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A study to calculate the nursing staff requirement for the Maternity Ward of Medical College Hospital, Kolkata Applying WISN method.

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Abstract: *For adequate and appropriate distribution of health services, together with increasing financial pressures in the public sector, determination of staffing levels in the health facilities are important. The Workload Indicators of Staffing Need (WISN) method is one such method. It uses a form of activity analysis (activity standards), together with measures of utilization and workload to determine staffing requirements. The present study was conducted to calculate the nursing staff requirement and their work pressure in maternity ward of Medical College Kolkata. WISN method provides a useful mechanism for assessing priorities to address staff overloads or staff under-utilization.*
Key words: *WISN, activity standards, workload, hospital staffing*

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I. Introduction

Most countries, both in the developing and developed world, are experiencing the burden of increasing demand for health services and, associated with this, increasing costs in health care provision. India, with limitations on funding of its public health service, must seek to meet these demands with new, more efficient and more radical approaches to health and health care provision. This must include a more effective use of its resources. A critical resource is the health workforce itself, both because it consumes between 70% and 75% of the recurrent budget allocated to health and because it is the skills, capacity and commitment of this resource that will be a major determinant of efficiency and effectiveness in the delivery of health care. The requirements across the country for health services and the related staff who go with these services will vary and depend on variations in population density, age, sex and mortality; wealth and education; geographical features; utilization patterns of health services; and the ease of access to these services. Institutional staffing norms based solely on population or institutional size do not adequately take into consideration these variations of need within a country. This necessarily creates real problems in health service provision, not only through under- or over-provision of health service staff but also through the inappropriate allocation of different cadres of staff. In the developing world there has been continued difficulty in ensuring an adequate and appropriate distribution of health service staff to deliver both preventive and curative health services equitably across a country. This difficulty has been compounded by increasing financial pressures on public sector finances; difficulties in providing adequate resources and facilities to support the workforce; increasing public expectations of health care and the quality of health care; and, finally, an emerging middle class able to purchase private health care which, in many cases, is substantially superior to the care available through the public sector organizations.

Public sector health services are, as a consequence, experiencing new pressures to improve the quality, quantity and accessibility of the services they provide, while at the same time having to operate under tight financial constraints. To meet these pressures, many governments are introducing radical changes, including decentralization of responsibility for health care and, increasingly, promotion of the private sector. Governments have, at the same time, to ensure increased value for the money they invest in public sector health services. This has led many countries to look at ways of improving the efficiency and effectiveness of the services they provide. This inevitably leads to a closer examination of the basis on which staffs are distributed throughout the health service and how they can be used more efficiently and effectively in raising the health of the population as a whole. One significant development in this has been increased attention to monitoring performance and efficiency in the constituent organizations of the health service.[1] There are increased efforts to ensure staff is fully utilized by introducing a new orientation to setting staffing standards for individual institutions. These new standards are intended to reflect both the type and volume of work undertaken by a particular institution. In the existing system in India, staffing requirements in health facilities are determined not by an assessment of needs or service utilization and workload but rather on notional principles of population served and/or numbers of beds. These norms for staffing, however, are not generally used. All the financial, organizational and operational dilemmas now facing most health systems, including that of India, require a new approach to determining staffing requirements which is locality specific, objective based and not derived solely on national norms that are unrelated to local service needs, staff utilization and workload. The overall intention of this study is to move staff requirement assessment from an arbitrary and institution based approach to an interactive one in which the determination of staff requirements is based on utilization and workload. The approach utilized is a method known as Workload Indicators of Staffing Needs (WISN). The conceptual approach behind WISN was described as early as 1980.[2] Subsequently it was developed as an operational tool in 1984 by P.J. Shipp to meet some specific requirements for a simple but rapid method for projecting staff requirements in Human Resources (HR) strategic planning.[3] Development of the method continued with pilot applications in a number of countries and culminated with its adoption, publication and promotion by the World Health Organization.[4,5,6] This paper reports on experiences surrounding the use of this method in the maternity ward of MCH, Kolkata. Hospitals are the most appropriate institutions in which the WISN method gives the most reliable result. This is because service statistics are more reliable in hospitals; the tasks performed by different types of staff, while often complex, are better defined; and because hospitals employ the majority of health personnel in India. The study revealed that there was over staffing (WISN difference 9.32) and less work pressure (WISN ratio 1.38).

Objectives:

- To calculate the number of nursing staffs in the Maternity Ward of Medical College Hospital, Kolkata, required to serve the present workload, applying WISN method.
- To measure the difference between this ideal number and current staffing levels.

II. Methodology

It was an observational, cross-sectional study conducted in the Maternity ward of Medical College & Hospital, Kolkata (except O.T.). The duration of the study was from January to March 2013. The study population was the staff nurses (total 34) working in six maternity wards of Medical College. Primary data sources are interviews with all staff nurses using semi-structured interview schedule. Secondary data sources are the available records at the Maternity Ward of Medical College Hospital, Kolkata. Data were entered in Microsoft Excel 2010 spread sheet and analyzed in SPSS software version 17.

Following steps were followed as per Workload Indicators of Staffing Needs (WISN) method to calculate the staff requirements.

STEP 1

Determining priority cadre(s) and health facility type(s)

Depends on following:-

- Which staff category is in shortest supply in relation to the need for staff?
- For which cadres the staff distribution is likely to be most inequitable?
- Which of these staffing problems have affected the quality of care most?
- Are any of the staff cadres or health facility types particularly important for planned future health programs?

STEP 2

Estimating available working time

- Available working time (AWT): The time a health worker has available in one year to do his or her work, taking into account authorized and unauthorized absences.

AWT = [A – (B + C + D + E)] x F

A is the number of possible working days in a year

B is the number of days off for public holidays in a year

C is the number of days off for annual leave in a year

D is the number of days off due to sick leave in a year

E is the number of days off due to other leave, such as training, etc., in a year.

F is the number of working hours in one day

STEP 3

Defining workload components

There are three kinds of workload components:

- Health service activities: Performed by all members of the staff category. Regular statistics are collected on them.

- Support activities: Performed by all members of the cadre, but regular statistics are not collected on them.
- Additional activities: Performed only by certain (not all) members of the cadre. Regular statistics are not collected on them.

STEP 4

Setting activity standards

An activity standard is the time necessary for a well-trained, skilled and motivated worker to perform an activity to professional standards in the local circumstances.

There are two types of activity standards: service standards and allowance standards.

A service standard is an activity standard for health service activities.

STEP 5

Establishing standard workloads

A standard workload is the amount of work within a health service workload component that one health worker can do in a year.

Standard workload = AWT in a year divided by service standard.

STEP 6

Calculating allowance factors

An allowance standard is an activity standard for support and additional activities.

There are two types of allowance standards.

- Category allowance standards (CAS) are determined for support activities that all members of a staff category perform.
- Individual allowance standards (IAS) are set for additional activities that only certain cadre members perform.

The category allowance factor (CAF) is a multiplier that is used to calculate the total number of health workers, required for support activities as well as health service activities.

CAF = 1 / [1 – (Total CAS / 100)]

The individual allowance factor (IAF) is the staff requirement to cover additional activities of certain cadre members.

To calculate the IAF, divide the annual total individual allowance standard (IAS) by the available working time (AWT).

STEP 7

Health service activities: A health facility's annual workload for each workload component (from annual service statistics) is divided by its respective standard workload. This gives the number of health workers that is required for the activity in this health facility. The requirements of all workload components are added together. The answer is the total staff requirement for all health service activities.

Support activities done by all members of the staff category: The answer got above is multiplied (the staff requirement of health service activities) by the category allowance factor. This gives the number of health workers required for all health service activities and support activities.

Additional activities of certain cadre members: The individual allowance factor is added to the above staff requirement.

STEP 8

The WISN results are analyzed in two ways.

Difference: By comparing the difference between current and required staffing levels, we can identify the health facilities that are relatively understaffed or overstaffed.

Ratio: By using the WISN ratio as a proxy measure, we can assess the work pressure that health workers experience in their daily work in a health facility.

III. Results

It was observed that in the maternity ward of Medical College Kolkata, total working days available in a year were 234. Total 131 days were unavailable for work due various reasons; weekly days off per year was 72, annual leave was 30, public holidays were 16, official leave per year (out of station on official duty) was 4, sick leave per year was 3 and maternity leave was 6. Total 1872 hours were available for work in a year. Table 1 depicts activity standards in the maternity ward. Maximum time was needed for assisting delivery of primigravidas (60 minutes per delivery) and assisting delivery of multiparas (50 minutes per delivery).

Regarding category allowance standard it was observed that per week 180 minutes was spent for general cleaning and for supervising students 100 minutes per year was needed. About individual allowance standards for staff nurse, medicine distribution rounds were the most time consuming process. Total basic staff requirement for the maternity ward was 13.76 (table 3). Intermediate staff requirement for the maternity ward was 22.15. Total staff required for all activities in the maternity ward was 24.03(table 5). When night duty is considered the total requirement for nursing officers, GNMs in the maternity ward became 24.68. Actual number of staffs posted was 34 with a difference of 9.32. So the WISN ratio became 1.38.

IV. Discussion

The WISN method of determining institutional staff requirements based on the amount and type of work that the institution undertakes has the potential to reduce costs. It does so by quantifying what staff are needed and how many to undertake the likely workload. To do this, it relies on the use of historical data (the previous year's workload) to project what the coming year's workload will be. This reliance on historical data is a potential weakness of the method, although it is unusual for workload to change dramatically on a year to year basis. Nevertheless, it does require that workload is reassessed on a year to year basis. Comparisons between actual staffing and required staffing, either as a difference between the two or as a ratio of actual staff to required staff (the WISN ratio) provide a useful mechanism for assessing priorities to address staff overloads or staff under-utilization. If the WISN ratio is 1, then there is a perfect match between requirement and the actual staffing; if it is greater than 1, there is a staff surplus; and if it is less than one, there is a staff shortage. These WISN calculations provide a clear and understandable presentation of the existence of workforce problems (staff surplus, staff shortage, distribution, and allocation) as well as how severe they are. It is possible to identify which staff categories are under pressure to cope with the existing workload. A Case Study was performed to Determine Hospital Workforce Requirements by Serpil Ozcan[7] in Turkey in 1999.Result showed that in Hospital A overall workload pressure was nearly equal to 1. So there is perfect match between overall work load and overall stuffing. In Hospital B there was low annual work load with acute staff shortage (WISN ratio <1). In our study workload pressure was less (WISN ratio >1). Total nonworking days were 61and it was due to annual leave (25days), sick leave (15 days), holidays (12 days) and administrative leave (9 days). In the present study total day off in a year was 131 of which weekly day off was most important (72 Days). Average working time was 1592 hours while in the present study it was 1872 hours. Though in the present study the annual non working days were more still the available working time in a year is more due to the 6 days in a week are available for working (c.f 5 working days per week). The study also showed the WISN ratio for nursing staff for hospital A was 0.87 and for hospital B 0.16 whereas in our study it was 1.38.

Another study was done by John F. Mugisha and Grace Namaganda, among the nursing staff of Lacor hospital in 2008.[8] Result showed that there was a real staff shortage of both nurses and nursing assistants in hospital, and the shortage of nursing assistants was twice that of nurses. However, the shortage of nursing staff was in part being relieved by the student nurses from the nurse training school. There was inappropriate use of both nurses and nursing assistants in the hospital. In our study there was excess of staff nurses (WISN difference 9.32) in the maternity ward of Medical College. This either led to inefficiency in cases where nurses were used for activities that could be done by lower level cadres or could have compromised quality in cases where nursing assistants were doing the work meant for qualified nurses. The nursing staff is working under some degree of pressure to accomplish the present workload. This could pose a negative effect on the quality of work that the nursing staff was providing. It, also, could have a negative impact on staff motivation and could easily explain the high turn-over of this cadre of staff in the hospital.

V. Conclusion

Thee are many different methods for undertaking an activity analysis, each with varying degrees of accuracy and cost. The WISN method deliberately sets out to simplify the process. Necessarily, this results in the loss of some accuracy in describing and detailing the activities. Nevertheless, the relative simplicity of the WISN method makes it both appealing and understandable to those who must make judgments based on a WISN assessment. Despite its relative simplicity, the WISN method can appear complex to the untrained eye.

There is, therefore, a need to train a core of people who are proficient in the WISN methodology and able to make the necessary calculations to determine local staff requirements. At the same time, managers in the health system need some training to understand how the techniques and technology of WISN can be used by them to improve their management decision making. The WISN method is intended for application in any type of health institution. However, the multiplicity of specialties and complex interactions in tertiary institutions makes the application of the WISN method cumbersome and ultimately less believable. It is in the smaller hospitals at district and, in some cases, regional level with fewer complex processes that the WISN method provides an efficient and rapid assessment method. It is true that the WISN method could be applied to sub-elements of a tertiary hospital such as wards. However, there are other approaches to determining ward staffing which may be more accurate and just as acceptable with more flexibility in their use.

VI. Tables and Charts

Table 1: Activity standards for staff nurses in the maternity ward (n = 34)

Activity	Most appropriate cadre	Activity standard	Workload data
Receiving, registering and admitting patients	1 GNM	10 minutes per patient	Number of admissions
Daily ward round	1 GNM	5 minutes per patient per day	Number of inpatient days
Preparing patients for theatre	1 GNM	30 minutes per patient	Number of operations from maternity
Clearing discharged patients out of the ward	1 GNM	5 minutes per patient	Number of admissions
Assisting delivery of primigravidas (from second stage), weighing babies, cleaning up and taking them to bed	1 GNM	60 minutes per delivery	Number of primigravida deliveries
Assisting delivery of multiparas (from second stage), weighing babies, cleaning up and taking them to bed	1 GNM	50 minutes per delivery	Number of multipara deliveries
Assisting doctors with evacuations	1 GNM	20 minutes per delivery	Number of vacuum deliveries
Receiving and resuscitating baby from theatre	1 GNM	40 minutes per caesarean delivery	Number of caesarean deliveries
Counseling patients	1 GNM	15 minutes per patient	Number of admissions

Table 2: Category allowance standards for staff nurses (n =34)

Activity	Cadre	Category allowance standard
General cleaning	All GNMs	180 minutes per week
Handing over shifts	All GNMs	60 minutes per day
Tea break	All GNMs	30 minutes per day
Ward meetings	All GNMs	60 minutes per month
Supervising students on the ward	All GNMs	100 minutes per year

Table 3: Individual allowance standards for staff nurse (n = 34)

Activity	Cadre	Individual allowance standard
Writing handover report	1 GNM	45 minutes per report 3 reports/day
Requisition of supplies and drugs from stores	2 GNMs	30 minutes per week
Medicine round	1 GNM	60 minutes per round 4 rounds/day
Wound dressing round	1 GNM	60 minutes per day
Minor procedures on the ward, e.g. catheterization, etc.	1 GNM	20 minutes per day
Vital sign observation	1 GNM	120 minutes per day

Table 4: Calculating a basic requirement for GNMs in the maternity Ward

Activity	Activity standard (in minutes)	AWT (in minutes)	Standard workload [1]	Total workload (from HMIS)	Basic staff requirement [2]
Receiving, registering and admitting patients	10	112320	11232	14115	1.26
Daily ward round	5	112320	22464	75656	3.37
Preparing patients for theatre	30	112320	3744	4740	1.27
Clearing discharged patients out of the ward	5	112320	22464	14115	0.63
Assisting delivery of primigravidas (from second stage), weighing babies, cleaning up and taking them to bed	60	112320	1872	3063	1.64
Assisting delivery of multiparas (from second stage), weighing babies, cleaning up and taking them to bed	50	112320	2246	4500	2
Assisting doctors with evacuations	20	112320	5616	48	0.008
Receiving and resuscitating baby from theatre	40	112320	2808	4740	1.69
Counseling patients	15	112320	7488	14115	1.89
Total basic staff requirement					13.76

[1] Standard workload = AWT divided by activity standard.
[2] Basic staff requirement = total workload divided by standard workload.

Table 5: Calculating an intermediate requirement for GNMs in the maternity ward

Activity	Category allowance standard (in minutes)	Working time per week/day/month/ year (in minutes)	As % of total time
General cleaning	180 per week	2160	8%
Handing over shifts	60 per day	308	19%
Tea break	30 per day	308	10%
Ward meetings	60 per month	9360	1%
Supervising students on the ward	100 per year	112320	0%
Total			38%
Category allowance factor			1.61
Intermediate staff requirement: 13.76 * 1.61			22.15

Category allowance factor = 1 / 1-(total CAS/100)

Table 6: Calculating the total requirement for GNMs in the maternity ward

Activity	Individual allowance standard (in minutes)	Times activity done in a year	Time requirement (in minutes) (annual total IAS)
Writing hand-over report	135 per day	365	49275
Requisition of supplies and drugs from the store	30 per week	52	1560
Medicine round	240 per day	365	87600
Wound dressing round	60 per day	365	21900
Minor procedures on the ward	20 per day	365	7300
Vital sign observation	120 per day	365	43800
Total nursing time required for all individual activities			211435
Total individual allowance standard (Staff equivalent for individual activities)			1.88
Total staff required for all activities			22.15+1.88=24.03

Staff equivalent = annual total IAS / AWT

Total staff requirement = Intermediate requirement + staff equivalent for individual activities
Table 7: Total requirement for GNMs in the maternity ward considering the night duty.

Night duty in MCH, Kolkata per night.	10 hours.
Day off after 3 consecutive days of night duty	1 day.
Total night off a year	365/3=122.
Total hrs of night off	122x10=1220.
AWT for GNM	1872.
The staff equivalent of the time off as compensation for night duty	1220/1872=0.65.
The total requirement for nursing officers, GNMs in the maternity ward, MCH, Kolkata, considering the night duty.	24.03+0.65=24.68.

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