

RESEARCH STUDY

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Evaluation of Patient Satisfaction with Nutrition Installation Services at PKU Muhammadiyah Gamping Hospital Yogyakarta, Indonesia

Evaluasi Kepuasan Pasien terhadap Pelayanan Instalasi Gizi di RS PKU Muhammadiyah Gamping Yogyakarta, Indonesia

Faturahman Fauzi Azwarjaya¹, Maria Ulfa^{1*}, Nurul Huda Razalli², Roslee Rajikan², Nesrin Akca³, Meltem Saygili³¹School of Medicine, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia²Dietetic Program, Center for Healthy Ageing and Wellbeing, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Selangor, Malaysia³Department of Health Management, Faculty of Health Sciences, Kirikkale University, Kirikkale, Turkiye

ARTICLE INFO

Received: 05-11-2024

Accepted: 17-06-2025

Published online: 12-09-2025

*Correspondent:

Maria Ulfa

mariaulfa@umy.ac.id

DOI:

10.20473/amnt.v9i3.2025.524-532

Available online at:

[https://e-](https://e-journal.unair.ac.id/AMNT)[journal.unair.ac.id/AMNT](https://e-journal.unair.ac.id/AMNT)

Keywords:

Patient Satisfaction, Nutrition Services, Hospitals, Food Quality

ABSTRACT

Background: PKU Muhammadiyah Gamping Hospital, Yogyakarta, recorded an estimated food waste production of around 900 kg from January to June 2024. This data highlights the significant food-related problems in healthcare facilities and underscores the need for strategies to improve patient satisfaction.

Objectives: This study aims to evaluate patient satisfaction with nutritional services at PKU Muhammadiyah Gamping Hospital, Yogyakarta.

Methods: This study employed a quantitative approach, utilizing a questionnaire comprising 44 questions adapted from the Schiavone and Acute Hospital Foodservice Patient Satisfaction Questionnaire (ACHFSPQ), which was analyzed using SPSS. Respondents were patients treated at PKU Muhammadiyah Gamping Hospital, Yogyakarta.

Results: The average patient satisfaction with food quality based on Schiavone was 3.64 ± 0.83 , and the average patient satisfaction with food quality based on the ACHFSPQ was 3.64 ± 0.873 . The satisfaction ratings ranged from 2.38 ± 0.862 to 4.64 ± 0.5 . The highest rating for food prepared and distributed safely and under control was 4.28 ± 0.573 , while the lowest rating for hospital food quality expectations was 2.38 ± 0.862 . According to Schiavone, the average patient satisfaction with food service was 4.12 ± 0.596 ; according to the ACHFSPQ, it was 4.45 ± 0.486 . The highest score for staff who delivered food neatly and cleanly was 4.64 ± 0.5 . The lowest score for comparing current food service quality with previous care experience was 3.50 ± 0.723 .

Conclusions: The research findings indicated that patients were generally satisfied with the comprehensive nutrition services. Nevertheless, some areas require enhancement, particularly in healthy menu options and food taste quality.

INTRODUCTION

Patient satisfaction is an indicator that is widely used to evaluate the quality of health services¹. Inpatient satisfaction depends on essential medical services, communication, socialization skills, and hospital food service. Food service in hospitals is a fundamental problem. Hospital food services must provide safe food according to nutritional quality, adequacy, palatability, and temperature standards, from food preparation to distribution². Foodservice in hospitals is the only source of nutrition for most patients and is an essential component of healthcare management³. Food quality and service play an essential role in patient satisfaction; food waste, which patients waste, indicates this quality¹.

Various studies have revealed that the quality of hospital food service contributes significantly to patient satisfaction during treatment⁴. Qualitative studies have revealed that patient satisfaction with hospital food service involves various factors that affect each other. Emotional, moral, cultural influences, and medical discourse also shape patient perceptions. In addition, the quality of service and the environment in which the food is provided also affect their satisfaction level⁵. The food supply system for hospital patients is an interconnected network in which various elements, such as food types, menu choices, quality, appearance, taste, and aroma, affect each other⁶. Patient satisfaction with the hospital indicates the delivery of excellent and high-quality healthcare services⁷. The overall level of patient

satisfaction with hospital service quality influences the development of loyalty. Several studies have shown that patient satisfaction drives their desire to return to the same healthcare facility⁸.

In recent years, food waste has received significant attention. After all, about 2.5 billion tons of food are thrown away yearly around the world, and the United States is the country that throws away the most food, which is almost 60 million tons per year⁹. The results of previous studies, especially those conducted in North America, have highlighted the large amount of food waste generated by institutions such as schools, universities, hospitals, and hotels¹⁰. Hospitals are one of the contributors to food waste, producing 71% of the total solid waste related to health services, with 10-15% being food waste¹¹. Several factors contribute to the occurrence of abundant and complex food waste in hospital food services. Some of the contributing factors include food spoilage, overproduction of food, inaccurate estimates, excessive use of food decorations, lack of effective communication, poorly coordinated ordering system, excessive portion portions, inadequate food quality, limited food options, reduced appetite of patients, irregular meal times, and the presence of medical disorders that affect the patient's ability to consume food¹². To assess food waste, especially in hospitals, we can adopt a questionnaire from Schiavone et al. in 2019 to evaluate patient perceptions of food waste. This tool can help us gather valuable insights into how patients view food waste and identify areas for improvement.

Nutrition services are among the most essential aspects of a hospital. This service manages food, prepares, and supplies suitable food for patients. However, most hospital management does not consider the nutrition department seriously¹³. A straightforward indicator of the success of hospital nutrition services is the amount of food waste¹⁴. The ACHFPSQ (2005) can be utilized to evaluate patient satisfaction with food service in healthcare settings. Some problems that often arise are related to patient dissatisfaction with the recommended food. One of these is that the type of food served many times in a short period will cause patients to feel bored, decreasing their appetite and food consumption¹⁵. If left unchecked, dissatisfaction with food services will cause malnutrition in hospital patients. Malnutrition in hospitals increases the severity of the disease, the duration of recovery, the duration of hospitalization, and the cost of treatment¹⁶. From January to June 2024, PKU Muhammadiyah Gamping Yogyakarta Hospital generated approximately 900 kg of food waste. This waste primarily comprises food scraps, including leftovers from meals prepared for patients and the peels and trimmings of various fruits and vegetables used in meal preparation. The high volume of food waste highlights a pressing issue within healthcare facilities, where efficient management of food resources is crucial. This situation underscores the urgent need for comprehensive waste management strategies to reduce food waste and promote sustainability practices within the hospital environment. Implementing these strategies could enhance resource efficiency, minimize environmental impact, and ultimately contribute to

better health outcomes for the community. The objective of this study is to thoroughly analyze patient satisfaction with food services at PKU Gamping Yogyakarta Hospital, which has never been done before, particularly by the hospital.

METHODS

Study Design

This study utilized a quantitative method, using a questionnaire given to predetermined respondents. The location of this research was PKU Muhammadiyah Gamping Hospital, Yogyakarta, which was carried out from February to June 2024. An online questionnaire was created using Google Forms and distributed over social media sites utilizing the snowball method to achieve a larger sample.

Participants

The target population for this study comprises patients undergoing treatment at PKU Gamping Hospital in Yogyakarta. The sample size was 50% of the total bed capacity, 225. Consequently, 112 patients who received treatment at PKU Muhammadiyah Gamping Hospital were selected as participants in this study. Selecting 50% of the total bed capacity effectively balances representativeness and feasibility. This approach captures adequate patient variability while ensuring that data collection remains manageable. Given logistical constraints such as time and resources, conducting a full-sample study would be impractical. Moreover, limiting the sample size helps minimize selection bias, enhances generalizability, and addresses ethical considerations by reducing patient burden. Purposive sampling was employed for respondent selection. The inclusion criteria specified that participants must be over 18 years old, have been hospitalized for at least two days, and be conscious and capable of eating independently. Exclusion criteria included patients who are part of combined/joint treatments, those on special diets (such as salt-restricted, post-surgery, or carbohydrate-specific diets), individuals with mental health disorders, and patients with infectious diseases.

Data Source Measures

In this study, a questionnaire consisting of 44 questions was used. The questions were adopted from Schiavone et al. (2019), with 21 questions to assess the patient evaluation of food waste and from the ACHFPSQ (2005), which consisted of 23 questions to evaluate the measure of patient food service satisfaction. The respondents' attitudes, opinions, and perceptions were then analyzed using SPSS and the Likert scale to measure the attitudes, opinions, and perceptions of the respondents.

Statistical Analysis

After being imported into Microsoft Excel, the data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Statistical significance was determined by employing a p-value of 0.05. In descriptive statistics, continuous variables were represented as the mean and standard deviation (SD),

while categorical variables were expressed as percentages and numerals.

Ethical Consideration

This research has received Ethical Approval from the Ethics Committee of Aisyiyah University Yogyakarta (No. 3410/KEP-UNISA/I/2024, valid from 29 January 2024 to 30 January 2025) and PKU Gamping Hospital (No. 030/KEP-PKU/I/2024) and a research permit from PKU Muhammadiyah Gamping Hospital Yogyakarta with No. 0289/PI.24.2/II/2024, valid from 29 January 2024 to 29 February 2024.

RESULTS AND DISCUSSIONS

PKU Muhammadiyah Gamping Hospital is an Islamic health institution that combines the functions of patient service and medical education, making it the choice of location for research. It is the primary teaching

hospital for the Faculty of Medicine and Health Sciences, University of Muhammadiyah Yogyakarta (FKIK UMY). As an Islamic-based hospital, PKU Muhammadiyah Gamping has unique service characteristics.

Based on Table 1, the majority of respondents in this study are 54.46% male, with most ages ranging from 55-65 years (33.93%). Most respondents have the last level of education in high school (43.75%) and student status (21.43%). The economic aspect showed that 51.79% of respondents had no income, and 24.11% had an income above the UMR of Sleman Regency. Interestingly, the patients who were respondents in this study were 0.89% non-Muslim, and the patients not only came from Yogyakarta, where the majority were Javanese (97.32%), but also from Kalimantan, Papua, and Chinese tribes, each 0.89%, who received the same health services without discrimination and differences.

Table 1. Respondent demographics

Information	Frequency (n=112)	Percentage (%)
Gender		
Male	61	54.46
Female	51	45.54
Age		
17-25 Years	33	29.46
26-35 Years	13	11.51
36-45 Years	18	16.07
46-55 Years	10	8.93
56-65 Years	38	33.93
Religion		
Muslim	111	99.11
Catholic	1	0.89
Ethnic		
Javanese	109	97.32
Kalimantan	1	0.89
Papua	1	0.89
Chinese	1	0.89
Marital Status		
Married	81	72.32
Unmarried	30	26.79
Divorce for Life/Divorce for Death	1	0.89
Latest Education		
Not in School	7	6.25
Elementary School/Equivalent	16	14.29
Junior High School/Equivalent	20	17.86
Public High School/Equivalent	49	43.75
College/University	20	17.86
Job		
Student	24	21.43
Private Employees	13	11.61
Housewives	23	20.54
Entrepreneur	12	10.71
Labor/Farmer	16	14.49
Freelance	10	8.93
Unemployment	14	12.50
Income		

Information	Frequency (n=112)	Percentage (%)
No Income	58	51.79
<IDR 900,000	13	11.61
IDR 1,000,000-Rp 1,999,999	14	12.50
IDR 2,000,000-Rp 2,999,999	22	19.64
IDR 3,000,000-Rp 3,999,999	3	2.68
IDR 4,000,000-Rp 4,999,999	2	1.79
IDR 5,000,000-Rp 5,999,999	0	0.00
>IDR 6,000,000	0	0.00

Hospitalization History

The survey found that 58.04% of the participants had experienced inpatient medical care at some point. Delving deeper into the data presented in Table 2, it becomes evident that 25% of these individuals received

treatment at PKU Muhammadiyah Gamping Hospital in Yogyakarta. This finding highlights that many respondents have sought medical attention at this particular hospital, indicating its prominence in providing healthcare services in the region.

Table 2. Inpatient history

Information	Frequency (n=112)	Percentage (%)
Inpatient History		
Have been Treated	65	58.04
Never Treated	47	41.96
History of Inpatient Locations		
Never Treated	47	41.96
In this Hospital (PKU Muhammadiyah Gamping Hospital)	28	25.00
At other Hospitals in the same area	19	16.96
In other Hospitals in other areas	18	16.07
In other Hospitals Abroad	0	0.00
Junior High School/Equivalent	20	17.86
Public High School/Equivalent	49	43.75
College/University	20	17.86

Food Quality

The average patient satisfaction was 3.64 ± 0.855 for the quality of food and nutrition at PKU Muhammadiyah Gamping Hospital. According to the questionnaire by Schiavone, the lowest level of satisfaction is the quality of the food in this hospital compared to your expectations for the quality of the hospital's food, with an average of 2.38 ± 0.862 . The highest level of satisfaction was that food was made and

distributed safely and controlled at an average of 4.28 ± 0.573 , and had an average of 3.64 ± 0.831 . Meanwhile, based on the ACHFSQ questionnaire, the lowest level of satisfaction is being able to choose healthy food in the hospital, with an average of 2.94 ± 1.157 . The highest level of satisfaction was receiving enough food, with an average of 4.08 ± 0.686 and an average of 3.64 ± 0.873 .

Table 3. Food quality

SCHIAVONE		
No	Component	Mean $\pm$ SD
1	Patient assessment of the quality of food in this hospital.	3.88 ± 0.654
2	Patient expectations regarding the quality of food in the hospital before being treated.	3.55 ± 0.695
3	How does the quality of the food at this hospital compare to patients expectations of the quality of the hospital's food.	2.38 ± 0.862
5	Patients feel that food is made and distributed safely and in a controlled manner.	4.28 ± 0.573
6	According to patients, the varied menu offered by the hospital.	3.88 ± 0.654
7	According to the patient, the number of portions served is sufficient.	3.89 ± 0.662
8	According to the patient, the appearance of the food served.	3.71 ± 0.690
9	The temperature of the food served is at the patient's wishes.	3.69 ± 0.911
10	Whether the patient eats the food served.	3.48 ± 1.781
Average		3.64 ± 0.831

Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFSQ)		
No	Component	Mean $\pm$ SD
1	Patient expectations regarding the quality of food in the hospital before being treated.	3.55 $\pm$ 0.695
2	The hospital food was as the patient expected.	3.63 $\pm$ 0.699
3	The menu at the hospital is varied enough that patients are interested in eating it.	3.64 $\pm$ 0.769
4	The food served by the hospital has a very delicious and different taste.	3.67 $\pm$ 0.715
5	Hot food is served at the appropriate temperature.	3.64 $\pm$ 1.056
6	Cold/warm foods are served at the appropriate temperature according to the patient.	3.6 $\pm$ 1.061
7	Hot beverages are served at the appropriate temperature according to the patient.	3.87 $\pm$ 0.982
8	Cold/warm beverages are served at the proper temperature according to the patient.	3.86 $\pm$ 0.985
9	Patients can choose healthy food in the hospital.	2.94 $\pm$ 1.157
10	The patient likes how the vegetables are cooked.	3.56 $\pm$ 0.898
11	The patient feels that he is receiving enough food.	4.08 $\pm$ 0.686
12	The patient felt that the food served was delicious.	3.59 $\pm$ 0.778
Average		3.64 $\pm$ 0.873

Quality of Service

The average patient satisfaction was 4.28 $\pm$ 0.547 for the quality of food and nutrition services at PKU Muhammadiyah Gamping Hospital. According to Schiavone's questionnaire, the lowest satisfaction level is how the quality of this hospital's meal service compares to your previous experience, with an average of 3.50 $\pm$ 0.723. The highest level of satisfaction was among

the officers who delivered friendly and polite food, with an average of 4.59 $\pm$ 0.529 and an average of 4.12 $\pm$ 0.596. Meanwhile, based on the ACHFSQ questionnaire, the lowest satisfaction level is how you rate your satisfaction with the food service, with an average of 4.13 $\pm$ 0.383. The highest level of satisfaction was that the staff who delivered my food were neat and clean, with an average of 4.64 $\pm$ 0.5 and an average of 4.45 $\pm$ 0.486.

Table 4. Quality of service

SCHIAVONE		
No	Component	Mean $\pm$ SD
1	Patients feel that meal times in the hospital are important.	4.25 $\pm$ 0.664
2	According to the patient, the officer who delivered the food was friendly and polite.	4.59 $\pm$ 0.529
3	According to patients, the overall quality of dining services.	4.15 $\pm$ 0.588
4	According to patients, the quality of dining services at the current hospital is compared to their previous experience at other hospitals.	3.50 $\pm$ 0.723
	In general, what does the house provide in terms of quality of service.	4.34 $\pm$ 0.476
5	If the patient has received treatment before, according to the patient, the quality of food services at the hospital is currently better than the patient's previous experience.	
Average		4.12 $\pm$ 0.596

Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFSQ)		
No	Component	Mean $\pm$ SD
1	The employee who served my food was neat and clean.	4.64 $\pm$ 0.5
2	The staff who picked up my food tray were friendly and polite.	4.63 $\pm$ 0.52
3	The staff who delivered my food were very helpful.	4.38 $\pm$ 0.541
4	Overall, how satisfied are you with the food service.	4.13 $\pm$ 0.383
Average		4.45 $\pm$ 0.486

After an analysis of patient satisfaction with the quality of food and food services in the inner squeezing ward at the PKU Muhammadiyah Gamping Yogyakarta Zakir house, it can be seen that patient satisfaction is multidimensional and complex, so it is difficult to measure it with certainty. This research aims to dig deeper into this complex concept. The finding that patients' overall expectations of hospital food quality

were poor, with a score of 2.38 $\pm$ 0.862, has significant implications for both patients and hospitals. Low expectations can negatively affect patients' perception of care, reduce trust in the institution, and potentially lead to inadequate nutritional intake if meals are rejected, which may delay recovery and compromise overall health. Poor food quality can also diminish patients' mental well-being, as food is essential to comfort and

satisfaction during hospitalization. For hospitals, these low expectations can harm their reputation, as patient dissatisfaction may lead to negative word-of-mouth and decreased competitiveness. Furthermore, patients rejecting meals could increase operational costs and extend hospital stays, straining resources.

Persistently poor expectations may also indicate a failure to meet nutritional and regulatory standards, posing risks for compliance and accreditation. Addressing these issues by improving food quality, incorporating patient feedback, and offering more personalized meal options can enhance patient satisfaction, recovery outcomes, and the hospital's overall performance. This observation is of considerable importance, as it underscores a potential area for enhancement in patient satisfaction levels. The relationship between patient expectations for hospital services, including culinary offerings, and their loyalty to healthcare institutions is well-documented in the literature. Several studies suggest that positive patient expectations and experiences significantly influence their propensity to return to the same healthcare facility in the future. Consequently, improving the quality of hospital food may be a vital strategy for enhancing overall patient satisfaction and fostering long-term loyalty within the patient population. Various factors, ranging from food characteristics (taste, texture, variety), service quality (staff friendliness, speed of service), and the condition of the dining environment, contribute to patient satisfaction with food service¹⁷. However, research shows that food quality, taste, nutrition, and appearance are significant factors in satisfaction¹⁸. In addition, the available evidence does not clearly show the relationship between patients' expectations and their satisfaction level¹⁹. There is no globally accepted knowledge of how and to what extent unmet expectations affect overall satisfaction²⁰. However, it was also found that the experience of patients who had been treated compared to the current experience at this hospital tended to be good, with a value of 3.50 ± 0.723 . It indicates an improvement in the quality of food service at this hospital. Patients who have undergone previous treatment have given positive feedback, indicating that the hospital's improvement efforts have improved the quality of their food over time.

This study found that the assessment of food quality in this hospital was the highest in food made and distributed safely and controlled at 4.28 ± 0.573 . Proper food delivery time and guaranteed food safety during the distribution process are crucial to meeting the nutritional needs of patients and increasing patient satisfaction with the services provided. Previous studies showed that patients were satisfied when food was served on time²¹. Each type of food at PKU Gamping Hospital Yogyakarta was placed in a separate container equipped with a lid to prevent bacterial cross-contamination. This practice is a crucial step to ensure food safety, considering that contamination can occur if tableware hygiene procedures are not carried out adequately²². Additionally, the patient's appetite may be impacted by the taste of the food, so if it does not taste well, it could also be influenced by the cleanliness or temperature at which it is served. It will affect patient satisfaction with the service²³. This study also shows that eating portions that

suit the needs of patients is very important. The average assessment of patients on food portions was 4.08 ± 0.686 . Based on the patient's assessment, the portion of food given tends to be larger than they need, although the hospital calculates portions of vegetables and side dishes to meet nutritional needs²². This condition shows a mismatch between the patient's perception and the nutrition plan that has been set. As a result, unfinished food can lead to food waste and hinder the achievement of optimal nutrition goals²⁴.

According to the researchers, the lowest assessment of patients' expectations of hospital food quality received a poor score of 2.38 ± 0.862 . Individual expectations vary significantly between populations, influenced by prior knowledge, socioeconomic status, values, and attitudes². Every patient expects the hospital's food service always to be consistent and in line with their expectations²⁵. In addition, being able to choose healthy food in the hospital got a sufficient score of 2.94 ± 1.157 . A variety of food options can increase the patient's appetite. One way to overcome boredom while eating is to offer a varied menu²⁶. One of the leading causes of low patient satisfaction with the quality of food in hospitals is the need for more information about menu variations. The absence of a comprehensive menu list makes it difficult for patients to choose food according to their preferences²⁷. Therefore, improvements to this problem are significant.

In this study, it was indicated that the evaluation of food service in this hospital was highest in the staff who delivered friendly and polite food, 4.59 ± 0.529 , and the staff who delivered my food was neat and clean, 4.64 ± 0.5 . Both evaluation results of hospital staff showed good to excellent performance. The results of research in halal-certified and non-halal-certified hospitals show that there is a difference in the level of patient satisfaction with nutritional services based on the friendliness of the waiters²⁸. It is essential because food delivery officers not only deliver food but also act as hospital representatives and directly influence patients' perceptions of service quality. The majority of patients expressed a high level of satisfaction due to the staff's friendliness in providing services²⁹. These dimensions of successful services need to be maintained and continuously developed to strengthen patients' confidence in hospital food services in the future³⁰. One of the findings that needs to be considered is the low score in comparing the current food service quality with the previous experience of 3.50 ± 0.723 . It shows that there is still room for improvement in improving the quality of food service to meet patient expectations and provide a better experience. Punctuality, diverse food options, and good interpersonal relationships with staff are important factors in providing optimal service¹⁸. Another factor affects inpatient satisfaction in the context of food service quality. In particular, attention is paid to freshness, presentation, taste preferences, and improving the presentation of food to have a positive impact on the inpatient experience³¹.

The study results showed a diversity of food preferences among patients. 17.9% of respondents stated that the menu served differed from their taste, while 0.89% felt it did not match the food's aroma,

temperature, and taste. In addition, 1.79% of respondents also complained about the inconsistency of the time and portion of meals given. Patient satisfaction with the overall food service, including the variety of available dishes, is crucial. Research shows that menu-related problems can have a significant impact on patients' food consumption¹⁶. In addition, the taste, aroma, and cooking technique of meat and vegetables are also essential determinants in the patient's assessment of the quality of the food served³². Paying attention to the complaints of patients is also an effort to reduce food waste because other studies say there is a significant relationship between food taste and food waste at the Teluk Kuantan Regional Hospital³³. Food waste can be an indication of the nutritional adequacy of patients because inpatient food consumption is related to nutritional status and satisfaction with food services³⁴.

The findings indicate that evaluations can be conducted to identify improvements related to the deficiencies in the food provided, including the diversity of nutritious options and patient expectations regarding food quality. This study employs the criteria of respondents, specifically patients in the class III internal medicine ward at PKU Gamping Yogyakarta Hospital, limiting its applicability to evaluating patient satisfaction within this ward classification.

CONCLUSIONS

The evaluation of overall patient satisfaction with the quality and food service at PKU Gamping Hospital, Yogyakarta, showed promising results. However, it was found that there was dissatisfaction with several services, one of which was that patients needed help to choose a healthy food menu at the hospital. Other factors that need to be considered in patient satisfaction are aroma, temperature, taste, time, and portion of food. Improving services can provide a good experience to patients so that a sense of trust and loyalty arises in patients on the next visit. It will increase patients' expectations of the quality of hospital food, which currently has poor judgments.

ACKNOWLEDGEMENT

The writers would like to thank all respondents who participated in this study, RS PKU Muhammadiyah Gamping Yogyakarta, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia, Universiti Kebangsaan Malaysia, Malaysia, Universiti Kiriikkale, Turkiye, and all authors for supporting this research.

CONFLICT OF INTEREST AND FUNDING DISCLOSURE

There is no conflict of interest in this study. This research did not receive funding from sponsors or any other party.

AUTHOR CONTRIBUTIONS

FFA: conceptualization, investigation, formal analysis, methodology, writing original draft, and editing; MU: conceptualization, investigation, visualization, methodology, supervision, writing review and editing; NHR & RR: methodology, writing review and editing; NA: validation, writing review and editing; MS: validation, writing review and editing.

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