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Analysis of Staffing Calculation Using the Workload Indicators of Staffing Need (WISN) Method in the Washing Unit of SPPG Wonosari

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WISN; workload analysis; staffing requirement; SPPG Wonosari; human resources.

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ABSTRACT

Purpose: *This study aims to objectively analyse staffing requirements in the dishwashing unit of SPPG Wonosari using the Workload Indicators of Staffing Need (WISN) method based on actual workload conditions.* ***Methodology:*** *A case study design integrating quantitative WISN analysis was employed, with data collected through direct observation of work activities and in-depth interviews with dishwashing personnel and the kitchen supervisor.* ***Results:*** *The results show that the effective available working time was 2,144 hours or 128,640 minutes per worker per year. Based on the WISN calculation, the ideal staffing requirement was 18 workers, while only 16 were currently available, resulting in a WISN ratio of 0.9.* ***Findings:*** *This ratio indicates an understaffing condition that increases individual workload and may reduce operational efficiency and service quality.* ***Novelty & Originality:*** *This study provides empirical evidence on the application of the WISN method in a non-healthcare operational setting, specifically in a food service unit, which has received limited attention in prior research. Its originality emerges from the adaptation of a workforce planning tool traditionally used in healthcare to the context of institutional food service operations.* ***Conclusions:*** *The study concludes that the dishwashing unit at SPPG Wonosari requires additional staff to achieve optimal workload balance and maintain service quality. These findings offer practical insights for workforce planning in similar operational environments.* ***Type of Paper:*** *This paper is an empirical research paper.*

INTRODUCTION

Presidential Regulation Number 83 of 2024 concerning the National Nutrition Agency stipulates the establishment of a government body operating under and directly accountable to the President, with the principal mandate of implementing national nutrition fulfilment in a planned and systematic manner. This agency is tasked with coordinating, formulating, and determining technical policies in the areas of governance, provision, promotion, as well as monitoring and supervision of nutrition fulfilment, particularly for vulnerable groups such as early childhood populations, students, pregnant women, and breastfeeding mothers. The organisational structure of the National Nutrition Agency comprises a Steering Committee and

an Executive Body, both of which perform strategic functions in enhancing the nutritional status of the Indonesian population in order to support the development of high-quality and competitive human resources (Presiden Republik Indonesia, 2024).

The Free Nutritious Meal Programme (*Makan Bergizi Gratis*, MBG) constitutes one of the flagship initiatives introduced by the Prabowo–Gibran administration to address malnutrition and improve the quality of national human resources. The programme primarily targets children, school students, and pregnant women. Data obtained from the Ministry of Health and the Coordinating Ministry for Human Development and Cultural Affairs indicate that 41% of students experience hunger-related problems, which adversely affect educational quality (Merlinda & Yusmar Yusuf, 2025).

The MBG Programme was officially launched in early 2025 through the Nutrition Fulfilment Service Units (*Satuan Pelayanan Pemenuhan Gizi*, SPPG) and is being implemented progressively to reach millions of beneficiaries across Indonesia (Harsono, 2025). The National Nutrition Agency plans to establish SPPG units by utilising government-owned land under a lending-use scheme as an efficiency measure (Abdurrahman & Izzuddin, 2025). Kitchens responsible for providing nutritious meals are not merely facilities for large-scale cooking. They require systematic management, structured workforce allocation, and efficient, hygienic kitchen equipment to ensure that meals are served punctually, are safe for consumption, and meet daily nutritional requirements (Horeca, 2025).

Based on preliminary interviews conducted with the Head of the SPPG Wonosari kitchen, it was found that the washing unit employs 16 staff members. A recurrent issue identified is that washing staff frequently exceed the standard eight-hour working day due to the absence of one or two employees. If assigned duties remain incomplete, overtime of up to two additional hours may be authorised. This situation commonly occurs when oily menus are prepared, as such meals are considerably more difficult to clean. Under normal conditions, a single utensil requires approximately five minutes for washing; however, when oily meals are served, the average cleaning time increases to nine minutes per utensil. SPPG Wonosari provides 3,200 free lunch portions daily, consisting of 272 portions for kindergarten pupils, 766 for primary school students, 1,840 for vocational secondary school students, and 473 for students of the As-Shofa Islamic boarding school.

Workload analysis refers to the process of determining the number of labour hours required to complete a specific task within a given timeframe. In essence, workload analysis aims to establish the appropriate number of personnel and the suitable distribution of responsibilities assigned to each staff member (Arifin, 2020). It enables the mapping of actual working time utilisation to determine the optimal number of staff objectively (Hermanto & Widiyarini, 2020). Nevertheless, workload analysis is highly susceptible to bias if observational time data are inaccurate or inconsistent (Mahawati et al., 2021).

The Workload Indicators of Staffing Need (WISN) method is employed to calculate the required number of personnel. WISN is an approach for determining staffing requirements based on the actual workload borne by staff members. It involves establishing activity time standards, calculating the volume of actual activities, and comparing these figures with available working time to generate an estimate of the ideal number of staff (Susilawati, Komariah, & Somantri, 2023). The WISN method is considered user-friendly, technically straightforward, comprehensive, and realistic in calculating staffing requirements (Agustini, Muharni, & Dwiputri, 2023). However, WISN does not explicitly account for individual productivity, meaning that calculated activities may not necessarily translate into optimal service delivery (Permatasari & Pudjirahardjo, 2015).

Within the context of SPPG, the Workload Indicators of Staffing Need (WISN) method is regarded as more relevant than conventional workload analysis techniques, as it not only considers the average time required to complete tasks but also incorporates the actual volume of activities performed by staff over a specific period. This provides a more comprehensive

representation of the real workload in the field. Furthermore, WISN enables a more realistic estimation of staffing requirements by accounting for standard activity times, effective available working time, and allowance factors for non-routine and administrative activities that are often overlooked in conventional methods. By incorporating these elements, WISN offers a more accurate and adaptive basis for workforce planning and distribution, particularly within dynamic service environments, compared with traditional workload analyses that tend to be static and less responsive to operational changes (Wahyuningtyas et al., 2024). Nevertheless, as WISN was originally developed by the World Health Organization for the health sector, its application within SPPG requires contextual adjustments. In light of field findings—namely, that washing staff frequently work overtime due to staff shortages, especially when handling oily menus that require longer cleaning times—the WISN method is deemed most appropriate for calculating the actual staffing needs of the washing unit based on meal volume and utensil quantities, thereby providing a managerial basis for workforce expansion or rotation.

The WISN method is therefore essential in assessing human resource requirements within Nutrition Fulfilment Service Units, as it determines staffing needs based on actual workload, enabling workforce planning to align with genuine service volumes and operational demands. Moreover, by incorporating standard time per activity and effective available working time, WISN can reveal additional staffing needs (or surplus staff) that may remain undetected when relying solely on staffing ratios or budgetary assumptions. Through its activity-based calculation framework, WISN supports the assurance that MBG operational units possess sufficient human resource capacity to maintain nutritional standards for beneficiaries, minimise risks to service quality, and ensure the continuity of nutritious meal provision (Jocom, Massie, & Porotu'o, 2017; Ratnawati & Fayasari, 2023).

Accordingly, this study aims to apply the Workload Indicators of Staffing Need (WISN) method to calculate staffing requirements objectively and to identify staffing gaps within the washing unit of SPPG Wonosari. By measuring workload based on actual operational conditions, this research is expected to provide an empirical foundation for human resource planning and to support improvements in operational efficiency in the implementation of the Nutrition Fulfilment Service Programme.

METHODS

This study employed a case study design with a mixed-methods approach integrating qualitative and quantitative data. The research was conducted in the equipment washing unit of the Nutrition Fulfilment Service Unit Wonosari in 2024. The qualitative approach was utilised to understand workflow processes and the characteristics of activities through direct observation and interviews. The findings derived from this phase subsequently informed the quantitative analysis using the Workload Indicators of Staffing Need (WISN) method to calculate staffing requirements objectively. The research subjects comprised four staff members directly involved in the entire sequence of equipment washing activities. Participants were selected purposively based on their active involvement in daily operational processes.

The limited number of subjects was attributable to the relatively small organisational structure of the unit and operational constraints during the research period, which constitute a limitation of this study. Data collection was undertaken through direct observation of work activities and semi-structured interviews. Observations were conducted over several cycles during operational working days to measure the standard time for principal activities, including washing, rinsing, drying, as well as the handover and arrangement of equipment. Interviews were conducted to validate observational findings and to obtain supplementary information regarding variations in workload. Data analysis was performed by applying the WISN method in accordance with the WHO WISN Manual guidelines. The analytical stages included the calculation

of available working time, determination of workload standards, estimation of allowance factors, calculation of staffing requirements, and computation of the WISN ratio.

RESULTS AND DISCUSSION

RESULTS

Available Working Time

a) Working Days (A)
   At SPPG Wonosari, operational activities are conducted six days per week. However, each unit has its own designated starting time. The total number of working days in one year is therefore calculated as: 6 days × 52 weeks = 312 days.
b) Annual Leave (B)
   The annual leave entitlement determined by SPPG Wonosari is 12 days.
c) Education and Training (C)
   Education and training activities for staff members at SPPG Wonosari are conducted for one day per year.
d) Public Holidays (D)
   National public holidays are stipulated by Joint Ministerial Decree (SKB) No. 933/2025, No. 1/2025, and No. 3/2025, signed by the Minister of Religious Affairs, the Minister of Manpower, and the Minister of Administrative and Bureaucratic Reform (PANRB). In 2025, the total number of public holidays amounts to 16 days.
e) Work Absence (E)
   The average number of days of absence due to illness or authorised leave in the washing unit of SPPG Wonosari is seven days per year.
f) Working Hours (F)
   The working hours in the Washing Unit of SPPG Wonosari are eight hours per day.

The available working time was calculated using the following formula:
Formula: Available Working Time (minutes/year) = {A – (B + C + D + E)} × F

Table 1. Available Working Time per Year in the Washing Unit of SPPG Wonosari

Code	Factor	Total	Description
A	Working days	312	Days/year
B	Annual leave	12	Days/year
C	Education and training	1	Days/year
D	National public holidays	16	Days/year
E	Work absence	7	Days/year
F	Working hours	8	Hours/day
	Available Working Time Formula		
	{A - (B+C+D+E)} x F	2.144	Hours/year
	Total Minutes	128.640	Minutes/year

Source: Primary Data, 2025

Based on Table 1, it can be concluded that the available working time in the Washing Unit of SPPG Wonosari amounts to 2,144 hours per person per year, which is equivalent to 128,640 minutes per person per year.

Workload Standards

Workload standards represent the total volume of activities performed by each employee within one year. The determination of workload standards is based on the average time required to complete each core task.

$$\text{Workload Standard} = \frac{\text{Available Working Time}}{\text{Average Time}}$$

Table 2. Workload Standards for Staff in the Washing Unit of SPPG Wonosari

No	Main Activity	WKT	RRW (minutes)	SBK (minutes)
1	Handover of food containers	128.640	30	4.288
2	Washing of food containers	128.640	250	514,56
3	Drying of food containers	128.640	200	643,2
4	Arranging food containers	128.640	30	4.288
5	Cleaning the washing area	128.640	60	2.144
TOTAL				**570**

Source: Primary Data, 2025

DESCRIPTION:

1. WKT (Available Working Time)
2. RRW (Average Time)
3. SBK (Workload Standard)

From Table 2, it is evident that the greatest workload standard is associated with the activities of handover and arranging food containers, each reaching 4,288 activities per year. In contrast, the washing of food containers demonstrates the lowest workload standard, at 514.56 activities per year, reflecting the considerably longer time required to complete this task.

Allowance Standards

Allowance standards refer to the proportion of time required by each worker in the washing unit to perform supplementary activities beyond their principal duties. These activities are not directly related to core operational tasks but are necessary for supporting work continuity and worker well-being.

$$\text{Allowance Standard} = \frac{\text{Total Allowance Time}}{\text{Available Working Time}}$$

Table 3. Allowance Standards for Staff in the Washing Unit of SPPG Wonosari

Activity	Time	RRW	Total	SK
Asr prayer	128.640	10 minutes/day	3.650 minutes/day	0,02
Maghrib prayer	128.640	10 minutes/day	3.650 minutes/day	0,02
Isha prayer	128.640	10 minutes/day	3.650 minutes/day	0,02
Evening meal	128.640	20 minutes/day	7.300 minutes/day	0,05
		Total		0,11

Source: Primary Data, 2025

Description:

1. WKT (Available Working Time)
2. RRW (Average Time)
3. SK (Allowance Standard)

Based on the calculation of allowance standards for staff in the washing unit, as presented in Table 3, the total allowance factor obtained is **0.11**.

Human Resource Requirements

Within the washing unit of SPPG Wonosari, numerous employees have expressed concerns regarding insufficient staffing, resulting in a perceived increase in workload intensity. By applying the WISN method, the staffing requirements for the washing unit can be calculated as follows.

$$\text{Required Staff} = \frac{\text{Quantity of Core Activites}}{\text{Workload Standard}} + \text{Allowance Standard}$$

Table 4. Staffing Requirements for the Washing Unit of SPPG Wonosari

No	Activity	KKP	SBK	SK	KT
1	Handover of food containers	4.020	4.288	0,11	1,01
2	Washing of food containers	4.020	514,56	0,11	7,91
3	Drying of food containers	4.020	643,2	0,11	6,36
4	Arranging food containers	4.020	4.288	0,11	1,01
5	Cleaning the washing area	4.020	2.144	0,11	2,01
			Total Required Staff		18,3
			Rounding		18

Source: Primary Data, 2025

Description:

1. KKP = Quantity of Core Activities
2. SBK = Workload Standard
3. SK = Standar Kelonggaran
4. KT = Required Staff

Based on the WISN estimation presented in Table 4, the ideal number of staff required to reduce workload pressure in the washing unit of SPPG Wonosari is eighteen (18) personnel. This calculation has been conducted in accordance with the WISN guidelines as endorsed by (Menteri Kesehatan Republik Indonesia, 2004).

Human Resource Gap Ratio

The WISN ratio constitutes an analytical indicator used to reflect the workload pressure experienced by human resources in the performance of their daily duties within the health sector. According to the World Health Organization (WHO, 2023), there are three criteria for interpreting the WISN ratio: a ratio equal to one indicates that the number of staff is commensurate with the existing workload; a ratio greater than one signifies that the available workforce exceeds the required staffing level (overstaffing); whereas a ratio below one indicates a shortage of personnel relative to the workload demand (understaffing) (WHO, 2023).

Formula: a/b
Description:
a: Number of available staff
b: Number of required staff

Table 5. Staffing Ratio in the Washing Unit of SPPG Wonosari

Available Staff (a)	Required Staff (b)	Difference (a-b)	WISN Ratio (a/b)
16	18	-2	0,9

Source: Primary Data, 2025

Based on the calculation presented in Table 5, the WISN ratio obtained is 0.9, which is below one. This indicates that the number of staff in the washing unit of SPPG Wonosari is insufficient to meet the actual workload demand. In other words, the existing workforce is operating under a relatively high workload pressure.

DISCUSSION

The findings indicate that the available working time for staff in the washing unit of SPPG Wonosari amounts to 2,144 hours per person per year, equivalent to 128,640 minutes. This figure was derived after accounting for effective working days, annual leave, training, national public holidays, and absences due to illness or authorised leave. Within the WISN framework, available working time constitutes a fundamental component, as it forms the basis for determining the actual working capacity of each staff member. Inaccuracies in establishing available working time may lead to errors in workforce planning, either in the form of overstaffing or understaffing, ultimately affecting operational efficiency and service quality (Jocom et al., 2017; Permatasari & Pudjirahardjo, 2015).

The calculation of workload standards demonstrates that the handover and arrangement of food containers exhibit the highest workload values compared with other activities. The substantial workload associated with these activities suggests that the final stages of the washing service process are labour-intensive and require significant time allocation. This condition reflects not only the limited number of personnel but also potential inefficiencies in workflow processes, such as suboptimal distribution routes for food containers or the absence of a standardised arrangement system. Consequently, the elevated workload observed in certain activities may not solely be attributable to staffing shortages but may also indicate the need for process evaluation and improvement.

The WISN-based staffing analysis reveals that the ideal number of staff required in the washing unit is eighteen, whereas the current staffing level is sixteen. The shortfall of two personnel is reflected in a WISN ratio of 0.9. According to WHO (2023), a WISN ratio below one indicates a condition of understaffing, meaning that the workload borne by staff exceeds their optimal capacity. Such a condition may contribute to increased work fatigue, prolonged task completion times, and heightened risks of reduced service quality and occupational safety.

These findings are consistent with previous studies in nutrition and healthcare service sectors, which report that WISN ratios below one are associated with increased work pressure and decreased operational efficiency (Jocom et al., 2017; Permatasari & Pudjirahardjo, 2015; Ratnawati & Fayasari, 2023).

Compared with other studies applying the WISN method in hospital nutrition installations or healthcare service units, the present findings reveal a similar pattern of imbalance between staffing levels and actual workload. However, the application of the WISN method within the washing unit of SPPG presents specific challenges, as WISN was originally developed for the health sector. Washing and logistics activities possess distinct operational characteristics, particularly regarding variability in working time due to menu type, degree of equipment contamination, and daily service volume. Therefore, although the WISN method proves relevant and applicable, the interpretation of its results must be contextualised within non-healthcare operational settings to ensure that recommendations remain realistic and implementable.

This study presents several limitations that warrant consideration. First, the number of participants involved in the observations and interviews was relatively limited and confined to a single work unit; therefore, the findings cannot be generalised to all SPPG units or similar operational settings. Secondly, the use of a single case study design may have introduced observer bias, particularly in the recording of working time and routine activities. Accordingly, future research is recommended to include a greater number of SPPG units, employ a longer observation period, and integrate workload measurement with additional quantitative approaches in order to enhance the robustness of findings.

From a practical perspective, the results of this study provide a clear basis for the management of SPPG Wonosari to improve human resource planning. Management is advised to prioritise the recruitment of at least two additional staff members in the washing unit to alleviate excessive workload. Furthermore, an evaluation of the handover and arrangement processes for food containers should be undertaken to identify opportunities for time efficiency through workflow simplification or the implementation of more effective standard operating procedures. Through a combination of workforce expansion and operational process improvement, it is anticipated that both work efficiency and service quality within SPPG can be sustainably enhanced.

CONCLUSION

Based on the findings, it can be concluded that the application of the Workload Indicators of Staffing Need (WISN) method provides an objective representation of staffing requirements based on actual workload. In the washing unit of SPPG Wonosari, effective working time was calculated at 2,144 hours per person per year, with an ideal staffing requirement of eighteen personnel. However, only sixteen staff members are currently available. This condition is reflected in a WISN ratio of 0.9, indicating understaffing and the potential for increased individual workload, reduced operational efficiency, and diminished service quality.

This study is subject to several limitations, including the relatively small number of participants, its focus on a single work unit, and the use of a single case study design that may allow for observational bias. Consequently, the findings cannot be broadly generalised to all SPPG units.

Future research is recommended to apply the WISN method across other SPPG units or in multiple locations using a comparative approach to obtain a more comprehensive understanding of staffing requirements. Additionally, longitudinal studies following the recruitment of additional staff should be conducted to evaluate the impact of staffing adjustments on workload and operational efficiency. The use of alternative workload

assessment methods as comparative instruments is also recommended in order to strengthen the validity of future findings.

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