

Human Resource Planning of Nurses in the Inpatient Wards of RSUD Dr. H. Kumpulan Pane, Tebing Tinggi

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Abstract— Human resources planning of nurses is crucial in preparing required nurses at the RSUD Dr. H. Kumpulan Pane, Tebing Tinggi. A well-designed planning can determine the number and competency of the nurses needed. A descriptive research methods was conducted in qualitative and quantitative approaches that aimed to analyze the need of nurses in the inpatient wards. Data were collected through direct observation, in-depth interviews, questionnaires and document review. A total sample of 40 nurses were selected through random sampling. The results of the study found that the number of nurses needed for the inpatient ward was 129 contrast to 74 nurses available. Therefore, there was a deficiency of 55 nurses. Based on the Importance Performance Analysis method, it was found that competencies which became the main priority for improvement were doing nursing documentation according to the nursing care standard, installing and releasing nasogastric tube (NGT) according to standard operating procedures, and demonstrating an effective and efficient working attitude.

Keywords— Human Resource Planning; Nurse Workload.

I. INTRODUCTION

The condition of hospitals in Indonesia, especially government-owned hospitals, is under pressure in the form of high operational costs, limited resources and demands for improving health services. The cost of health services that tend to rise from year to year has been influenced by the increase in drug prices, the use of advanced technology and the lack of medical service standards. Consequently, the government-owned hospitals face a dilemma between the mission of serving affordable and quality hospitals with the one of maintaining hospitals as business units that must be able to compete in an effective and reasonable manner through proper management.

RSUD (regional public hospital) Dr. H. Kumpulan Pane, Tebing Tinggi has set up its financial management with the Regional Public Service Agency's Financial Management Pattern in accordance with the Decree of Mayor of Tebing Tinggi Number 900/832 in 2010. The essence of the Regional Public Service is improving service and budget efficiency. To meet the objectives, thus, human resource planning is crucial to become the basis for employee recruitment, selection and placement. Nurses are one of the human resources that play an important role in inpatient services. Nurses are health workers in hospitals who provide nursing services to patients for 24 hours. High workload of nurses and low compensation will have an impact on decreasing nurses' work productivity which can affect service to patients. Nursing as a profession is a kind of profession that it determines its action based on science and

clear skills of expertise. The form of nursing care is a process in nursing practice that is directly given to clients in various health service settings; using nursing process methodology; guided by nursing standards; and based on nursing ethics within the scope of authority and nursing responsibilities.

Human resource planning of nurses at inpatient wards becomes a process of determining nurse demands based on forecasting, developing, implementing, and controlling the demands integrated with organizational planning to create appropriately and economically useful number of nurses and their placement (Muninjaya, 2011; Sabarguna, 2014).

The number of patient visits and treatment days of inpatient wards in 2012 – 2016 is shown in the table below:

TABLE 1. The number of patient visits of inpatient wards in 2012 – 2016.

| Year | Number of patients | Number of treatment days | BOR (%) |
|------|--------------------|--------------------------|---------|
| 2012 | 7.857 | 35.234 | 63 |
| 2013 | 10.062 | 38.576 | 71 |
| 2014 | 10.323 | 37.184 | 72 |
| 2015 | 8.839 | 33.954 | 70 |
| 2016 | 9.803 | 47.008 | 71 |

The table above shows the difference in the number of patient visits, treatment days and the value of Bed Occupancy Ratio that is the percentage of bed usage each year. The number of treatment days in the previous year was the basis for estimating the number of treatment days for the next five years. There were 72 nurses and 188 beds in the inpatient wards in July 2017. Hence, the nurses have a high workload when referring to Minister of Health Regulation Number 56 of 2014 concerning Hospital Classification and Licensing denoting that the number of nursing staff is equal to the number of beds in the inpatient wards.

In addition to the number of nurses, it is important to focus on the nurse competency. There are 18 competency groups of vocational nurse groups and 85 units of generic nurse group competencies according to the Indonesian National Work Competency Standards (INWCS) in Nursing. Through the Delphi Process, 12 core nurse competencies were obtained from this INWCS. The management of the RSUD Dr. H. Kumpulan Pane has never thoroughly evaluated the 12 core competencies of nurses, so it is necessary to do competency mapping for nurses, especially in the inpatient wards.

II. LITERATURE REVIEW

Human resource planning is a series of activities carried out systematically to forecast future labor requirements in the

number and competency as needed (Poniman and Hidayat, 2015). According to Nasution (2008) the stages that will be carried out, namely, analysis of human resources availability, analysis of human resources demand and gap analysis of both quality and quantity.

Competency is the knowledge, skills and personal qualities of a person to perform a task with an effective performance. According to Nasution and Soetadi (2012) competency-forming elements can be grouped into three parts, namely: knowledge, skills and personal characteristics. Nurse competency reflects the ability that must be possessed by nurses in providing professional nursing care including knowledge, skills and attitudes in completing a specified job or task (Parulian, 2014; Kusnanto, 2016).

Workload is the quantity of basic tasks and functions performed by nurses based on standards and a certain period of time. Workload Analysis Method (WAM) is a method of calculating health human resources needs based on the workload carried out by each type of human resources in each health facility in accordance with their main tasks and functions. This method can be used to calculate all types of human resources in the health sector.

The Ministry of Health's Human Resources Planning and Utilization Agency or PPSDM (2015) determined the steps to be taken to calculate the workload, namely as follows:

- Establishing health facilities and types of health human resources.
- Establishing Available Working Time (AWT). Available Working Time = $\{A - (B + C + D + E)\} \times F$ (A = Workday; B = Annual leave; C = Education and training; D = National holidays; E = Employment absence; F = Working time).
- Establishing components of workload and time norms. The workload component is a type of assignment and a job description that are clearly carried out by a particular type of human resource in accordance with the predetermined tasks and functions. Time norms are the average time needed by an educated, skilled, trained and dedicated human resource to carry out an activity normally in accordance with the applicable service standards in the concerned health care facility.
- Calculating Workload Standards (WS). Workload standard is the volume / quantity of workload for 1 year for each type of human resource. Workload Standard (WS) = $(\text{Available Working Time (AWT)}) / (\text{Time Norms per Main Activity})$.
- Calculating Supporting Task Standards (STS) and Supporting Task Factors (STF). Supporting tasks are tasks to complete activities that are not directly related to the main tasks and functions carried out by all types of human resource. Supporting Task Standards (STS) is the proportion of time spent on completing each activity per unit time (per day or per week or per month or per semester). Supporting Task Factor (STF) = $(\text{Activity Time: AWT}) \times 100$. Supporting Task Standards (STS) = $(1 / (1 - \text{STF} / 100))$.
- Calculating Human Resource Needs. Data and information needed per health facility are Available Working Time (AWT), Workload Standards (WS) and Supporting Task

Standards (STS) as well as achievement data (coverage) of the main tasks and activities of each health facility for a period of one year. Human Resources Needs = $(1 \text{ year achievement}) / (\text{Workload Standards}) \times \text{Supporting Task Standards}$.

III. METHODS

This research is a descriptive study with the aim to find out an overview of the workload, competency and needs of nurses in the inpatient wards of the RSUD Dr. H. Kumpulan Pane, Tebing Tinggi. The population in this study was 74 nurses on duty in the inpatient wards. The number of samples is 40 nurses. Inpatient rooms to be analyzed were Room I, Pavilion 1, VIP A, VIP B, Isolation Room, Children's Room, Pine Room 1,2 and 3.

This study used data collection techniques of observation and questionnaires. Observation techniques were used to determine the norms of time needed by nurses in carrying out nursing actions in the inpatient wards. Researcher with the help of the heads of the room recorded the start time and expiration time when the nurse carried out nursing actions. The questionnaires were used for competency mapping.

The sources of primary data were obtained through a competency questionnaire, observation to measure workload and Consensus Decision Making Group (CDMG). CDMG involved Structural Officials in Nursing, Head of Room, Head of Inpatient Ward and Nursing Committee. CDMG is a decision-making process that involves more than one decision maker in a group (Purnomo and Masruroh, 2015). In this study, CDMG was used to determine the types of basic and supporting tasks carried out by nurses in the inpatient wards of the RSUD Dr. H. Kumpulan Pane.

The Importance Performance Analysis (IPA) method was conducted to analyze the competency variable data. It combined the measurement of competency gaps and importance levels into the Cartesian diagram (Wong, 2011). The measurement instrument used was the Likert Scale. Linear trend analysis was used to analyze the needs of nurses for the next 5 years in each inpatient ward. The value to be predicted was the number of treatment days for the next 5 years based on the data of the number of treatment days 5 years before.

IV. RESULTS

Respondents in this study were 40 inpatient ward nurses which were 31 - 40 years old (47.5%), female (90%), 6 - 10 years of working period (37.5%) civil servant employment status (52, 5%) and associate's degree on nursing education (77.5%).

Validity and reliability tests were carried out on nurses at RSUD Dr. H. Kumpulan Pane as many as 30 people. Validity testing used Pearson Product Moment correlation. Based on the validity test, 2 items of invalid statements were obtained, namely statement items number 9 and 12. These two items were not used in the actual data collection. Cronbach Alpha test was used for reliability testing. It was found that the Cronbach Alpha value of competency variable was 0.917 and

the importance variable was 0.907. Thus, the competency and importance level instruments were reliable.

The forecasting of number of treatment days used time series analysis with linear regression method known as linear trend analysis. To analyze the needs of nurses for the next five years in each inpatient room, it was necessary to know the number of treatment days at least five years in advance. Since the Pine 1 room began operating in 2016, Pine room 2 operated in 2017 and Pine 3 room began receiving patient visits in March 2018, the linear trend analysis could not be carried out in those three rooms because the available data is insufficient. The recapitulation of the results of the linear trend analysis on the rooms is presented in the Table 2 below:

TABLE 2. The recapitulation of the forecast of treatment days.

| Room | Year (total and %) | | | | |
|--------|--------------------|-------|-------|-------|-------|
| | 2018 | 2019 | 2020 | 2021 | 2022 |
| Room 1 | 13964 | 14217 | 14470 | 14723 | 14976 |
| | 16.03 | 1.81 | 1.78 | 1.75 | 1.72 |
| Pav 1 | 5017 | 4728 | 4438 | 4149 | 3860 |
| | -5.77 | -5.76 | -6.11 | -6.51 | -6.97 |
| VIP A | 2770 | 2785 | 2800 | 2815 | 2831 |
| | 0.37 | 0.54 | 0.54 | 0.54 | 0.53 |
| VIP B | 3830 | 3905 | 3980 | 4055 | 4130 |
| | 22.09 | 1.96 | 1.92 | 1.88 | 1.85 |
| CHILD | 3365 | 3504 | 3642 | 3780 | 3919 |
| | 10.55 | 4.10 | 3.94 | 3.79 | 3.65 |
| ISO | 1642 | 1723 | 1804 | 1886 | 1967 |
| | 29.80 | 4.93 | 4.70 | 4.49 | 4.30 |

Based on Table 2, the results of linear trend analysis show that Room 1, VIP A, VIP B, Children Room and Isolation Room experienced growth in the number of treatment days. Isolation Room has the highest growth rate. Only the Pavilion 1 room has decreased the number of treatment days by an average of 6.22% per year.

To calculate the number of nurses needed in the inpatient wards of the RSUD Dr. H. Kumpulan Pane Tebing Tinggi, the researcher used the Health Workload Analysis Method compiled by the Human Resources Planning and Utilization Center of the Ministry of Health. This method is adopted from the Workload Indicators Staff Need (WISN) method. The steps taken are as follows:

1. Establishing the type of health human resources and type of services. The type of human resource to be studied was nurses who were in charge in the inpatient wards Room 1, Pavilion 1, VIP A, VIP B, Children's Room, Isolation Room, Pine 1, 2 and 3.

2. Establishing Available Working Time (AWT). Available Working Time = $\{A - (B + C + D + E)\} \times F = \{312 - (12 + 24 + 2 + 12)\} \times 4,375 = 262 \text{ days / year} \times 4,375 \text{ hours / day} = 1146.25 \text{ (Rounding 1146 hours / year)} = 68,760 \text{ minutes / year.}$
3. Establishing Components of Workload and Time Norms. Components of workload can be obtained from Service Standards and Standard Operating Procedures (SOP), which are prepared in conjunction with the Nursing Department and Nursing Committees. According to the CDMG results, it was obtained 49 actions that are the main tasks. The time norm for each main activity was obtained from the observation of 30 nurses then the average time used to complete each of these activities was calculated. In addition to the norms of the time to carry out basic tasks, it was also necessary to know the components and norms of time for supporting tasks. Supporting tasks are tasks that are not directly related to their main tasks and functions. According to the results of the CDMG, 8 activities were found to be supporting tasks.
4. Calculating Workload Standards (WS). Having known the average time in carrying out the main tasks, then researcher calculated the workload standards by comparing the available working time with the average time needed to carry out activities.
5. Calculating Supporting Task Standards (STS) and Supporting Task Factors (STF). Supporting Task Standards (STS) is the proportion of time spent in completing each activity in one year (262 days or 52 weeks or 12 months or two semesters). Table 3 shows supporting tasks standards for Room 1, Pavilion 1, VIP A, VIP B, Children's Room, Isolation Room, Pine 1, Pine 2, and Pine 3 Room.
6. Calculating nurse needs. The recapitulation of the calculation of inpatient nurses needs is presented in Table 4. The recapitulation of human resources planning of nurses in inpatient wards year 2018 - 2022 can be seen in Table 5.

Nurse competency variables were measured using a questionnaire consisting of 22 statement items with two choice columns, namely: competence and level of importance. Furthermore, the results of respondents' answers on competency variable were analyzed using the Importance Performance Analysis (IPA) diagram consisting of the following 4 quadrants in Fig. 1.:

TABLE 3. Supporting Tasks Standards (STS) and Supporting Task Factors (STF).

| NO | Activities | Supporting task factors in % | | | | | | | | |
|----------------------------------|--|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | R1 | Pav1 | VIP.A | VIP.B | R.A | IS | P.1 | P.2 | P.3 |
| 1 | Collaborating with 'on call' doctors | 7.62 | 7.62 | 5.72 | 7.62 | 5.72 | 3.81 | 5.72 | 5.72 | 3.81 |
| 2 | Making service administration | 11.43 | 7.62 | 11.43 | 11.43 | 7.62 | 3.81 | 11.43 | 11.43 | 7.62 |
| 3 | Delivering status to consul | 7.62 | 7.62 | 7.62 | 7.62 | 7.62 | 3.81 | 5.72 | 7.62 | 5.72 |
| 4 | Joining doctor's visit | 26.67 | 22.86 | 11.43 | 19.05 | 17.15 | 11.43 | 11.43 | 17.15 | 7.62 |
| 5 | Performing nursing rounds | 0.87 | 0.87 | 0.79 | 0.87 | 0.79 | 0.70 | 0.70 | 0.70 | 0.70 |
| 6 | Joining the activities of professional association | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| 7 | Joining trainings | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 |
| 8 | Joining monthly room meetings | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 |
| Total of Supporting Task Factors | | 55.44 | 47.82 | 38.21 | 47.82 | 40.11 | 24.78 | 36.21 | 43.83 | 26.69 |
| STS = (1/ (1-STF/100)) | | 2.24 | 1.92 | 1.62 | 1.92 | 1.67 | 1.33 | 1.57 | 1.78 | 1.36 |

TABLE 4. Nurse needs for inpatient wards.

| No. | Room | MTN | STS | Needs | Roundings | Total of current nurses | Gaps |
|-------|----------------|-------|------|-------|-----------|-------------------------|------|
| 1. | Room 1 | 16,46 | 2,24 | 36,94 | 37 | 11 | -26 |
| 2. | Pavilion 1 | 8,35 | 1,92 | 16,01 | 16 | 10 | -6 |
| 3. | VIP A | 5,04 | 1,62 | 8,15 | 8 | 9 | 1 |
| 4. | VIP B | 12,54 | 1,92 | 24,03 | 24 | 11 | -13 |
| 5. | Children Room | 9,24 | 1,67 | 15,43 | 16 | 4 | -12 |
| 6. | Isolation Room | 4,21 | 1,33 | 5,6 | 6 | 5 | -1 |
| 7. | Pine 1 | 6,19 | 1,57 | 9,74 | 10 | 8 | -2 |
| 8. | Pine 2 | 4,99 | 1,78 | 8,89 | 9 | 10 | 1 |
| 9. | Pine 3 | 1,80 | 1,36 | 2,45 | 3 | 6 | 3 |
| Total | | | | | 129 | 74 | -55 |

Number of Main Task Needs (MTN), Supporting Task Standards (STS)

TABLE 5. Human resources planning of nurses in inpatient wards year 2018-2022

| No | ROOM | 2018 | | | 2019 | | | 2020 | | | 2021 | | | 2022 | | |
|----------|-----------|------|---|---|------|---|---|------|---|---|------|---|---|------|---|---|
| | | WA | P | M | ABK | P | M |
| 1 | Room 1 | 37 | | | 38 | | | 39 | | | 40 | | | 41 | | |
| 2 | Pav 1 | 16 | | | 15 | | | 14 | | | 13 | | | 12 | | |
| 3 | VIP A | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | |
| 4 | VIP B | 24 | | | 24 | | | 25 | | | 25 | | | 26 | | |
| 5 | Children | 16 | 1 | 6 | 17 | 0 | 4 | 18 | 1 | 4 | 19 | 0 | 4 | 20 | 0 | 4 |
| 6 | Isolation | 6 | | | 6 | | | 7 | | | 7 | | | 8 | | |
| 7 | Pine 1 | 10 | | | - | | | - | | | - | | | - | | |
| 8 | Pine 2 | 9 | | | - | | | - | | | - | | | - | | |
| 9 | Pine 3 | 3 | | | - | | | - | | | - | | | - | | |
| Subtotal | | 129 | 1 | 6 | 108 | 0 | 4 | 111 | 1 | 4 | 112 | 0 | 4 | 115 | 0 | 4 |
| Total | | 136 | | | 112 | | | 116 | | | 116 | | | 119 | | |

Workload Analysis (WA), Estimated Retirement (P), Estimated Mutations (M).

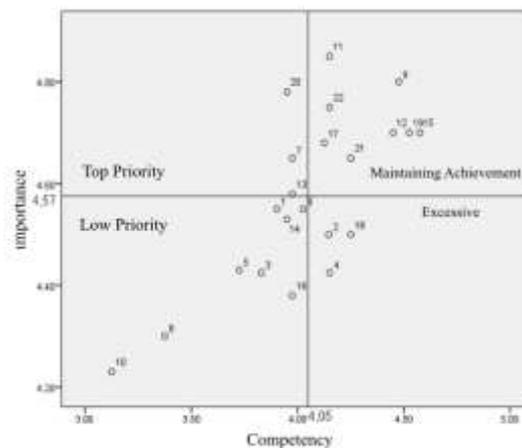


Fig. 1. Nurse competency IPA diagram

The X-axis shows the level of competence used as a cut-off between the low competencies and high competencies. The Y-axis indicates the level of importance used as a cut-off between the low importance and the high importance level. On the X axis the mean value is 4.05 and the Y-axis is 4.57. The IPA diagram above (Figure 1) shows the spread of statement items based on 4 quadrants, as follows:

- Quadrant A (Top Priority), shows the level of importance of competencies is considered high for nurses but in reality nurses' competencies are still low; thus they become a top priority for improvement. Competencies in this quadrant are number 7 (Performing nursing documentation), 13 (Installing and releasing Nasogastric Tube) and 20 (Demonstrating effective and efficient work attitude).
- Quadrant B (Maintaining Achievement), shows the level

of importance of competencies is high and competencies of nurses are also high; thus it is enough to maintain achievement. Competencies in this quadrant are number 9 (installing, treating and releasing infusions), 11 (installing and removing the patient's urine catheter), 12 (Performing medication safely and appropriately), 15 (Treating patients regardless of ethnicity, religion, race and group), 17 (Demonstrating trusting relationships with clients and families), 19 (Maintaining confidentiality and security of patient health status information), 21 (Demonstrating mutual trust and respect between team members) and 22 (Demonstrating compliance with the standard operating procedures and nursing care guidelines).

- Quadrant C (Low Priority) shows that the level of importance of competency is low and nurses' competencies

are low also; so it needs to be improved but it has not been a main priority yet. Statements that are in this quadrant are number 1 (Making nursing diagnoses), 3 (Establishing nursing interventions), 5 (Providing accurate information to patients about nursing action plans), 6 (Explaining nursing actions completely to other nurses at the schedule shifting of service duty), 8 (Establishing nursing actions that are needed immediately in emergency situations), 10 (Performing cardiopulmonary resuscitation procedures), 14 (Performing mucus suction according to standard operating procedures), and 16 (Demonstrating an attitude of hope and confidence in patient health).

- Quadrant D (Excessive), shows that the level of importance of competency is low while the competency of nurses is high; so there is competence exceeding expectation. Statements in this quadrant are statements number 2 (Conducting nursing studies to patients), 4 (Carrying out infection prevention procedures), 18 (Demonstrating empathy for patients).

V. DISCUSSION

Human resource planning was conducted in the study to forecast the number of nurses needed in the inpatient room for the year of 2018 to 2022. The estimation was based on the growth of the number of treatment days in 2012 to 2017 (6 years) using time series analysis with linear regression method known as linear trend analysis. The result of the study indicates that five nurses in 2019; eight nurses in 2020; five nurses in 2021; and seven nurses in 2022 are needed to recruit to meet the demand of nurses in each year accordingly. In linear trend analysis, the more data collected, the better the estimation or forecast obtained. Conversely, if the data collected is getting smaller, the estimation result or forecasting will be less accurate. The estimation for the total number of nurses needed for the hospital will be more accurate if researchers can provide the data within the previous 10 years.

Forecasting is a technique to estimate a value in the future by looking at past and current data. Forecasting methods can be divided into two main categories, namely qualitative methods and quantitative methods. The quantitative forecasting method bases its predictions on statistical and mathematical methods. There are two quantitative forecasting models, namely time series models and regression models. In this study, it can be considered using other time series methods by considering the type of data pattern. Data patterns can be divided into four as follows: Horizontal pattern (H) occurs when data values fluctuate around constant average values; the seasonal pattern (M) occurs when a series is influenced by seasonal factors; the cycle pattern (S) occurs when the data is affected by long-term economic fluctuations; the trend (T) pattern occurs when there is a long-term secular increase / decrease in the data.

To calculate the number of nurses needed at the inpatient wards, the Ministry of Health's Human Resources Planning and Utilization Agency conducted the Health Workload Analysis Method. The results obtained namely 129 nurses needed in the inpatient room while the current number of nurses is 74 people. The shortage of nurses was 55 people,

which resulted in a high workload of nurses. The calculation of data on the achievement of main tasks in the study was based on the data during April 2018 and then it was converted for one year. This is due to the limitation of the grace period that the researchers have. The next researcher should calculate the data of the achievement of the main task for one year to obtain more accurate results.

Calculation of data on the achievement of main tasks was based on the results of filling in the workload questionnaire. This method has several disadvantages such as nurses were not careful in self reporting so that some activities were missed or activities that were not included in the task component becoming the nurse's job. Therefore, it was suggested that the hospital apply a software program that was integrated with the Hospital Management Information System (HMIS) so as to facilitate the data calculation on the achievement of the main tasks.

Mapping nurse's competencies was conducted by using the Importance Performance Analysis (IPA) method. One of the main priorities for improvement is to carry out nursing documentation according to the standards of nursing care. Documentation of nursing care is a professional demand that must be accountable, both from the aspect of ethics and legal issue. Both of these aspects are closely related to managerial aspects, which on the one hand protect patients as recipients of services (consumers) and on the other hand protect nurses as providers of services and nursing care. One effort to improve the quality of the implementation of nursing documentation is to carry out a documentation audit. Documentation audits were carried out by comparing the documentation found in the patient's medical records with the documentation standards specified in the nursing care standard. Using a software program that is integrated with the Hospital Management Information System (HMIS) makes it easier for nurses to record nursing care.

This is quite surprising considering that nursing care documentation is a professional demand that must be accountable, both from ethical aspects and legal aspects. Both of these aspects are closely related to managerial aspects, which on the one hand protecting patients as recipients of services (consumers) and on the other hand protecting nurses as providers of services and nursing care. The obstacle found was that nurses were not detailed and thorough in documenting nursing care. Filling out nursing documentation that does not meet the standards can result in a misdiagnosis and giving inappropriate actions to the patient. One of the efforts to improve the quality of the implementation of nursing documentation is to carry out a documentation audit. Documentation audit was carried out by comparing the documentation found in the patient's medical records with the documentation standards specified in the nursing care standard. It is also beneficial to use a software program that is integrated with the Hospital Management Information System, making it easier for nurses to document nursing care.

For further research, it is recommended that the study to be conducted not only limited to nurses but also to medical personnel, health workers and other non-health workers. Further research can also use different methods of calculating

the number of human resource needed in the organization so that comparison can be produced between existing methods. Other calculation methods that can be used, namely: 1) Ratio method. This method uses the number of beds as a comparison. The method is used because it is simple and easy. This method only knows the total number of nurses but it cannot record the productivity of nurses and the number of workers needed for each unit. 2) Need method. This method calculates the need of staff based on the needs according to workloads that are calculated on their units and according to professional standards. To calculate all nurses needed, it is necessary to firstly describe the types of services provided to clients while in hospital, namely Category I: Self care, Category II: intermediate care, and Category III: Intensive care. 3) Demand method. The method of demand is the calculation of the amount of nurses needed according to activities that are indeed real implemented by nurses. 4) The calculating principle of the Gillies formula. In providing nursing services, there are three types of services, namely: a. Direct care, is the care provided by nurses who have special relationships with physical, psychological, and spiritual needs. b. Indirect care, including the activities of making a treatment plan, installing / preparing tools, consulting with team members, writing and reading health records, reporting on the patient's condition and c. Health education provided to clients including: activities, treatment and follow-up treatment.

VI. LIMITATION

As with the majority of studies, the design of the current study is subject to limitations. First, the study used linear trend analysis to predict nurse needs for the next 5 years. However, the use of linear trend analysis would be more accurate if researchers could provide the data within the previous 10 years. The more data collected, the better the estimation or forecast obtained. In this study, the data on the number of care days available is within 6 years, namely in 2012 – 2017, thus, the estimated number of care days for the next 5 years is less accurate.

Second, in calculating workload analysis, the data on the achievement of the main tasks needed are within a period of one year. Because of the limited time of the study, the researchers used the one month data on the achievement of the main tasks and then carried out the conversion for one year. Researchers assumed that the average number of visits was not much different every month. This could be a limitation since the trend of patient visits might not always be the same every month.

VII. CONCLUSION

The needs of nurses in the inpatient wards of the RSUD (regional public hospital) Dr. H. Kumpulan Pane in 2018 are 129 people. Thus, with the current available 74 nurses, there is a shortage of nurses as many as 55 people. Five nurses are necessary to be recruited to meet the needs of nurses in 2019;

eight nurses for 2020, five nurses for 2021, and seven nurses for 2022 respectively.

Based on 12 core competencies of a nurse, the competencies that are the top priority for improvement are analyzing, interpreting data and documents accurately, facilitating the fulfillment of fluid and electrolyte needs and applying ethical and etiquette principles in nursing. The next competency that needs to be improved is to carry out interpersonal communication in accomplishing nursing care and basic emergency nursing.

The suggestions for advanced research and organizations are as follows:

1. Planning for the recruitment of 5 nurses in 2019, 8 nurses in 2020, 5 nurses in 2021 and 7 nurses in 2022. Given that each new nurse needs an orientation period of 6 months, the selection process should finish by June each year.
2. In preparing the educational and training curricula, hospitals can prioritize training materials that can improve the competency of analyzing, interpreting data and documents accurately, facilitating the fulfillment of fluid and electrolyte needs and applying ethical and etiquette principles in nursing. The other competency that needs to be trained is interpersonal communication in accomplishing nursing care and basic emergency nursing.
3. Evaluating the Standard Operating Procedures (SOP) of nursing care on a regular basis, so that nursing actions are carried out more efficiently and in accordance with the latest scientific findings.
4. Further research can be implemented for medical staff, other health or non-health related human resources.

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