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An Assessment of the Quality of Inpatient Meals and Nutrition and Dietetics Processes in Select Public Hospitals in the Philippines

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Abstract

In hospitals, nutrition care is a set of actions that allows for the identification of patient nutritional needs and the provision of care to address those needs. Optimal nutrition for inpatients has a critical role in the prevention and treatment of diseases: It helps boost the body's immune system, reduces the risk of disease and infection, and aids in the recovery from illness. In Philippine public hospitals, nutrition care is provided by the Nutrition and Dietetics Service. In this work, we give a case study on the one of the hospital processes—the quality of hospital nutrition. Processes refer to the way care is delivered and whether it is aligned to evidenced-based practice or standards. We looked at whether Philippine public hospitals deliver high-quality, nutritionally appropriate meals to inpatients, adhere to the minimum meal allowance budget, and follow the minimal NDS inputs and process standards. Apart from the issue of unmet minimum meal allowance budget and nutritional content, we were able to unpack concerns related to human resources, equipment, management functions, and other NDS processes that could have an impact on the quality of nutrition care delivered. The general insight in enhancing the nutritional care offered in hospitals is to look at Nutrition and Dietetics Service as a whole, rather than just increasing the minimum meal allowance budget. The Department of Health must also guarantee that the value of high-quality nutrition care is recognized in hospitals, as it is often overlooked that it has an impact on total patient care quality.

Keywords: Nutrition and Dietetics Service, nutrition care, public hospitals, Philippines

Disclaimer: *This article/report reflects the points of view and thoughts of the authors, and the information, conclusions, and recommendations presented are not to be misconstrued as those of the Department of Health. Furthermore, this article/report has not yet been reviewed by our collaborators at the DOH at the time of writing. The material presented here, however, is done in the spirit of promoting open access and meaningful dialogue for policy/plan/program improvement, and the responsibility for its interpretation and use lies with the reader.*

Executive Summary

Hospital nutrition care is a set of actions that allows for the identification of patient nutritional needs and the provision of care to address those needs. Optimal nutrition for inpatients has a critical role in the prevention and treatment of diseases and aids in the recovery from illness.

In Philippine public hospitals, nutrition care is provided by the Nutrition and Dietetics Service. Overall, the NDS aims to maintain and improve patient health by providing high quality, safe, and nutritious foods at minimum cost. This work is focused on case study on the one of the hospital processes—the quality of hospital nutrition. Processes refer to the way care is delivered and whether it is aligned to evidenced-based practice or standards. We looked at whether Philippine public hospitals deliver high-quality, nutritionally appropriate meals to inpatients, adhere to the minimum meal allowance budget, and follow the minimal NDS inputs and process standards.

Nutrition Content of Inpatient Meals

- **Overall, public hospitals had difficulty achieving the minimum dietary requirements for inpatients with regular diets**.
    - **Only 35% of hospitals met the prescribed 1,800 calories for regular adults.** LGU level 1 hospitals in the sample had the lowest compliance at 22% while DOH hospitals had the highest at 56%.
    - **Most of the hospitals (96%) self-report that they met macronutrient standards while only 43% report meeting the micronutrient standards for inpatient meals**.
    - On the contrary to an assessment of provided meal calories, almost **all (94%) of the hospitals perceive through self-report that they met the prescribed calorie requirement of 1,800 calories for regular adults.** Our results overestimate the compliance of hospitals to the minimum meal standards. **The real proportion of hospitals meeting meal standards might be lower, and the quality of impatient meals more comprised than our data presents.**

Meeting the Prescribed Budget Meal Allowance

- **Since 2015, compliance to 150 improved from 10% in 2015 to 14% in 2016, but it is still low at 51% in 2021.** Improvements in compliance mostly came from DOH hospitals.
    - Top reasons were **limited NDS budget (44%)** and **higher costs of commodities in the area (40%)**.
- **Despite not meeting the minimum meal allowance budget, 80% of hospitals still perceive this amount as insufficient.** Reported reasons are the following: **inflation of prices (80%) and extra use of disposables (77%).**

NDS Structures and Process Standards
Management and Procurement Practices

- **Meal allowance and NDS budget is decided mostly by the hospital administration (60% and 58%, respectively).**
- **Procurement responsibilities are decentralized in the Nutrition and Dietetics Service (86%).** The most used procurement mode is Shopping (62%), which may be reflective of inefficient procurement practices.
- **Lastly, the hospitals (50%) perceive that their respective regional offices are not providing sufficient support in the implementation of the DOH AO on standardized meal allowance (AO 2016-0020).**

Human Resources

- **Only half of the public hospitals (59%, 50%, 61%) meet the staffing pattern as required by the DBM-DOH JC 2013-01.** This may result in a higher workload for the staff. Results showed that in LGU Level 2 and 3 hospitals, one Nutritionist-Dietitian, and Chef/Cook supervises 210 and 201 (IQR: 137-336) meals in a working day.
- **In most hospitals, the permanent positions are fully filled for all NDS staff.** Thus, hospitals resort to hiring staff under Contract of Services/Job Order.
- **By nature, employees hired under contract-of-service or job-order positions have no security of tenure and have lower pay rate.** The median salary of non-permanent Nutritionist-Dietitians as reported was ₱ 16,500 pesos, which is ₱7,000 below the salary of an entry-level Nutritionist-Dietitian I (Salary Grade 11 - ₱23,877).
- **Among the NDS staffs, only the Nutritionist-Dietitians usually have opportunities for training.** 62% of the hospitals reported that the NDs have at least one training every year, while for the Chefs/Cooks and FSWs, more than half (51% and 54%) have none.

Equipment and Process Standards

- **Less than half (42%) of the hospitals have present nutrition support teams. Of these, 18% have the four essential healthcare professional cadres (MD, RN RND, RPh).**
- **In terms of equipment, some hospitals lack even just the basic equipment for nutritional assessment.** Only 64 (33%) of the hospital NDS have both weighing scale and stadiometer (equipment used for height measurement).
- **Alarmingly, 37% of the hospitals have no standardized recipes.** As the chefs/cooks are not measuring standard portions of ingredients this may cost-inefficiency.
- **Only 14% do all three given standards to ensure food quality.** These options are food tasting, visual inspection of food, and food weighing of cooked food for portioning.
- **All the hospitals do the given standards to ensure food safety, except for the use of color-coded utensils**. Only (36%) of hospitals in this sample use color-coded utensils, which is helpful in avoiding cross-contamination .
- **High proportion of hospitals (82%) are not collecting data on plate food waste.** Among those who collect, 4% of the hospitals reported that only 51-75% of the food served is consumed.
- **Two years after the institutionalization of Nutrition Care Process (AO 2019-0033), only a quarter of the hospitals in this sample (25%) were able to implement the policy (collects NCP Bi-annual report) with) the lowest proportion in LGU hospitals (5% and 7%).**

Moving Forward

Results from this case study revealed that the nutrition and dietetics services (NDS) in Philippine public hospitals generally are not able to provide admitted patients meals with adequate nutrition content, cannot comply with the minimum meal allowance budget, and cannot adhere to minimum inputs and process standards set necessary to provide high quality nutrition care to inpatients. The Department of Health needs to ensure that the importance of high-quality nutrition care is realized in the hospitals, as it is oftentimes unrecognized that it can influence in the overall quality of patient care.

Our recommendations are divided into research and policy recommendations:

A. Research recommendations

- Assessment of quality of service provided by the NDS **should be regularly done to monitor and continue to unpack and fix issues that might be influencing on the quality of nutrition care provided.** Defined nutrition care quality indicators and frameworks to regularly assess the impact of national policies on nutritional outcomes should be explored to be the focus of future measurement of nutrition care quality.

- Various NDS Food Service System models (e.g., outsourcing the FSS operations) should also be explored to see the best fit in improving the overall quality of meals. Exploring and establishing the efficient procurement strategy for food (WHO, 2021) commodities and the ideal cost management models (Neriz et al., 2014) should be investigated. Moreover, the ability to consolidate or pool food supply procurement across service delivery networks for volume under the Universal Health Care should be explored as well.

B. Policy recommendations

- **The ongoing adjustment of meal allowance budget should be advocated.** This is for the cost to be updated with the current context and adjusted for regional prices and for inflation for the following years, so the hospitals have the policy basis to adjust according to their needs.
    - **The updated meal allowance budget should be modular** so there is no fixed absolute price for all the components and that they can be flexible on which costs they can modify.
    - **The new policy should also advocate to the hospital administration regarding the importance of allocating resources for the meal budget allowance**.
    - **The standards for the prescribed nutrition content should updated and be based on the new 2015 Philippine Dietary Recommended Intakes or PDRI.**
    - The DOH should also consider mandating strictly the presence and use of standardized recipes to all hospitals.
    - Strict and regular monitoring or auditing if these standards are being met should also be done to ensure that the patient nutritional requirements is being met.
- Policies and standards on **efficient procurement practices** should be established to serve as a guide for the hospital Chief Nutritionist-Dietitians for cost-efficiency measures.
- **The new staffing pattern for the Nutrition and Dietetics Service proposed to the Department of Budget Management in 2019 should be advocated**.
- **The hospitals should provide regular in-house trainings or opportunities for capacity building not only for the Nutritionist-Dietitians, but the other NDS staff too (Chefs/Cooks, and FSWs).**
- **The NDS should also establish regular efforts on monitoring NDS outcomes.** This is important to know how you would intervene in maybe an unrecognized problem in the hospital. **The Department of Health should also consider revision of the current monitoring tools for the NDS vis-à-vis the standards set.** This is to monitor the change in the indicators whenever a policy is implemented, to see if its objectives are being met.

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1. Introduction

Nutrition is a critical foundation of one's health, and physical and mental development from in utero until old age (Davis, 2021; WHO, 2000). Good or optimal nutrition means that the body receives all required nutrients (energy, macronutrients, and micronutrients) necessary for growth and maintenance of bodily processes (Sruthi, 2021). Optimal nutrition has a critical role in the prevention and treatment of diseases: It helps boost the body's immune system, reduces the risk of disease and infection, and aids in the recovery from illness (Chima et al., 1997; Nienow et al., 2021; Tappenden et al., 2013). Hence, it is important to investigate the quality of nutrition provided in hospitals where patients need them the most for their recovery. Inadequate, or suboptimal nutrition for inpatients that causes malnutrition or misses its diagnosis upon admission may contribute to the prolonged recovery, higher risk of complications, or worsening of the patient's condition while admitted (Carvalho-Salemi et al., 2018; Correia, 2018; Fessler, 2008; NACNS, 2017; Reber, Gomes, Bally, et al., 2019).

Hospital nutritional care is an organized set of activities that allow the identification of patient nutritional needs and the provision of care to meet these needs (DOH, 2016). In the Philippines, nutritional care is provided in hospitals through the **Hospital Nutrition and Dietetics Service (NDS)** as required by licensing standards (RP, 1965). The NDS is composed of registered nutritionist-dietitians, cooks, food service workers, and administrative support staff. The NDS oversees nutrition assessment, diagnosis of malnutrition or risk of malnutrition, intervention, and monitoring of patient nutritional status during admission **Overall, the NDS aims to maintain and improve patient health by providing high quality, safe, and nutritious foods at minimum cost.**

Standards for meal budgeting and planning are provided by Department of Health (DOH) Administrative Order (AO) 2016-0020 "Standardization of Per Capita Budget for Meal Provision of Patients of the Department of Health (DOH) and Local Government Unit (LGU) Hospitals in the Country" rolled out in June 2016. This DOH-AO, mandates that the public hospitals should earmark at least ₱150 per day for inpatient meals to meet an energy requirement of 1,800 calories and a macronutrient content comprising of 60% carbohydrates, 15% protein, and 25% fat for normal adult diets. Meanwhile standards for human resources, equipment, and NDS processes are given by the Hospital NDS Manual (3rd edition) (DOH, 2019b).

This paper is related to a wider study on the quality of hospital care in the Philippines. Here, we present a case study of one hospital process: the nutrition of patients admitted to public hospitals. Processes refer to the way care is delivered and whether it is aligned to evidenced-

1 LDC, JU, and VU are Research Analyst, Supervising Research Specialist, and Senior Research Fellow, respectively. This study was done in collaboration with the Department of Health - Health Facility and Development Bureau (DOH-HFDB). The authors would like to thank Dr. Terence John M. Antonio and Ms. Josephine L. Guiao for their valuable support and insights for the study.

based practice or standards. Assessments for quality of care must be tailored to standards to the disease or healthcare service under consideration.

Specifically, given the DOH-AO 2016-0020 and the Hospital NDS Manual, which are important in ensuring quality inpatient nutrition, we examined if Philippine government hospitals:

- Provide admitted patients meals with adequate nutritional content,
- Comply with the minimum meal allowance stipulated in DOH AO 2016-0020 and if this has been effective in promoting adequate nutrition for inpatients, and
- Follow minimum NDS inputs and process standards given in DOH's Hospital NDS Manual

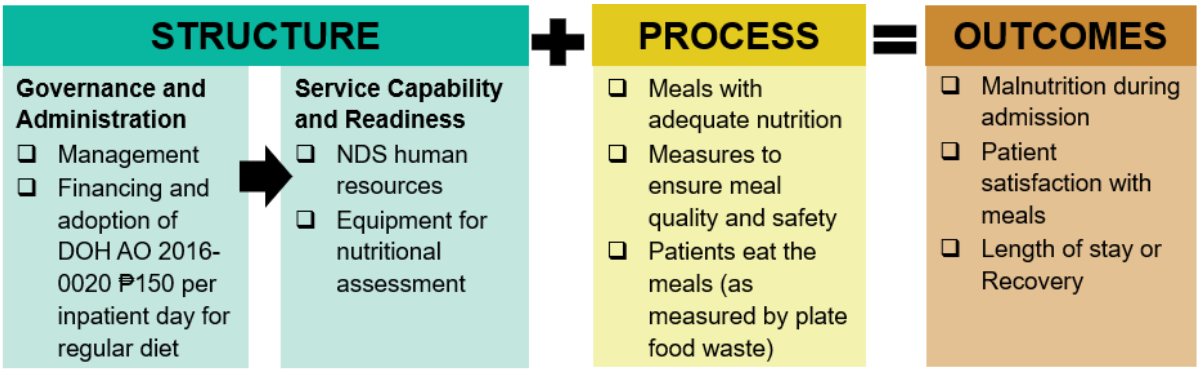
2. Methods

2.1. Study design and Conceptual Framework

The case study employed a cross-sectional design, collecting primary data through an online survey of Philippine public hospitals. The study was done in collaboration with the Department of Health - Health Facility and Development Bureau (DOH-HFDB) who is the primary policymaker in this case.

Our conceptual framework was based on DOH AO 2016-0022 and adapted to a wider Donabedian framework of Quality (See **Figure 1**).

Figure 1. Conceptual Framework for Evaluation of the Nutrition and Dietetics Service



This framework conveys that it is important to look into the **structures or minimum inputs** necessary to the functioning of the hospital NDS. NDS governance would include its management and financing through the actual adoption of the DOH AO 2016-002 that stipulates the earmarking of at least ₱150 for per-capita inpatient meals per day. Moreover, a service capable NDS would have adequate human resources and the necessary equipment to carry out its role in the nutritional care of patients. Service capable NDS should provide patients with meals of adequate quantity (1,800 calories) and nutritional content (macronutrients and micronutrients) through **systematic processes** that also ensure food quality and safety. **Good patient outcomes** (e.g., decreased malnutrition during admission, satisfaction with meals, improved recovery) are then facilitated when patients consume the meals as intended and receive good nutrition during their hospital stay.

To note, we do not focus on evaluating nutritional outcomes (e.g., prevalence of malnutrition among inpatients before and after admission) as data on these indicators are sparse and difficult

to collect. We were only able to assess whether the hospitals have started collecting any data related to patient nutritional outcomes.

2.2 Data Collection: Online Facility Survey

The DOH rolled-out a self-administered survey tool, in protected Microsoft Excel format, to all 428 DOH and LGU-owned public hospitals in the Philippines. Prior to the data collection, the survey tool was pre-tested and validated with the DOH Technical Working Group for Nutrition with the goal of ensuring that the questions were clear and logically arranged. Hospital submissions were followed-up multiple times in the course of three months. Submissions were also validated with the hospital respondent by a data quality assurance team for any unclear and improbable answers.

The target was to census DOH-retained hospitals and LGU-owned level 2 and 3 hospitals, while having a convenience sample of 100 LGU-owned level 1 hospitals. The final sample includes 193 hospitals, with 65 (of 70) DOH-retained hospitals, 19 (of 49) LGU-owned level 2 and 3 hospitals, and 109 LGU-owned level 1 hospitals (**See Table 1**).

Table 1. Distribution and response rate of DOH- and LGU-owned public hospitals

Hospital Type	Sampling Frame	Responded	Response Rate
DOH-retained	70	65	93%
LGU-owned level 2 and 3	49	19	39%
LGU-owned level 1	309	109	[redacted]
Total	428	193	[redacted]

Given this sample, results for DOH-retained hospitals are representative of the target population while those for LGU-owned hospitals are not.

3. Results and Discussion

Table 2 summarizes the characteristics of our sample. Out of 193 hospitals, 65 (33%) are DOH-retained, 19 (10%) are LGU-owned level 2 and 3 hospitals, and 109 (67%) are LGU-owned level 1 hospitals. On average, DOH-retained hospitals are older (median: 78 years) and have higher bed capacities (median: 250 beds) compared to LGU level 2 and 3 hospitals (52 years, 150 beds) and LGU level 1 hospitals (43 years, 29 beds). Majority of the Level 3 hospitals (40 of 47) in the sample are DOH-retained hospitals. More than half (68%) of the included hospitals are located in the National Capital Region and Luzon. Only 11 (6%) have outsourced NDS, with 9 found in LGU level 1 hospitals.

Table 2. Sample characteristics of government hospitals who participated in the NDS survey

Variable	All Hospitals n=193	DOH n=65	LGU Level 2-3 n=19	LGU Level 1 n=109
Age in years, median (range)	49 (2-120)	78 (9-120)	52 (13-98)	43 (2-116)
Bed capacity, median (range)	50 (10-4,200)	250 (10-4,200)	150 (100-408)	29 (10-173)
Ownership, n (%)				
DOH-retained	65 (33)	-	-	-
LGU	128 (66)	-	-	-
Functional Capacity, n (%)				
Level 1	129 (67)*	20 (30)	-	109 (100)
Level 2	17 (9)	5 (8)	12 (63)	-
Level 3	47 (24)	40 (62)	7 (37)	-
Island Group, n (%)				
NCR + Luzon	132 (68)	38 (58)	10 (53)	84 (77)
Visayas	27 (14)	11 (17)	1 (5)	15 (14)
Mindanao	34 (18)	16 (25)	8 (42)	10 (9)
NDS Food Service Type, n (%)				
In-house	179 (94)	63 (98)	17 (94)	99 (92)
Outsourced	11 (6)	1 (2)	1 (6)	9 (8)

* Includes two (2) infirmaries and one (1) custodial psychiatric care facility.

3.1. Nutritional Content of Inpatient Meals

We assessed the quality of hospital meals based on self-reported **calorie, macronutrient, and micronutrient content**. Meeting requirements for meal components is necessary if hospitals wish to provide patients with the energy and nutrients needed for their physiologic processes and recovery from illness. **Overall, public hospitals had difficulty achieving the minimum dietary requirements for inpatients with regular diets**.

In terms of caloric content (energy food can provide), only 35% of hospitals met the prescribed 1,800 calories for regular adults (See
Table 3). We based the prescribed calories standard on the 2002 Recommended Energy and Nutrient Intakes (RENI) put forward by the Food and Nutrition Research Institute (FNRI). On the median, hospitals that did not meet the RENI provided 1,500 calories per day (IQR: 1,200-1,700). Among the public hospital types, LGU level 1 hospitals in the sample had the lowest compliance at 22% while DOH hospitals had the highest at 56%.

Table 3. Quality of Meals in Philippine Government Hospitals

Variable	All Hospitals n=193	DOH n=65	LGU Level 2-3 n=19	LGU Level 1 n=109
Meal Calorie Content - Regular Adults, 2021				
Met 1,800 calories / day, n (%)†, *	64 (35)	35 (56)	6 (32)	23 (22)
Calories provided, median (IQR)				
All hospitals	1,500 (1,400-1,800)	1,800 (1,500-1,800)	1,600 (1,400-1,800)	1,500 (1,200-1,600)
Hospitals who did not meet requirements	1,500 (1,200-1,500)	1,500 (1,500-1,600)	1,500 (1,400-1,600)	1,400 (1,200-1,500)
Self-reported achievement of Nutritional Content Standards**				
Energy	181 (94)	62 (95)	17 (89)	102 (94)
Macronutrients	186 (96)	60 (92)	19 (100)	107 (98)
All Micronutrients	83 (43)	27 (42)	13 (68)	43 (39)
Dietary Fiber	158 (82)	50 (77)	17 (89)	91 (83)
Minerals				
Calcium	118 (61)	34 (52)	16 (84)	68 (62)
Sodium	138 (72)	43 (66)	16 (84)	79 (72)
Phosphorus	106 (55)	32 (49)	16 (84)	58 (53)
Iron	128 (66)	38 (58)	16 (84)	74 (68)
Vitamins				
Vitamin C	109 (56)	34 (52)	14 (74)	61 (56)
Vitamin A	114 (59)	32 (49)	16 (84)	66 (61)
Vitamin B1 (Thiamin)	104 (54)	31 (48)	15 (79)	58 (53)
Vitamin B2 (Riboflavin)	103 (53)	31 (48)	15 (79)	57 (52)
Vitamin B3 (Niacin)	99 (51)	31 (48)	15 (79)	53 (49)

† Based on the 2002 Recommended Energy and Nutrient Intakes (RENI) recommended by the FNRI.
* Assessed based on reported calories per day provided to patients.
** Binary variable (yes/no) as reported by surveyed facilities.

Most of the hospitals (96%) self-report that they met macronutrient standards while only 43% report meeting the micronutrient standards for inpatient meals. Based on the 2002 RENI, the macronutrient requirements for carbohydrates, proteins, and fat, are 60%, 15%, and 25% of total meal calories. Macronutrients are the nutrients needed in large amounts to provide the body with energy, or calories (WHO, n.d.-b). On the contrary, micronutrients are vitamins and

minerals needed in small quantities, but serious deficiencies in any of them can cause severe illness (WHO, n.d.-a): Vitamins are necessary for energy production, immune function, and blood clotting. Meanwhile, minerals are required for growth, bone health, and fluid balance. Specific micronutrients that sampled hospitals have a more difficult time meeting standards for were phosphorus (55%), vitamin B1 (54%), vitamin B2 (53%) and vitamin B3 (51%).

In addition, only 39% of LGU Level 1 hospitals in this sample were able to meet (self-report) the micronutrient standards (based on 2002 RENI). Since the hospitals have limited resources, they may be prioritizing meeting the macronutrient and energy requirements than micronutrients. Moreover, the usual sources of micronutrients are the fruits and vegetables, which is relatively expensive (Darmon & Drewnowski, 2015; Yahia et al., 2019). LGU Level 1 hospitals may also have no choice but to efficiently use the resources to meet the prescribed nutritional requirements.

On the contrary to an assessment of provided meal calories, almost all (94%) of the hospitals perceive through self-report that they met the prescribed calorie requirement of 1,800 calories for regular adults. This implies that the NDS of hospitals may not be aware of the standard or there is a gap in the understanding of the appropriate caloric content. This could also be the case for both macronutrients and micronutrients. Ultimately, this may mean that the real proportion of hospitals meeting meal standards might be lower, and the quality of impatient meals more comprised than our data presents, because public hospital NDS might not be aware that they are serving meals short of the required nutritional content.

We are aware of that self-reported data is biased, and our results on the compliance of hospitals for standard nutritional content of meals is likely higher than reality. More accurate results may be obtained from a more in-depth and time-intensive analysis of hospital cycle menus; This analysis forthcoming, and the results of this paper will be updated in the future.

3.2. Meeting the DOH Prescribed Budget Meal Allowance

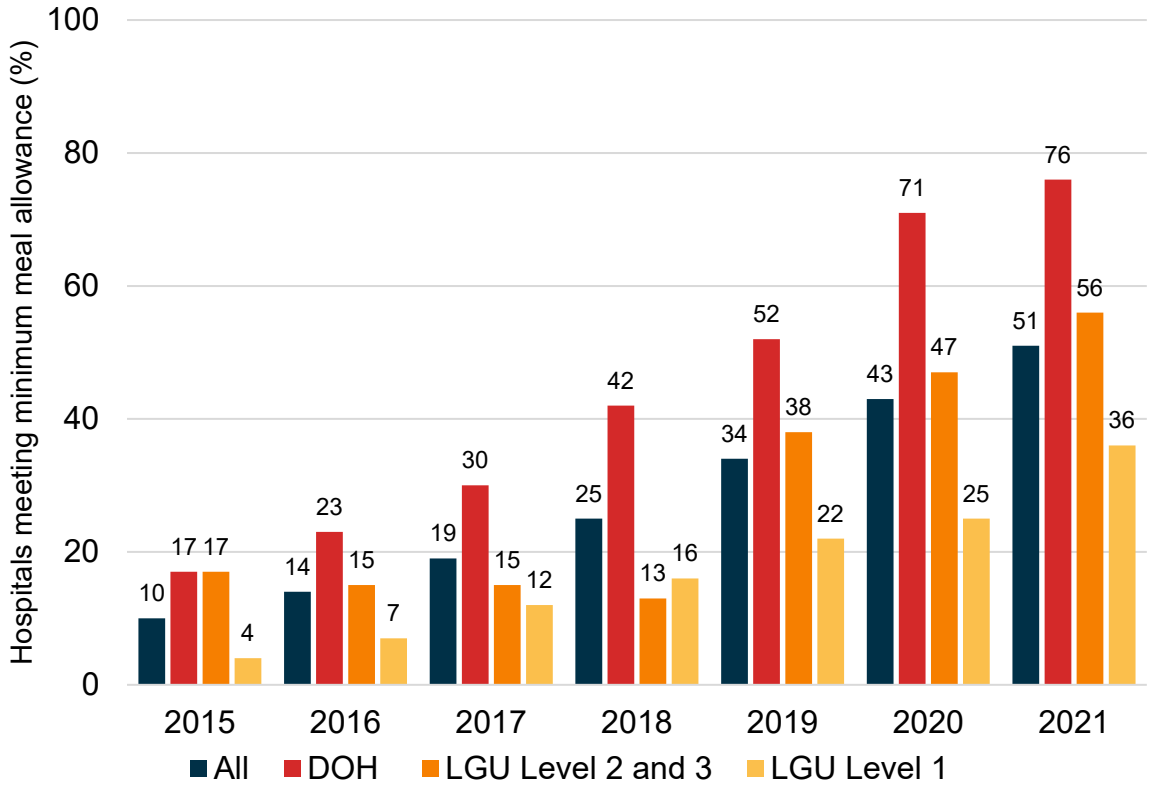
DOH AO 2016-0020 (Article 2) was instituted in June 2016 "to prescribe and implement a standardized per-capita budget for meals of inpatients in DOH and LGU Hospitals." The policy was based on a study of 15 public hospitals done in 2014 which revealed that the sampled hospitals spent only ₱45.20 to ₱68.80 per meal and so had difficulty meeting the meal calorie and macronutrient requirements. **The policy assumed that an increase of the daily meal allowance budget to at least ₱150 pesos per patient per day would allow the NDS to improve the quality of their meals.** The meal allowance of at least ₱150 pesos per day was based on costing an ideal 4-day meal plan for an adult regular diet that met the dietary requirements for calories and macronutrients.

Despite the policy being in effect for five (5) years, only 51% of the hospitals met the minimum meal allowance budget in 2021 (See Figure 2). Over the years, however, the compliance to the policy has slowly improved: In 2015, before the policy was instituted, only 10% of the hospitals earmarked ₱150 and the median meal allowance budget per day was ₱75. Right after its implementation in 2016, compliance increased by 4 percentage points (to 14%) and the median meal allowance budget was ₱80. In 2021, or five years after its implementation, compliance reached 51%, and the median meal allowance budget reached ₱150 (range: ₱40 - ₱600).

This improvement in compliance to the minimum meal allowance budget mostly came from the DOH hospitals. There is a large gap in the proportion of meeting the budget between the DOH and LGU hospitals. In 2021, 76% of DOH hospitals were able to meet the minimum budget. On the other hand, only 56% in LGU Level 2 and 3 hospitals and 36% in LGU Level 1 hospitals have met it.

Low adoption in the prescribed meal allowance has implications on the quality of meals, especially in terms of nutritional content. The previous study done by the FNRI in 2014 revealed that there was a positive relationship between cost and nutrient adequacy of energy and carbohydrate content (DOST-FNRI, 2014). Moreover, foods rich in micronutrients are known to be more expensive than the less healthy foods (Andrieu et al., 2006; Cade et al., 1999). The higher the cost of food, the better the quality, and the NDS may have more flexibility to add more variety, choose healthier ingredients, and increase the amount of food to meet the prescribed requirements (Darmon & Drewnowski, 2015; McAllister et al., 1994; Morris et al., 2014; Rao et al., 2013).

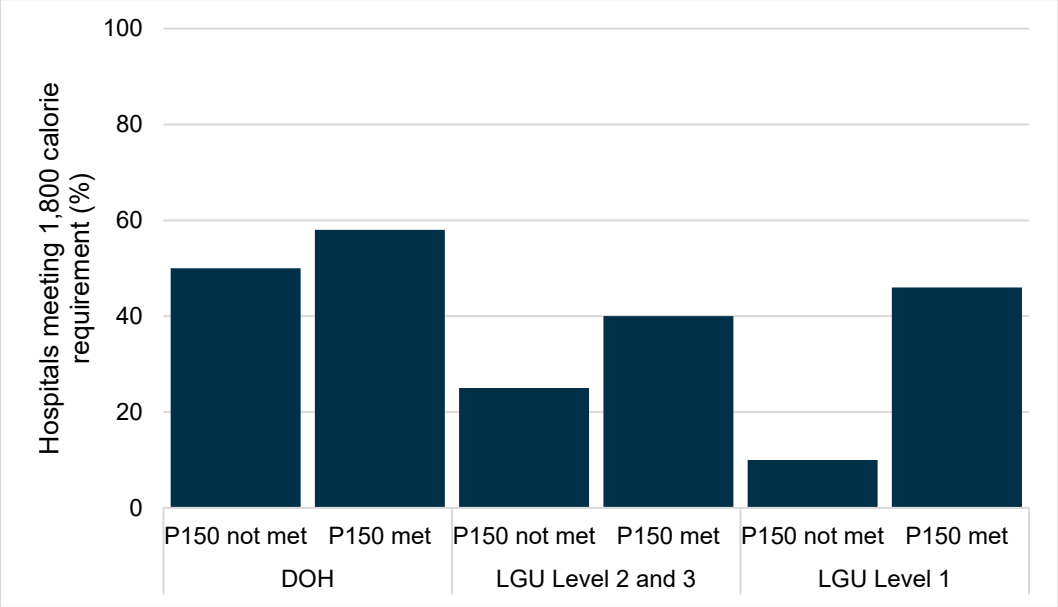
Figure 2. Percent of public hospitals meeting the ₱150 meal budget allowance per inpatient day, 2015-2021



Barring any other policy intervention in the hospital, we can say that the policy helped raise the meal budget allowance and help meet the prescribed nutritional requirements in 2021. In particular, the policy and the minimum meal allowance budget of ₱150 pesos helped in meeting the prescribed energy requirement of 1,800 calories. The sharp increase in the proportion of hospitals meeting the energy requirement is seen in LGU Level 1 hospitals (36 percentage

points difference), followed by LGU Level 2 and 3 (15 percentage points difference), and DOH hospitals (8 percentage points difference) (See Figure 3).

Figure 3. Compliance to meal energy requirement between those who met and did not meet meal allowance budget, 2021



When asked about the reasons why they were unable to earmark a meal allowance budget of at least ₱150 per day for inpatient meals, top reasons were limited NDS budget (44%) and higher costs of commodities in the area (40%) (See Table 4). The proportion of hospitals saying that these two are the reasons why they could not meet the meal allowance budget is both high In LGU Level 1 hospitals (56% and 50%, respectively). The lowest proportion of meeting the minimum meal allowance is also seen in this group

Table 4. Challenges in complying with the DOH policy on Meal Allowance Budget (AO 2016-0020)

Variable, n (%)	All Hospitals n=193	DOH n=65	LGU Level 2-3 n=19	LGU Level 1 n=109
Limited Budget	85 (44)	14 (22)	10 (53)	61 (56)
Higher costs in area	77 (40)	17 (26)	6 (32)	54 (50)
Nutritional requirements can be met at <P150	20 (11)	5 (8)	1 (5)	14 (13)
Perceived insufficiency of ₱150	155 (80)	61 (94)	14 (74)	80 (73)
Inflation of commodity prices	155 (80)	61 (94)	14 (74)	80 (73)
Cannot provide nutritional requirements	155 (80)	61 (94)	14 (74)	80 (73)
Overhead not accounted	73 (38)	38 (59)	8 (42)	27 (25)
COVID-19 extra disposables & PPE	149 (77)	58 (89)	13 (68)	78 (72)
Staff meals shouldered by NDS	1 (1)	0 (0)	0 (0)	1 (1)
Adjust/reduce (keep all necessary food groups)	132 (68)	39 (60)	15 (79)	78 (72)
Reduce food groups & amount, macros retained	76 (39)	18 (28)	6 (32)	52 (48)
Cheaper suppliers of ingredients	93 (48)	32 (49)	2 (11)	59 (54)
Save on utilities/overhead costs	87 (45)	34 (52)	10 (53)	43 (39)
Lay off personnel	5 (3)	0 (0)	1 (5)	4 (4)
Ask hospital management to augment	83 (43)	28 (43)	10 (53)	45 (41)
Hospital vegetable garden	5 (3)	1 (2)	1 (5)	3 (3)
Efficient: Meal plan with cheap, but high-quality meal	1 (1)	0 (0)	0 (0)	1 (1)

Even though the public hospitals are having difficulty in meeting the minimum ₱150 meal allowance budget, 80% of hospitals still perceive this amount as insufficient (See Table 4). There seems to be a gap between the current set meal allowance and what hospitals perceive they need to provide meals of high quality (meeting nutritional content standards). In fact, more than half of them (51%) stated that ₱ 150 cannot provide the nutritional requirements needed for a complete three meals. Only 20 hospitals reported that nutritional requirements set by the policy can possibly be met with less than ₱150 pesos meal allowance budget, and 14 of these were LGU Level 1 hospitals. Due to limited resources in meeting the minimum meal allowance budget in lower level hospitals, they may be trying to make use of the available resources by efficiently planning meals, with its quality considered.

Reported reasons why the meal allowance budget of ₱150 pesos was perceived to be insufficient are the following**: inflation of prices (80%) and extra use of disposables (77%).** Since the policy was implemented five years ago, current commodity prices have increased already due to inflation. Also, the problem in meeting the minimum meal allowance budget was aggravated by the COVID-19 pandemic because the hospitals had to use extra disposables for the inpatient meals for COVID-19 patients.

Because of the set meal allowance budget and NDS budget that could not be met or not kept up with the current context (i.e., inflation of prices, COVID-19 related additional expenses), hospitals resort to different measures to cope. Top measures include reduction of the food groups in the meal (retaining the very basic food groups) (68%), opting for cheaper suppliers of food items (48%), and lobbying of Chief RNDs to the hospital management to augment for the budget (43%). With limited budgets, hospitals must be efficient in planning meals, (i.e., the meal is cheaper but of high quality); however, this may not always be possible. In fact, only 1 hospital reported that they were able to do this measure to cope with the budget constraints.

Hence, even in hospitals who do meet the minimum meal allowance budget of ₱150 pesos, this may not translate to improvement in quality of meals because there is a gap in the meal allowance set and what they need to deliver meals of high quality. Moreover, this will influence the health outcomes of hospital inpatients. Failing to deliver meals of high quality, or meals that do not meet the prescribed nutritional content adequacy may lead to unfavorable outcomes such as lengthened hospital stays, increased risks for complications, and malnutrition (Reber, Gomes, Bally, et al., 2019; Reber, Gomes, Vasiloglou, et al., 2019).

3.3. NDS Structures and Process Standards

Challenges do not lie in meal budgeting and planning alone, but on the other structures or inputs and processes of NDS as well. In this section, we examined if the hospital NDS follows the minimum structures/inputs and process standards given in DOH's Hospital NDS Manual (3rd edition). We look at NDS management and procurement practices, human resources, equipment for nutritional assessment, and whether hospitals abide by meal quality and safety measures and monitor patient outcomes related to nutrition.

3.3.1. NDS Management and Procurement Practices

Meal allowance and NDS budget is decided mostly by the hospital administration (60% and 58%, respectively) (See
Table 5). This means that the allotment of resources for the NDS will be largely influenced by the hospital administration, and their buy-in is important in lobbying for additional resources.

Table 5. Management Functions of the NDS

Variable, n (%)	n	All Hospitals n=193	DOH n=65	LGU Level 2-3 n=19	LGU Level 1 n=109
Decision-maker on NDS Budget					
Hospital administration	187	109 (58)	45 (70)	10 (53)	54 (52)
Chief Nutritionist-Dietitian		78 (42)	19 (30)	9 (47)	50 (48)
Decision-maker on Meal Allowance					
Hospital administration	185	111 (60)	34 (54)	12 (67)	65 (62)
Chief Nutritionist-Dietitian		69 (37)	29 (46)	6 (33)	34 (33)
Outsourced company		5 (3)	0 (0)	0 (0)	5 (5)
Person Responsible for Procurement					
Hospital administration	191	19 (10)	9 (14)	5 (26)	5 (5)
Chief Nutritionist-Dietitian		164 (86)	54 (83)	13 (68)	97 (91)
Outsourced company		8 (4)	2 (3)	1 (5)	5 (5)
Procurement Modes Used					
Competitive Bidding	193	67 (35)	42 (65)	9 (47)	16 (15)
Repeat Order		40 (21)	15 (23)	4 (21)	21 (19)
Limited Source/Selective Bidding		18 (9)	4 (6)	4 (21)	10 (9)
Direct Contracting/Single Source Procurement		49 (25)	10 (15)	4 (21)	35 (32)
Shopping (retail price)		119 (62)	43 (66)	8 (42)	68 (62)
Negotiated Procurement		43 (22)	23 (35)	2 (11)	18 (17)
CHD support perceived sufficient	193	89 (50)	37 (61)	8 (42)	44 (44)
Advocating the adoption		117 (61)	38 (58)	14 (74)	65 (60)
Dissemination of policy		84 (44)	28 (43)	11 (59)	45 (41)
Monitoring and evaluation		70 (36)	28 (43)	9 (47)	33 (30)
Technical assistance		46 (24)	18 (28)	5 (26)	23 (21)
Training/seminars on the implementation		65 (34)	23 (35)	3 (16)	39 (36)

In terms of procurement, responsibilities are decentralized in the Nutrition and Dietetics Service through the Chief Nutritionist-Dietitian (86%). The most used procurement mode is Shopping (62%), which may be reflective of inefficient procurement practices. Food item prices in *shopping* are more expensive compared to other procurement modes because the prices are in retail. Moreover, shopping is oftentimes used as an alternative mode of procurement in contingency situations where immediate procurement of goods is needed and should not be the main procurement mode used (GPPB, 2021). Compared to *repeat orders*,

suppliers may offer lower prices because they are the same suppliers that you would order your food items from, thus, they could offer wholesale prices and discounts. Moreover, in *competitive bidding*, the bidder with the lowest prices following the desired quality of the commodities will be chosen. This signals that Nutritionist-Dietitians should also be equipped with skills and knowledge of efficient procurement strategies.

There are a lot of reasons why the hospitals resort to shopping or emergency procurement. One is the inefficient planning of menus. If the menus are not planned well, there may be food items or ingredients that need to be bought in emergency as it was not part of the pre-projected list of food items. The presence of cycle menus and standardized recipes would aid in efficient planning of procurement of food items, however, 37% of the hospitals have no standardized recipes (See **Table 7)**. Another reason may be the inability of the hospital to procure in large quantities and volume. In addition, hospitals located in rural and GIDA areas where you have to consider the availability of food commodities in the area and the freshness of perishable ingredients, might also be having difficulties in efficient procurement.

Lastly, the hospitals (50%) perceive that their respective regional offices (DOH - Center of Health Development) are not providing sufficient support in the implementation of the DOH AO on standardized meal allowance (AO 2016-0020). They might not be fully aware of the implementation guidelines and technical provisions of the policy; hence, it isn't fully adopted in hospitals. Among the kinds of support provided, the most common is the support on advocating the adoption of the policy (61%), and the least provided support is the technical assistance (24%), which may be what the NDS needs in the operationalization and implementation of the policy.

3.3.2. NDS Human Resources

Among the important contributors in the delivery of high-quality nutritional care are the NDS human resources. They are the key actors in realizing the goals of the Nutrition and Dietetics Service; thus, it is important that there are enough staff complement and well-trained personnel present to provide the services of the NDS. NDS Human Resources are composed of 3 key staffs namely: Nutritionist-Dietitians, Chefs/Cooks, and Food Service Workers.

The Nutritionist-Dietitians, does the overall planning, organizing, directing and evaluation of the clinical, food service, and administrative side of the NDS. They oversee the budget planning, cost control measures, implementation of NDS policies, planning and implementation of sanitation, food safety, and food production and quality standards. On the other hand, the Chefs/Cooks handle the meal preparation and cooking, recipe development, assists in the standardization of recipe, and portion control. They are also in charge of ensuring the food's palatability and food safety. Lastly, the Food Service Workers are tasked with a variety of unskilled manual duties in meal preparation and service including portioning of food in patient tray, distribution of food in different wards, collection and cleaning of used trays and plates, and assists in food preparation and cleaning/sanitizing of the kitchen area (DOH, 2019b).

Only half of the public hospitals (59%, 50%, 61%) meet the staffing pattern as required by the DBM-DOH Joint-Circular 2013-01 for Nutritionist-Dietitians, Chefs/Cooks, and Food Service Workers. The DBM-DOH Joint Circular No. 2013-01 states the number of staff for each staff type the NDS should have depending on the hospital's bed capacity. For instance, for a hospital with 100 authorized bed capacity, the NDS should have one (1) Nutritionist-Dietitian III, one

(1) Nutritionist-Dietitian I, three (3) Cooks, and four (4) Food Servers (as Administrative Aide III) (See Appendix A). LGU Level 2 and 3 hospitals have the least proportion meeting the standard staffing pattern for NDs and chefs/cooks (11% and 32% respectively).

This may result in a higher number of meals to supervise per staff type per working day. Results showed that in LGU Level 2 and 3 hospitals, one Nutritionist-Dietitian, and Chef/Cook supervises 210 and 201 (IQR: 137-336) meals in a working day. This is the highest compared to DOH and LGU Level 1 hospitals. Having a high workload (increased quantity of meals to prepare) may influence the working performance of the staff which in turn may affect the quality of meals (BC Cook, 2015).

Table 6. NDS Human Resources

Variable	n	All Hospitals n=193	DOH n=65	LGU Level 2-3 n=19	LGU Level 1 n=109
Staffing pattern versus standard by Bed Capacity *(DBM-DOH Joint Circular 2013-01), n (%)*					
Nutritionist-Dietitians	193	114 (59)	45 (69)	2 (11)	67 (61)
Chefs/Cooks		96 (50)	52 (80)	6 (32)	38 (35)
Food Service		118 (61)	43 (66)	12 (63)	63 (58)
Number of Meals (2020) per Staff Type per Working Day, median (IQR)					
Nutritionist-Dietitians	176	108.4 (53.4-197.7)	159.6 (72.4-219.1)	210.0 (137.6-335.6)	79.8 (44.1-135.3)
Chefs/Cooks	165	84.1 (48.7-138.9)	95.8 (72.5-145.6)	201.2 (137.6-335.6)	73.0 (37.2-116.3)
Food Service	142	60.5 (25.8-97.9)	78.7 (31.6-132.4)	73.0 (33.9-130.2)	44.2 (17.2-78.0)
Employee Contract Type, n (%)					
Nutritionist-Dietitians					
All staff hired under COS/JO* appointment	104	18 (10)	0 (0)	0 (0)	18 (17)
All permanent positions (plantilla) filled	97	137 (76)	42 (66)	15 (79)	80 (82)
Chefs/Cooks					
All staff hired under COS/JO* appointment	95	18 (10)	0 (0)	2 (11)	16 (17)
All permanent positions (plantilla) filled	90	124 (73)	41 (64)	12 (71)	71 (79)
Food Service Workers					
All staff hired under COS/JO* appointment	71	46 (31)	9 (14)	4 (25)	33 (46)
All permanent positions (plantilla) filled	43	80 (70)	38 (67)	9 (64)	33 (77)
Salary of non-permanent positions per Staff Type, median in thousands (range)					
Nutritionist-Dietitians	18	16.4 (6.6-30.0)	17,2 (11.5 -24.0)	15.2 (14.0-20.3)	17.3

					(6.6-30.0)
Chefs/Cooks	20	9.9 (6.0-16.2)	11.6 (7.9-16.2)	9.0 (8.9-12.9)	10.3 (6.0-14.4)
Food Service	70	11.0 (6.3 -15.0)	12.0 (7.5-15.0)	9.8 (7.0-12.6)	11.0 (6.3-14.4)
Trainings, n (%)					
Nutritionist-Dietitians					
No trainings	193	12 (6)	1 (2)	0 (0)	11 (10)
At least every year		119 (62)	49 (75)	6 (32)	64 (59)
Less than annually or no set time		62 (32)	15 (23)	13 (68)	34 (31)
Chefs/Cooks					
No trainings	193	98 (51)	8 (12)	12 (63)	78 (72)
At least every year		50 (26)	30 (46)	2 (11)	18 (17)
Less than annually or no set time		45 (23)	27 (42)	5 (26)	13 (12)
Food Service Workers					
No trainings	193	104 (54)	13 (20)	11 (58)	80 (73)
At least every year		41 (21)	27 (42)	2 (11)	12 (11)
Less than annually or no set time		48 (25)	25 (38)	6 (32)	17 (16)
Reasons for Lack of Trainings or Inability to Attend, n (%)					
No budget for trainings	193	90 (47)	18 (28)	12 (63)	60 (55)
No internal hospital trainings		86 (45)	14 (22)	10 (53)	62 (57)
Schedule conflicts with food service		108 (56)	39 (60)	11 (58)	58 (53)

*COS/JO – This refers to employees hired under contract of services or job-order appointments and without employer-employee relationship.

In most hospitals, the permanent positions are fully filled for Nutritionist-Dietitians, Chefs/Cooks, and Food Service Workers. Thus, hospitals resort to hiring staff under Contract of Services/Job Order, especially for food service workers. Around 70% of hospitals in this sample have fully filled permanent positions for Nutritionist-Dietitians, whose responsibility is to oversee the operations of the NDS. Ten percent (10%) of the hospitals have all their Nutritionist-Dietitians and Chefs/Cooks hired under contract of services or job order appointments, and thirty percent (30%) for the food service workers. Higher proportion of all staff being hired as COS/JO, and fully filled permanent positions is seen in LGU Level 1 hospitals.

By nature, employees hired under contract-of-service or job-order positions have no security of tenure and have lower pay rate. They also have no benefits and allowances as

they have no employer-employee relationship. This kind of precarious employment has been a known issue in the Philippines, especially in the health sector, despite the recent administration's attempt to end it (Ellao, 2015; Garcia & Daño, 2019; Tolentino, 2017). The median salary of non-permanent Nutritionist-Dietitians as reported was ₱ 16,500 pesos which is ₱7,000 below the salary of an entry-level Nutritionist-Dietitian I (Salary Grade 11 - ₱23,877). Meanwhile, for the Chefs/Cooks, non-permanent staffs are receiving on the median a salary of ₱9,900, ₱5,000 pesos short of the entry-level Cook II salary (Salary Grade 5 - ₱15,275) and for the Food Service Workers, non-permanent staffs are receiving on the median a salary of ₱11,000, ₱2,500 entry-level Administrative Aide III-Food Service Worker salary (Salary Grade 3 - ₱13,572) (DBM, 2018; DBM & DOH, 2013; RP, 2020).

Lastly, in terms of learning and development or skills enablement, among the NDS staffs, only the Nutritionist-Dietitians usually have opportunities for training. 62% of the hospitals in this sample reported that the Nutritionist-Dietitians have at least one training every year, while for the Chefs/Cooks and Food Service Workers, more than half (51% and 54%) have none. The top reasons were the lack of budget (47%) and schedule conflicts (56%). The NDS staff's peak work hours are early, mid, and end-day for the meal preparation schedules and are non-adjustable because they must serve the meals on time. Moreover, 45% of the hospitals also stated that there is no internal hospital training being conducted for them.

Opportunities for training are important to the Chefs/Cooks and FSWs as well because they are involved in the delivery of quality meals, especially in meal preparation considering food safety, and quality measures. A study done by Chang et al (2003) revealed that the Hazard Analysis Critical Control Point (HACCP) based training, which is a systematic approach in identifying food safety hazards, was found effective in improving the food safety knowledge and behavior of hospital food service employees. This is also similar to the study conducted by York et al (2009); only that training is more effective if complemented by interventions (Chang et al., 2003; York et al., 2009).

Suboptimal performance of the NDS personnel may result to delivery of low-quality nutritional care. Most performance problems may be related to skills shortfall, resource shortages, and lack of motivation (Dieleman & Harnmeijer, 2007; Hughes et al., 2021), and these usually are caused by low salaries, lack of training, and harsh working conditions (high workload) (Dieleman & Harnmeijer, 2007).

3.3.3. NDS Equipment and Process Standards

Nutrition assessment is a comprehensive approach to measure nutrition status that utilizes medical nutrition and medication histories, physical examination, anthropometric measurements, and laboratory data (DOH, 2019b). Here, nutrition assessment tools/equipment are needed. Data collected from nutrition assessment will provide the basis for the nutrition care plan and it will help the nutrition support team in providing specialized nutrition support to patients.

Less than half (42%) of the hospitals have present nutrition support teams and of these, 18% have the four essential healthcare professional cadres in NST (See Table 7). Nutrition Support Team is a group of multidisciplinary healthcare professionals with expertise in nutrition care who will be critical in the provision of nutrition support (Nightingale, 2010; Ukleja, 2018). These essential cadres are the physicians, nurses, nutritionist-dietitians, and pharmacists

(Nightingale, 2010). In terms of equipment, some hospitals lack even just the basic equipment for nutritional assessment. Only 64 (33%) of the hospital NDS have both weighing scale and stadiometer (equipment used for height measurement).

The DOH in 2019 released the Administrative Order 2019-0033 or the Implementation of Nutrition Care Process in Philippine Hospitals. This requires all patients to be screened upon admission whether they are nutritionally at risk. The multidisciplinary nutrition support team will be the key actors in this process; hence, its presence and establishment are necessary for the implementation of NCP. Also, having enough assessment tools and equipment is also critical as it is needed in nutrition assessment, which is part of the whole nutrition care process.

Table 7. NDS Equipment and Process Standards

Variable, n (%)	All Hospitals n=193	DOH n=65	LGU Level 2-3 n=19	LGU Level 1 n=109
NST Present	79 (42)	28 (43)	7 (37)	44 (42)
Has MD, RN, RND, and Pharmacist	35 (18)	14 (22)	3 (16)	18 (17)
Weighting scale + Stadiometer (height)	64 (33)	23 (35)	6 (32)	35 (32)
Tape measure (i.e., MUAC tape)	107 (55)	46 (71)	11 (58)	50 (46)
Salter scale	18 (9)	4 (6)	1 (5)	13 (12)
Body fat analyzer	7 (4)	3 (5)	1 (5)	3 (3)
None	71 (37)	15 (24)	5 (26)	51 (47)
Present, but not always followed	50 (26)	20 (32)	5 (26)	25 (23)
Present AND always followed by cooks	69 (36)	28 (44)	9 (47)	32 (30)
Measures to Ensure Food Quality	27 (14)	9 (14)	3 (16)	15 (14)
Food tasting	176 (91)	60 (92)	19 (100)	97 (89)
Visual inspection	180 (93)	61 (94)	19 (100)	100 (92)
Food weighing of cooked food for standard portions	28 (15)	9 (14)	3 (16)	16 (15)
Any measures for Food Temperature	17 (9)	7 (11)	2 (11)	8 (7)
Constant handwashing of personnel for food preparation	190 (98)	63 (97)	19 (100)	108 (99)
Washing of fruits and vegetables	192 (99)	65 (100)	19 (100)	108 (99)
Separation of raw and cooked food	187 (97)	64 (98)	19 (100)	104 (95)
Cooking of food to the right temperature	172 (89)	57 (88)	17 (89)	98 (90)
Keeping food at safe temperatures	168 (87)	54 (83)	19 (100)	95 (87)

Appropriate holding time	152 (79)	49 (75)	17 (89)	86 (79)
FIFO principle	183 (95)	63 (97)	19 (100)	101 (93)
Separate cold storage for perishables	156 (81)	52 (80)	19 (100)	85 (78)
Color-coded utensils	70 (36)	38 (58)	6 (32)	26 (24)

In terms of processes for menu planning, food quality and safety measures, and monitoring, the hospitals are also not meeting the standards.

Alarmingly, 37% of the hospitals have no standardized recipes. This means that the chefs/cooks are not measuring standard portions of ingredients, and this may result to over or underproduction of meals, having an effect on its cost-efficiency. Inconsistent or unmeasured meal portions may also lead to the emergency purchase of additional ingredients outside the projected quantities. This can contribute to the higher price of the food item because it will be bought in retail price.

Moreover, imprecise portions veering away from a set standardized recipe could also have an impact on the nutritional content of meals served (Kim et al., 2010). If a certain meal is computed to provide 1,800 calories, failing to follow the required standard portion would either provide a higher or lower energy content. Also, one thing that must be emphasized is the need to consistently advocate and teach the chefs, cooks, and food service workers on the importance of these things and how this will influence the quality of meals served because for instance, in DOH hospitals, 30% have standardized recipe, but the staff does not follow it strictly.

In terms of ensuring food quality, only 14% do all three given standards to ensure quality. These options are food tasting, visual inspection of food, and food weighing of cooked food for portioning. Usually, what the hospitals miss is the food weighing of cooked food for portioning. This may be due to the high quantity of meals to be prepared, so they usually skip this process to save time.

In terms of food safety measures, almost all the hospitals do the given standards to ensure food safety, except for the use of color-coded utensils. Food safety is critical in ensuring the quality of meals because unsafe food may cause food poisoning, and other microbiological and nutritional risks (WHO, 2020). The use of color-coded utensils is advised for the prevention of cross-contamination during meal preparation (Starovoytova, 2019); however, only (36%) of hospitals in this sample does this.

In monitoring patient outcomes, it seems that the hospitals only take into consideration the satisfaction of the patients with the NDS service or meals served (See **Table 8**). 71% of the hospitals collect data on patient satisfaction survey (either asked from all the patients, random selection, or patients with special diets). However, other indicators of patient outcomes might also be important as these can be measures of the quality of nutrition care provided to patients.

One important indicator is plate food waste. High proportion of hospitals (82%) are not collecting data on plate food waste. Among those who collect, 4% of the hospitals reported that only 51-75% of the food served is consumed. Plate food waste is the food that is served to the patients that remained to be uneaten or put to waste. This may contribute to malnutrition related complications while in the hospital, and there are also environmental and financial costs of

having a high food wastage per patient (Williams & Walton, 2011). Thus, this is important to be measured because even if the NDS were able to provide a high quality and nutritionally adequate meal, if this is not fully consumed, the patient would still not meet its nutritional requirements. This issue may remain unrecognized by the NDS if it would not be regularly measured.

Another indicator is the patient nutritional outcome. In 2019, The DOH instituted the implementation of **Nutrition Care Process (DOH AO 2019-0033).** This policy aims to standardize the process of provision of medical nutrition therapy which uses the nutrition care process in disease prevention, treatment, and management to treat nutritionally at-risk patients and further impact on overall quality of patient care (DOH, 2019a). Two years after its institutionalization, only a quarter of the hospitals in this sample (25%) were able to implement the policy (collects NCP Bi-annual report) with) the lowest proportion in LGU hospitals (5% and 7%).

Table 8. Monitoring of patient outcomes

Variable	n	All Hospitals	DOH	LGU Level 2-3	LGU Level 1
Collection of nutritional outcomes data, n (%)					
NCP Bi-annual report	193	48 (25)	39 (60)	1 (5)	8 (7)
Adverse Events		2 (1)	0 (0)	1 (5)	1 (1)
Collection of data on plate food waste, n (%)					
Not Collecting	193	158 (82)	52 (80)	15 (79)	91 (83)
0-25% consumed		2 (1)	1 (2)	0 (0)	1 (1)
26-50% consumed		0 (0)	0 (0)	0 (0)	0 (0)
51-75% consumed		8 (4)	4 (6)	0 (0)	4 (4)
76-100% consumed		25 (13)	8 (12)	4 (21)	13 (12)
Patient satisfaction survey, n (%)					
None	193	56 (29)	13 (20)	7 (37)	36 (33)
Special diets		5 (3)	2 (3)	1 (5)	2 (2)
Random		74 (38)	32 (49)	7 (37)	35 (32)
Census		58 (30)	18 (28)	4 (21)	36 (33)

The lack of monitoring processes may contribute further to the problem of unrecognized and undetected malnutrition among hospital patients. Local studies revealed that the rate of malnutrition in Philippine public hospitals is at 35-50% (DOH, 2016; Hospital Malnutrition and Clinical Nutrition Program Task Force, 2011). Bernardino et al. (2018), also showed that prevalence of malnutrition on admission and on discharge was high at 73% and is positively linked to longer hospital stays, and this is also consistent with other local studies, although focusing on specific comorbidities (Bernardino & Li ido, 2018; Caballero et al., 2012; Cabangon et al., 2016; Larrazabal et al., 2021; Ocampo et al., 2011). It is also oftentimes unrecognized and undetected, aggravating the intensity of the problem. The same pattern is

also seen in Southeast Asia and some high-income countries (Baik, 2015; Corkins et al., 2014; Inciong et al., 2020; Luma et al., 2017).

4. Conclusion and Recommendations

In conclusion, results from this case study revealed that the nutrition and dietetics services (NDS) in Philippine public hospitals generally are not able to provide admitted patients meals with adequate nutrition content, cannot comply with the minimum meal allowance budget, and cannot adhere to minimum inputs and process standards set necessary to provide high quality nutrition care to inpatients. We were able to unpack issues on human resources, equipment, management functions, and other processes of the NDS that could also influence in the quality of nutrition care provided apart from the issue in non-meeting of the minimum meal allowance budget and nutritional content as stipulated in the DOH policy on standardized meal allowance. The general intuition in improving the nutritional care provided in hospitals does not only lie in increasing the minimum meal allowance budget, but looking at the overall structures/inputs, and processes of the Nutrition and Dietetics Service as a whole. The Department of Health needs to ensure that the importance of high-quality nutrition care is realized in the hospitals, as it is oftentimes unrecognized that it can influence in the overall quality of patient care.

Due to the limited sample, **results for DOH-retained hospitals are representative of the target population** while those for LGU-owned hospitals are not. Nevertheless, we believe the results are already revealing about what could be the state of other hospitals. There may be downward bias because most of the hospitals in the LGU sample is from LGU Level 1; however, the results do not change that a stronger enabling policy is necessary for all Nutrition and Dietetics Services in public hospitals in the country.

Our recommendations are divided into research and policy recommendations:

A. Research recommendations
   - **There is a scarce literature looking into issues on the quality of nutrition care provision in the country.** Most literature in the past had focused on improving the quantity in the delivery of healthcare services; but there are only a few efforts in measuring the overall quality, and specifically, the quality of nutritional care provided in hospitals.
     - Assessment of quality of service provided by the Nutrition and Dietetics Services in Philippine public hospitals, similar to this study, **should be regularly done to monitor and continue to unpack and fix issues that might be influencing on the quality of nutrition care provided.**
     - Defined nutrition care quality indicators and frameworks to regularly assess the impact of national policies on hospital NDS and nutritional outcomes in hospitals should be explored to be the focus of future measurement of quality of nutrition care provided in hospitals (Moick et al., 2020).
   - Given the critical implications of unrecognized and undetected patient malnutrition in hospitals, monitoring of nutrition outcomes in hospitals should be further investigated see the extent of the effect of nutritional care being provided should it not adhere with the standards.
   - Various NDS Food Service System models (e.g., outsourcing the FSS operations) should also be explored to see the best fit in improving the overall quality of meals. Also, exploring and establishing the most efficient procurement strategy for food (WHO, 2021) commodities and the ideal cost management models (Neriz et al., 2014) would also aid in improving the management strategies of the NDS. Moreover, the ability to consolidate or

pool food supply procurement across service delivery networks for volume under the Universal Health Care should be explored.

B. Policy recommendations

- **The ongoing adjustment of meal allowance budget should be advocated.** This is for the cost to be updated with the current context (e.g., inflation, higher prices), and adjusted for regional prices and for inflation for the following years, so the hospitals have the policy basis to adjust according to their needs.
    - **The updated meal allowance budget should be modular**. This is so that they know how much the set cost for food, utility, and overhead costs is and not a fixed absolute price for all the components and that they can be flexible on which costs they can modify.
    - **The new policy should also advocate to the hospital administration regarding the importance of allocating resources for the meal budget allowance**. Hospital administrators are the key influencers in the decision on set meal budget allowance; hence, they should know the importance of allocating resources for provision of nutrition care (including meals).
    - **The new policy on standardized meal allowance should also be clearer in terms of its implementation and adoption**. The role of the respected DOH regional offices should be clearly stipulated so they can help in lobbying to the hospital administration for its adoption and resource allocation.
    - The standards for the prescribed nutrition content should also be clearly stipulated from energy, macronutrient, and micronutrients, and should be based on the new 2015 Philippine Dietary Recommended Intakes or PDRI. Moreover, the DOH should consider mandating strictly the presence and use of standardized recipes to all hospitals to ensure cost-efficiency, and nutrition adequacy of meals.
    - Strict and regular monitoring or auditing if this is being met should also be done to ensure that the needed nutritional requirements of the patients is being provided to them.
- Policies and standards, prescribed strategies, or capacity building activities on **efficient procurement practices** should be established to serve as a guide for the hospital Chief Nutritionist-Dietitians for cost-efficiency measures. In addition, guidelines on how to efficiently plan meals ensuring it is of high quality maximizing the limited resources available should also be present.
- **The new staffing pattern for the Nutrition and Dietetics Service proposed to the Department of Budget Management in 2019 should be advocated**. This will address problems in the lack of permanent (plantilla) positions, mismatch of designations, and the high proportion of staff being hired under contract-of-service or job order appointments with low pay and no security of tenure.
- The hospitals should provide regular in-house trainings or opportunities for capacity building not only for the Nutritionist-Dietitians, but the other NDS staff too (Chefs/Cooks, and FSWs). They should be regularly reminded of the importance and objectives of nutrition care and its impact to the overall patient outcomes. Skills training on food safety and quality measures should also be done regularly.
- **The NDS should also establish regular efforts on monitoring NDS outcomes.** This is important to know how you would intervene in maybe an unrecognized problem in the hospital. For instance, efforts should be established to measure the plate food waste in hospitals to know if the patients are receiving the nutrition provided by the meals served in hospitals.
- **The Department of Health should also consider revision of the current monitoring tools for the NDS vis-à-vis the standards set.** This is to monitor the change in the indicators whenever a policy is implemented, to see if its objectives are being met.

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Appendix A. Staffing pattern for Nutrition and Dietetics Service for 25-500 bed capacity hospitals according to DBM-DOH Joint Circular 2013-01

Position	Salary Grade	Bed Capacity									
		25	50	75	100	150	200 (L1)	200 (L3)	300	400	500
Nutritionist-Dietitian V	22							1	1	1	1
Nutritionist-Dietitian IV	20							1	1	1	1
Nutritionist-Dietitian III	18				1	1	1				
Nutritionist-Dietitian II	15	1	1	1				2	3	5	6
Nutritionist-Dietitian I	11				1	2	2				
Cook II	5	2	2	2	3	4	5	6	8	10	12
Administrative Aide III (Food Server)	3	1	2	3	4	6	7	12	12	16	16
Administrative Assistant II	8							1	1	1	1
TOTAL		4	5	6	9	13	15	23	26	34	37