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Associations between menu quality, foodservice quality, patient satisfaction, and trust among hospital inpatients: A PLS-SEM study

Hubungan antara kualitas menu, kualitas layanan makanan, kepuasan pasien, dan kepercayaan pasien rawat inap rumah sakit: Studi PLS-SEM

Sri Rahayu Yuni Mulyaningtyas[1*], Nurul Muslihah[2], Irma Sarita Rahmawati[3]

[1] Master's Student, Nutrition Science Program, Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia.
E-mail: srirahayuyani123@outlook.co.id
[2] Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia.
E-mail: nurul_muslihah.fk@ub.ac.id
[3] Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia.
E-mail: irma_sr@ub.ac.id

***Correspondence Author:**
Master's Student, Nutrition Science Program, Faculty of Health Sciences, Universitas Brawijaya, Puncak Dieng Exclusive, Kunci, Kalisongo, Dau District, Malang Regency, East Java, Indonesia.
Email: srirahayuyani123@outlook.co.id

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Abstract

Hospital nutrition services influence the quality of patient care; however, the mediating role of satisfaction in building patient trust remains underexplored. This cross-sectional study examined the associations between menu quality, foodservice quality, patient satisfaction, and patient trust among 385 Class III inpatients at Kanjuruhan Regional General Hospital, Indonesia (February–May 2025), recruited through consecutive sampling. Data were collected via structured interviews using a validated 32-item questionnaire (Cronbach's α=0.960). Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to examine the direct and indirect associations. Menu quality significantly influenced patient satisfaction (β=0.446, p<0.001) and trust (β=0.280, p<0.001). Foodservice quality significantly affected satisfaction (β=0.263, p<0.001) and trust (β=0.194, p=0.001) in the present study. Patient satisfaction strongly predicted trust (β=0.445, p<0.001) and partially mediated the effects of menu quality (indirect effect=0.198, p<0.001) and foodservice quality (indirect effect=0.117, p<0.001). The model explained 40.7% of the variance in satisfaction and 62.0% in trust. In conclusion, menu quality and foodservice quality were significantly associated with patient trust through both direct and satisfaction-mediated pathways. Enhancing these dimensions is a strategic priority for improving institutional trust in hospital nutrition services.

Keywords: food service, hospital nutrition services, menu quality, patient satisfaction, patient trust; PLS-SEM.

Abstrak

Layanan gizi rumah sakit berpengaruh terhadap kualitas perawatan pasien, namun peran mediasi kepuasan dalam membangun kepercayaan pasien masih belum banyak dieksplorasi. Studi potong lintang mengkaji hubungan kualitas menu, kualitas layanan makanan, kepuasan pasien, dan kepercayaan pasien pada 385 pasien rawat inap Kelas III di RSUD Kanjuruhan, (Februari–Mei 2025). Data dikumpulkan menggunakan kuesioner tervalidasi 32 item (Cronbach's α=0,960). Partial Least Squares Structural Equation Modeling (PLS-SEM). Kualitas menu berpengaruh signifikan terhadap kepuasan (β=0,446, p<0,001) dan kepercayaan (β=0,280, p<0,001). Kualitas layanan makanan berpengaruh signifikan terhadap kepuasan (β=0,263, p<0,001) dan kepercayaan (β=0,194, p=0,001). Kepuasan memprediksi kepercayaan secara kuat (β=0,445, p<0,001) dan memediasi parsial pengaruh kualitas menu (efek tidak langsung=0,198, p<0,001) dan kualitas layanan makanan (efek tidak langsung=0,117, p<0,001). Model menjelaskan 40,7% varians kepuasan dan 62,0% kepercayaan. Kesimpulan, kualitas menu dan layanan makanan berhubungan signifikan dengan kepercayaan melalui jalur langsung dan mediasi kepuasan. Peningkatan

kedua dimensi merupakan prioritas strategis meningkatkan kepercayaan layanan gizi rumah sakit.

Kata Kunci: kualitas menu, layanan makanan; layanan gizi rumah sakit kepercayaan pasien; kepuasan pasien; PLS-SEM.

Introduction

Nutrition services are an essential component of hospital healthcare systems, as they support medical therapy, accelerate recovery, and help maintain patients' nutritional status These services do not merely fulfill nutritional requirements based on clinical conditions but also ensure that the meals provided are safe, of good quality, and sensorially acceptable (Putri, 2023). Eating experience attributes, including taste, aroma, and appearance, are closely related to patients' food intake and satisfaction with hospital services (Pradnyani et al., 2024; Firdaus et al., 2025; Mariasih et al., 2023).

The food preparation process plays a vital role in determining the final quality of the meals served to patients. The implementation of standardized recipes, seasonings, and operational procedures is required to ensure taste consistency, appearance, and food safety (Furqonia & Fermeza, 2025). Appropriate portion standards also contribute to fulfilling nutritional needs; however, studies indicate discrepancies between standard and actual portions, which may reduce the quality of nutrition services (Asyriani et al., 2024).

Beyond food preparation, menu quality and food service performance are influenced by menu variety, serving procedures, timeliness of food distribution, and staff attitude. A lack of menu variety has been reported to reduce patient satisfaction among inpatients (Sofiadila et al., 2025).Irregular evaluation of service standards may also lead to inconsistencies in taste, aroma, and the availability of monotonous meal options (Cholilullah et al., 2022). Cleanliness of equipment, courtesy, and appearance of foodservice attendants also serve as indicators of patient satisfaction with hospital food services (Pratiwi et al., 2022).

Patient satisfaction with hospital meals is an indicator of healthcare quality and is included in the Minimum Service Standards (SPM), which target ≥90% satisfaction (Dewanti & Ruhana, 2025). Satisfaction is shaped by the interaction between patients' expectations and their actual care experience, including food-related experiences during their hospitalization (Laila, 2024). Positive eating experiences increase satisfaction, whereas dissatisfaction can drive patients to seek external food sources (Palupi et al., 2024).

Despite the growing recognition of the importance of nutrition services in patient care, research examining the mediating role of satisfaction in the formation of patient trust remains limited. Most prior studies have positioned satisfaction as a final outcome, rather than as an intermediary mechanism. Recent hospital foodservice research has predominantly focused on the direct relationship between service quality and satisfaction (Priantini et al., 2025; Cahyaningrum, 2025; Widyaningsih & Panjaitan, 2024; Nurdini & Wijayanti, 2023; Palupi et al., 2024), without testing the mediating role of satisfaction in trust formation. Although studies in broader healthcare contexts have demonstrated that satisfaction mediates the relationship between service quality and trust (Al-Hilou & Suifan, 2023; Sari et al., 2025), this mediation pathway has not been systematically tested in hospital nutrition services.

This represents a significant gap in understanding how service quality influences trust, which is a more strategic construct in long-term healthcare relationships. Trust reflects patients' confidence in the hospital's competence, benevolence, and integrity (Al-Hilou & Suifan, 2023) and is theoretically distinct from satisfaction in both conceptual meaning and temporal development. According to the Expectation Confirmation Theory (Oliver, 1980), satisfaction arises when service performance meets or exceeds expectations, subsequently reinforcing long-term trust in the service provider. The Service Quality Theory developed by Parasuraman et al. in 1988 states that consistent service quality contributes to positive perceptions and institutional trust over time. These theoretical frameworks suggest that satisfaction functions as a psychological intermediary through which service quality attributes translate into trust; however, empirical testing of this mechanism in hospital nutrition services remains scarce (Wilder et al., 2024). This study developed a mediation model

to examine the influence of menu quality and foodservice quality on patient trust, with satisfaction as the mediating variable.

The novelty of this study lies in the development and empirical testing of a mediation model that positions patient satisfaction as an intermediary mechanism linking menu and foodservice quality to patient trust. Unlike previous research that treated satisfaction as an endpoint, this study conceptualizes satisfaction as a psychological pathway through which operational service dimensions (menu quality and foodservice quality) contribute to the formation of trust in the institution. This theoretical positioning is grounded in service quality and expectation confirmation theories, both of which suggest that service quality operates through satisfaction to build trust. Furthermore, this study addresses a contextual gap by focusing on Class III inpatients in a regional public hospital setting, a population segment that has received limited empirical attention despite representing the majority of patients in Indonesian public healthcare facilities.

This study aimed to examine the associations between menu quality, foodservice quality, patient satisfaction, and patient trust among Class III inpatients at Kanjuruhan Regional Public Hospital, Malang Regency, with patient satisfaction as a potential mediator. Specifically, this study tested the following hypotheses using a structural equation modeling framework. This study proposes that menu quality and foodservice quality play significant roles in shaping patients' perceptions within healthcare settings. Specifically, menu quality was hypothesized to be positively associated with patient satisfaction (H1) and trust (H3). Likewise, foodservice quality is expected to be positively associated with patient satisfaction (H2) and trust (H4). Furthermore, patient satisfaction was proposed to have a positive association with patient trust (H5). Importantly, patient satisfaction was hypothesized to mediate the relationship between menu quality and patient trust (H6) and between foodservice quality and patient trust (H7), suggesting that improvements in dietary and service aspects may enhance trust indirectly through increased satisfaction.

Figure 1 presents the conceptual framework guiding this study, illustrating the hypothesized direct and indirect associations between menu quality, foodservice quality, patient satisfaction, and patient trust.

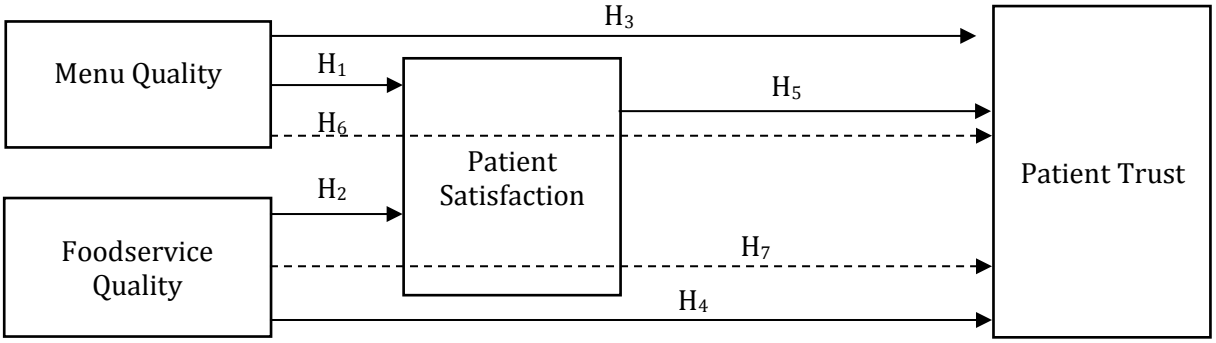

Figure 1. Conceptual framework hypothesized direct and indirect associations among study variables

Methods

This study employed an analytical, cross-sectional design. Given the nature of cross-sectional data collection, causal relationships cannot be established; instead, this study examined the associations among variables at a single point in time. Although mediation hypotheses were tested using structural equation modeling techniques, it is acknowledged that the cross-sectional design does not permit definitive conclusions regarding temporal precedence or causal directionality among variables. The mediation model tested represents a theoretically grounded framework consistent with Expectation Confirmation Theory and Service Quality Theory, but empirical confirmation of temporal sequencing would require longitudinal data.The research was conducted in the Class III inpatient wards of Kanjuruhan Regional Public Hospital, Malang Regency, from February to May 2025.

The study population consisted of all Class III inpatients at RSUD Kanjuruhan Malang who

met the eligibility criteria during the data collection period. The sample size was determined using two approaches: (1) proportion estimation formula at 95% confidence level (n = 384), and (2) PLS-SEM minimum requirement following Ezeugwa et al. (2022), which recommends at least 10 times the maximum number of structural paths directed at a construct (three paths to patient trust, requiring minimum n = 30). To ensure a robust analysis and accommodate potential incomplete responses, 400 eligible patients were approached using consecutive sampling among those meeting the inclusion criteria: aged ≥ 19 years, receiving regular/soft/pureed diets, having received ≥3 meal servings, medically stable, and willing to participate. The exclusion criteria were cognitive impairment, critically ill status, and specialized therapeutic diets. To minimize selection bias, data collection was conducted across different days/times, with trained research assistants independent of foodservice delivery approaching patients, and participation was entirely voluntary. Of the 400 eligible patients approached, 385 completed valid questionnaires (response rate: 96.25%), with non-response analysis showing no significant demographic differences between respondents and non-respondents, indicating minimal non-response bias.

The independent variables were menu quality and foodservice quality, the dependent variable was patient trust, and patient satisfaction served as a mediating variable. Menu quality was assessed using indicators such as taste, aroma, texture, menu variation, portion size, temperature, appearance, and doneness. Foodservice quality was evaluated based on staff courtesy, appearance, foodservice equipment, and timeliness of meal distribution. Patient satisfaction and trust were measured using a 32-item questionnaire adapted from the Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFPSQ) (Potsi & Syngelakis, 2025). Translation validation was conducted through forward-backward translation by two independent bilingual translators and a content validity assessment by three experts in hospital nutrition services. The questionnaire employed a 4-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) without a neutral midpoint to encourage decisive responses and minimize acquiescence bias, following the recommendations by Kankaraš and Capecchi (2025) for healthcare satisfaction research, where respondents' clear positioning is needed for actionable quality improvement. Patient trust was operationalized using dimensions adapted from Richmond et al., (2022) and Greene & Samuel-Jakubos (2021) and commitment-trust theory, encompassing reliability (consistency in service delivery), competence (ability to meet nutritional needs), and benevolence (patient-centered care orientation), which were contextualized to hospital foodservice settings. The instrument demonstrated excellent internal consistency (Cronbach's $\alpha = 0.960$) and adequate validity (all items $r > 0.05$), with all constructs meeting PLS-SEM criteria for convergent validity (outer loadings >0.6, AVE >0.5) and discriminant validity (HTMT <0.90).

Data were collected through structured interviews with trained enumerators. The collected data were coded, tabulated, and entered into a computerized database. Responses to the Likert-scale items were converted into numerical scores to generate composite indices for each variable.

Data analysis was performed using structural equation modeling-partial least squares (SEM-PLS) with SmartPLS 4.0 software to evaluate the direct and indirect effects among variables, including patient satisfaction as a mediator. Multicollinearity was assessed using the Variance Inflation Factor (VIF < 3.0), and common method bias was evaluated through full collinearity assessment (all inner VIF values < 3.3), confirming no substantial bias (Kelana et al., 2025). The measurement model was evaluated for convergent validity (outer loadings >0.6, AVE >0.5), discriminant validity (HTMT <0.9), and construct reliability (Composite Reliability >0.7). The structural model was assessed using bootstrapping with 5,000 resamples to generate robust confidence intervals (CIs). Statistical evaluation included path coefficients (β), t-statistics, p-values (one-tailed, $\alpha = 0.05$), coefficient of determination (R^2) to assess explanatory power, effect size (f^2) for practical significance, and indirect effect testing with bias-corrected confidence intervals to evaluate mediation effects (Rabbi et al., 2025).

Ethical approval was obtained from the Research Ethics Committee of the Kanjuruhan Regional Public Hospital, Malang Regency (Approval No. 072.1/EA.KEPK-

003/35.07.302.101/2025). Written informed consent was obtained from all respondents prior to data collection, and the confidentiality of participant information was strictly maintained.

Result and Discussion

Respondent Characteristics

A total of 385 Class III inpatients at Kanjuruhan Regional Public Hospital, Malang Regency, participated in this study, demonstrating a relatively balanced sex distribution (male: 49.4%; female: 50.6%). Respondents were distributed across three age groups: 19–44 years (30.6%), 45–59 years (36.9%), and ≥60 years (32.5%), with the largest proportion in the middle-age category. The majority of respondents had completed primary school education (53.0%), followed by junior high school (23.4%), senior high school (20.3%), and higher education (3.4%) levels.

Table 1. Characteristics of respondents

Characteristics	n (%)
Sex	
Male	190 (49.4)
Female	195 (50.6)
Age (years)	
19–44	118 (30.6)
45–59	142 (36.9)
≥ 60	125 (32.5)
Education	
Primary School	204 (53.0)
Junior High School	90 (23.4)
Senior High School	78 (20.3)
Higher Education	13 (3.4)

This demographic pattern reflects the general profile of Class III inpatients in Indonesian public hospitals and is consistent with previous studies indicating that while demographic characteristics shape patients' perceptions of hospital food and nutrition services, they do not consistently exert a significant influence on overall satisfaction (Palupi et al., 2024).

Respondents' Assessment of Research Variables

The research instrument consisted of 32 items that had undergone validity testing ($r < 0.05$) and reliability testing, with a Cronbach's alpha value of 0.960, indicating an excellent level of internal consistency.

Table 2. Descriptive statistics and interpretation of research variables

Variables	Mean ± SD	Range	Interpretation Category*
Menu Quality	3.16 ± 0.339	1.75–4.00	High
Foodservice Quality	3.32 ± 0.407	1.25–4.00	Very High
Patient Satisfaction	3.21 ± 0.389	1.50–4.00	High
Patient Trust	3.22 ± 0.401	1.75–4.00	High

Respondent assessments indicated that all the study variables were rated favorably (Table 2). Foodservice quality received the highest mean score (3.32 ± 0.407; very high), followed by patient trust (3.22 ± 0.401; high), patient satisfaction (3.21 ± 0.389; high), and menu quality (3.16 ± 0.339; high). Using the interpretation criteria based on interval class width calculation [(maximum score − minimum score) / number of categories = (4−1)/4 = 0.75], all constructs demonstrated mean scores above the midpoint of the scale (≥2.50), indicating positive perceptions of hospital foodservice quality and relatively strong patient confidence in the nutrition service system.

Notably, Foodservice quality received a higher rating than menu quality, suggesting that service delivery aspects, such as staff courtesy, timeliness, and presentation, were perceived more favorably than food attributes. This finding aligns with a recent cross-sectional study by Barros et al. (2025), who reported that service dimensions such as timeliness, staff attitude, and personal engagement significantly contributed to patient satisfaction with hospital food services. The study emphasized that excellence in service delivery can enhance the overall patient experience, even when menu-related factors show room for improvement, underscoring the importance of integrating both menu design enhancements and consistent service standards as complementary strategies to support institutional quality goals.

Measurement Model Evaluation

Table 3. Outer loading values and construct validity metrics

Construct	Indicator	Description	Outer Loading
Menu Quality	X11	Taste	0.782
	X12	Aroma	0.758
	X13	Texture	0.773
	X14	Menu variation	0.776
	X15	Portion size	0.755
	X16	Temperature	0.78
	X17	Appearance	0.804
	X18	Doneness	0.639
Foodservice Quality	X21	Staff courtesy	0.875
	X22	Staff appearance	0.867
	X23	Equipment cleanliness	0.909
	X24	Timeliness	0.907
Patient Satisfaction	Y1	Satisfaction with menu	0.912
	Y2	Satisfaction with service	0.9
	Y3	Satisfaction with ambiance	0.882
Patient Trust	Z1	Service reliability	0.872
	Z2	Food safety	0.909
	Z3	Support for recovery	0.889

Measurement model evaluation using PLS-SEM confirmed that all latent constructs met the validity and reliability criteria. Convergent validity was established through outer loading values (0.639–0.912, all >0.6) and AVE values (0.591–0.797, all >0.5). Discriminant validity was confirmed via the HTMT (all <0.90) and Fornell-Larcker criterion (√AVE exceeded inter-construct correlations). Construct reliability was excellent, with Composite Reliability (0.920–0.938) and Cronbach's alpha (0.869–0.912) exceeding 0.7. The detailed indicator-level outer loadings are presented in Table 3.

Structural Model Evaluation

Table 4. Structural model results summary

Path	β (p-value)	f^2	R^2
Menu quality → patient satisfaction	0.446 (<0.001)	0.217	0.407
Foodservice quality → patient satisfaction	0.263 (<0.001)	0.076	
Menu quality → patient trust	0.280 (<0.001)	0.11	0.62
Foodservice quality → patient trust	0.194 (<0.001)	0.059	
Patient satisfaction → patient trust	0.445 (<0.001)	0.308	
Menu quality → patient satisfaction → patient trust	0.198 (<0.001)		
Food service quality → patient satisfaction → patient trust	0.117 (<0.001)		

The structural model demonstrated strong explanatory and predictive relevance. Menu quality and foodservice quality explained 40.7% of the variance in patient satisfaction (R^2 = 0.407), whereas all three predictors explained 62.0% of the variance in patient trust (R^2 = 0.620). Stone-Geisser's Q^2 (0.775) confirmed robust predictive capability. The goodness of fit index (0.618) substantially exceeded the 0.36 threshold, indicating an excellent model fit.

All direct path coefficients were statistically significant ($p < 0.001$): menu quality → patient satisfaction (β = 0.446), foodservice quality → patient satisfaction (β = 0.263), menu quality → patient trust (β = 0.280), foodservice quality → patient trust (β = 0.194), and patient satisfaction → patient trust (β = 0.445). Effect size analysis (f^2) revealed that menu quality exerted moderate effects on patient satisfaction (0.217) and small effects on patient trust (0.110); foodservice quality showed small effects on both satisfaction (0.076) and trust (0.059); and patient satisfaction demonstrated moderate effects on trust (0.308). Mediation

analysis confirmed that patient satisfaction partially mediated the relationship between menu quality and trust (indirect β = 0.198, p < 0.001) and between foodservice quality and trust (indirect β = 0.117, p < 0.001), as both direct and indirect effects were significant (Table 4).

Mediation of Patient Satisfaction in the Relationship Between Menu Quality, Foodservice Quality, and Patient Trust

All pathway coefficients in Table 4 were significant at p<0.01, confirming that the relationships among the variables occurred directly and via the mediating pathway.

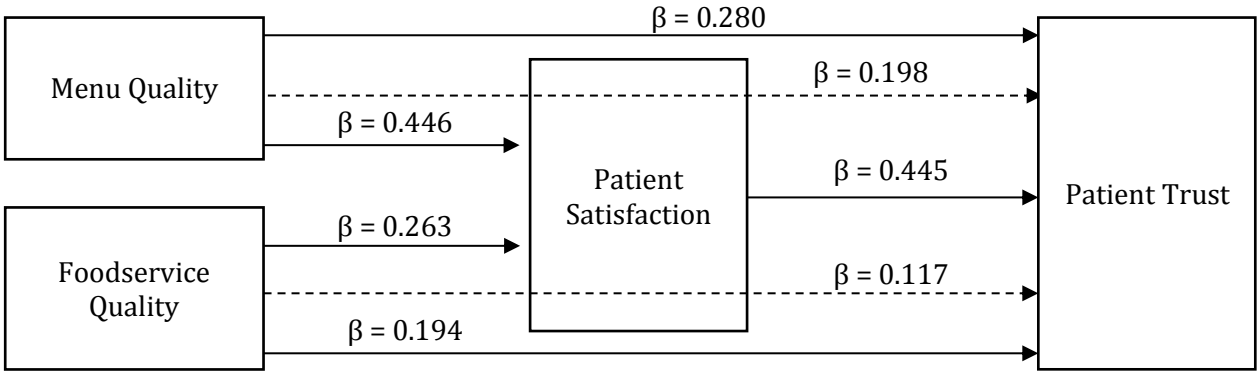

Figure 2. Mediation model of patient satisfaction on the relationship between menu quality, foodservice quality, and patient trust

Effects of Menu and Foodservice Quality on Patient Satisfaction

The SEM-PLS analysis showed that both menu quality and foodservice quality had positive and significant effects on inpatient's satisfaction. Menu quality had the strongest influence on patient satisfaction (β = 0.446; p < 0.001), followed by foodservice quality (β = 0.263; p < 0.001). These findings indicate that improvements in menu quality and food service delivery contribute to higher patient satisfaction with hospital nutrition services.

These results are consistent with those of Priantini et al. (2025), who found that better food quality, including taste, nutritional value, and hygiene, significantly increased patient satisfaction. Widyaningsih and Panjaitan (2024) emphasized that multiple components of hospital food services must be improved to encourage patients to consume hospital food, with menu quality (nutrient-dense variety and good taste) contributing to improved dietary intake and satisfaction. In addition, a study by Cahyaningrum (2025) at the Islamic Hospital of Surabaya reported that foodservice attributes, such as timeliness, server hygiene, and staff attitude, were significantly correlated with patient satisfaction.

In this study, higher menu variety, ingredient quality, and service standards through training and food handler hygiene were associated with stronger patient perceptions of service quality and satisfaction. This association aligns with the findings of Nurdini & Wijayanti (2023), who reported that patient satisfaction was related to timely meal distribution, menu variety and taste, cleanliness of utensils, and staff appearance. Conversely, monotonous or poor-quality menus were associated with reduced appetite and satisfaction, suggesting that menu and foodservice quality improvements are strategic priorities for enhancing patient satisfaction in hospital settings.

Effects of Menu and Foodservice Quality on Patient Trust

The finding that menu quality (β = 0.280; p < 0.001) and foodservice quality (β = 0.194; p < 0.001) were positively associated with patient trust underscores the strategic importance of nutrition services in building institutional trust in hospital settings.

These findings align with and extend Parasuraman's Service Quality Theory, which posits that service quality operates through five dimensions–reliability, responsiveness, assurance, empathy, and tangibles–to shape customer perceptions and trust (Lapian & Irawati, 2024). In the hospital foodservice context, menu quality represents the tangible dimension (physical evidence of food presentation, appearance, and sensory attributes), whereas foodservice quality

embodies multiple dimensions: reliability (consistent meal delivery), responsiveness (timely service), assurance (staff competence and courtesy), and empathy (staff attentiveness to patient needs). The stronger effect of menu quality (β = 0.280) compared to foodservice quality (β = 0.194) suggests that in nutrition services, tangible food attributes may exert a greater influence on trust formation than process-oriented service dimensions. This pattern extends Service Quality Theory by demonstrating that in healthcare contexts where patients are vulnerable and dependent on institutional care, the physical product (food) may serve as a more salient trust cue than interpersonal service encounters. Furthermore, the mediating role of satisfaction (discussed below) supports the theory's premise that service quality influences behavioral outcomes (trust and loyalty) through attitudinal mechanisms (satisfaction). Al-Hilou and Suifan (2023) confirmed that service quality contributes to patient trust through satisfaction mediation, reinforcing the theoretical pathway observed in this study.

To operationalize these theoretical insights, hospitals should implement evidence-based strategies across all service quality dimensions: (1) Tangibles enhancement: conducting regular sensory evaluations of menu quality through expert tasting panels and patient feedback systems to ensure consistency in taste, aroma, texture, and food presentation; (2) Reliability and assurance strengthening: establishing strict Standard Operating Procedures (SOPs) for food preparation, distribution, and service hygiene, supported by systematic staff training on both technical competence and service attitude to build patient confidence in foodservice dependability; and (3) Responsiveness development: creating responsive complaint-handling and service recovery systems to address foodservice issues promptly, thereby maintaining trust even when service gaps occur. These interventions should not be conceptualized as isolated operational improvements but as integrated strategies to strengthen the service quality-satisfaction-trust pathway theorized by Parasuraman and empirically validated in this healthcare nutrition context.

Mediating Role of Patient Satisfaction

The mediation analysis showed that patient satisfaction partially mediated the relationship between menu quality (indirect effect β = 0.198; $p < 0.001$) and foodservice quality (indirect effect β = 0.117; $p < 0.001$) and patient trust, with satisfaction emerging as a strong predictor of trust (β = 0.445; $p < 0.001$). These results indicate that improvements in nutritional services do not automatically translate into institutional trust; instead, they must first generate positive satisfaction experiences as a psychological intermediary mechanism. This pattern is consistent with recent findings that satisfaction plays a pivotal role in translating service quality into sustained trust across various contexts (El-Sokkary et al., 2021; Zhang et al., 2022).

The observed mediation pattern aligns with and provides empirical support for Oliver's Expectation Confirmation Theory (ECT), which offers a comprehensive framework for understanding satisfaction formation and its consequences in service contexts (Schiebler et al., 2025). ECT proposes a sequential cognitive-affective process: (1) consumers form pre-consumption expectations about service performance based on prior experiences, word-of-mouth, or institutional reputation; (2) they experience actual service performance (e.g., menu quality, foodservice delivery); (3) they engage in a comparison process between expectations and perceived performance, resulting in either confirmation (performance meets expectations), positive disconfirmation (performance exceeds expectations), or negative disconfirmation (performance falls short); (4) this comparison generates an affective response—satisfaction when expectations are met or exceeded, dissatisfaction when unmet; and (5) satisfaction, in turn, influences post-consumption attitudes and behaviors, including trust, loyalty, and behavioral intentions (Zhang et al., 2022; Shukla et al., 2025).

In the hospital foodservice context, ECT explains why satisfaction serves as a necessary mediator between service quality and trust: menu and foodservice quality represent objective performance attributes that patients directly experience, but these attributes influence trust only after being cognitively processed and affectively evaluated through the satisfaction mechanism. Specifically, when menu quality (taste, aroma, appearance) and foodservice quality (staff courtesy, timeliness) meet or exceed patients' expectations for hospital food, which are often modest given the

institutional setting, positive disconfirmation occurs, generating satisfaction. This satisfaction, as an affective state reflecting fulfilled or exceeded expectations, consolidates into cognitive trust, a belief that the hospital is reliable, competent, and patient-centered in its nutrition services (Al-Hilou & Suifan, 2023). Conversely, when service quality fails to meet expectations (negative disconfirmation), dissatisfaction erodes the foundation for trust formation, even if objective quality indicators are adequate by external standards.

The partial (rather than full) mediation observed in this study further refines ECT's application: while satisfaction is a critical pathway (indirect effects: β = 0.198 and β = 0.117), the direct effects of menu quality (β = 0.280) and foodservice quality (β = 0.194) on trust remain significant. This suggests that in healthcare settings, some dimensions of service quality may bypass the expectation-confirmation mechanism and directly signal institutional competence and reliability, particularly tangible attributes such as food safety and preparation hygiene, which serve as trust cues independent of subjective satisfaction. Thus, trust formation in hospital foodservice operates through dual pathways: an affective-cognitive route (quality to satisfaction to trust) consistent with ECT and a direct cognitive route (quality to trust) reflecting immediate inference from observable service attributes (Nguyen et al., 2021).

To operationalize these theoretical insights, hospitals should implement expectation management and satisfaction monitoring strategies across the patient journey: (1) expectation calibration: establishing a Patient Experience Committee to systematically integrate satisfaction feedback into menu and service design, ensuring that foodservice standards are transparently communicated to align patient expectations with achievable performance levels; (2) real-time disconfirmation detection: designing continuous quality improvement cycles through digital patient feedback systems (e.g., bedside tablets, mobile apps) to monitor expectation-performance gaps in real time, enabling early detection of negative disconfirmation patterns and rapid corrective action before dissatisfaction solidifies; and (3) service recovery protocols: developing structured service recovery programs that address expectation-performance discrepancies through timely apologies, meal replacements, or personalized accommodations, thereby converting negative disconfirmation experiences into opportunities to exceed expectations and restore trust. These interventions recognize that satisfaction is not merely an outcome to be measured but a dynamic psychological process that mediates the translation of operational quality improvements into enduring institutional trust.

Overall, this cross-sectional study demonstrated that menu quality and foodservice quality were positively associated with patient satisfaction and trust in hospital nutrition services. Patient satisfaction partially mediated the relationship between nutrition service quality and patient trust, suggesting that the relationship operates through both direct and satisfaction-mediated pathways. The relatively stronger association of menu quality (β = 0.446 to satisfaction; β = 0.280 to trust) compared to foodservice quality (β = 0.263 to satisfaction; β = 0.194 to trust) suggests that tangible food attributes may be particularly salient in shaping patient perceptions in hospital nutrition contexts. These findings contribute to the theoretical understanding of service quality-satisfaction-trust relationships in healthcare settings and suggest that menu and foodservice quality warrant continued attention in hospital quality improvement initiatives. However, the cross-sectional design precludes definitive causal inference, and future longitudinal or experimental research is needed to establish temporal precedence and test specific intervention strategies to enhance patient satisfaction and trust through nutrition service improvements.

This study has several limitations. First, the cross-sectional design precludes causal inference, requiring longitudinal or experimental studies to establish temporal relationships between variables. Second, self-reported measures may introduce common method bias and social desirability bias, despite acceptable Harman's test results (38.2% < 50%). Third, purposive sampling from a single hospital (RSUD Kanjuruhan, Malang) limits the generalizability to other settings and patient populations. Fourth, the sample comprised exclusively Class III inpatients, whose perceptions may differ from those of higher care classes. Fifth, unmeasured confounders (e.g.,

clinical diagnosis, disease severity, length of stay) were not controlled for. Despite these limitations, this study provides valuable evidence of the relationships among menu quality, foodservice quality, patient satisfaction, and patient trust in hospital nutrition services.

Conclusion

This study demonstrates that menu quality and foodservice quality are positively associated with patient satisfaction and trust in hospital nutrition services, with satisfaction serving as a partial mediator. These findings contribute to the understanding of the service quality-satisfaction-trust relationships in healthcare nutrition contexts. However, the cross-sectional design, self-reported measures, purposive sampling from a single hospital, and focus on Class III patients limit the causal inference and generalizability of the findings.

Future research should employ longitudinal or experimental designs across diverse hospital settings, incorporate objective quality measures, and test specific intervention strategies through randomized controlled trials to provide actionable evidence for enhancing patient satisfaction and institutional trust through improvements in nutrition services

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