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WORKLOAD MEASUREMENT MODELS IN HOSPITAL: LITERATURE REVIEW

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Abstract: Nurse workload is all activities, activities, and actions taken by a nurse while the nurse is on duty in a hospital service unit. The purpose of this literature is to identify which method is more effective and efficient to measure the workload of nurses. Article review was carried out through several electronic databases including Google Scholar, and Pubmed with the keyword "nurse workload", inclusion criteria included articles published between 2015 and 2022, full text in both English and Indonesian. A literature search found 72 articles, then 51 articles were removed according to the exclusion criteria so that only 8 articles were identified. The results of the literature study show that the WISN method is most often used to determine the workload of health workers, not only nurses. made by several people including Richa Noprianty et al, 2020 with the topic Analysis of Nurses Staff Needs Using Workload Indicate Staff Needs in Pediatric Ward with Time Motion Study, Taufique Joarder et al, 2020 with the topic Assessment of staffing needs for physicians and nurses at Upazila health complexes in Bangladesh using WHO workload indicators of staffing need (WISN) method and Angélica Araújo de Menezes et al, 2022 with the topic Application of the workload indicators of staffing need a method to calculate the size of the medical staff at a maternity hospital in the state of Bahia, Brazil. But beyond that, it doesn't mean that other methods are ineffective, because each method has its own advantages and disadvantages, it's up to the researchers or the hospital to choose which method to use.

Keywords: Nurse Workload; WISN; PPNI; Ilyas; Balanced Scorecard.

INTRODUCTION

Today performance measurement has become a hot topic in many developed countries. National and international companies are trying to be one step ahead in realizing a competitive environment. Good organizational management is an urgent matter in winning the business competition. For this reason, based on its business environment, every organization needs to formulate a management strategy to achieve excellent service. Service maximization is expected to be able to provide value-added for an organization in order to achieve effective and efficient goals. The purpose of an organization varies according to its orientation. Profit-oriented organizations expect high profitability, in contrast to non-profit organizations, namely their orientation focuses on the best service to the community (Andi R., 2019).

Nurse workload is all activities carried out by nurses based on calculations and experience in a given unit of time. The analysis of the nurse's workload can be seen from aspects such as the tasks carried out based on the main functions and additional tasks performed, the number of patients to be treated, the working capacity according to the education obtained, the working time used to perform her work according to the working hours that take place every day, and the overall facilities that can help the nurse complete her work well (Noprianty et al., 2020).

Some of the methods used to calculate the number of nurses needed include: Douglas Method, Ratio Method, Gillies Method, PPNI Workshop Method, Ministry of Health Method, Ilyas Method, and WISN Method (Nursalam, 2015). Of the several methods of calculating nurse needs, the closest result to the reality of nurse capacity needs is to calculate the workload of nurses in the room with activity standards applied to each component of the task (Ministry of Health of the Republic of Indonesia, 2010).

MATERIALS AND METHODS

Diagram Flow Literature review berdsarakan PRISMA 2009 (Polit & Beck, 2013).

Literature Review research is carried out by searching for articles through several databases, namely Google Scholar, Google Scholar, and Pubmed with the keyword "nurse workload", inclusion criteria included articles published between 2015 to 2022, full text both in English and Indonesian. A literature search found 72 articles, then 51 articles were issued according to the exclusion criteria, so only 9 articles were identified. The 9 articles were analyzed and nothing was issued, then the articles were extracted into a table and further analyzed for discussion and conclusion. A summary of the 9 articles that the author analyzed and in accordance with the inclusion and exclusion criteria that the author has applied, can be seen in table 1 as follows:

Table 1.
Results of Literature Review

No	Heading	Writer	Result
1	Analysis of Nurses Staff Needs Using Workload Indicate Staff Need in Pediatric Ward with Time Motion Study	(Noprianty et al., 2020)	The results of this study show that in the morning shift, the results of direct activities were obtained as much as 609.35, indirect as many as 1783.13, and personal as many as 386.23, while the afternoon shift obtained the results of direct activities as much as 1119.26, indirect as many as 1413.46, and personal as many as 466.18, and while the night shift obtained the results of direct activities as much as 700.1, indirect as many as 1541.7, and personal as many as 2126.22, with the number of standard workloads 422773.6674 hours / year, the standard allowance 0.023775782, so that the final result of the number of nursing staff needs is 28 people, while the available ones are 24 people. The result of the WISN Ratio was obtained that 0.8 is less than 1. It can be concluded that there is a shortage of nursing personnel. The results of this study can be taken into consideration in reducing the number of nursing staff on the morning shift and added in the afternoon shift.
2	Assessment of staffing needs for physicians and nurses at Upazila health complexes in Bangladesh using WHO workload indicators of staffing need (WISN) method.	(Joarder et al., 2020)	The results of this study showed that the doctor's results were very high (WISN ratio 0.43) and the nurse's workload pressure was high (WISN ratio 0.69). 50% of the time nurses are preoccupied with support activities, instead of nursing care. There are different workloads between the same categories of staff in different healthcare facilities. If only vacant positions were filled, the workload would be reduced. In fact, the number of approved doctors and nurses is more than the actual need.
3	Application of the workload indicators of stafng need method to calculate the size of the medical staf	(Hamdan & Hamra, 2015)	The results of this study show that the Results of interventions/activities observed in data collection at UCC initially focused on calculating the time spent on examination and re-examination in treatment for 26 patients, with procedures ranging from admission to discharge from the maternity hospital. The main

	at a maternity hospital in the state of Bahia, Brazil		emergencies identified in this process involve women with preeclampsia, sepsis, and a suspected diagnosis of uterine cancer with active bleeding. In OD, researchers recorded the duration of activities performed during the stay of 44 patients, 20 of whom were in normal labor, two of whom gave birth involving instrumentation, and 24 of whom underwent cesarean delivery, three with serious complications. Researchers also estimated the procedure was performed on 20 patients who came to the unit after the abortion, 14 developed with manual vacuum aspiration (MVA) and six with uterine curettage. Per day, four routine check-ups were performed per patient in prenatal, maternity, and postpartum beds, but not all of them were observed by researchers. The workshop and data collection and treatment were followed by the establishment of a list of seven patient care activities at OD and two at UCC.
4	The implementation process of the Workload Indicators Staffing Need (WISN) method by WHO in determining midwifery staff requirements in Greek Hospitals	(Gialama et al., 2019)	The results of this study showed that the results for both private hospitals showed a shortage in the number of midwives. However, after combining the interpretation of the results, as demonstrated by the WISN methodology and structured interviews, the current and required staff are balanced in both. On the other hand, both general hospitals showed a surplus of midwives (1.83 and 1.33 ratios for General Hospitals in Corinthos and Kalamata, respectively).
5	Analysis of Nurses Staff Needs Using Workload Indicate Staff Need in Pediatric Ward with Time Motion Study	(Noprianty et al., 2020)	The results of this study showed that the morning shift obtained the results of direct activities 609.35, indirect activities 1783.13, and personal 386.23, while night shifts obtained the results of direct activities 1119.26, indirect activities 1413.46, and personal 466.18, and evenings obtained the results of direct activities 700.1, indirect activities 1541.7, and personal 2126.22, with a total workload standard of 422773.6674 hours / year. The final result obtained by the needs of nurses was 28

			people, while the available 24 nurses, with the WISN Ratio result obtained 0.8 less than 1. The results of this study can be taken into consideration in reducing the number of nurses on the morning shift and adding it on the afternoon shift.
6	The Analysis of Workload and Need of Nurse With Wisn Method in Inpatient Room in Hospital X in Yogyakarta	(Ekawati, 2018)	The results of this study show that the WISN ratio is 0.7, this shows that the WISN ratio <1 means that the human resources in the unit are insufficient and not in accordance with the workload. The number of human resources in the Al-Kausar inpatient room is currently 15 nurses while the need according to the WISN method is 21 nurses so the total shortage is 6 nurses.
7	Analysis of Nursery Needs of Intensive Services Units Based on Work Loads and Competency in Intensive Services Units in Dr. Oen Solo Baru Hospital, Methode ILYAS	(Antonny Halim Gunawan, 2015)	The results of this study show that data on the characteristics of nurses in intensive care units are presented in table 1. Based on the characteristic data obtained, it can be seen that based on gender, 84.21% (32 people) of intensive care unit nurses are women and 15.79% (6 people) are men. Based on work experience seen from the length of time working at dr Oen Solo Baru Hospital, it is known that, 10.52% (4 people) have only worked for less than 5 years, while the remaining 89.48% (34 people) have worked for more than 5 years. Based on education, 100% (38 people) are D III Nursing graduates. Based on non-formal education, it is known that, 71.05% (27 people) attended BHD competency training, 26.31% (10 people) attended Basic ICU competency training, 26.31% (10 people) attended ACLS competency training, 18.42% (7 people) attended Basic Cardiology competency training, 2.63% (1 person) attended BACLS competency training, 5.26% (2 people) attended Mini ICU competency training, 5.26% (2 people) attended ECG competency training, 2.63% (1 person) attended PPGD competency training, 10.52% (4 people) attended Mechanical Ventilation competency training, 2.63% (1 person) attended Basic PICU competency training, 5.26% (2

			people) attended Fluid Therapy competency training.
8	Performance measurement analysis with balanced scorecard approarch on sultan with hosptal king bulukumba	(Andi R., 2019)	The results showed in general that 1) Sultan Dg. Raja Bulukumba Hospital made it possible to apply a Balanced Scorecard measuring organizational performance, because with a Balanced Scorecard all aspects can be measured. The application of the Balanced Scorecard is possible because Sultan Dg. Raja Bulukumba Hospital has formulated its vision, mission and strategy and the results of the study show that the performance of Sultan Dg. Raja Bulukumba Hospital is said to be quite good when using the Balanced Scorecard. And 2) performance measurement of Sultan Dg. Raja Bulukumba Hospital using a Balanced Scorecard for a period of 2 years showed good results.
9	Analysis of Labor Needs for Medical Records Based on Workload with PPNI Method in Hospitals Pekanbaru Health Center (PMC) in 2020	(Isti Q., 2021)	The results showed that the working time in the hospital was 0.4. hours in the assembling section, 1 hour in the filling section, and 1 hour in the reporting section with a workload of 6670 workloads per day, and relaxation standards 76 leniency standards. There is an imbalance between the workload and the manpower in the medical records unit, so it still needs medical record manpower, so that the work does not double. The conclusion of the study showed that in hospitals still need 7 medical record personnel with the ppni method, namely 1 in the assembling section, 3 in the filling section and 3 in the reporting section. It must be added energy so that the effort does not double.

RESULTS AND DISCUSSION

Research conducted by (Noprianty et al., 2020) with the title Analysis of Nurses Staff Needs Using Workload Indicate Staff Needs in Pediatric Ward with Time Motion Study. The purpose of this study was to determine the analysis of the needs of nurses based on the WISN method. The method in this study is an observational descriptive method with a One-Shot method approach model. The number of samples was 9 room nurses when performing in-person nursing actions, indirect and personal nursing, both in the morning, afternoon, and evening shifts so a total of 27 observations were obtained

with a total of 12,960 minutes. Observations are carried out by means of time and motion study with 5 steps. From the results of the study, it was shown that in the morning shift, the results of direct activities were obtained as much as 609.35, indirect as many as 1783.13, and personal as many as 386.23, while the afternoon shift obtained the results of direct activities as much as 1119.26, indirect as many as 1413.46, and personal as much as 466.18, and while the night shift obtained the results of direct activities as much as 700.1, indirect as many as 1541.7, and personal as many as 2126.22, with the number of standard workloads 422773.6674 hours/year, the standard allowance 0.023775782, so that the final result of the number of nursing staff needs is 28 people, while the available ones are 24 people. The result of the WISN Ratio was obtained that 0.8 is less than 1. It can be concluded that there is a shortage of nursing personnel. The results of this study can be taken into consideration in reducing the number of nursing staff on the morning shift and adding in the afternoon shift.

The results of the research of (Joarder et al., 2020) The results of this study show that the doctor's results are very high (WISN ratio 0.43) and the nurse's workload pressure is high (WISN ratio 0.69). 50% of the time nurses are preoccupied with support activities, instead of nursing care. There are different workloads between the same categories of staff in different healthcare facilities. If only vacant positions were filled, the workload would be reduced. In fact, the number of approved doctors and nurses is more than the actual need.

The results of the study of Angélica Araújo de Menezes et al, 2022 The results of this study show that the Results of interventions/activities observed in data collection at UCC initially focused on calculating the time spent on examination and re-examination in care for 26 patients, with procedures ranging from admission to discharge from the maternity hospital. The main emergencies identified in this process involve women with preeclampsia, sepsis, and a suspected diagnosis of uterine cancer with active bleeding. In OD, researchers recorded the duration of activities performed during the stay of 44 patients, 20 of whom were in normal labor, two of whom gave birth involving instrumentation, and 24 of whom underwent cesarean delivery, three with serious complications. Researchers also estimated the procedure was performed on 20 patients who came to the unit after the abortion, 14 developed with manual vacuum aspiration (MVA) and six with uterine curettage. Per day, four routine check-ups were performed per patient in prenatal, maternity, and postpartum beds, but not all of them were observed by researchers. The workshop and data collection and treatment were followed by the establishment of a list of seven patient care activities at OD and two at UCC.

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DISCUSSION

Nursing Workload is all activities or activities carried out by a nurse while on duty in a nursing service unit. The workload is usually defined as patient days which refer to a number of procedures, examinations, visits to patients, injections, and so on. The definition of workload in general is an effort to detail the components and target volume of work in a certain unit of time and unit of results.

WISN is Based on manual guidance issued by WHO, WISN's Workload Indicators of Staffing Need is a standard for measuring the needs of health workers based on workload indicators that were first tested around 1998. The WISN method is a resource management tool that calculates staff needs based on workload for specific staff categories and types of health facilities. This tool can be applied nationally, regionally, in a single health facility, or even a unit or ward in a hospital. WISN is also a method of calculating HR needs as stated in the Decree of the Minister of Health of the Republic of Indonesia Number: 81MenkesSKI2004 concerning Guidelines for the Preparation of Health Human Resource Planning at the Provincial, City District and Hospital Levels. The WISN method has the advantage that it is easy to use both techniques, comprehensively, and realistically and provides convenience in determining the variety of HR needs in various types of health services such as Puskesmas and Hospitals. However, the WISN method has weaknesses, where it is very necessary to have completeness of data that will later be analyzed statistically and will affect the accuracy of the results of WISN WHO, 2010.

PPNI (PPNI Formula), where this formula requires a component consisting of the results of the percentage of Bed Occupancy Ratio (BOR), TT (Bed) of the hospital at one specific time, the number of working hours of the medical recorder for 24 hours, the number of effective working hours and the number of effective working days.

Ilyas is Calculating the workload of a labor-intensive organizational unit is important but at the same time very difficult. Many personnel managers and Unit managers struggle when asked: "What is the personnel workload to produce the main and supporting products or services in the sister unit"? Scientific methods that have been developed by experts such as Work Sampling and Time and Motion Study can actually produce accurate results. The problem is, in this method, takes experts, many observers

and a long time. This has consequences for costs and usually has to be implemented by other parties such as: sultans and research institutions. The hospital management will find it difficult to implement this method itself because of the difficulty of the instrument and the implementation of its own research. In addition, there is a possibility of bias because the personnel factor calculates the workload itself. In the daily log method that records and calculates the workload itself, the accuracy is very doubtful so from the aspect of validity and reliability it is difficult to use as a reference for employee workload.

Balanced Scorecard is Balanced Scorecard (BSC) can be said to be the simplest measuring tool in a company so there are many weaknesses. One of the drawbacks is that the information presented is limited and lacks accuracy. So you can't see other factors that can affect the company's performance. At first, BSC was only used to improve the financial measurement system. It then expanded and was used to measure four objectives namely finance, customer, internal business processes, and learning and growth.

Based on the results of several researchers, WISN is a resource management tool that calculates staff needs based on workload for certain categories of staff and types of health facilities. This tool can be applied nationally, regionally, in a single health facility, even a unit or ward in a hospital. WISN is also a method of calculating HR needs as stated in the Decree of the Minister of Health of the Republic of Indonesia Number: 81MenkesSKI2004 concerning Guidelines for the Preparation of Health Human Resource Planning at the Provincial, City District and Hospital Levels. The WISN method has the advantage that it is easy to use both techniques, comprehensively, and realistically and provides convenience in determining the variety of HR needs in various types of health services such as Puskesmas and Hospitals. However, the WISN method has weaknesses, where it is very necessary to have completeness of data that will later be analyzed statistically and will affect the accuracy of the results of WISN WHO, 2010.

CONCLUSIONS

Based on the results of several articles that can show that the WISN method is most often used compared to other methods, for example, one of the articles created by several people including (Noprianty et al., 2020) with the topic Analysis of Nurses Staff Needs Using Workload Indicate Staff Needs in Pediatric Ward with Time Motion Study, (Joarder et al., 2020) with the topic Assessment of staffing needs for physicians and nurses at Upazila health complexes in Bangladesh using WHO workload indicators of staffing need (WISN) method and Angélica Araújo de Menezes et al, 2022 with the topic Application of the workload indicators of staffing need a method to calculate the size of the medical staff at a maternity hospital in the state of Bahia, Brazil. But beyond that, it does not mean that other methods are ineffective, because each method must have its own disadvantages and advantages, go back to the choice of the researcher or the hospital to use which method.

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