already employed staff are not terminated, recruitment of new staff is an issue (24). To make matters worse, implementation of contract-based house officers means that there is a possibility of lesser recruitment for permanent medical officers into the service (19). According to the Professional Registries, nationwide human resource densities, especially for medical officers, have increased by 2.1-fold since 2002. As Malaysia aims to be a developed country, the doctor–patient ratio should be within 1 to 400 population, and yet, the country is still far from this goal (25). Even worse, despite a rise in terms of population densities, the distribution of medical officers is geographically uneven, especially for Sabah, Sarawak, and Kelantan, compared with the west coast of Peninsular Malaysia.

Control Measures

The MOH's Malaysia Plan of Action 2016–2020 has clearly delineated the strategy of strengthening the health system's governance and organizational capacity. One of the involved measures is by addressing health personnel shortages and unequal distributions (26). However, the implementation of this strategy is still ongoing, and requires more time to be fruitful.

The strategies to overcome the problem can involve increased recruitment of medical officers, postponement of retirement, well-planned distribution and allocation, or cutting migration to the private health sector (1, 4). Nevertheless, the implementable action at the state level is adopting well-planned distribution and allocation. A lack of medical officers can increase the burden and subsequently hamper the quality of service delivery.

There are 397 medical officers currently serving at HCs in Kelantan. According to the current study, a total of 558 medical officers is needed to provide optimum health services in HCs (18). To begin with, additional medical officers can be supplied to the HCs with the highest workload pressure.

In this study, we identified that the 58 HCs with high workload pressure can be divided into four quartiles according to the numerical score of workload pressure (the lower the score, the higher the workload pressure was). Hence, the top 14 HCs with the highest workload pressure were identified according to hierarchy, and it was suggested that extra medical officers should be prioritised to these HCs.

Besides the upstream approach at the Kelantan State Health Department, a downstream approach at the level of district health offices was suggested. In certain districts, the allocation of medical officers within the district itself was also uneven. For instance, it was found that two HCs in the same district lack of two medical officers, while another HC had two extra medical officers. Internal shuffling was suggested to generate an equitable distribution in the respective districts.

The current study had its own limitations. The accuracy of WISN measurement depended highly on the activities and activity standard measured. If the standards used were not precise, the result (required number of medical officers) will be misleading (5). Nevertheless, the standards used in this study had adopted the perspective of subject matter experts from the Kelantan State Health Department. In addition, the required number of medical officers was large. Stakeholders' dedication and full commitment will be needed to perform effective interventions. As another point, the standards used in WISN measurement only considered the medical officers. Some standard activities can be co-managed

and redundant with other support staffs, such as assistant medical officers and staff nurses, and neglecting them may have led to inaccuracy of measurement.

CONCLUSION

Kelantan has a double burden as the state possesses the lowest ratio of medical officers per 1,000 persons in Peninsular Malaysia and concurrent inequitable distribution of medical officers in HCs. These are the tipping points reflecting the magnitude of workload pressure is. Therefore, WISN measurement represents a timely method, providing an objective approach for measuring workload pressure in HCs. To achieve universal health coverage, the process of implementing equitable distribution of medical officers in HCs is instrumental. As the main stakeholder, Kelantan State Health Department ought to facilitate and spearhead the transformation.

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