



# ASSESSING STAFF REQUIREMENTS AND WORKLOAD PRESSURE AMONG DOCTORS WORKING IN OBSTETRICS & GYNECOLOGY DEPARTMENT OF A PUBLIC SECTOR HOSPITAL IN PAKISTAN USING THE WORLD HEALTH ORGANIZATION'S WORKLOAD INDICATORS OF STAFFING NEEDS

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## ABSTRACT

**OBJECTIVE:** To assess the doctors' requirement/workload pressure in Department of Obstetrics and Gynecology (DOBGyn) of a public sector hospital for effective planning and management of human resources.

**METHODS:** World Health Organization's Workload Indicators of Staffing Needs (WISN) tool was used in assessing the staffing requirements for doctors working in the DOBGyn of a public sector hospital Khyber Pakhtunkhwa, Pakistan. Information on working conditions and staffing was acquired by reviewing relevant documents and interviewing key informants. We obtained workload statistics from the hospital from January 1 to December 31, 2015. We assisted a senior technical expert working group in identifying workload components and activity standards, as well as validating both.

**RESULTS:** The average working time needed by the doctors to perform 'health service activities' was 1952 hours, for which 32 doctors are needed, while there are 36 doctors in the department. 'Support activities' accounted for about a fifth of the doctors' annual working hours (-category allowance standards= 18.54%), for which 7 doctors were additionally needed. The 'additional activities' required 3566 hours for which 2 additional doctors were needed. To perform all the three activities, there was a total need of 41 doctors. The workload pressure was also found to be high (WISN ratio: 0.87) on doctors.

**CONCLUSION:** The health services, support and additional activities take up about significant part of the doctors' time annually. This may require recruitment of a low-cost skill-mix of healthcare personnel to cope with the current workload and/or a health system thinking perspective to reduce the workload indirectly.

**KEYWORDS:** WISN (Non-MeSH), Human Resource for Health (Non-MeSH), Workload Pressure (Non-MeSH), Workload (MeSH); Obstetrics (MeSH); Gynecology (MeSH), Doctors (Non-MeSH); Nurses (MeSH)

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## INTRODUCTION

The purpose of any health care system is to meet the healthcare needs of the population, whether it is preventive or curative. Furthermore, the ability to achieve the health objectives of a country depends on the knowledge, skills, and motivation of present health workers to deliver efficient and effective

health services.<sup>1</sup> These healthcare requirements cannot be addressed without the availability of Human Resource for Health (HRH), which is why a shortage of HRH could obstruct universal health coverage and jeopardize the SDGs' attainment.<sup>1,2</sup> Globally, there is a shortage of HRH, about 7.2 million shortage exists in low- and middle-income countries. Global strategy on HRH<sup>1</sup> has

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estimated a shortage of 18 million of skilled health workers by 2030.<sup>3</sup>

Pakistan is one of the low-middle income countries where HRH is critically deficient in terms of doctor to patient or even doctor to nurse ratio, doctor: patient=1:1300 and doctor: nurse=1:2.7.<sup>4</sup> The Economic Survey of Pakistan talks about the shortfall of HRH in the country: doctors at 53 per cent and nurses at 96 percent.<sup>5</sup> To overcome the shortage of doctors and to divert the load from the public, several private medical colleges were allowed to establish and operate in the province, along with the mandatory requirement of establishing a teaching hospital.

The working environment and motivation of the healthcare workforce is not satisfactory in Pakistan.<sup>6</sup> The healthcare staff prefers to work in urban and metropolitan cities, for the reasons of better social and economic opportunities.<sup>7</sup> Doctors are more concentrated in urban areas, depriving rural health facilities of

basic health needs and functions. Tertiary health care facilities in metropolitan settings are likewise preferable to avoid long delays or inaccessibility for health clients. As a result, there has been an increased patient load on secondary and tertiary care teaching hospitals, resulting in the burnout of doctors.<sup>8</sup> Pakistan devolved health administration to the provinces, offering the provinces legislative and executive authority in the health sector traditionally controlled by the federal government. At the time of devolution, Khyber Pakhtunkhwa already had the Health Sector Strategy (HSS) 2010-2017<sup>9</sup> in place, but the process triggered a series of reforms aimed at addressing the province's unique challenges in terms of upgrading the health system as a whole. After the devolution of health to provinces from the federation in 2011, the provinces are still facing challenges in establishing health workforce policies and strategies for human resource management for health especially in the rural and underprivileged areas.<sup>10</sup> To address this issue, the Government of Khyber Pakhtunkhwa, Pakistan created incentives for various cadres of health service providers,<sup>11</sup> e.g. provision of financial allowances to work in rural areas.<sup>12</sup> In addition, the Medical Teaching Institutions (MTI) act was promulgated in the year 2015 in the province with an objective to decentralize decision making power to the public sector teaching hospitals from the Department of Health to improve the health service provision to the public.<sup>13</sup> For example, induction of required HRH based on their need, establishment of new departments/wards, creation of quality assurance teams, etc. With all these health reforms implemented, it was assumed that the health system would be performing optimally, especially after the introduction of financial incentives for the healthcare workforce to work in rural and underprivileged areas. Therefore, the workload pressure would be minimized at the public sector tertiary level hospital. To test this assumption, we conducted this study in the Department of Obstetrics & Gynecology (DObGyn) of a public sector tertiary level teaching hospital of Khyber Pakhtunkhwa province of Pakistan. The reason behind choosing the DObGyn was that the ObGyn services are provided at all levels (primary, secondary, and tertiary) of the healthcare system in Pakistan.

The objectives of the study were: 1) to assess the required number of doctors

needed in the DObGyn; 2) to determine the workload pressure on doctors working in the DObGyn of a public sector hospital using the Workload Indicators of Staffing Needs (WISN) approach. This study will aid to understand the effectiveness of the health reforms in the province in the domain of HRH and will help to make evidence-based decision making, especially in reference to HRH.

## METHODS

This cross-sectional study was conducted at the DObGyn of a tertiary care public sector hospital of Khyber Pakhtunkhwa province of Pakistan. Study was approved by the ethical committee of the respective hospital (#NMC/IERB/Sec-09/11/2020). Hospital name is not revealed in the paper as requirement of the hospital administration and ethical committee.

Information on working conditions and staffing was acquired by reviewing relevant documents of the hospital records from January–December 2019 and interviewing key informants. Further information about setting the activity standards was collected by interviewing the relevant healthcare personnel of the concerned hospital after taking their informed consent.

The government started healthcare reforms in Khyber Pakhtunkhwa and promulgated the Medical Teaching Institution (MTI) Reforms Act in 2015.<sup>14</sup> The concerned teaching hospital is working under the provincial MTI act of 2015, having qualified teaching faculty for clinical and basic sciences.

The DObGyn of the concerned hospital has 36 doctors, out of which 13 work as medical officers, 9 as training medical officers, 5 as junior registrars, 6 as senior registrars, 1 as an assistant professor, and 2 as associate professors. These doctors were responsible for providing health services in the operation theater, labor room, and maternity wards.

As WISN approach recommends formation of three groups for successful implementation of the WISN process, therefore, the following implementation groups were established after discussing with the management of the hospital and meetings were held with them:

1. The *Steering committee of the hospital* included the hospital's management who approved the approach for WISN implementation and endorsed to conduct

the study in DObGyn due to high patient load throughout the year. Subsequently, the senior most official of the department also granted approval for conduction of this study. The committee was keen to use the WISN results for improvement purposes.

2. *Technical task force* was responsible for the implementation of WISN process. It included the senior most official of the DObGyn and liaison officer. The leader of technical task force was the senior most official of the DObGyn who also served as a secretary for the steering committee meetings and provided updates on WISN implementation process to the members of the steering committee.

3. *Expert working group* included one senior representative from each cadre of doctors (junior registrar, senior registrar, assistant professor, and an associate professor) working in the DObGyn. This group of experts, in consultation with the technical task force, defined the main workload components and activity standards for all the three activities. The activity standards, for both service and allowance standards, were developed by the senior representatives from each cadre of doctor in the expert group based on their experience. The activity standards were defined as the average time, in minutes/hours per activity or per day/week/month, taken to complete each workload component in the best professional manner in the hospital's departmental setting. These activity standards could be found in supplementary tables SI, SII, & SIII. Using the collected data on the activity statistics, the staff requirement was calculated according to the following six steps as laid out in the WISN manual.<sup>15</sup> Further details on all these steps and their subsequent calculation could be found in the WISN manual.<sup>15</sup>

i. **Available Working Time**

**(AWT):** AWT was estimated using the time faculty/staff was available in one year to do their work; considering the authorized absences and national holidays. It was expressed in days per year and subsequently converted to hours per year. The formula for calculation is  $AWT = A - (B + C + D + E)$  where A is the number of possible working days in a year (312 days), B is the number of days off for public holidays in a year (15 days), C is the number of days off for annual leave in a year (24

**TABLE I: AVAILABLE WORKING TIME IN A YEAR IN DEPARTMENT OF OBSTETRICS & GYNECOLOGY BASED ON WISN**

Total number of possible working days in a year (A)	52 x 6 = 312
Total number of weeks in a year	52
Available working days in a week	6
Total number of days not worked (B+C+D+E)	68
Days not worked due to public holidays (B)	15
Days not worked due to annual leaves (C)	24
Days not worked due to sick leaves (D)	24
Days not worked due to other leaves (E)	5
Available working days in a year (A-(B+C+D+E))	312 - 68 = 244
Average available working hours in a day	8
Available working time (in hours) in a year (AWT)	244 x 8 = 1952

WISN: Workload Indicators of Staffing Needs

days), D is the number of days off due to sick leave in a year (24 days), and E is the number of days off due to other sanctioned leaves in a year (5 days).

ii. **Defining the workload components:**

The three activities in the study's WISN process included the health services, support, and additional activities. The main workload components in each of these activities were identified by members of the expert working group (supplementary tables SI, SII, & SIII).

iii. **Setting activity standards:**

The activity standard was defined as the time required, for each workload component in each of the activities section, by a well-trained, skilled, and motivated doctor to perform to professional standards in the hospital's departmental setting. Based on support and additional activities, the standards were determined separately for each as follow:

- a. Service standards for health service activities: This was estimated by members of the expert working group based on their experience. It was expressed in the form of unit time, i.e. the time from the start of one workload component on one patient to the start of the same workload component on the next patient by the same doctor who is well-trained, skilled, and motivated (Supplementary Table SI).
- b. Allowance standards for support and additional activities: The allowance standards for support activities

were determined through category allowance standards (CAS). The support activities were performed by all the doctors but regular statistics were not collected on them. CAS was expressed as a percentage of total working time in this study (Supplementary Table SII). For additional activities, individual allowance standards (IAS) were estimated. The main additional activities were performed by some of the doctors and regular statistics were not collected on them. To collect work time statistics on each component in respective activities, the expert working group organized interviews with the doctors in each cadre and averaged the time it took to complete each workload component (Supplementary Table SII).

iv. **Establishing standard workloads:**

A standard workload was established for each workload component in the health service activity group using the unit time (as described above in the section 3 (a)) as the factor to estimate the amount of work that one doctor could do in a year (Supplementary Table SI).

v. **Calculating allowance factors:**

The two allowance standards estimated were CAS, for support activities, and IAS, for additional activities. The category allowance factor (CAF) estimates the total number of doctors required for both health service and support activities. The individual allowance factor (IAF) is the number of doctors required to cover additional activities

of certain cadres of doctors. These allowance standards were converted into allowance factors, the CAF and IAF respectively.

vi. **Determination of the doctors' requirement based on WISN:**

To determine the number of doctors required to work in the DObGyn, the total required number of doctors was calculated separately for the three different activity groups. The routine data on each identified workload component in health service activities were collected retrospectively through the patient records and the schedule record of the various cadres of doctors in the year 2019 that resulted in the estimation of average time spent on each workload component. This gave us the required number of doctors to perform health services activities. Similarly, the doctor's requirement to perform each of the support and additional activities was calculated using the WISN software.

vii. **Analyzing WISN results:** The WISN results were analyzed in the following two ways:

- a. Difference in staffing levels: The number of doctors needed based on WISN and the number of doctor's present in the DObGyn were compared to assess under-, over-, or adequate staffing level.
- b. WISN ratio: The WISN ratio was also calculated to assess the workload pressure on the doctors working in the DObGyn.

To facilitate the calculation of all the statistics, the collected data was entered and analyzed in the WISN software, developed by the World Health Organization (WHO) (English language, version 1.0.15.102). The datasets used and/or analyzed for this study are available from the corresponding author on a reasonable request.

## RESULTS

The expert working group, in consultation with the technical task force, identified the workload components along with the time taken by each component in each of the activity groups as described in the methods section. The collected data was analyzed using the WISN software. The

**TABLE II: DETERMINING DOCTORS REQUIREMENT IN DEPARTMENT OF OBSTETRICS & GYNECOLOGY BASED ON WISN**

Available Working Time (AWT) = 1952 hours				
Health service activities of all doctors	Workload component	Annual workload	Standard workload	Required number of doctors
	Antenatal & Postnatal Care	25240	11712	2.15
	Collect/ maintain client information, examination and record keeping in inpatient ward, labor ward and outpatient clinic	8400	780.8	10.75
	Deliveries	4992	7808	0.63
	Labor monitoring	4992	325.3	15.3
	Other elective procedures	302	2602	0.11
	Emergency OT procedures	1210	1952	0.61
	Emergency supportive care and referral	1764	5856	0.30
	Monitoring of high-risk patients	840	325.3	2.58
<b>A. Total required doctors for health service activities</b>				<b>32.43</b>
Support activities for all doctors	Workload component	CAS (Annual working time)	CAS (Percentage working time)	
	Prepare & present morning meeting	20 minutes per day	4.16 per cent	
	Monthly statistic presentation	20 minutes per month	0.20 per cent	
	Weekly duty roster preparation	2 hours per week	4.16 per cent	
	Monthly academic roster preparation	20 minutes per month	0.20 per cent	
	Organize and participate in workshop	10 minutes per month	0.09 per cent	
	Counseling and caring clients & coworkers	5 minutes per day	1.04 per cent	
	Reassess medical record of clients	10 minutes per day	2.08 per cent	
	Coordination with assistants, anesthesiologist, nursing and auxiliary staff	5 minutes per day	1.04 per cent	
	Dealing administrative issues	30 minutes per week	1.04 per cent	
	Patient management issues	30 minutes per week	1.04 per cent	
	Attend emergency call from another department	30 minutes per week	1.04 per cent	
	Journal club	30 minutes per week	1.04 per cent	
	Training Medical Officers (TMOs) presentations	4 hours per month	2.45 per cent	
	Weekly Obstetric emergency drill	30 minutes per week	1.04 per cent	
Prepare birth certificates/ evaluations/ disease statistics etc.	1 hours per week	2.08 per cent		
<b>Total CAS percentage</b>				<b>18.54 per cent</b>
<b>B. Category allowance factor: <math>\{1 / [1 - (\text{total CAS percentage} / 100)]\}</math></b>				<b>1.21</b>
<b>Number of additional doctors needed to perform support activities <math>((A*B)-A)</math></b>				<b>6.81</b>
Additional activities of certain doctors	Workload component	Number of doctors performing the work	IAS (Actual working time per doctor)	Annual IAS (for all doctors performing activity)
	Teaching undergraduate students of medical college	3	4 hours per week	624 hours
	Supportive supervision	9	2 hours per week	234 hours
	Inspecting equipment, structure & material, check and maintain biomedical equipment	9	2 hours per week	234 hours
	Meetings of committees and councils	3	140 hours per year	210 hours
	(academic council, purchase, inquiry, child adoption, harassment and curriculum committees)	2	8 hours per year	16 hours
	House officer orientation	2	8 hours per year	16 hours
	House officer induction meeting	9	10 hours per year	72 hours
	Other administrative activities	9	5 hours per week	468 hours
	Teaching rounds with Training Medical Officers (TMOs)	9	18 hours per week	1404 hours
	Ward teaching of undergraduate medical students	3	24 hours per year	72 hours
	Teaching nurses	9	6 hours per month	216 hours
Conduct research			<b>3,566 hours</b>	
<b>C. Individual allowance factor (Annual total IAS/ AWT)</b>				<b>1.82</b>
<b>D. Total required number of doctors based on WISN: <math>(A \times B + C)</math></b>				<b>41.06</b>

WISN: Workload Indicators of Staffing Needs; AWT: Available Working Time; CAS: category allowance standards; IAS: individual allowance standards

**TABLE III: DOCTORS REQUIREMENT / WORKLOAD PRESSURE IN THE PUBLIC SECTOR TERTIARY HOSPITAL**

Current number	36
Required number based on WISN	41.06
Shortage/ Excess	-5.06
Workforce problem	Deficit
WISN ratio	0.87
Workload pressure	High

WISN: Workload Indicators of Staffing Needs

results of the analyzed data have been discussed under individual headings as shown below:

#### The Available Working Time:

The DObGyn has 36 doctors who work 6 days a week with an average of eight hours per day. The estimated AWT of a doctor came out to be 244 days in a year or 1952 working hours per year, adjusted for 68 non worked days in a year (Table I).

#### The Activity Standards & Factors:

The time taken by each workload component, to complete the task in the best professional manner in the departmental setting, in each of the health service, support, and additional activities were identified. In the health service activities, eight components were identified as workload areas. The department has a total of 36 doctors, while the WISN statistics showed a need of 32 doctors to carry out "health service activities" (Table II:A). The highest workload was found to be in 'labor monitoring' component, where the annual workload was 4992 hours while the standard workload should have been 325.3 hours annually, requiring about 15 doctors only for this workload component. Other workload components that had the highest workload were 'collect or maintain client information/examination and record keeping in inpatient ward/labor ward and outpatient clinic' and 'monitoring of high-risk patients' that had an annual workload of 8400 and 840 hours respectively, while the standard workload should have been 780.8 and 325.3 hours thereby creating a requirement of 11 and 3 doctors respectively.

There were 15 workload components in support activities. These support activities took up 18.54 per cent of the total annual working time of doctors working in the DObGyn (Table II: B), creating a need of additional 7 doctors to cover this workload. Majority of the workload components were the "preparation and presentation of morning meetings" (4.16

per cent of the total annual work time), followed by weekly duty roster presentation (4.16 per cent of the total annual work time), and training medical officers' presentations, etc. (2.45 per cent of the total annual work time).

There were 11 workload components in additional activities that some cadres of doctors performed. These activities required 3566 hours from the doctors annually. The individual allowance factor showed that the department needs about 2 additional doctors to cover the additional activities (Table II: C).

#### Doctors' requirement based on WISN:

The WISN score showed that the DObGyn needs a total number of 41 doctors to cover all the health service, support, and additional activities (Table II: D).

#### Workload Pressure:

The WISN method identified a WISN ratio of 0.87, indicating a high workload pressure. The Table III shows that the DObGyn of the hospital has either a high workload or less than required number of doctors in the hospital. The WISN also identified a total shortage of 5 doctors based on the current workload, thereby indicating a total need of 41 doctors to cope with the current workload pressure.

## DISCUSSION

The thirty-six doctors in the DObGyn of the public sector hospital of the province work six days a week on an average of eight hours per day. They did not work for a total of 68 days in a year, thus, making a total of 244 working days in a year. The WISN method used in this study calculated the workload of these doctors and estimated the need of doctors accordingly. This study found that there is either a shortage of doctors in the DObGyn of the hospital or the workload pressure is high. The WISN process indicated a need of 5 additional doctors to cover the workload

responsibilities of the doctors working in the DObGyn.

The finding of this study is that the current number of doctors is sufficient to cover the patient load of the department based on the "health service activities" assessment. However, when the "support" and "additional activities" are added to the health service activities, the number of doctors increased. The WISN statistics show that just to perform "health service activities" with "support activities", there is an additional need of 7 doctors. But when "additional activities" are added to the "health service" and "support activities", the department needs a further of 2 doctors, making a total need of 41 doctors to have a manageable workload.

The WISN method, used to determine the staff requirement in an institution, is based on the amount of workload. The method has been appreciated and used by many countries not only in improving the human resource but to have an equitably distributed workload.<sup>16,17</sup> Our study findings suggest that the DObGyn of the public sector hospital in Pakistan is under high workload pressure. The WISN process finds this workload pressure predominantly in support activities rather than health service activities that involve the actual patient care. Majority of the components in the support activities indicate administrative tasks that consume most of the doctors' time. The American College of Physicians published policy recommendations for limiting administrative tasks in healthcare organizations to the administration of the respective hospital's department, as it increases stress and causes burnout.<sup>18</sup> Though it seems like there are adequate doctors to perform health service activities, support and additional activities take up more time of the doctors, thus requiring additional number of doctors. However, more doctors should be made available to split up the load in all the three activities' categories and not just the support and additional activities. The reason being that the tasks in support and additional categories go along the health service duties of the doctors in teaching hospitals in Pakistan and thus, cannot be segregated from each other. Alternatively, the hospital administration should think of introducing low-cost personnel to deal with the support and additional activities. One example of such low-cost healthcare personnel could be the physician

assistants. The findings of this study are quite similar to the studies conducted in other low-middle income countries like Bangladesh, Tanzania, India, and Namibia where the shortage of essential categories of health staff was pronounced and workload pressure was very high as a result.<sup>3,19,20</sup> The WISN method could be extremely helpful to hospital's administration in forecasting the staffing<sup>17</sup> needs and to anticipate the impact of their decision on staffing especially in low- and middle-income countries.

Now that the MTIs are independent in decision-making, the hospital director should measure the workload pressure of all the departments of the hospital for evidence-based recruitment of various cadres of HRH. As a tertiary care hospital, the hospital director needs to assess the reasons of high workload, e.g. to differentiate the high workload due to patient overload from unnecessary administrative tasks given to the healthcare personnel. If the former case is due to failing primary or secondary health system due to non-referral cases, then the hospital director may report such cases to the district health officer to remedy it. These efforts will help strengthen the health care system of the district at the very least. In the latter case, more doctors may be hired but it will increase the financial burden on the hospital. Alternatively, the hospital could delegate the unnecessary administrative responsibilities to a nurse or a paramedical staff, provided they are not overburdened. The literature, however, does not advocate shifting the workload on nurses or paramedical staff as this healthcare cadre is already in shortage in Pakistan.<sup>21</sup> Therefore, a better option would be to hire low-cost healthcare personnel to share some of the health service, support, and additional activities in the department. Lastly, the hospital administration may recruit a mix of doctors and low-cost healthcare personnel.

Though the method is used globally for determining the workload but it has certain limitations e.g. the results of WISN could not be generalized as certain factors like topography, population, and climate have a significant role in assessing the staffing need. The application of WISN to other categories working in clinical facilities as part of clinical care teams is suggested that will also ensure that work decisions can be made based on evidence.

## CONCLUSION

The doctor to patient load is adequate in the hospital. Much of the workload is a result of support and additional activities in the department. The hospital has three options: (i) to hire more doctors that may cost the hospital; (ii) to hire low-cost healthcare staff to assist the doctors; or (iii) to hire a mix of doctors and low-cost healthcare staff to cater the workload needs of the clinical/teaching and administrative tasks. Additional research into aspects such as the nature of activities, which activities can be delegated, and to whom without causing inefficiencies and shortages in another professional group is suggested.

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#### SUPPLEMENTARY INFORMATION

Supplementary information accompanies this paper at <http://www.kmu.jkmu.edu.pk/article/view/22505>

#### AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

**WQ, MQ, HMK & NP:** Concept and study design, acquisition, analysis and interpretation of data, drafting the manuscript, critical review, approval of the final version to be published

**NS:** Analysis and interpretation of data, drafting the manuscript, critical review, approval of the final version to be published

**WN & SHS:** Analysis and interpretation of data, critical review, approval of the final version to be published

*Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.*

#### CONFLICT OF INTEREST

Authors declared no conflict of interest

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#### DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request



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